Economics of Developing Countries



Tiago N. Caldeira

NOVA

ECONOMICS OF DEVELOPING COUNTRIES

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TIAGO N. CALDEIRA
EDITOR

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PREFACE

There are many economic issues especially relevant to developing countries and the third world such as international aid, globalization, free trade, and labor issues. In fact, the mix of them and other economic issues and conflicts over priorities and the urgency to transit to a Developed Country present an often overwhelming array of dilemmas. This new book presents new research on some of these issues.

The Short Communication investigates the sources of fluctuations in real effective exchange rates in six sub-Saharan African countries, i.e., Burundi, Ghana, Lesotho, Malawi, Nigeria, and South Africa. We constructed a structural vector autoregression (SVAR) model to analyze the sources that have driven the fluctuations in real effective exchange rates since the early 1990s. Though much of the existing literature relies on bilateral exchange rates, this paper uses the effective exchange rate of each country. The effective exchange rate reflects a country's international competitiveness. An analysis of the sources behind fluctuations in the real effective exchange rate can therefore help us understand the international competitiveness of a country in greater depth. To the best of our knowledge, this study is the first to use this approach for the analysis of exchange rate fluctuations in sub-Saharan Africa. Our empirical results show that real shocks play a dominant role in driving real exchange rate fluctuations. This suggests that a flexible exchange rate may be preferable as the exchange rate regime in the countries studied.

The aim of Chapter 1 is to give a broad overview of the main issues faced by developing countries in a context of trade liberalization as part of the multilateral agricultural trade negotiations in the WTO Doha Round. The bargaining positions of developing countries in the Doha Round are described. A comparison of empirical results on possible outcomes of a Doha Round agreement follows with a focus on impacts in terms of poverty reduction. Results are then analysed using the main theoretical findings on trade-poverty links and the specific role of preference erosion in order to shed some light on potential failures of a trade reform in the absence of complementary policy actions.

Chapter 2 reviews the theoretical and empirical evidence on the relationship between financial liberalization and socio-political risk by identifying the inter-dependent nature of socio-political and economic fault lines. In particular, the research examines the dynamic relationship between the volatility of short-term capital flows and socio-political instability. Accordingly, the socio-political risk is argued to be endogenously determined with the volatility of short term capital inflows such that increasing volatility by disrupting market activities, domestic investment and growth increases socio-political risk, which further feeds

into the volatility of such flows. Using evidence from three major developing countries that are Argentina, Mexico and Turkey and applying Granger causality tests and Impulse Response Functions, the paper finds support for the presence of an endogenous relationship between the volatility of short-term capital inflows and socio-political instability. The results challenge the previous research regarding the use of political risk as a purely exogenous variable.

Chapter 3 empirically investigates the importance of administrative quality as one of the key dimensions of governance institutions on structural reforms and capital formation in developing countries between 1985 and 2004. The empirical results show that administrative quality has considerable effects on structural reforms. Furthermore, structural reforms and administrative quality have an effect on both on the aggregate and private investment decisions. Empirical estimation especially reveals the positive effects of administrative quality on capital accumulation both directly and indirectly through enhancing the structural reforms. Our estimations also stress the importance of human capital again both on structural reforms and capital accumulation. Even after controlling for structural reforms, human capital and GNP per capita, macroeconomic indicators like neoclassical accelerator model and real interest rate are still crucial for the capital accumulation decision. However, as compare advances in these macroeconomic indicators, the improvements in administrative quality, structural reforms and human capital yield much higher returns in developing countries.

In Chapter 4, our panel data analysis (1988-2002) of a sample of 31 less developed countries shows that the stock market capitalization as a percentage of GDP- an important indicator of stock market development- has no relationship with the growth rates of gross fixed capital formation. Our time series analysis (1976-2005) of 15 countries shows that in at least 10 cases we observe no positive long-run relationship between the stock market turnover ratio and the growth of capital accumulation. Interestingly the countries experiencing the developmental function of stock market are by and large civil law origin countries with alleged poor shareholder protection.

In the first section of Chapter 5, having identified the main clusters of food insecure households worldwide and their prevailing livelihood profiles, we discuss the interaction and relevance of key economic and social factors affecting child health in developing countries. Using the World Bank WDI database, we carry out a cross-country econometric analysis on the impact of income and non-income factors on child health in developing countries. Our main findings are threefold. First, among income factors, each country’s overall level of economic development is paramount, but income distribution also plays an important role. Second, each country's relative propensity to spend on basic services is significantly and negatively correlated with child malnutrition and mortality. Third, women’s level of education and relative status play an important role. In the second section, on the basis of this general framework of interpretation of child health and human development outcomes in the developing world, we focus specifically on the performance of China and Vietnam in reducing under-five child malnutrition and mortality. Under the market socialist model, both countries achieved very high rates of GDP growth, and managed to decrease significantly the prevalence of malnutrition. However, China’s progress in reducing child mortality was relatively slow in the 1980s and 1990s, before improving in the early 2000s. Vietnam’s record was markedly better, notwithstanding the fact that Vietnam is still much poorer than its giant Northern neighbour. We show that this apparent paradox is due mainly to the negative side-effects of market-oriented reforms, which have reached a more advanced stage in China than

in Vietnam. Our results also suggest that the relatively better status of women in Vietnam with respect to China is an additional factor. This phenomenon appears to have been exacerbated by the perverse effects of China's rigid population control policies, and by the increasingly, uncontrolled and quasi-privatized availability of advanced medical services. In the policy conclusions, we criticize the market-oriented bias of social sectors reforms, and advocate in favour of recovering some essential features of the original socialist approach, which had been particularly effective in the crucial task of providing universally accessible basic public services.

Chapter 6 deals with knowledge solely as an economic resource and a commodity, it deals with knowledge of the material and that part that can be used for economic progress, that part of knowledge that is a commodity, and the beginning of the chapter very clearly defines this concept. This chapter deals with key components of the knowledge theory in regards to more specifically the need of understanding for the less developed countries. The paper begins with why in terms of knowledge economics that developed countries are said to be behind, this leads to the discussion of the concept of time. Time is analyzed both as an independent variable as well as a dependent variable. Having analyzed the variable time, we need definitive prove of why less developed countries have less knowledge, this is done using the concept of point X and point U developed in the paper "Point X and the Economics of Knowledge.", written by the author. The paper then leads on to discuss the issue of systems potential and asks the questions why systems potential in less developed countries are lower than the more industrialized societies. Finally the paper asks and answers the question what needs to be done in terms of knowledge for less developed countries to improve themselves and contribute more effectively to humanity, this needs a look at using the knowledge that is available to the best use, maximizing knowledge and reducing the opportunity costs of decisions.

The purpose of Chapter 7 is to examine development experiences and to revise the growth paradigm from the beginning of the nineteenth century. The characteristics of the economic development vary with respect to time and factors which determine the growth process from one country to another. There is not one growth and/or development recipe. Phsical and human capital, technological innovations and the structure of the population were common pillars for growth. Although, the importance of these factors, they are not enough to reveal the development process. Specialization, income distribution, the role of the goverment, foreign capital, borrowing ability, external trade and dependency, regional characteristics, political stability and/or instability, education and genetical factors are also have serious effects on the development process. In this study, we propose that all these factors must be investigated altogether.

Studies in the framework of Beta-convergence, conditionally beta-convergence and sigma convergence shows the differences in income levels among the developed countries decreased, but between the developed countries and developing countries increased. There was an absolute poverty trap, for example Zambia, Mozambic, Chad and Afghanistan became relatively poor in the twentieth century than before.

In this study, beside these points OECD countries, European Union, transition economies, Asian countries, Afrique countries and Middle-east countries will be analysed. We hope to find answers of some questions, such as why Turkey, Brazil, Mexico and Argentina left behind in the development proccess, why former SSCB countries failed in transition countries.Why as an owner of petroleum Iran and Irak were lag behind in the

Middle-east countries. Why there was a poverty trap among Afrique countries. the ownership of natural resources can explain the highness of Per Capita Income in Saudi Arabie, Quatar, Kuveyt, United Arab Emirates, but can not explain the lowness of Per Capita Income of Iran, Iraq, Azerbajcan and North African Countries. The USA and Mexico are the examples of contradictions. Having human capital is important for development, but it is not adequate to reveal the whole process. A % 100 education level of SSCB is not enough to increase growth performance. While transition countries in Europe has faster growth rates than Russia.Why the growth rates differ regionally, and it was unequal. Could growth theories explain these differences. For examining these questions, Panel unit and panel cointegration methods will be used.

The 1997 financial crisis in Indonesia changed dramatically the destiny of the country. Before crisis, Indonesia was a prosperous country with a very promising future. But crisis changed this good direction. Unfortunately, until nowadays there is no consensus about the main sources of the crisis. After ten years of Asian crisis, it is still unclear what are really the roots of crisis; whether internal fundamental economic system rather than global financial system has to be responsible to this turbulence; whether the macro factors rather than micro factors propagate the mechanism; whether it is liquidity problem rather than solvability problem of the economy; whether corruption and political governmental system is responsible, and so on. It is in the above context that this paper seeks to the explanation of the evolution of Indonesia economic system.

The aim of Chapter 8 is to contribute to the lively debate by two steps of analysis. Firstly, it shows the sequence of events of the Indonesia's economy starting from financial liberalization in the 1980s until recently, in order to understand the relationship between financial globalisation, national deregulation and institutional development in Indonesia. It emphasises the evidence that following a financial liberalisation, huge foreign capital was circulating in such a situation in which supervision and regulation were not well-established. As a consequence, risk taking behaviour and self-fulfilling responses emerged when shocks originating from external source were entering in the country. It is probably the "main story" (mechanism) of the 1997 financial crisis in Indonesia. Secondly, the paper argues that financing policies of the firms are central in propagating financial crisis. The perspective of "Balance Sheet Effect" is preferably considered for better understanding of the corporate borrowing behavior in the relation with macro economic fluctuation. The accounting data covers the period 1994-2004 and includes all non-financial sectors but excludes the financial sector, since the debt structure of banks and investment institutions is not comparable to that in other sectors. Macro indicators are taken from International Finance Statistic (IFS) provided by International Monetary Fund (IMF). By this data, we investigate the relationship between the financing choice of the firms and their vulnerability in the mid of macro economic fluctuation. In other sense, this paper takes into account the impact of macroeconomic fluctuation on firm performance where capital structure choices might play a pivotal role in the mechanism.

Chapetr 9 serves as an *ex ante* measure of the impact on Ivoirian household income that would result from any of four possible long-run cotton policy outcomes. Central among these are the discontinuation of U.S. cotton subsidies, as well as the liberalization of the heavily regulated Ivoirian cotton market. Because cotton-growing households are most prevalent in the 40th-90th percentiles of the income distribution and because every policy change considered here results in a higher Ivoirian farm gate price of cotton, the first round effect in

each of the simulations is a slightly more unequal distribution of household income. The impact on aggregate household income is more significant—over 5 percent under the most generous assumptions—but still insufficient to have much influence on measures of poverty.

Chapter 10 argues that current funding campaigns to fight AIDS in developing countries fail to recognize significant losses associated with the introduction of innovative treatment technologies. For instance, the future albeit uncertain appearance and widespread use of a therapeutic vaccine will trigger significant and unrecoverable losses in current drugs treatment investments. Our objective is then two-fold. We first document losses associated with the transition to better treatment technologies and we show that failure to hedge against such losses leads to sub-optimal policies. Our second objective is to provide policy recommendations to alleviate this problem. We show how to transform some cutting-hedge financial products to generate full insurance coverage against such losses, and in some cases how to achieve full risk-sharing with agencies developing innovative treatments. We recommend that every funding campaign in current AIDS treatments be accompanied with the provision of such insurance against the cost of switching to future albeit uncertain innovative treatments.

Transformation of East Asian countries from imitation to reaching the frontier areas of innovations in a short span of time is a question that has been explored in this paper. Asian continent has emerged as the hub of innovative activities in the fast pace of globalization. Within Asian continent, there are wide differentials in the stage of economic development and transformation as well as in the national innovation systems. Two distinct patterns of economic transformation and systems of innovations which have evolved over time are-one, based on building strong industrial sector as an engine of innovations and growth; two, the engine of growth is the service sector and innovation system is heavily dependent on foreign capital and technology. Public innovation policies played active role in the process of evolving distinct national innovation systems of Asian type. Chapter 11, while drawing lessons from public innovation policy of the successful innovators of East Asian countries, brings out the need for public innovation policies to develop industrial sector rather than prematurely move towards service sector oriented economic growth.

Chapter 12 develops a multi-region model that captures the role of communications networks in enhancing interregional trade in intermediate business services. A link between the adoption of communications networks and improved regional performance is explored. The paper also examines the relationship between interregional trade in business services and international trade in goods.

In an environment of intense global competition the importance of information in the process of location choice increases sharply. This is due to location cost differences – that either stem from local regulation or natural location factors – which may contribute in a decisive manner to total costs of production. Particularly such investors who consider locations in developing countries need authentic and credible information about a site’s productivity. Trying to influence an investor’s location choice, developing countries use instruments of location marketing including fiscal incentive policies. These activities aim not only to draw investor’s attention to the mere existence of a region but may even contain credible information about the productivity of the respective location factors. Chapter 13 attempts a comparison between means of marketing policy on product markets and instruments of business location marketing, which current research up to now failed to attempt. We present a study of analogies and illustrate it by using the figure of a location

market on which location-seeking mobile factors and location-offering jurisdictions exchange services to the benefit of both. From the observation that location demanders cannot achieve complete knowledge about the quality of the location we deduce the existence of information asymmetries to the location demanders' disadvantage. We point out the exceptional usefulness of signalling strategies for developing country locations in this context. A simple model serves as an answer to the question in how far introductory offers such as upfront subsidies or tax holidays, advertisement and the instrument of lighthouse policy, having acquired some fame in Eastern Germany after the fall of the iron curtain, are suited to alleviate the location demanders' informational disadvantages and to allow the risk connected with deciding for a location to become more calculable.

Western media have used the term 'swing to the left' to describe tendencies towards nationalisation and increasing state control in Latin American countries such as Bolivia and Brazil. Using the energy sector in Bolivia and the commercial real estate market in Brazil as case studies, Chapter 14 shows how investors react to radical changes in economic policy, political uncertainty and market opaqueness. The example of Bolivia makes clear that resource richness can exert direct influence on a country's political and socio-economic stability. The example of Brazil provides a broader perspective on the significance of global buzz. Impressions, rumours and moods influence and guide current thinking on political developments and along with this, ideas on "right" or "wrong" investment locations.

In Chapter 15, the question of differential welfare impacts, across interest groups post democratic reform in a developing country, is explored. There is data evidence that welfare has improved post democracy in Nigeria. However, the distribution or concentration of the benefits of democracy in subgroups of the population is unknown. I break down the population into interest groups along the lines of sector, region, age cohort and education. The analysis shows these groups all benefitted from reforms post democracy but the magnitude differed significantly. I find that individuals with tertiary education are the big winners post democratic reform in Nigeria. Part of the high benefit of democratic reform on those with tertiary education is explainable from policy choices and reform. However, a part of it is linked with general equilibrium effects of a movement to democracy.

In Chapter 16 we investigate the effect of the level and continuity of democratization on growth of developing countries by estimating growth equations based on panel and cross-section data with economic and socio-economic variables. We provide three main sets of results. Firstly, we conduct panel data analysis that chiefly tries to answer whether the level of democratization has a statistically significant effect on growth for developing countries. This set of results adds to the literature on the growth and economic freedom literature as well as providing evidence for the link between political freedom and economic growth. This is complemented by a cross-section analysis that aims to answer if the set backs in the democratization process has a statistically significant effect on growth of countries. Thirdly, we also ask whether there is convergence in the level of democratization. Our finding of no convergence in democracy is troubling, however, our analysis indicates that stability of democracy might be more important than the level of democratization.

SHORT COMMUNICATION

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STRUCTURAL VAR APPROACH TO THE SOURCES OF EXCHANGE RATE FLUCTUATIONS IN SUB-SAHARAN AFRICAN COUNTRIES

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Abstract

This paper investigates the sources of fluctuations in real effective exchange rates in six sub-Saharan African countries, i.e., Burundi, Ghana, Lesotho, Malawi, Nigeria, and South Africa. We constructed a structural vector autoregression (SVAR) model to analyze the sources that have driven the fluctuations in real effective exchange rates since the early 1990s. Though much of the existing literature relies on bilateral exchange rates, this paper uses the effective exchange rate of each country. The effective exchange rate reflects a country's international competitiveness. An analysis of the sources behind fluctuations in the real effective exchange rate can therefore help us understand the international competitiveness of a country in greater depth. To the best of our knowledge, this study is the first to use this approach for the analysis of exchange rate fluctuations in sub-Saharan Africa. Our empirical results show that real shocks play a dominant role in driving real exchange rate fluctuations. This suggests that a flexible exchange rate may be preferable as the exchange rate regime in the countries studied.

1. Introduction

Since the pioneering research by Blanchard and Quah (1989), the structural vector autoregression (SVAR) model has been widely used in empirical research macroeconomics. Blanchard and Quah (1989) develop a bivariate VAR model in which real GNP is affected by aggregate supply shocks and aggregate demand shocks. Aggregate supply shocks

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(productivity shocks) are assumed to have permanent effects on real GNP, while aggregate demand shocks are assumed to have only temporary effects on real GNP. Blanchard and Quah (1989) identify aggregate supply shocks and aggregate demand shocks from VAR estimations with these restrictions imposed, then analyze how each type of shock affects real GNP based on impulse response and forecast error variance.

Bayoumi and Eichengreen (1992) and Lastrapes (1992) apply the SVAR model to evaluate the sources behind real and nominal exchange rate fluctuations. Bayoumi and Eichengreen (1992) analyze exchange rate fluctuations using the Blanchard and Quah (1989) approach. They distinguish between supply shocks and demand shocks by assuming that the former have permanent effects whereas the latter have no permanent effects. Their empirical results for G-7 countries indicate that the shift from the Bretton Woods system of pegged exchange rates to the post-Bretton Woods float can be explained by a modest increase in the cross-country dispersion of supply shocks.

Lastrapes (1992) carries out a similar analysis for six industrialized countries from 1973 to 1989. He identifies two types of structural disturbance, nominal shocks and real shocks, with the restriction that the former has no long-run impact on the real exchange rate. His results indicate that real shocks account for the major part of both real and nominal exchange rate fluctuations in six industrialized countries, i.e., the United States, Germany, the United Kingdom, Japan, Italy and Canada.

This type of research is further developed by Enders and Lee (1997), Dibooglu and Kutan (2001), and Chowdhury (2002). Enders and Lee (1997) decompose real and nominal exchange rate movements into the components induced by real and nominal factors over the period from 1973 to 1992. They find that nominal shocks have minor effects on the real and nominal bilateral exchange rates of the Canadian-US, Japanese-US, and German-US currencies. Dibooglu and Kutan (2001) use the SVAR model to decompose real exchange rate and price movements into those attributable to real and nominal shocks, on the assumption that nominal shocks are neutral in the long run. Using monthly data from 1990 to 1999 for Hungary and Poland, they find that real exchange rate movements in Poland are influenced mainly by nominal shocks, while those in Hungary are influenced mainly by real shocks. Chowdhury (2002) investigates sources behind the fluctuations in the real and nominal US dollar exchange rates of six emerging market economies (Chile, Colombia, Malaysia, Singapore, South Korea, and Uruguay) by decomposing the exchange rate series into stochastic components induced by real and nominal factors. His results indicate that real shocks dominate nominal shocks for the exchange rate series examined.[1]

This paper empirically analyzes the sources of real exchange rate movements of six sub-Saharan African countries, i.e., Burundi, Ghana, Lesotho, Malawi, Nigeria and South Africa. To the best of our knowledge, this study is the first to use this approach for an analysis of exchange rate fluctuations in sub-Saharan Africa. We construct a bivariate SVAR model for each country in order to assess the relative importance of real shocks and nominal shocks. The SVAR decomposition implies that (i) real shocks can be expected to influence real and nominal exchange rates in the long run, while (ii) nominal shocks cannot be expected to have a long-run impact on real exchange rates. Though much of the existing literature relies on bilateral exchange rates, this paper uses the effective exchange rate of each country.[2] The

[1] Also see Clarida and Gali (1994) and Rogers (1999).
[2] Dibooglu and Kutan (2001) also use the effective exchange rate for empirical analysis.

effective exchange rate reflects a country's international competitiveness in terms of its foreign exchange rates. The competitiveness cannot be understood by simply examining the individual exchange rates between the home country currency and the currencies of other countries. An analysis of the sources behind the fluctuation of the real effective exchange rate therefore helps us understand the international competitiveness of a country overall. Our empirical results show that real shocks play a dominant role in driving the movements of real exchange rates in the six countries studied.

2. Data

The data are taken from the *International Financial Statistics* (IFS) of the International Monetary Fund (IFM). We use the nominal effective exchange rate and real effective exchange rate of six sub-Saharan African countries, i.e., Burundi, Ghana, Lesotho, Malawi, Nigeria, and South Africa. The empirical analysis is carried out using monthly observations from January 1990 to July 2003. The log of the nominal effective exchange rate (e_t) and the log of the real effective exchange rate (re_t) are used in the empirical analysis. Figure 1 shows the movements of real and nominal exchange rates for each country.

The augmented Dickey-Fuller (ADF) tests (Dickey and Fuller, 1979) is used to test for the presence of a unit root for each variable in the univariate representations of the log of the nominal effective exchange rate and the log of the real effective exchange rate. The auxiliary regression for the unit root test is given as follows:

$$\Delta y_t = z_t{}'\delta + \alpha y_{t-1} + \sum_{i=1}^{p} \beta_i \Delta y_{t-i} + u_t \,, \tag{1}$$

where z_t are optional exogenous variables that may consist of a constant, or a constant and a time trend; $\delta, \alpha, \beta_i \, (i = 1, 2, \cdots, p)$ are unknown parameters to be estimated; and u_t is assumed to be white noise.

The null and alternative hypotheses are written as,

$$\begin{aligned} H_0 &: \alpha = 0, \\ H_{A:} &: \alpha < 0. \end{aligned} \tag{2}$$

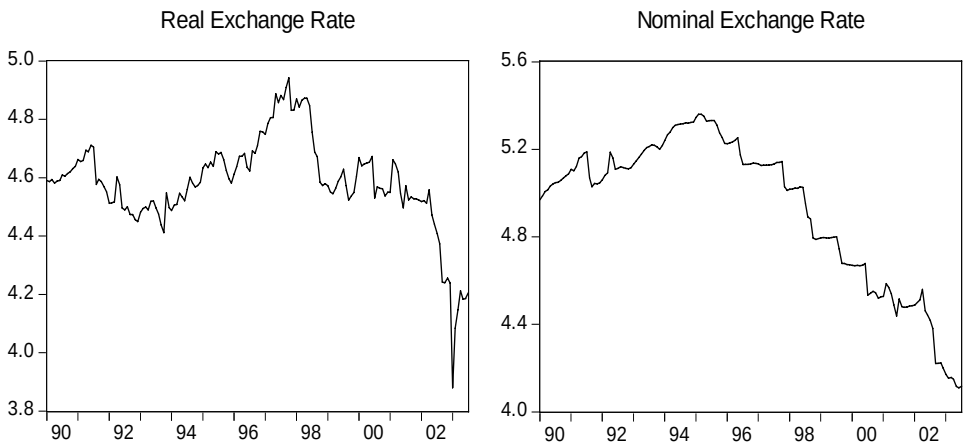
The ADF test is based on the conventional $t-$ratio for α:

$$t(\alpha) = \frac{\hat{\alpha}}{SE(\hat{\alpha})} \,, \tag{3}$$

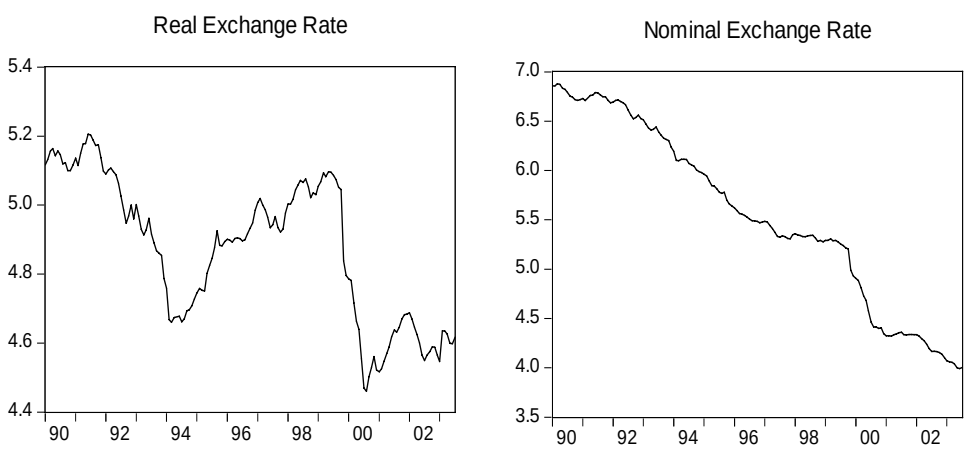
where $\hat{\alpha}$ is the estimator of α and $SE(\hat{\alpha})$ is the standard error of $\hat{\alpha}$. If the null hypothesis ($\alpha = 0$) is accepted, y_t has a unit root whose variance increases with time and approaches infinity. If the null hypothesis ($\alpha < 0$) is rejected, y_t is a (trend-) stationary series. The lag

length (p) of augmented terms in equation (1) is chosen using the Schwarz Bayesian criterion (SBIC).

As Table 1 clearly shows, the null hypothesis of a unit root is not rejected at conventional significance levels for either the real or nominal exchange rate in any of the six countries. For the first difference for each variable, the null hypothesis of a unit root is rejected at the conventional significance level in every country. These results are robust to the specification of the auxiliary regression. Thus, each e_t and re_t is found to be integrated of order one, i.e., the I(1) series.

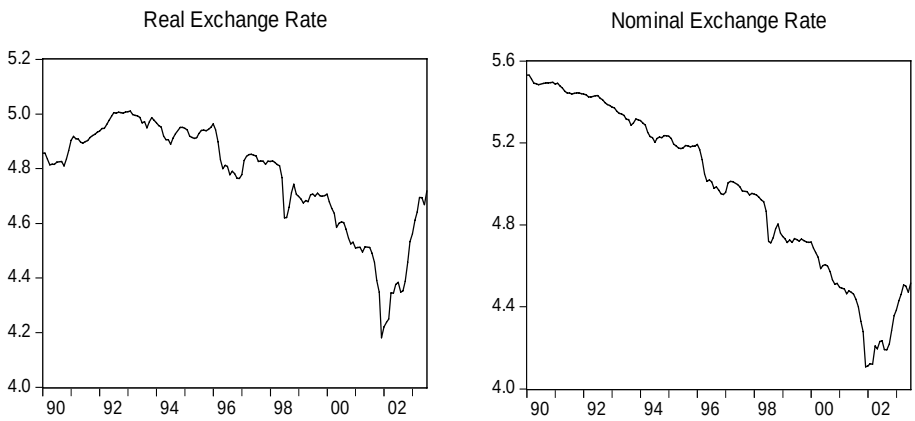


(a) Burundi



(b) Ghana

Figure 1. Continued on next page.



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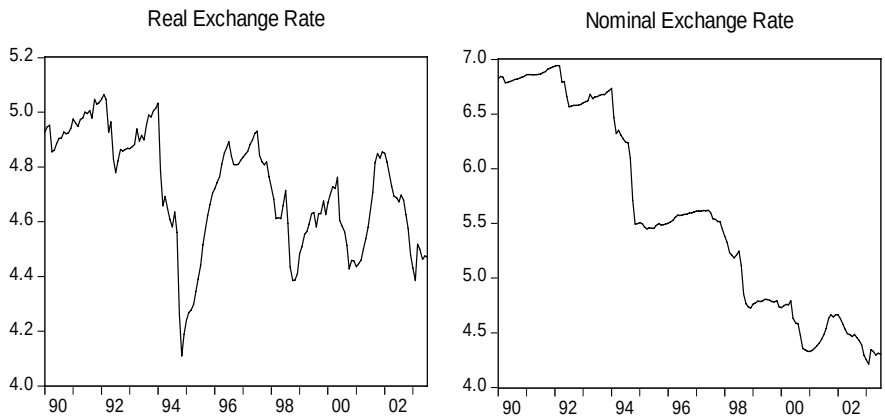
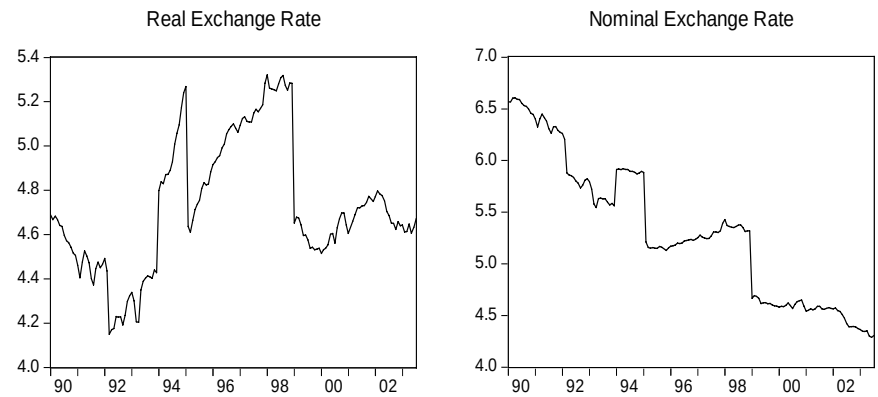
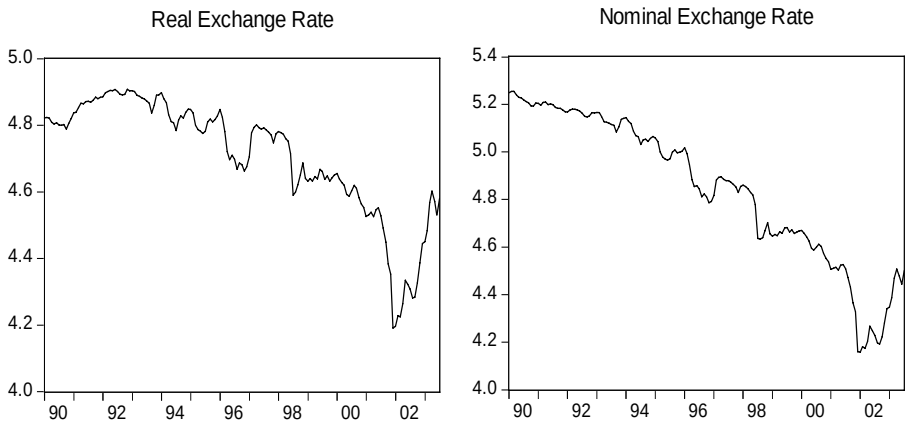


(d) Malawi



(e) Nigeria

Figure 1. Continued on next page.



(f) South Africa

Figure 1. Real Exchange Rate and Nominal Exchange Rate.

Table 1. Unit Root Tests

(a) Burundi

Variable	Specification	Test Statistic	*p*-value
re_t	Const and Trend	-1.669	0.761
	Const	-1.372	0.595
e_t	Const and Trend	-1.456	0.841
	Const	1.837	1.000
Δre_t	Const and Trend	-14.725	0.000
	Const	-14.676	0.000
Δe_t	Const and Trend	-12.322	0.000
	Const	-11.563	0.000

(b) Ghana

Variable	Specification	Test Statistic	*p*-value
re_t	Const and Trend	-1.812	0.695
	Const	-1.278	0.639
e_t	Const and Trend	-2.269	0.448
	Const	0.230	0.974
Δre_t	Const and Trend	-9.276	0.000
	Const	-9.305	0.000
Δe_t	Const and Trend	-8.639	0.000
	Const	-8.638	0.000

Table 1. Continued

(c) Lesotho

Variable	Specification	Test Statistic	*p*-value
re_t	Const and Trend	-2.545	0.307
	Const	-1.333	0.614
e_t	Const and Trend	-2.669	0.251
	Const	-0.680	0.848
Δre_t	Const and Trend	-9.210	0.000
	Const	-9.238	0.000
Δe_t	Const and Trend	-8.961	0.000
	Const	-8.993	0.000

(d) Malawi

Variable	Specification	Test Statistic	*p*-value
re_t	Const and Trend	-2.893	0.168
	Const	-2.335	0.162
e_t	Const and Trend	-2.544	0.307
	Const	-0.783	0.821
Δre_t	Const and Trend	-9.257	0.000
	Const	-9.285	0.000
Δe_t	Const and Trend	-8.181	0.000
	Const	-8.205	0.000

(e) Nigeria

Variable	Specification	Test Statistic	*p*-value
re_t	Const and Trend	-1.923	0.638
	Const	-1.861	0.350
e_t	Const and Trend	-2.785	0.205
	Const	-1.295	0.631
Δre_t	Const and Trend	-11.995	0.000
	Const	-12.032	0.000
Δe_t	Const and Trend	-12.121	0.000
	Const	-12.141	0.000

Table 1. Continued

(f) South Africa

Variable	Specification	Test Statistic	*p*-value
re_t	Const and Trend	-2.732	0.225
	Const	-1.414	0.574
e_t	Const and Trend	-2.667	0.252
	Const	-1.110	0.711
Δre_t	Const and Trend	-8.981	0.000
	Const	-9.014	0.000
Δe_t	Const and Trend	-8.767	0.000
	Const	-8.786	0.000

Note: In the "Constant and Trend" specification, the auxiliary regression includes both a constant term and time trend. In the "Constant" specification, the auxiliary regression includes a constant term only.

3. Empirical Analysis

Following Lastrapes (1992), Enders and Lee (1994), Dibooglu and Kutan (2001), and Chowdhury (2004), we use the bivariate SVAR model. Consider the following infinite-order vector moving average (VMA) representation:

$$\Delta x_t = C(L)\varepsilon_t . \tag{4}$$

Here, L is a lag operator, Δ is a difference operator, $\Delta x_t = [\Delta re_t, \Delta e_t]'$ is a (2×1) vector of endogenous variables, and $\varepsilon_t = [\varepsilon_{r,t}, \varepsilon_{n,t}]'$ is a (2×1) vector of structural shocks with covariance matrix Σ. The error terms can be interpreted as real shocks ($\varepsilon_{r,t}$) and nominal shocks ($\varepsilon_{n,t}$). We assume that the structural shocks have no contemporaneous correlation and are not autocorrelated. This implies that Σ is a diagonal matrix.

To implement the econometric methodology, we need to estimate the following finite-order VAR model:

$$[I - \Phi(L)]\Delta x_t = u_t . \tag{5}$$

Here, $\Phi(L)$ is a finite-order matrix polynomial in the lag operator and u_t is a vector of disturbances. If the stationarity condition is satisfied, we can transfer equation (5) to the VMA representation

$$\Delta x_t = A(L)u_t , \tag{6}$$

where $A(L)$ is a lag polynomial.

Equations (4) and (6) imply a linear relationship between ε_t and u_t:

$$u_t = C_0 \varepsilon_t . \tag{7}$$

Here, C_0 is a 2×2 matrix defining the contemporaneous structural relationship among two variables (u_t and ε_t) that need to be identified for the vector of structural shocks ε_t to be recovered from the estimated disturbance vector u_t. We need four parameters to convert the residuals from the estimated VAR into original shocks that drive the behavior of the endogenous variables. Of these four parameters, only three are given by the elements of $\Sigma = C_0 C_0'$. We therefore need another identifying restriction to obtain the fourth. Blanchard and Quah (1989) propose the use of economic theory to impose these restrictions. An additional restriction is imposed on the long-run multipliers, while the short-run dynamics are freely determined. The restriction is written as follows:

Assumption: Nominal (monetary) shocks do not have a long-run impact on the real exchange rate.

The long-run representation of equation (4) can be written as follows,

$$\begin{bmatrix} \Delta r_t \\ \Delta e_t \end{bmatrix} = \begin{bmatrix} C_{11}(1) & C_{12}(1) \\ C_{21}(1) & C_{22}(1) \end{bmatrix} \begin{bmatrix} \varepsilon_{r,t} \\ \varepsilon_{n,t} \end{bmatrix} \tag{8}$$

Here, $C(1) = C_0 + C_1 + C_2 + \cdots$ are long-run multipliers of the SVAR (long-run effect of ε_t on Δx_t). The long-run multiplier C_{12} is assumed to be equal to zero, which makes the matrix $C(1)$ lower triangular.

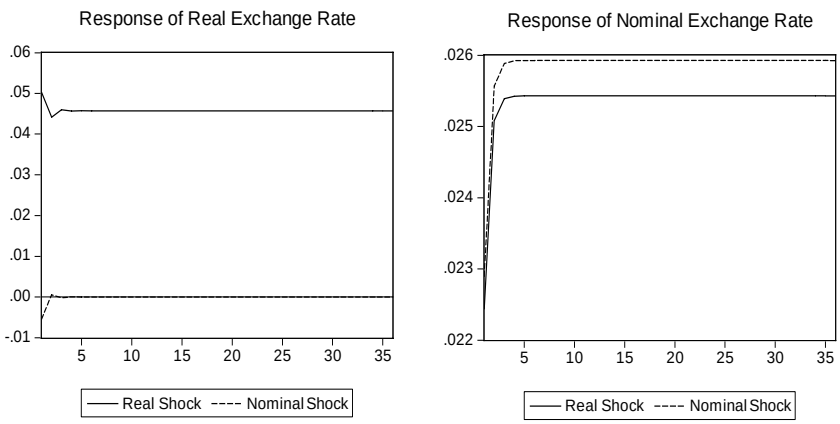
4. Empirical Results

The Akaike Information Criterion (AIC) is used to choose the optimal lag length of VAR in the empirical analysis. VAR(1) was found to be appropriate for Burundi; VAR(2), for Ghana, Malawi, Nigeria, and South Africa; and VAR(5), for Lesotho.

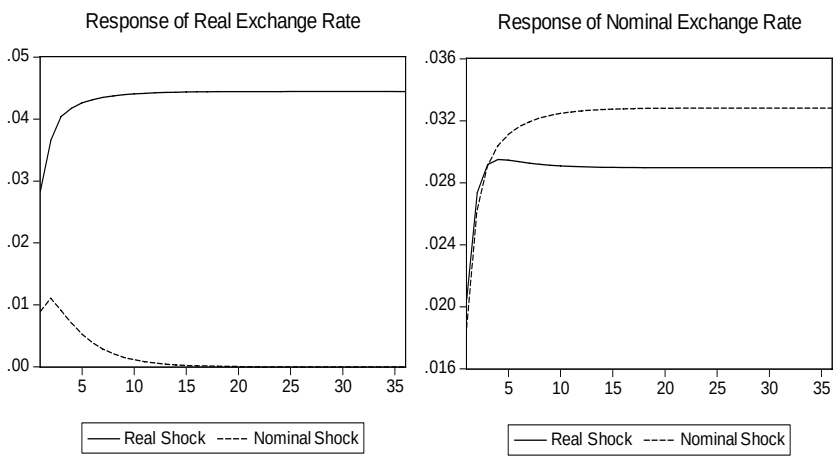
Figure 2 illustrates the impulse response functions of the real and nominal exchange rates to one standard deviation in each of the structural shocks over a horizon from 1 to 36 months. As the figure clearly shows, real shocks lead to permanent increases in the real exchange rate. Nominal shocks have smaller effects and leave the long-run real exchange rate unaffected, as imposed by long-run restrictions. The impact of a nominal shock on the real exchange rate fully disappears within about a year, suggesting that nominal rigidities in these countries are only temporary. Figure 2 also demonstrates that a real shock leads to a persistent increase in the nominal exchange rate. A nominal shock is associated with a permanent increase in the nominal exchange rate. Enders and Lee (1997) find that a real shock induces a jump in the real and nominal rates of nearly the same magnitude. Our results are consistent with the results for most cases.

Next, we use forecast error variance decompositions to shed light on the sources behind real exchange rate fluctuations. Impulse responses are useful for assessing the signs and magnitudes of responses to specific shocks by revealing the dynamic effects. Variance decomposition, meanwhile, serves well in measuring the relative importance of shocks to the system. Table 2 shows the percentages of forecast error variance attributable to real and to nominal shocks in the model for each variable.

Real shocks account for 97.445 percent, 89.888 percent, 99.120 percent, 98.888 percent, 98.730 percent, and 93.042 percent of the variance in the real exchange rate of Burundi, Ghana, Lesotho, Malawi, Nigeria, and South Africa, respectively. Nominal shocks account for 2.555 percent, 10.112 percent, 0.880 percent, 1.112 percent, 1.270 percent, and 6.958 percent of the variance in the real exchange rate of Burundi, Ghana, Lesotho, Malawi, Nigeria and South Africa, respectively. These results imply that real shocks explain a substantial amount of the variance in the real exchange rate of each country. Other existing evidence also generally suggests that real shocks are important in explaining real exchange rate movements (Lastrapes, 1992; Enders and Lee, 1997; Dibooglu and Kutan, 2001; and Chowdhury, 2004).

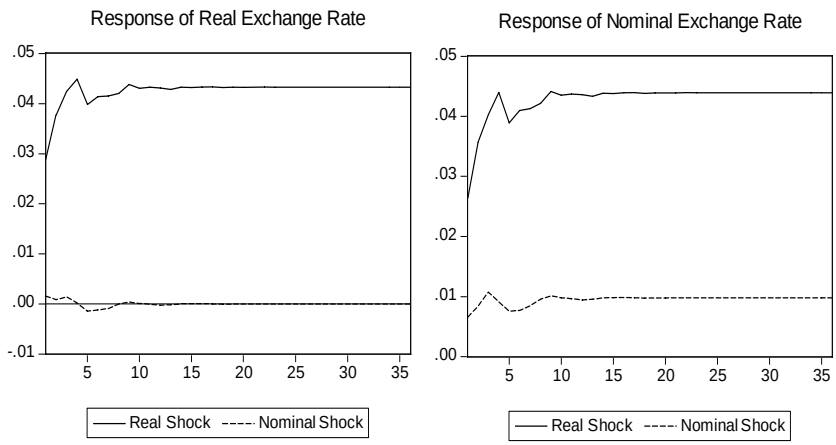


(a) Burundi

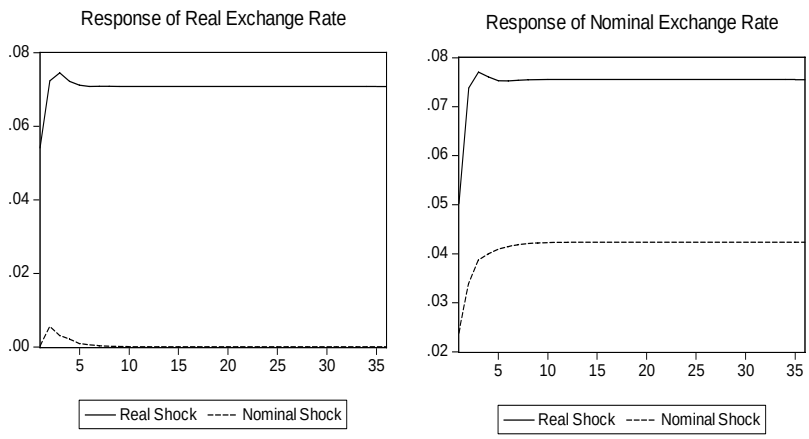


(b) Ghana

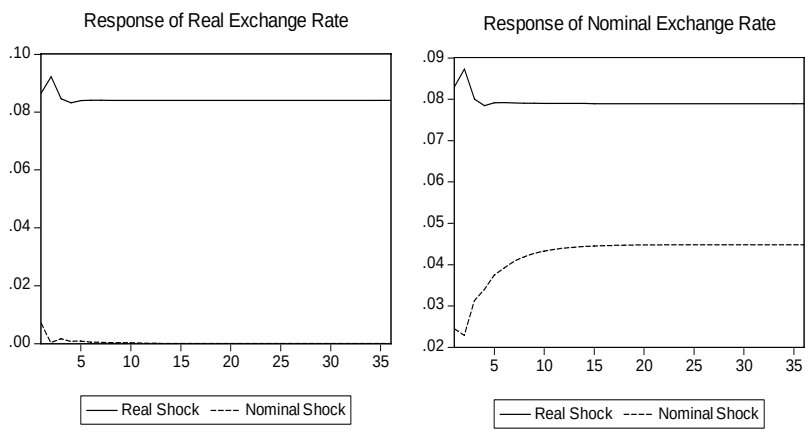
Figure 1. Continued on next page.



(c) Lesotho

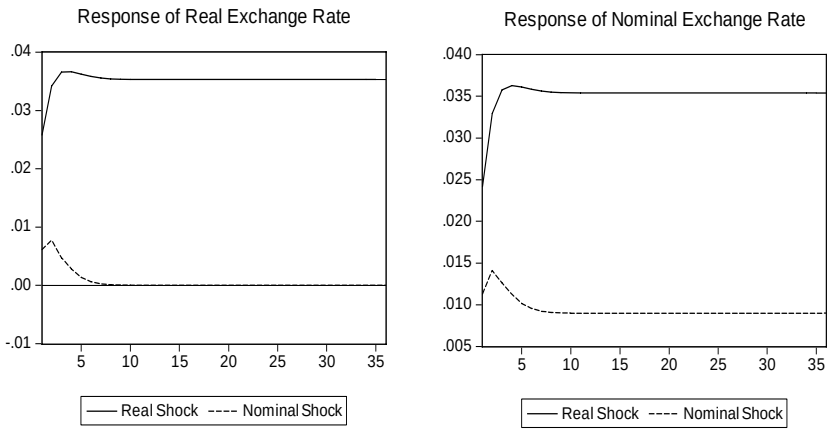


(d) Malawi



(e) Nigeria

Figure 2. Continued on next page.



(f) South Africa

Figure 3. Accumulated Impulse Responses.

Table 2. Forecast Error Variance Decomposition

(a) Burundi: VAR(1)

	Real Exchange Rate		Nominal Exchange Rate	
Horizon	**Real Shock**	**Nominal Shock**	**Real Shock**	**Nominal Shock**
1 month	98.819	1.182	48.996	51.004
3 months	97.447	2.553	49.001	50.999
6 months	97.445	2.555	49.001	50.999
9 months	97.445	2.555	49.001	50.999
12 months	97.445	2.555	49.001	50.999
18 months	97.445	2.555	49.001	50.999
24 months	97.445	2.555	49.001	50.999
36 months	97.445	2.555	49.001	50.999

(b) Ghana: VAR(2)

	Real Exchange Rate		Nominal Exchange Rate	
Horizon	**Real Shock**	**Nominal Shock**	**Real Shock**	**Nominal Shock**
1 month	90.981	9.019	54.607	45.393
3 months	90.926	9.074	53.160	46.840
6 months	90.096	9.904	53.018	46.982
9 months	89.921	10.079	53.007	46.993
12 months	89.893	10.107	53.006	46.994
18 months	89.888	10.112	53.005	46.995
24 months	89.888	10.112	53.005	46.995
36 months	89.888	10.112	53.005	46.995

Table 2. Continued

(c) Lesotho: VAR(5)

	Real Exchange Rate		Nominal Exchange Rate	
Horizon	**Real Shock**	**Nominal Shock**	**Real Shock**	**Nominal Shock**
1 month	99.717	0.283	94.134	5.866
3 months	99.662	0.338	93.911	6.089
6 months	99.241	0.759	93.676	6.324
9 months	99.136	0.864	93.496	6.504
12 months	99.124	0.876	93.481	6.519
18 months	99.120	0.880	93.477	6.523
24 months	99.120	0.880	93.477	6.523
36 months	99.120	0.880	93.477	6.523

(d) Malawi: VAR(2)

	Real Exchange Rate		Nominal Exchange Rate	
Horizon	**Real Shock**	**Nominal Shock**	**Real Shock**	**Nominal Shock**
1 month	99.998	0.002	81.670	18.330
3 months	98.963	1.037	81.716	18.284
6 months	98.891	1.109	81.663	18.337
9 months	98.888	1.112	81.658	18.342
12 months	98.888	1.112	81.658	18.342
18 months	98.888	1.112	81.658	18.342
24 months	98.888	1.112	81.658	18.342
36 months	98.888	1.112	81.658	18.342

(e) Nigeria: VAR(2)

	Real Exchange Rate		Nominal Exchange Rate	
Horizon	**Real Shock**	**Nominal Shock**	**Real Shock**	**Nominal Shock**
1 month	99.343	0.657	92.080	7.920
3 months	98.743	1.257	91.282	8.718
6 months	98.731	1.269	91.016	8.984
9 months	98.730	1.270	90.964	9.036
12 months	98.730	1.270	90.957	9.043
18 months	98.730	1.270	90.956	9.044
24 months	98.730	1.270	90.956	9.044
36 months	98.730	1.270	90.956	9.044

Table 2. Continued

(f) South Africa: VAR(2)

	Real Exchange Rate		Nominal Exchange Rate	
Horizon	**Real Shock**	**Nominal Shock**	**Real Shock**	**Nominal Shock**
1 month	94.688	5.312	82.103	17.897
3 months	93.797	6.203	82.948	17.052
6 months	93.061	6.939	82.599	17.401
9 months	93.042	6.958	82.587	17.413
12 months	93.042	6.958	82.587	17.413
18 months	93.042	6.958	82.587	17.413
24 months	93.042	6.958	82.587	17.413
36 months	93.042	6.958	82.587	17.413

Real shocks account for 49.001 percent, 53.005 percent, 93.477 percent, 81.658 percent, 90.956 percent, and 82.587 percent of the variance in the nominal exchange rate movements in Burundi, Ghana, Lesotho, Malawi, Nigeria, and South Africa, respectively. Nominal shocks account for 50.999 percent, 46.995 percent, 6.523 percent, 18.342 percent, 9.044 percent, and 17.413 percent of the variance in the nominal exchange rate movements in Burundi, Ghana, Lesotho, Malawi, Nigeria, and South Africa, respectively. The contribution of nominal shocks to the fluctuations of the nominal exchange rate is found to be relatively large, particularly in Burundi and Ghana. The forecast error variance decompositions for the variations in the nominal exchange rate suggest that although real shocks account for much of the movement in the nominal exchange rates of many countries, the nominal shocks also play a large role. The relative importance of nominal shocks in explaining nominal exchange rate movements is consistent with Lastrapes (1992), Enders and Lee (1997), Dibooglu and Kutan (2001), and Chowdhury (2004).

5. Conclusion

This paper investigates the sources behind the fluctuations of the real effective exchange rate in six sub-Saharan African countries, i.e., Burundi, Ghana, Lesotho, Malawi, Nigeria, and South Africa. We construct a bivariate SVAR model to analyze the sources behind the fluctuations of the real effective exchange rate and identify the dynamics and forces that have driven these fluctuations since the early 1990s. The sources underlying the movements of real effective exchange rate are crucially important to understand, given that the real effective exchange rate reflects the performance and competitiveness of an economy.

Our empirical results show that real shocks play an important role in driving the movements of real exchange rates in the six countries studied. These results for Sub-Saharan Africa are consistent with those for developed countries (Lastrapes, 1992; Enders and Lee, 1997). This suggests that a flexible exchange rate may be a preferable exchange rate regime in the sub-Saharan African countries studied.

Acknowledgments

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RESEARCH AND REVIEW STUDIES

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Chapter 1

WTO AGRICULTURE NEGOTIATIONS AND DEVELOPING COUNTRIES: AN OVERVIEW

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Abstract

The aim of this paper is to give a broad overview of the main issues faced by developing countries in a context of trade liberalization as part of the multilateral agricultural trade negotiations in the WTO Doha Round. The bargaining positions of developing countries in the Doha Round are described. A comparison of empirical results on possible outcomes of a Doha Round agreement follows with a focus on impacts in terms of poverty reduction. Results are then analysed using the main theoretical findings on trade-poverty links and the specific role of preference erosion in order to shed some light on potential failures of a trade reform in the absence of complementary policy actions.

Keywords: Agriculture, Developing Countries, Multilateral Trade Negotiations, Poverty, WTO

J.E.L.: F13; I32; Q17

1. Introduction

Impacts of trade reforms on developing countries (DCs) have become a cornerstone of the World Trade Organization (WTO) negotiations which are part of the Doha Development Agenda (DDA) launched in November 2001 at Doha. The question of rich country agricultural support and its potential impacts on rural poverty in developing countries has been one of the major concerns during the Doha Round. Poverty reduction is now widely accepted as a primary objective of the international agenda in which the Millennium

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Development Goals defined by the United Nations in the Millennium Declaration (UN, 2000) commit the international community to halve poverty by 2015 and promote a more open, rule-based trading system as an important means of reaching the Millennium Development Goals.

Historically, many WTO rules have evolved to reflect the perceived interests of developed countries in an era in which the participation of DCs was limited. As DCs have become more actively involved in the WTO, the challenge is to design rules that promote development that requires the active involvement of DCs in the whole negotiation process.

In contrast to the preceding General Agreement of Tariffs and Trade (GATT), all WTO agreements and disciplines, with few exceptions, apply to all members regardless of the level of development although, in many cases, transition periods and rules apply to DCs. A consequence of this so-called "Single Undertaking" and the expansion in the coverage of multilateral rules to new areas such as intellectual property rights and trade in services was that DCs were confronted with a significant implementation agenda as well as new policy constraints.

In practice, ensuring that the liberalization agreements promote development in DCs means prioritizing reforms which yield the largest benefits to poor countries. In order to assure a development path of this kind, governments must be helped to move towards good trade policies and deal effectively with the implementation constraints faced by DCs. Reform proposals should therefore be prioritized with a view to maximizing the welfare gains for all WTO members. The potential gains from liberalization in different areas are not homogeneous and depend on the structural economic features of each country (Charlton and Stiglitz, 2005). In particular, the welfare gains associated with agricultural liberalization are substantial for DCs if there are appropriate domestic and international complementary policies which correct the market and institutional failures characterizing most DCs. The Doha Round has actually reached a deadlock due to the contrasting positions of developing and developed countries, mainly on agriculture. More generally, although the DDA reflected the obvious fact that DCs were central to the new trade liberalization agenda, three key difficulties emerged during negotiations (Collier, 2006): i) there are currently radically different aspirations among WTO members where DCs explicitly aspire to transfers from developed countries in contrast with the reciprocal characteristic of multilateral negotiations; ii) a large group of WTO members are highly marginalized from the world economy and see themselves as having no basis for bargaining mutual advantage; iii) the necessity to negotiate over all sectors (not separately) increases the difficulties that DCs face in participating in the bargaining process.

These three aspects have exacerbated the contrasting positions of the DCs who want significant domestic trade reforms to be made by developed countries and pro-development exemptions in favor of the DCs themselves. The developed countries, on the other hand, are oriented towards fully reciprocal concessions by both groups of countries.

The aim of the paper is to analyze the DCs' negotiating positions in agricultural liberalization and try to understand which factors mainly affected the failure in the negotiation process.

The rest of the paper is organized as follows. Section 2 generally describes the terms of the debate on the role of DCs in the Doha Round with a special focus on the agricultural issues that heavily influenced the current deadlock. Section 3 gives a comparison of some empirical results on possible outcomes of the Doha Round and focuses on agriculture and

impacts in terms of poverty reduction for DCs. What strongly emerges from this comparison is that the positive effects in favor of DCs predicted by simulation exercises are inadequate compared with expectations. These results help us to understand why DCs are highly unsatisfied by achievements in the Doha Round. The main explanations for these limited welfare improvements are linked to market and institutional failures - Section 4 - and the problem of preference erosion occurring in the agricultural sector - Section 5. Section 6 offers some concluding remarks.

2. The DOHA Round and Agricultural Negotiations

The agricultural sector has been one of the most contentious issues in the multilateral trade negotiations that have been taking place since 1999 when the Ministerial Conference of the WTO was held in Seattle. Discussions on the agricultural sector determined the delay in the adoption of the DDA so that the new negotiation round for trade liberalization could be open to all WTO members. The dramatic events in the United States on September 11th were one of the major reasons for opening the Doha Round, launched by the 2001 Ministerial Declaration.

The Uruguay Round Agreement on Agriculture (URAA) took a major step forward by bringing the agricultural sector within the WTO multilateral trading rules but its success in opening up the sector to global competition was limited. Today, agriculture remains one of the most contentious issues and special efforts from developing-country bargaining coalitions have been made in order to achieve ambitious results in terms of improving market access in developed countries.

Although DCs have an interest in promoting all of the areas under negotiation, they have repeatedly made it clear that agriculture is the key issue that will determine whether or not they sign up to a deal for two main reasons. The first is because many DCs see potential opportunities once the large trade distortions in world agriculture markets are either eliminated or substantially reduced. The second is because many DCs, and particularly Least Developed Countries (LDCs), have deeply vulnerable people who depend on agriculture. There is a need to ensure that integration of the agricultural sectors of these countries into any emerging reform framework takes their interests into account. These concerns shape the offensive and defensive interests of DCs in these negotiations (Matthews, 2005a).[1]

2.1. The Role of Developing Countries in Agricultural Negotiations

During these long negotiations, the DCs have emerged as a significant political force. In particular, after the failure of the WTO Ministerial Conference in Cancun (September 2003), it was clear to industrialized countries that the hegemony of the United States and the European Union (EU) in the negotiation process had been reduced. The leading actor on the scene was the G20, a group of heterogeneous DCs including powerful members such as Brazil, China and India which obtained a great consensus from advanced and very poor DCs (Narlikar and Tussie, 2004; Panagariya, 2002a). Since the Ministerial Cancun meeting, the

[1] The requests of DCs are well reflected in one recent report published by Oxfam (2005) which affirms that for every US$100 generated by world exports today, about 97 per cent goes to high- and middle-income countries and only 3 per cent goes to low-income countries.

G20 has criticized the farm policies and agricultural tariffs in developed countries. In the last two years, 2004 and 2005, DCs have extracted some concessions from developed countries in terms of dropping out of EU export subsidies and obtaining the promise of substantial reduction of highly protective tariffs.

Another coalition coordinated by Indonesia and Philippines, the G33, was also established on the eve of the Cancun Conference. The main concerns of G33 are that issues such as food security, rural livelihoods and rural development should become an integral part of the negotiations. During the Cancun Conference, it wanted to introduce two specific instruments for DCs, one being the possibility to use an *ad hoc* category of Special Products (SPs) only in favor of DCs and the second, a Special Safeguard Mechanism (SSM) which were both embodied in the modalities of the WTO agricultural negotiations.

A further grouping was the G90 - an alliance of African, Caribbean and Pacific countries (ACP), African Union states and LDCs - with a platform that was essentially oriented towards protection from the negative impacts of trade liberalization of particularly vulnerable economies which are largely dependent on long-standing preferences for their economic development. The G90 also required a binding and meaningful Special and Differential Treatment (SDT) in favor of poor countries in all areas of the DDA and, in general, greater efficacy of aid flows and assistance for DCs.

The consolidation of developing country coalitions appeared to deepen in the last Hong Kong Ministerial Conference with the creation of a grand coalition called the G110 which grouped together G20, G33 and G90, representing 80 per cent of humanity (Oxfam, 2005). This result goes well beyond the expectations of the developing country coalitions during the Cancun meeting to remain a stable political force in the Doha Round negotiations.

The DCs and the bargaining coalitions are divided into heterogeneous groups: subsistence agriculture (much of Africa and part of South East Asia, or the G90 and G33), export agriculture (particularly Argentina and Brazil, or the G20) and those breaking out of agriculture and becoming increasingly centered on manufacturing (from a range of coalitions).

If we consider simple data, the sector's share of global GDP for DCs is around 11 per cent whereas for developed countries, it is significantly lower (Table 1). Furthermore, the annual growth rate of agricultural value added as a share of GDP for DCs over the last ten years was twice the growth rate for developed countries. Agriculture's share of global merchandise trade is almost the same for both developed and developing countries (7%) but substantially higher for Sub-Saharan Africa (13%). Furthermore, 57 per cent of total population in DCs lives in rural areas (64% for Sub-Saharan Africa) whereas figures for advanced economies are significantly lower. These divergences show two main aspects: agriculture is still an important sector for livelihood in DCs and especially LDCs and, at the same time, rural populations in DCs on average are considerably less productive and hence poorer than those employed outside agriculture (FAO, 2005a). For this reason, improving the incomes of small-scale farmers is an essential step toward achieving poverty reduction and equality in income distribution (Polaski, 2005).

For agricultural exporters, the failure to liberalize trade in agriculture and remove subsidies has been particularly costly and this may well explain the offensive position of the G20 in negotiations. Trade-distorting measures of industrialized countries displace the agricultural exports of DCs by reducing the world prices by 3.5-5 per cent for many agricultural commodities including wheat, other grains and oilseeds (Dimaranan *et al*., 2003).

Elimination of protectionism and subsidies of the industrialized world's agriculture would therefore bring high benefits for DCs' net agricultural trade.[2]

Table 1. Main Statistics for Agricultural sector, 2003 (percentage values)

	World	Developed Countries	Developing Countries	Sub-Saharan Africa
Agriculture value added relative to GDP	6.3	2.4	11.5	16.8
Agriculture value added relative to GDP (annual growth rate 1992-2003)	2.4	1.2	3.1	3.7
Rural population relative to total population	51	27	57	64
Economically active population in agriculture	43	6	53	60
Agricultural exports relative to total exports	7.1	7.0	7.4	13.7
Agricultural exports relative to agriculture value added	36.2	74.4	19.4	20.2

Source: FAO (2005a)

For this reason, many DCs claim a substantial improvement in market access by developed countries in the Doha Round and declare that most efforts in tariff reduction during the Uruguay Round were made by DCs whereas developed countries applied lower reduction rates to their own tariffs (Finger and Winters, 2005). DCs also had to take on costly commitments embodied in the Sanitary and Phytosanitary Measures (SPS) and Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreements and in the Doha Round they would contemplate the opening of their markets only if developed countries commitments for further market access were significant. One of the main requests made by the DCs is the adoption of stronger SDT provisions, considering three core areas: preferential access to developed-country markets, typically without reciprocal commitments from DCs, exemptions or deferrals from some WTO rules and technical assistance to help implement WTO mandates.

The 2001 Doha Ministerial Declaration emphasized the importance of SDT, stating that provisions for special and differential treatment were an integral part of the WTO agreements and paragraph 44 explicitly called for a review of SDT provisions with a view to "strengthening them and making them more precise, effective, and operational".[3]

2.2. Special and Differential Treatment for DCs

The intellectual foundations of SDT was laid in the Prebisch-Singer hypothesis which argued that developing-country exports were mainly concentrated in commodities with volatile and declining terms of trade (Prebisch, 1950; Singer, 1950). That theory was based on the

[2] According to Diao *et al*. (2003), protectionism and subsidies by industrialized nations cost DCs about US$24 billion annually in lost of agricultural and agro-industrial income. Trade-distorting measures also displace more than US$40 billion of net agricultural exports per year from DCs.

[3] For a very useful description of the dynamics in agriculture negotiations in the Doha Round, see Aggarwal (2005).

argument that DCs needed to foster industrial capacity to reduce import dependence and diversify the economic system, shifting factors away from the production of traditional commodities towards the industrial sector. These policies were justified by the declining terms of trade of traditional commodities in the long term, often affected by short-term price volatility. In practice, the protection of the infant industry was reached with the creation of trade barriers to reduce import flows. International specialization along the lines of static comparative advantage had excluded developing countries from the fruits of technological progress that has so enriched the industrialized world (Cuddington, 1992). At the same time, it was acknowledged that exports were important as a source of foreign exchange and that the local market might be too small for local industry to be able to capture economies of scale. Therefore, in 1968, the Generalized System of Preferences (GSP) was launched under UNCTAD auspices and called for developed countries to provide preferential access to developing-country exports on a voluntary basis.

Because GSP programs violate the GATT's Most-Favored Nation (MFN) rule, in 1979 at the conclusion of the Tokyo Round, permanent legal cover for GSP was obtained through the Decision on Differential and More Favorable Treatment, Reciprocity and Fuller Participation of Developing Countries, better known as the "Enabling Clause" which called for preferential market access for DCs and limited reciprocity in GATT negotiating rounds to levels consistent with development needs.[4]

SDT became an integral part of the URAA and was further emphasized in the DDA. Currently, SDT provisions in the WTO rules call for preferential access to developed country markets, exemptions from certain rules and promises of development assistance (Table 2).

Table 2. SDT main provisions

Category	Developing country	Developed country
Concessions in tariff schedules	Smaller tariff reductions over a longer period	Take into account erosion of preferences
	Designation of special products	Reduce tariff escalation
	Longer implementation period for elimination of export subsidies	Liberalization of tropical products markets
	Smaller cuts in domestic support over a longer period	Market access for alternative products
	Higher *de minimis* for domestic support	Increased technical assistance for trade capacity
	No reduction commitments for LDCs	Duty- and quota-free access for LDCs, where possible
Differentiation in rules	Special safeguard mechanism	Decision on low-income food-deficit countries
	Special consideration for State Trading Enterprises	Export credits
		Ad hoc temporary finance for developing country imports

Source: Josling (2005)

[4] An important feature of the Enabling Clause was that SDT was to be phased out when countries reached a certain level of development. That level was never defined, however, leaving eligibility for trade preferences to the discretion of preference-granting countries.

One of the main problems during recent negotiations is how much SDT DCs should demand. If too much is requested, the chance for a satisfactory outcome to the round is reduced. If too little, the DCs may lose opportunities for *ad hoc* measures (Josling, 2005). The political economy problem is complicated by the fact that SDT would not bring the same benefits for all DCs but the effects are well differentiated. If the actual classification of developing country members in the WTO remains unchanged, effective liberalization in the DDA would bring scarce results for DCs themselves, reducing substantially the possibility to increase South-South trade flows (Anderson and Martin, 2005; Bouet, 2006).

In order to make SDT more effective in providing real compensation to losers in the liberalization process, a greater differentiation among DCs - based not only on a self-declaration system as before but on quantitative assessment of vulnerability to trade liberalization process - could be a source of compensation for those countries which would effectively face welfare losses after the Doha Round. Nonetheless, DCs are not generally favorable to a hard differentiation and such a position can be explained in two ways: on the one hand, DCs as a single group would be more powerful in the bargaining process and, on the other, more advanced countries such as Brazil, China and India would not lose the more favorable treatment permitted to DCs (Evenett and Hoekman, 2006; FAO, 2005c; Hoekman, 2005; Kleen and Page, 2005; Matthews, 2005b).

Considering the explicit position by DCs not to concede any differentiation criteria in order to apply gradual SDT provisions on the basis of the development *status* of DCs, it is clear that the outcome of the negotiations is quite ambiguous. The question as to whether self-designation should be allowed remains on the ground whereas in recent years, the developing country *status* was not conceded to any new WTO member but only the LDC *status* was adopted. There are compelling political reasons for taking SDT provisions seriously. A degree of SDT that is satisfactory to DCs will be necessary for an agreement in the Doha Round because developing country groups such as G20, G33 and G90 are committed to meaningful SDT although DCs differ considerably on the real impact of SDT on their economic systems.

Most DCs have requested SDT with the possibility of exemption from further tariff reductions or, alternatively, a greater flexibility to set tariffs at whatever levels they deem appropriate, justifying the case using four key arguments (Matthews, 2005a):

- The case for *development tariffs* where high tariffs are necessary to provide adequate incentives for producers in DCs in order to encourage agricultural growth with its accompanying poverty alleviation and multiplier effects;
- The case for *food security tariffs* where levels of food self-sufficiency at world market prices or with low tariff bindings are insufficient to provide the level of national food security that DCs desire;
- The case for *stabilization tariffs* where tariff bindings should be sufficiently high to give DCs the ability to vary applied tariffs in order to offset most or all of price volatility arising from world market prices;
- The case for *compensatory tariffs* - high tariffs in DCs are justified as a countervailing measure as long as developed countries continue to provide significantly larger amounts of trade-distorting support.

To this end, Hoekman (2005) states that self-designation criterion is likely to survive but that specific SDT provisions could be targeted to particular circumstances that can themselves be monitored. A developing-country category itself would therefore become less attractive as the SDT provisions cover more objective subsets of countries. At the same time, Josling (2005) underlines that this solution raises the question as to whether the multilateral trade system should encourage the proliferation of groups of countries treated differently in the rules, in a trade system based on non-discrimination.

2.3. Main Issues of Agricultural Negotiations Affecting the Doha Round Deadlock

The negotiations to reach further agreement on agriculture by the Hong Kong Ministerial Conference (December 2005) took place based on the Framework to Establish Modalities in Agriculture attached to the Doha Work Program agreed by the WTO General Council on 1 August 2005 (WT/L/579), generally known as the July Framework Agreement (FA).

After the Ministerial Conference held in Hong Kong in December 2005, few noticeable results emerged from a long negotiation process and the July 2006 deadline for establishing modalities was missed leading to a Round standstill.[5]

During the past five years, the requests from DCs find general agreement on two main issues:

- Demands for a high level of ambition in disciplines in the three main pillars under negotiation – market access, export competition and domestic subsidies, including extension of duty-free and quota-free access for LDCs. Support for this request is partially moderated by the concerns of preference recipients about the impact of reduced tariffs on their preferential margins.
- A defensive interest in retaining the maximum policy space to take account of particular vulnerabilities such as food security, livelihood security and rural development concerns. These issues are all addressed in the proposal of a Development Box, next to the three existing Amber, Blue and Green boxes. Support for this demand and, more generally, for SDT is tempered by concerns expressed by the mainly Latin American agricultural exporting countries that other DCs may substantially reduce the potential South-South trade flows emerging from a deep liberalization.

After the Hong Kong Declaration, very few pro-development results in the three main negotiation areas, better known as the three pillars, were reached and the majority of hot issues remained open.

Specific issues of market access involving DCs regard the effects of a formula approach to tariff reduction and the existence of SP and SSM for development purposes.

An important issue for some DCs is how to reconcile a formula approach to tariff reductions with SDT where in the Uruguay Round this meant that commitments by DCs

[5] For an exhaustive examination of political obstacles to a final Doha Round Agreement and possible solutions, see Collier (2006).

averaged two-thirds of those undertaken by developed countries (Matthews, 2005a). If this is to be repeated in the Doha Round, the question is whether this commitment should be built into the formula to be used. Application of the same formula can lead to different outcomes depending on the initial structure of tariffs. There are considerable differences between the structure of bound tariffs in both developed and developing countries as well as between developed and developing countries. The difficulty arises when DCs start with very high and uniform-bound tariffs initially. Many DCs are in this position because, in the implementation of the URAA commitments, they opted for a ceiling binding on products not previously bound on the basis of appropriate protection bounds deemed autonomously. Although SDT in the formula would mean that DCs would be treated more leniently than developed countries with the same tariff structure, the differences in the initial tariff structures could mean that, in practice, the average cuts to be undertaken by many DCs would be considerably greater than the average cuts undertaken by developed countries.[6]

The Hong Kong Declaration officially introduced two specific exemptions for DCs on the basis of SDT rules. DCs will have the flexibility to self designate an appropriate numbers of Special Products to be exempted from commitments. Criteria for the eligibility of SPs are food security, livelihood security and rural development needs in line with the position of G33 (defending the position of Net Food Importing Developing Countries, NFIDCs).

Furthermore, DCs worried that trade liberalization could leave them vulnerable to import surges or a price collapse on world markets in a situation in which they have very limited ability to protect producers through purely internal measures. The G33 asked for a Special Safeguard Mechanism (SSM) for DCs only, along with the concept of SPs.[7]

While the Hong Kong Declaration officially introduced an SSM for DCs in the agricultural negotiations, the modalities for such a provision – and for the great part of agricultural issues - were not established by the end of April 2006, with the consequent collapse of the Round.

Another developing country specific issue in the market access pillar is the negative effect related to tariff escalation. Tariff escalation occurs when tariffs rise along processing chains in such a way that tariffs on the processed products are higher than on the corresponding primary products. An escalating tariff structure of this type creates greater protection for the domestic processing sector, acting as a subsidy to the activity of transformation whereas it acts as a disincentive for exporting processed products for exporters. A recent contribute by Sharma (2006) denotes the positive impact of formula cuts proposed by EU, G20 and US during October 2005, in terms of reduction of tariff escalation. For eight DCs (Brazil, Egypt, India, Indonesia, Pakistan, Philippines, Sri Lanka and Turkey) and seven products (cocoa, coffee, fruits, sugar, oilseeds, grains and rice), the proposed formula cuts would reduce tariff escalation from 40 percentage points on average in the URAA to 15-21 percentage points. Whether these reductions are sufficient or not is a matter

[6] Using a tiered approach with the explicit aim of harmonising tariffs, there will be a wide dispersion in the average tariff reduction achieved among developed countries. DCs often have tariff structures with most of the tariff lines corresponding to notified bound rates at 100% or above. Dividing tariff lines into tiers with decreasing cutting commitments corresponds to higher cuts for higher tariffs.

[7] The flexibility argued by DCs both on price and volume for the SSM is perfectly in line with the specific features of the existing Special Safeguard (SSG) available for all countries. Valdés and Foster (2005) have argued that price triggers should be better because volume triggers require up-to-date reliable information, which may be difficult to provide in DCs. A volume trigger could also be caused by a shortfall in domestic production rather than a change in external circumstances.

of judgment, depending on the desired degree of tariff escalation. Furthermore, it is necessary to consider the real impact of tariff escalation in accounting for the role of preferential agreements. Chevassus-Lozza and Gallezot (2003) note that countries benefiting from a preference with the European Union (ACP in particular) face quite homogeneous tariff rates for all agro-food chains whereas Clark and Bruce (2006) show a similar regularity for the US tariffs (e.g., with the other members of NAFTA).

The limited political efforts made by WTO members to solve this problem have only achieved the result that "[t]ariff escalation will be addressed through a formula to be agreed" (paragraph 36 of the FA) and paragraph 17 of the Hong Kong Declaration only adds that "there is full agreement on the need for this to be done and a genuine recognition of the particular importance of this for commodities exporters".

Probably the most apparently incisive decision provided by the Hong Kong Declaration is the decision no. 36 (Annex F of the Declaration) where duty- and quota-free market access will be provided by 2008 for all LDCs for at least 97 per cent of products. The proposal is much less generous than the original Doha mandate of full duty- and quota-free access. The exemption of 3 per cent corresponds to some 300-400 tariff lines in developed countries, allowing them to continue to protect the very sensitive products produced more competitively by LDC exporters (Oxfam, 2005).

With regard to the third pillar, few DCs have entitlements to provide trade-distorting domestic support beyond *de minimis* levels. Their interest in this pillar of the negotiations is therefore offensive. The G20 has made the most detailed proposal for reductions in aggregate measure of support (AMS) and in overall trade-distorting domestic support among the developing country groups. The FA recognizes the existence of a SDT in domestic support, partly adopting the proposal from the G20 where DCs with no AMS entitlements should be exempted from any reduction requirement in their *de minimis* level (currently twice than the levels allowed for developed countries). The FA states that DCs that allocate almost all *de minimis* programs for subsistence and resource-poor farmers will be exempt from any reductions in *de minimis* levels.

3. Winners and Losers in the DOHA Round

The bargaining positions of DCs are often directly linked to a political economy process. In any case, if we look at the empirical results provided by a large body of literature, the requests addressed by DCs seem to be coherent with the forecasted economic effects of the Round.

Several assessments of the effect of a potential agricultural agreement in the Doha Round have been produced in recent years, mainly analyzing simulations with Computable General Equilibrium (CGE) models, with special attention paid to the consequences of the DDA on DCs.[8]

Very broadly, the welfare effects of trade liberalization are dominated by two factors: i) the change in allocative efficiency and ii) the change in terms of trade.

[8] The Global Trade Analysis Project (GTAP) at Purdue University made a dramatic expansion of CGE models possible, sharing among the researcher a huge amount of trade-related data.

Gains from allocative efficiency are realized when market distortions are removed, permitting the economy to reallocate its resources to the most productive use. By eliminating import tariffs, consumption surplus is increased and productive factors are allocated to more efficient utilizations. These gains are obtained regardless of what trade partners are carrying out. These benefits accrue largely to the liberalizing region itself. This is the main explanation for the unequal distribution of welfare gains in agriculture where the larger benefits go in favor of developed countries such as the EU, the US and Japan where agricultural domestic supports are very high. The terms of trade effect comes from changes in a country's export prices relative to its import prices. According to the results of simulation exercises, agricultural market prices should be higher after the liberalization process and terms of trade for exporting DCs should be more favorable. This is the main explanation for the relatively high proportion of welfare gains going in favor of large exporting DCs which are the core members of the G20, characterized by an offensive position in the negotiations which moves in the direction of a full liberalization of developed country markets. At the same time, consumers in DCs could lose due to increasing market prices for agricultural products and the net effect of a wide-ranging agricultural reform depends on the composition of a country's exports and imports of different commodities and the price sensitivity of those commodities to liberalization.

Another important feature to be addressed in the analysis of the welfare effects of liberalization is the agricultural trade balance across countries. There is a division between temperate products (program crops and livestock), where DCs are largely net importers and developed countries net exporters, and tropical products for which DCs are largely net exporters. Program crops are those which would experience the largest price increases because they are the most subsidized in developed countries. Therefore, in many simulations, most DCs would face increasing prices for their agricultural imports. It is not surprising that many DCs are worse off as a result of the terms of trade effects after agricultural trade reforms.

Considering the specific perspective of LDCs, three special conditions should be more closely considered. First, in recent decades, the constant decreasing trends of agricultural products on world markets caused by protection and output and export subsidies by the developed countries have oriented the consumption path of LDCs towards large imports of agricultural products. As importers, LDCs have access to these low prices. Once the subsidies and protection are eliminated, the world prices rise and harm importers. For many LDCs who are large importers of agricultural products, these losses can be substantial (Panagariya, 2005).

Secondly, under preferential regimes such as the Everything But Arms (EBA) initiative of the EU, LDCs have quota- and duty-free access to the EU market (with the exception of few products). This means that they can sell their exports at the internal EU price that is kept artificially high to protect EU producers. With some exceptions, the EU internal price is far more lucrative than the price that could be obtained in a condition of free trade. With the ending of export subsidies and a decrease in tariffs and production-enhancing subsidies, world agricultural prices are likely to go up. Higher prices and better access to agricultural markets in developed countries should benefit DCs, whose comparative advantages often lie in agriculture. However, not all DCs are net exporters of agricultural products and not all net food-importing DCs have the capacity to increase production. The food-import bill could therefore increase thus enhancing the vulnerability of the economic system. This is

particularly likely for DCs that export agricultural products under specific preference agreements. After the trade liberalization process, the productivity structure of these countries would no longer be competitive, losing market quotas and increasing food imports. These economies are often characterized by high specialization in products with preferential treatments and the reduction of this preferential treatment would not be compensated by a shift to other more efficient productions.

Thirdly, in the presence of persistent unemployment, trade liberalization may simply move workers from low productivity protected sectors into unemployment. This lowers the country's national income and increases poverty (Polaski, 2006). High unemployment rates, weak safety nets and poor risk markets are all features of DCs that have to be taken into account in a comprehensive analysis of welfare effects related to trade liberalization. Historical evidence, not only simulations, suggests that without complementary policies, trade alone is unlikely to promote the absorption of agricultural labor force into more productive sectors (Polaski, 2005).[9]

After a brief description of the main results from CGE models with specific attention to poverty reduction effects, we will try to highlight some general issues on trade and poverty (par. 4) and preference erosion (par. 5) which could help to explain the small welfare effects commonly found in the simulation exercises of a Doha Agreement scenario.

The most recent results from simulation of alternative liberalization scenarios in this negotiation round are described in Anderson *et al.* (2005a; 2005b), Bouët *et al.* (2005b), Bouët (2006), Francois *et al.* (2005b), Hertel and Winters (2006), Polaski (2006) and a useful comparison of trade impacts on poverty reduction is described in Ackerman (2005). All these experiments reflect the effects of a trade reform scenario using benchmark data from 2001, updated with the key events occurred recently, namely the accession of China to the WTO, the phase out of the worldwide bilateral quota scheme for textiles and clothing and the 2004 enlargement of the EU to 25 members as well as the implementation of European reforms that were part of the so-called Agenda 2000 plan.[10]

Following Anderson *et al.* (2005a), in a full liberalization scenario, welfare gains in favor of DCs would be 45 per cent of total gains, a percentage well above their share of global GDP. Their welfare would increase by 1.2 per cent, compared with an increase of just 0.7 per cent for all countries (Table 3). DCs would reap substantial efficiency gains from reforming their own protection, in many cases higher than developed countries' tariffs structure. This higher share is partly because they have relatively high tariffs themselves and would therefore reap substantial efficiency gains from reforming their own markets and partly because their exports are more concentrated in those products whose tariffs in developed-country markets are consistently higher. Results in Francois *et al.* (2005b) are partially different where liberalization of domestic and export subsidies by the rich nations – the EU and US in particular – would produce larger efficiency gains in these countries. Moreover, these reforms would raise the world price of food. Because some developing nations are net food exporters

[9] The simplified theoretical assumptions used for the implementation of CGE models are affected by the difficulties in finding empirical data for the description of all the variables, especially related to the labour market where a disequilibrium condition requires a great deal of information on the effective labour-supply function for all the markets considered in the analysis.

[10] All the simulations use social accounting data from GTAP 6 whereas data on the trade policy rely on MAcMaps database, implemented with a joint CEPII(Paris)/ITC(Geneva) project and taking into account a more realistic measurement of protection (accounting for trade preferences, regional agreements and a distinction between the various groups of DCs).

and some other are net food importers, a narrow focus on rich-nation agricultural liberalization would show mixed effects on DCs. Some of the biggest developing country agro-food exporters – Argentina and Brazil – will face substantial gains in terms of increasing agricultural exports (and this is also confirmed in the analysis by Winters, 2005) but at the same time consumers in almost all DCs could be negatively affected by very uneven impacts in terms of food security and nutrition. In this case, all the considerations about possible negative impacts of trade reforms on poverty must be accounted for, especially in terms of distributional impacts.

Comparing the available studies, a common result emerged where it seems that for DCs most gains from trade liberalization are due to textiles and clothing and other manufacturers whereas agricultural liberalization would even produce welfare losses for DCs if a realistic Doha Round scenario were set (Bouët *et al*., 2005b). In particular, most of the welfare losses in an agricultural trade reform scenario would affect vulnerable economies as some ACP, Mediterranean and Sub-Saharan African countries where preference erosion would produce significant negative effects. This particular result is closely related to the more accurate modeling of preferential trade agreements in Bouët *et al*. (2005b), confirming that where the effective rate of utilization of preferential regimes are quite high, negative effects in terms of preference erosion are more likely.

Bouet (2006) presents simulations where imperfect competition and product differentiation in industry and services bring negative impacts for countries specializing in the primary sector after trade liberalization. Therefore, agricultural specialization has a cost even for export oriented countries such as Argentina, Australia, Brazil or New Zealand because trade reform gives agricultural countries incentives to reallocate productive factors in the primary sector, thus reducing positive effects related to economies of scale and varieties.

The simulation exercise provided by Polaski (2006) represents one of the most recent models, including a Doha scenario accounting for Hong Kong Declaration. One specific aspect of this model is the representation of the labor market which is divided into three types: agricultural labor, urban unskilled labor and urban skilled labor. In urban unskilled labor, there is unemployment whereas wages in the agricultural labor market are lower than urban unskilled wages. The rural and urban unskilled labor markets are linked by migration. Depending on the scenario, the gains to DCs are about 2 to 6 per cent less if labor forces are modeled separately rather than as a single, unskilled labor group.

Apart from specific consideration about different assumptions in the modeling procedures, two common results can be drawn by this comparison: i) agriculture is not always the main source of welfare gains, as Bouët (2006) and Polaski (2006) clearly show; ii) the overall effects linked to the agricultural sector would be followed by a decreasing welfare level especially for vulnerable economies with non-competitive farm households which correspond perfectly to the poorest individuals. Such common results should be taken into account during the negotiation process in order to assure adequate compensation for such welfare losses.[11]

[11] In multi-country trade models the size of the expected benefits depends on many factors, but crucially on the value of Armington trade elasticities. The Armington hypothesis means that products are differentiated by their country of origin. There is not a single world price for a specific commodity: according to Armington hypothesis, every country produces a specific product, thus the world price for each product is an average of export prices (Bouët, 2006).

Table 3. Welfare impacts in the most recent simulations of Doha Round negotiations

Authors	Assumptions for the agricultural sector	Scenarios	Welfare effects	
gains in 2015 compared to baseline calculated as the annual gains as % of base GDP			**World**	**DCs**
Anderson *et al*. (2005a)	Products as imperfect substitutes Factor markets with perfect competition Labor and capital mobile between sectors Full employment All preferential agreement are taken into account	Agriculture[1] Global[1] Global with productivity change[2] Doha scenario with productivity change[3]	0.44 0.7 1.1 0.3	0.76 1.2 2.2 0.39
Francois *et al*. (2005b)	Products as imperfect substitutes Factor markets with perfect competition Labor and capital mobile between sectors Full employment	Agriculture[4] Global[4]	0.1 0.5	0.35 1.06
Bouët *et al*. (2005b) and Bouët (2006)	Products as imperfect substitutes Capital market perfectly mobile Dual labor market with totally elastic supply of unskilled labour for modern sector Labor imperfectly mobile between agricultural activities and other sectors All preferential agreement are taken into account	Agriculture[5] Global	0.08 0.33	-0.03[6] 0.8
Polaski (2006a)	Labor market distinguished in three types: agricultural labor, urban unskilled labor, urban skilled labor, with unemployment in urban unskilled labor. Agricultural wages lower than urban unskilled wages.	Global[1] Agriculture Doha[7] Doha scenario[7] Hong Kong scenario[8]	0.53 0.02 0.19 0.14	1.2 -0.009 0.42 0.3

Notes:

[1] Full liberalization scenario implemented globally.

[2] Sector-specific labor productivity is allowed to respond to changes in sectoral openness.

[3] Doha scenario is based on possible negotiation outcome of the Doha Round considering realistic tariff cuts and exemption for DCs as SDT provisions, and exemptions for developed countries as sensitive products and the green box.

[4] Partial liberalization scenario implemented globally, where all trade protection instruments are reduced globally by 50%, as is domestic support for agriculture in the OECD.

[5] Partial liberalization scenario is only based on an agricultural agreement following on from last negotiation outcomes as the modalities described in the FA.

[6] This figure depends strictly on negative results for Mediterranean and Sub-Saharan African countries which would face consistent losses caused by preference erosion.

[7] Doha scenario, entails an ambitious expansion of market access for manufactured goods (50% reductions in applied tariffs by developed countries and 33% by developing countries) and a less ambitious expansion of market access for agricultural products (36% reduction in applied tariffs by developed countries and 24% by developing countries)

[8] Hong Kong scenario entails a 36% reduction in applied tariffs by developed countries and 24% by developing countries in both agricultural and manufacturing sector.

Following Hertel and Ivanic (2006), if substantial tariff cuts were adopted by DCs, global trade reform would bring large welfare gains for DCs, thus enhancing South-South trade flows. Domestic reforms implemented by DCs would be positive for two reasons: the first effect would be to enlarge demand markets whereas the second one would be to reduce inefficiencies in production (Fabiosa et al., 2005). As underlined in Ackerman (2005), if we look at a "Doha scenario", DCs would gain less than in a full liberalization scenario. Considering that in analyzed simulations the main difference in the two scenarios depends on reduced trade reforms applied by DCs, the role of preferential agreement and SDT emerges as a major cause of reduced welfare gains for DCs themselves. On the contrary, Polaski (2006) states that few losses arise from the erosion of preferences that DCs currently benefit from rich countries. A more fundamental problem is the structure of the agricultural sector in many DCs, often characterized by low productivity and small-scale subsistence farming markets.

These contrasting results are perfectly in line with contrasting positions between developed and developing countries where developed countries claim for a full reciprocal trade liberalization while many DCs claim for stronger SDT provisions. Deeper differentiation in the implementation of SDT could be a possible solution, especially in relation to the higher commitments for relatively advanced DCs such as Brazil, China and India which could be the major engine for the development of South-South trade flows, opening their markets to LDC exports.

In this sense, an effective reform of SDT seems to be necessary. SDT accorded to fast growing economies such as Brazil, China and India substantially reduced the possibility of South-South trade flows. In particular, looking at results in Bouët *et al*. (2005b), the average simulated tariffs faced by Sub-Saharan Africa on agricultural exports only decrease by 2.2 percentage points. In contrast, the cut amounts to 4.6 percentage points for relatively advanced members of the G20. This last result could explain the G20 requirements for hard liberalization on one side and the contemporary request for SDT for DCs in order to protect the poorer partners of the G20 and the other large coalition (G90) comprising LDCs and NFIDCs. The position of the G20 could be interpreted as highly ambiguous, when the requirement of a SDT which is not differentiated for DCs would substantially reduce the South-South trade flows. This position corresponds to a specific political will where less advanced economies would agree on the negotiation agenda of the G20, increasing the bargaining power of DCs as a whole, whereas differentiation criteria would inevitably reduce the cohesion within and between developing country coalitions.

In the valuation of the potential gains for DCs linked to increasing South-South trade flows, it must be remembered that industrialized economies constitute 75 per cent of the world's GDP and 77 per cent of total import flows, meaning that access to Northern markets remains critical for DCs (Polaski, 2006). Moreover, South-South trade is actually increasing without any intervention from the WTO and, during the 1990s, it grew at nearly double the rate of global trade. Therefore, there could be a strong case for a strategic position assumed by developed countries when claiming for welfare gains from South-South trade means an augmented market access for export flows coming from rich countries and directed to DCs (Oxfam, 2005).

The simulations previously described allow a strength analysis on poverty reduction linked to multilateral trade reforms. Following Anderson *et al*. (2005b), under a full merchandise trade liberalization scenario, extreme poverty in DCs (those earning less than $1/day) drop by 32 million in 2015 compared with the baseline level of 622 million, a

reduction of 5 per cent.[12] The majority of the poor by 2015 are projected to be in Sub-Saharan Africa where the reduction is estimated to be 6 per cent. The approach of the authors has been to take the change in the average per capita consumption of the poor, apply estimated income-to-poverty elasticity and assess the impacts on the poverty headcount ratio by calculating the change in the real wage of unskilled workers and deflating it by the food/clothing consumer price index which is more relevant for the poor than the total price index. The real wages grow and the assumption is that the change in unskilled wages is fully passed onto households. Furthermore, the closure of the model has been made considering that losses in tariff revenues would be replaced by increasing direct household taxation which mainly affects skilled workers and high-income households in the DCs.

Under the Doha scenario, the poverty impacts are more modest. The SDT for DCs and the exemptions in favor of rich countries such as the sensitive products and domestic support under the green box would substantially reduced the welfare gains of a trade liberalization reform, especially in the agricultural sector. The number of poor living on $1/day or less would fall by 2.5 million for the core Doha Scenario (of which 0.5 million are in Sub-Saharan Africa). If only agriculture were addressed in a scenario of liberalization, global poverty alleviation would be less than full liberalization and almost zero for Sub-Saharan Africa.

Such analysis seems to be quite unambiguous without making specific considerations on real factor mobility (in particular the unskilled labor force). The liberalization process in agriculture would bring up market prices, especially for cash crops and exported commodities in general. As described in Section 4, the capacity to use such increasing demand markets and increasing goods prices are generally available for efficient farms which do not correspond to poor farm households. Scarce market infrastructures typically occur in DCs, especially for crops sold in the local markets where international prices affect only imported goods. For low-skilled farm workers, increasing market prices would only correspond to increasing wages if there was a natural unemployment rate and the rural population was employed in the exporting sector.

The explicit assumptions made for these simulations only take into account welfare poverty in terms of pure income per capita for people living under the poverty line. These assumptions are far from the measurement and assessment of real poverty conditions where investment poverty matters as well (Reardon and Vosti, 1995) and the definition of welfare is very narrow if we consider only an increasing GDP per capita as a result. Focusing on a more general dimension of poverty as lack of access to resources, the situation changes due to the consideration that even the investment of gains from trade is important.[13]

As we have seen, two specific aspects concerning DCs are often emphasized. One is the role of market structure and market failures, particularly related to labor market and rural poor behavior, and the other, the effects of preferential regimes and preference erosion.

[12] The impacts on the headcount ratio considering a different poverty line – the number of people living on US$2 per day or less – are consistently lower, with a reduction of 3.6 per cent in 2015 under the full reform scenario compared with the baseline scenario. The main reason for this reduced impact is that the US$2 per day poverty-income elasticity is significantly lower than the US$1 per day poverty-income elasticity.

[13] For a thorough investigation of the poverty impacts related to trade reforms, see Hertel and Winters (2006).

4. Factors Influencing the Trade-Poverty Nexus

Openness and trade liberalization have been a major component of conventional economic policy advice in recent decades. There is wide acceptance that, in the long run, open economies fare better in aggregate than closed ones and that relatively open policies contribute to long-run development. The general tendency of the empirical evidence on dynamic effects – both form cross-section and case studies – is in the direction of positive correlation between trade openness and economic growth (Dollar and Kraay, 2004; Frankel and Romer, 1999; Greenaway *et al*., 2002). Many contributes stress, however, that in the short run, trade liberalization produces negative impacts on certain actors and that even in the long run, successful open regimes may leave some behind in poverty. In some cases, an open economy is more exposed to shocks that generate uncertainty and undermine policy measures designed to alleviate poverty and redistribute income. To be fully effective, trade liberalization needs to be part of a package of measures promoting greater use of the market, more stable and less arbitrary policy intervention, stronger competition and macroeconomic stability (Rodríguez and Rodrik, 2001; Rodrik, 1998).

Considering that the described CGE models adopted for Doha scenario simulation are mainly static, the main static effects will be described below with specific attention to market and institutional failures and households' behavior which are difficult to model in a general equilibrium context but which are crucial when describing the effective impacts on poverty reduction.

As underlined by Winters (2002, 2004, 2005), three groups of variables are useful when exploring the effects of trade policy on poverty: households' behavior, factor markets and the role (and size) of government. All these issues can have both positive and negative impacts in terms of poverty reduction and considering them all together leads to non-univocal solutions.

First of all, a general important aspect of any analysis of poverty is the definition and measurement of the phenomenon itself. The majority of analyses - which quantify the impacts on poverty from trade liberalization process aggregating (or comparing) different countries - adopts an absolute consumption metric. This entails that poverty is held to have fallen if fewer people fall below a fixed threshold in terms of their purchasing power over goods and services.[14]

On the contrary, poverty is a multi-dimensional phenomenon: there are many reasons why people are poor and even within broadly defined groups, there are huge differences in the circumstances of individual households. Thus, the effects of many shocks will differ among poor people depending on the poverty 'profile', or consumption, production and employment activities of the poor which can be very heterogeneous in the same country (Winters, 2002).

Following Ravallion (2003), the differences among alternative poverty measures are very important in the quantification of impacts on trade liberalization and most of the simulations on WTO negotiations account for a pure consumption measurement as the income per capita and an absolute poverty line as the number of people living with less than $1 a day. If we consider the alternative development theories widely diffused in the recent literature such as the human development paradigm (UNDP, various years) and the capability approach (Sen,

[14] In most of the cases, this choice is constrained by the fact that modelling general impacts of trade policies in a global context is a quite difficult task.

1979, 1985, 1999), it is clear that different poverty (or lack of entitlements) measures give different results.

Trade liberalization reforms, and, more generally, the globalization process have great importance in terms of both intra-country and inter-country inequality effects. Although many scholars analyze the empirical evidence of increasing or reducing intra-country inequality, less attention has been paid to the potential negative effects of rising global inequality. Following Griffin (2003), this second aspect has been described as "asymmetric globalization" and considers two specific aspects of global economic integration which are extremely harmful to poor countries. The first is the restriction on the movement of low-skilled labor that has been applied *de facto* in many rich countries in recent decades. Freer movement of labor would be advantageous for DCs and would allow greater efficiency in resource allocation, raise income and improve the distribution of world income. In this sense, advanced economies may reduce these negative effects implementing the "mode 4" commitments of GATS, therefore favoring the temporary migrant labor from DCs to developed countries (Oxfam, 2005). The second important issue in inter-country inequality is the continuing discrimination against products which are of particular importance to low income countries (i.e., tropical products, cotton, textiles and clothing) where the process of trade liberalization has generally occurred more slowly than in other products.[15] The status of WTO negotiations clearly reflects that even a deep agricultural reform implemented by advanced economies, without adequate progress in other "hot" topics, would not lead to hard welfare improvement for poor economies.

As we have seen, market and institutional failures are the first explanation for low welfare gains in favor of DCs. In particular, household behavior, factor markets (labor market, above all) and the role of government have been considered.

4.1. Household Behavior

The effect of a single price change on household welfare is proportional to its net supply position in that goods are expressed at current prices as a proportion of total expenditure. In practical terms, in order to quantify the exact poverty effects, we must know the price changes implied by shocks and poor households' net supply positions. Responsiveness to price shocks is particularly important when considering the vulnerability aspects of poverty.[16] Policies which reduce households' ability to cope with negative shocks might induce households to displace income from investment activities (with long term positive effects) to immediate consumption. The ability to switch between activities is an important aspect of adjusting to potentially impoverishing shocks. If labor market conditions are not favorable to immediate employment alternatives, trade shocks that produce, for example, higher price volatility could be a source of decreasing income per capita for households dependent on liberalized goods thus increasing uncertainty and risk aversion.

[15] For an exhaustive literature review on the trade-poverty linkages and the wide range of different approaches to analyze both the micro and macro effects on poverty related to a trade reform, see Hertel and Reimer (2005).

[16] Trade liberalization will typically affect both the means and variances of a household's sources of income, and could affect vulnerability in four ways: changes in mean incomes; changes in the portfolio of activities undertaken by households; changes in the variability of existing income sources; and poverty traps (Winters, 2004).

In addition, it is important to note that for small-open economies, the price of goods that are traded internationally will be largely determined by the world price, hence the prices of such goods will not change further as the market equilibrates and all the adjustment will be in internationally traded quantities. At the other extreme, if goods are only traded locally – because of transportation difficulties or other infrastructures deficiencies – the trading domain is very small and the price is likely to sustain only part of the adjustment.

In particular, agricultural liberalization is mainly considered effective for poverty alleviation because it produces demand spillovers that are heavily concentrated on relatively employment intensive and localized activities from which poor people gain the larger part of their income. This particular result is true for countries (households) where there are possibilities to specialize in the production of goods experiencing increasing prices due to trade liberalization (Anderson *et al*., 2005b). For vulnerable economies (i.e., countries benefiting from preferential agreements), the real capacity of such specialization is not so obvious because most of the economic resources have been invested in the production of goods benefiting form the preferential access to rich countries markets.

Moreover, in some cases, farmer (peasant household) behavior is the opposite of a specialization in cash (tradable) crops, even if cash crops undergo a price increase and appear to become the most remunerative choice. This paradoxical behavior has been explained with the presence of market failures in DCs.

In particular, the case for a non-Pareto optimal has been partly analyzed by Newbery and Stiglitz (1984) where the authors have demonstrated that lack of a complete set of risk markets for agricultural production in the case of trade openness would lead to adverse welfare effects both for consumers and producers.

An alternative explanation is the observation that poor people simply cannot afford the risks of being entrepreneurial and therefore switch from subsistence to cash crops. This situation is very familiar when investment poverty occurs (Reardon and Vosti, 1995) and poor farmers do not have adequate means to start with cash crops.[17] Furthermore, the inability of poor farmers to deal with the risks involved in producing cash crops (because, for example, a price decrease would push them below subsistence) might explain the unwillingness to pursue higher returns created by trade.

In the same venue, de Janvry *et al.* (1991) observe that further market failures could explain this behavior. In a fashionable definition, the authors highlight that in some cases market failures are not commodity specific but household specific where "general markets exist but they selectively fail for particular households, making the corresponding commodity a non-tradable for that household" (pp. 1401). There are many conditions – opportunity cost of time involved in selling (search costs) and buying (recruitment costs), risks associated with uncertain prices, lack of infrastructures and information - that are conducive to more advantages for the peasant household to be self-sufficient rather than a net buyer or seller on the market. The greater the price elasticity of demand of a household that tends to be a net seller, the more likely it is to stay self-sufficient as supply fluctuates. Considering that trade liberalization could be accompanied by increasing price volatility (with rising risks and uncertainties), farmers' behavior could lead to a reduction in cash crop supply rather than an

[17] In many cases, cash crops are produced by large farmers, with adequate transmission channels to deliver goods to international markets. On the contrary, poor farmers are usually confined to local markets and lack of infrastructures can be a significant trade barrier.

expected increase. Price instability in the agricultural sector is not a common issue for all the cash crops but the question of the persistence of low prices is certainly a major concern for agricultural producers (Valdès and Foster, 2005).

4.2. Factor Markets

Considering the factor markets, price changes affect the incentives to produce particular goods and the technologies they use. The simplest analysis of these incentives has been provided by the Stolper-Samuelson Theorem which states that – under certain conditions – an increase in the price of the good that is unskilled labor-intensive in production will increase the unskilled real wage and decrease that of skilled workers. In agricultural liberalization, DCs should have comparative advantages in the production of agricultural goods - typically an unskilled labor-intensive sector. As farmers increase production, jobs are created either on the farm or in related activities such as trading, transporting food, and equipment manufacturing. Increased profits from agriculture encourage farmers to convert available land into agriculture and further increase development in this sector. Farming attracts additional investment and increases economic growth. An improved climate for investment leads to advances in technology which serve to increase productivity.

All these positive spillover effects are not a necessary outcome of a multilateral trade reform but other conditions are important such as labor market characteristics and the real impacts on unskilled labor force. The market failures often affecting agricultural sector in DCs are the conditions influencing the final results (FAO, 2005a).

Considering the labor market, an increase in the demand for unskilled labor will not increase wage if unskilled labor is available in perfectly elastic supply. The wage will then be fixed exogenously and the adjustment will only take place in terms of employment. Supposing that the formal wage to unskilled labor is no more than the subsistence wage, this transfer will have very little effect in terms of poverty reduction (Winters *et al*., 2004).[18]

More generally, if wages are pushed up from poverty line to higher levels or the expanding sectors offer above poverty-line wages, then headcount poverty will fall. If, on the other hand, wages do not cross critical thresholds, recorded poverty could be unaffected, despite changes in welfare (Ravallion, 2003).

Moreover, international capital mobility tends to increase the effects, positive or negative, of trade liberalization. An inflow into a sector that has gained from liberalization is likely to boost wages and/or employment which will increase the welfare benefits and the poverty alleviation benefits of trade liberalization. If trade reform increases the demand for labor-intensive products, it boosts the demand for labor, pushing up employment and wages. However, if the poor are mostly in completely unskilled families and it is semi-skilled labor that receives the improvement, poverty will be unaffected (Stiglitz, 2000). In many cases, the fear is that technological advance provided by capital investments hurts the poor by reducing the demand for unskilled labor. If trade liberalization is accompanied by skill-biased technical change which can mean that skilled labor may benefit compared with unskilled labor, or similarly, if the unskilled are employed primarily in non-traded sectors while exports draw

[18] More generally, this will be the case because the formal sector can draw effectively infinite amounts of labour out of the informal sector or subsistence agriculture at the subsistence wage (Lewis, 1954).

mainly on semi-skilled workers, then trade liberalization will have adverse effects on unskilled labor, with no results in terms of poverty reduction (Polaski, 2006).

Finally, the role of infrastructures – as transport costs and the existence of local markets – is critical for ensuring that low-income countries are able to benefit from trade opportunities. Rural population often suffers from constraints in credit, marketing, insurance and other infrastructure (road, power, irrigation), meaning that trade reforms will only be effective if domestic policies and governance change.[19] Many countries remain largely without the appropriate institutional frameworks and systems to manage their trade policy and trade costs severely limit the competitiveness of developing-country firms in export markets. Transport costs are often the single most important cost component for exporters. In addition, the fragmentation of markets and remoteness of many farming communities, combined with numerous informal fees, lead to high transaction costs, lack of basic post-harvest marketing infrastructure and a pervasive degradation of natural resources. To improve competitiveness and extend the benefits of trade to the poorer segments of the population, trade liberalization should be followed up with other domestic and international policy measures.

4.3. The Role of Government

The role of institutions and government expenditures in a trade reform scenario can be analyzed from two different perspectives.

The first one is that a trade reform could have a great impact on government revenues due to reducing tariff rates. The early stages of trade liberalization involve converting quantitative restrictions and regulations into tariffs and reducing high tariff rates. If the latter is accompanied by a reduction in the scope of tariff exceptions and exemptions, this stage is likely to increase tariff revenue rather than reduce it.[20] Apart from this specific situation, trade liberalization will reduce tariff rates so far that government revenue falls. A reduction of government revenues will induce policy makers to curtail expenditure on social and other poverty-alleviating policies and/or to levy new taxes, reducing the income of the poor. The reduction of safety nets and the lack of investments for better market infrastructures, institutions, sanitation and education for rural people, would predictably worsen the negative effects of trade reforms on poor people in terms of food insecurity and increasing poverty and vulnerability (FAO, 2005a).

The second one is that the role of government could substantially change in a more open economy. To this end, Rodrik (1998) has underlined that there is a positive association between trade exposure and the scope of government, contrary to the widely diffused presumption that the effectiveness of government intervention is lower in economies that are highly integrated with the world economy. The main explanation focuses on the role of external risk where societies seem to receive an expanded government intervention as a form of social insurance for increasing exposure to external shocks. Following on from this first result, Rodrik has added a number of ancillary hypotheses: 1) increasing external risk must lead to greater volatility in domestic income and consumption; 2) a larger share in GDP of

[19] For a useful overview of many aspects concerning trade-rural poverty linkages, see Bardhan (2006) and Nissanke and Thorbecke (2006).

[20] This first stage corresponded for many DCs with access to the WTO and the implementation of the Uruguay Round Agreements with the so-called tariffication process.

government purchases of goods and services must reduce income volatility; 3) the risk-mitigating role of government spending should be displayed most prominently in social security and welfare spending; 4) causality nexus should run from exposure to external risk to government spending.

If we consider the main concern about reducing revenues from duties and tariffs with a trade liberalization process, the consequent reduction in government budget and the contemporary increase of exposure to external shocks and risk, these two simultaneous conditions could lead to welfare reduction for particularly vulnerable countries.

All these market and institutional failures should not be included in a CGE model and results from simulations could be biased especially in the evaluation of poverty reduction impacts of multilateral trade liberalization. As suggested by Hertel and Reimer (2005), probably the best way to address such difficulties is to link and compare the results from CGE models with results from micro-models applied to specific countries/products.

5. The Problem of Preference Erosion for Developing Countries

The comparative results from simulation exercises concerning the Doha Round potential agreements have revealed that, in many cases, the effective welfare improvement for selected groups of DCs is reduced by market and institutional failures and the households' behavior is not always coherent with the opportunities related to a more open international market. In this context, the question of preference erosion plays an important role where some specific vulnerable economies could face a welfare decrease after the trade reform.

In order to understand the real impact of preference erosion, a brief description of preferential regimes and their effective utilization rate could help to trace the terms of the problem.

5.1. Theoretical Aspects of Preferential Regimes and Preference Erosion

The Enabling Clause of 1979 provided the legal cover for exemptions to the MFN rule allowing reciprocal preferential agreements and unilateral preferences granted to DCs. The rationale for grants of preferential access to developed country markets emerged as one of the factors included in SDT provisions, partly reflecting the development thinking based on import-substitution policies for domestic support to the infant industries.

There are two alternative provisions for trade preferences exclusively in favor of DCs in the GATT/WTO system. First, developed countries can give DCs one-way trade preferences, on the basis of the GSP which is explicitly designed to promote exports from DCs. Secondly, under the Enabling Clause, DCs can exchange virtually any trade preferences among DCs themselves. Under the Enabling Clause, preferences need not lead to a full free trade area; partial preferences across a subset of goods are permitted. All preferential trade areas among DCs – as the MERCOSUR, or the ASEAN Free Trade Area (AFTA) - were formed under this provision (Panagariya, 2000).

In addition to the GSP, high-income countries maintain a variety of schemes granting preferences either under preferential regimes linked to economic development criteria - as the specific regimes offered to LDCs by EU under the Everything But Arms (EBA) initiative - or

on a geographical basis – such as the EU Lomé/Cotonou agreements with ACP countries, or the US Africa Growth Opportunity Act (AGOA), and the Caribbean Basin Initiative (CBI) – which are of considerable importance to some DCs (OECD, 2005; Panagariya, 2002b).

This extensive range of preferences could alter the empirical assessments of their effects, a task further complicated by the difficulty of identifying the specific impact of preferences as opposed to other factors.

First, OECD preference programs explicitly differentiate between DCs (by region, level of development and export capacity) and impose significant "conditionality" in the determination of the eligibility and product coverage, including rules of origins and non-trade requirements. This conditionality represents a barrier for DCs who encounter considerable difficulties in the coverage of all criteria to reach the OECD markets. This is one of the requests of DCs in the Doha Round in order to simplify rules of origin and grant a wider (real) access to OECD markets at preferential rates.

Secondly, trade preferences granted by developed countries are voluntary. They are not WTO obligations. Donor countries determine eligibility criteria, product coverage, the size of preference margins and the duration of the preference. Developed-country governments have rarely granted deep preferences in sectors where DCs had the largest export potential. Indeed, preferences tend to be the most limited for products protected by tariff peaks (Hoekman, 2005).[21]

To this end, Francois *et al*. (2005a) estimated that the threshold level for preference margin in terms of tariff difference (preferential margin as difference between MFN and preferential tariff) to be convenient is about 4-4.5%, otherwise, the transaction costs for satisfying the rules of origin and other administrative constraints are larger than the benefits from the preferential trade regime. Thus, preferential tariff must be 4-4.5 percentage points lower than third country tariffs for traders to request preferences. This threshold level means that in many cases preference margins are not utilized because they are not economically convenient.[22]

The resulting uncertainty can only have a negative impact on incentives to invest in export sectors, reducing the convenience of preferential agreements. A relatively small number of mostly middle-income countries are the main beneficiaries of GSP programs (excluding LDCs preferential treatment) and have the capacity to exploit the opportunities offered by meeting the administrative requirements (Hoekman *et al*., 2005a, 2005b).[23]

However, some small countries have benefited significantly from preferential access to markets where high tariffs, subsidies, or other policies are used to drive domestic price of the product to levels well above the world market price (World Bank, 2004).[24] Therefore, the potential reduction of MFN tariffs and domestic subsidies implemented by developed

[21] Preferences are often limited by design. Market share or value thresholds limit the extent to which recipients can export on preferential terms.

[22] The European Union excludes from GSP eligibility certain products from large countries, regardless of their per capita income. Examples include Brazil, China, India, and Indonesia. In this case a sort of differentiation among countries is practically applied. Moreover, the EU has a safeguard clause allowing preferences to be suspended if imports cause or threaten to cause serious difficulties to a Community producer.

[23] In 2001, 10 of the 130 eligible countries accounted for 77 per cent of US imports under GSP provisions (India, Indonesia and Thailand alone account for 44% of the 10).

[24] The share of LDCs in total imports of the United States and the EU has not increased significantly in recent years. In the case of the EBA Initiative, for example, this may reflect that the products that matter most to a number of LDCs, bananas, rice, sugar, will be liberalized only in 2006 (bananas) or 2009 (rice and sugar).

countries could reduce preferential margins for DCs and lead to negative effects caused by preference erosion.

The assessment of real impacts of this phenomenon should account for a number of conditionalities which are necessary to understand the bulk of the problem of preference erosion, the real negative impacts and the potential policy responses:

- Preferences can only have an impact if there is a non-zero tariff in the importing market;
- There are general equilibrium effects to consider, especially the impact of changes in policies in other countries, both those that do and those that do not grant preferences: such changes may affect demand and supply and thus world prices of the product concerned (Anania, 1989; Stern and Deardorff, 2006);
- There must be a high utilization rate of the preferential regimes, in order to have a robust negative impact in terms of preference erosion;
- To the extent there is market power on the part of either importers/distributors or the transport and logistics sector, the benefits of preferential tariff reductions will be captured at least in part by intermediaries with market power rather than the exporters (Hoekman *et al*., 2005b);
- For preferences to have value, the beneficiary countries need to have an export capacity in the products for which preferential access is granted.

More generally, the magnitude of costs and benefits for granting and beneficiary countries depends on underlying supply and demand responsiveness to price changes as well as the degree of substitution between preferential and non-preferential suppliers. On net, trade preference therefore involves a mix of benefits for preferential exporters, costs imposed on third-country exporters and potential losses for importer as well (Panagariya, 2000).

5.2. The Real Utilization of Preferential Regimes

Several recent studies have made estimates of the use of commercial preferences, granted by the EU and the US especially, showing that, contrary to widespread belief, commercial preferences granted to DCs have high utilization rates (OECD, 2005). In both the EU and the US, only a very small share (about 11%) of eligible agricultural products were exported outside a preferential regime,[25] and among exports from DCs the trade flows eligible are essentially exported under these preferences (Bureau et al., 2005a, 2005b, 2006).

Nonetheless, the utilization rates of preferences are different for different countries and products and the impacts related to a MFN tariff reduction in terms of reduction of preference margin are not therefore univocal and their effective quantification depends on a number of factors (Low *et al.*, 2005).

The utilization rate of preferential regimes is a key factor to consider when assessing the erosion of preference margins. If the utilization rate is not so high, the case of economic losses due to preference erosion is smaller. The exact estimation of the utilization rate of

[25] These rare cases of eligible exports under the MFN regime are largely explained by small trade flows and/or low MFN tariffs, meaning that the importer did not consider meeting the eligibility criteria worthwhile.

preferential regimes is strictly dependent on the measurement of the effective preference granted to beneficiary countries. As a first approximation, the value of the preference for the preference receiving country is often measured by the preference margin which is measured as the difference in percentage points between MFN and preferential tariff rate for each tariff line. Considering this simple indicator, the comparison of the preferences received by LDCs and all DCs shows that the bulk of preferences accrue to non-LDCs, reflecting the small share of LDCs on total developing country exports.

The preference margin has a number of limitations as a measure of the value of a preference. One is that it ignores the question whether the advantage given to the preference receiving country effectively helps the latter to export to the preference giving country. Similarly, preferences given in sectors where the receiving country is very inefficient may not be sufficient to trigger exports. In addition, tariff rate quotas may significantly limit the actual preference margin since preferences are limited to a certain quantity of exports whereas the calculation of the preference margin or preference erosion refers to the beneficiary country's overall exports.

More generally, one factor explaining attenuated utilization is limited supply response capacity in the beneficiary countries. Other factors are intrinsic to the preference schemes themselves, including product exclusions where export potential exists, country exclusions on a variety of economic and non-economic grounds, restrictive rules of origin and administrative costs incurred in gaining access to the schemes.

Furthermore, actual gains from preferences enjoyed by exporters may be lessened if monopsonistic distributors are operating in the importing market, or if third parties not receiving preferences strategically cut their prices. Finally, the net effects on export volumes under preferential regimes are highly differentiated, depending on the possible entrance of new exporters on the granting-country markets when MFN tariffs were reduced. In this case, other exporting countries will become more efficient and countries that previously benefited from preference margins will lose their market share.[26]

5.3. Dealing with Preference Erosion: Potential Policy Responses

Given the great uncertainty about the real utilization of preferential schemes and the difficulties in the assessment of negative impacts in terms of preference erosion, there is

[26] A number of alternative measures of preference margin have been proposed (Bureau *et al.*, 2006; Hoekman and Prowse, 2005; Low *et al.*, 2005):

- Potential coverage: the ratio between products covered by a scheme and the dutiable imports originating in beneficiary countries.
- Apparent rate of utilization: the ratio between imports that actually receive preferential treatment and those that are in principle covered.
- Actual rate of utilization: the ratio between the volume of imports of the good eligible to the GSP scheme and the volume of imports eligible to the GSP scheme, including those imported under the MFN regime.
- Utility: the ratio of the value of imports that get preferences to all dutiable imports from the exporter (the lower this number, the less generous the preference scheme).
- Trade-weighted value of the preference margin: the preference margin per unit of imports multiplied by the bilateral import value. A second adjustment has been suggested by Low *et al.* (2005) in order to account for the erosion of preferences due to the existence of other exporters benefiting from the same preferential scheme. A "competition-adjusted preference margin" is calculated as the percentage point difference between the weighted average tariff rate applied to the rest of the world and the preferential rate applied to the beneficiary country, where weights are represented by trade shares in the preference granting markets.

great concern about this issue at international level, especially among DCs. From the comparison of the most recent global simulations of trade reform scenarios, there emerge as a general result that only a limited number of small sized economies could be significantly affected by preference erosion as ACP and Mediterranean countries and the Sub-Saharan African region (Anderson and Martin, 2005; Anderson et al., 2005b; Bouët *et al*., 2005b; Brenton and Ikezuki, 2005; Bureau *et al*., 2005b; Hertel and Winters, 2005; 2006). Nonetheless, a significant effort from DCs was employed during the negotiation process to find a feasible solution to this problem and, more importantly, to include specific provisions in the official agricultural negotiation that acknowledge the problem with the requirement of *ad hoc* corrective measures. The most likely explanation is that the countries affected by preference erosion correspond to the poorest and most vulnerable economies in a trade reform context where the DDA states that all WTO members should benefit from the multilateral trade system.

At international level, two different approaches have been proposed to reduce the negative impacts of preference erosion: the first one completely within the WTO rules and the second one claiming for the intervention of external organizations.

The first approach mainly consists of different measures (Hoekman and Primo Braga, 2005; Hoekman and Prowse, 2005; Matthews, 2005b):

- In implementing their tariff reduction commitments, developed countries should maintain the nominal margins of preferences and other terms and conditions of preferential arrangements they accord to their developing trading partners;
- Enhancing existing preference programs by widening access - by harmonizing preferential regimes around liberal rules of origin and reducing compliance costs - or extending their coverage, leveraging utilization rates and increasing their effectiveness (permanent and comprehensive schemes with no product exclusions);
- The domestic investment environment in beneficiary countries must be improved so that producers and investors can exploit the opportunities that arise from trade preferences to develop competitive business that will survive once those preferences are eroded;
- DCs need to diversify into a broader range of exports and not become dependent on the preferential access granted for a narrow range of products;
- Beneficiaries should ensure preferences are integrated as one element of a strategy for broad-based export expansion;
- Implementation of new preferential trade regimes by non-OECD importers. Some DCs as Brazil, China and India may constitute large import markets for LDCs;
- Differentiation of DCs in the concession of preference regimes in order to facilitate more vulnerable economies.

Solutions adopted within the trading system may impose significant opportunity costs from the perspective of global efficiency if they result in additional discrimination and substantially reduce the overall level of ambition of MFN reforms in the Doha Round.

The second approach is focused on the role of development assistance financed both by existing mechanisms for international adjustments or *ad hoc* aid-for-trade initiatives

(Hoekman and Prowse, 2005; Hoekman *et al*., 2005a; Page, 2005). Possible aid-based solutions for preference erosion include:

- Relying on existing financial mechanisms for adjustment financing such as the IMF's Trade Integration Mechanism, or integrating trade-related investments and technical assistance into the broader Poverty Reduction Strategy Papers made by the World Bank in order to transfer responsibility as much as possible to countries effectively involved;[27]
- Establishing new stand-alone, grant-based compensation funds;
- Addressing the preference erosion as part of an aid-for-trade effort.

This last proposal finds its justification in the fact that, as shown by the simulations on trade liberalization scenarios, only a limited number of countries could be significantly affected by preference erosion. Therefore, measures to help mitigate the problem could be targeted closely on the country at risk. An appropriate response might be for the OECD countries to convert the implicit "preference transfers" (the value of current preferences) into equivalent development assistance. Aid transfers have the advantage of not distorting trade flows and being able to target the countries concerned.

The only official response to the problem of preference erosion that emerged during the agricultural negotiations is the recognition of the issue as a main concern for poor countries in the FA of July 2004 where paragraph 44 states that: 'The importance of long-standing preferences is fully recognized. The issue of preference erosion will be addressed." Even in the Hong Kong Declaration, preference erosion is declared as an important issue for development of poor countries but nothing more has been established. Only paragraph 48 highlights the importance of contributing to reducing the supply side constraints affecting LDC markets, affirming that the WTO members "continue to attach high priority to the effective implementation of the Integrated Framework […] as a viable instrument for LDCs' trade development, building on its principles of country ownership and partnership." Thus, it is hardly surprising that the Doha Round is deadlocked if almost all the development-oriented issues remained undefined.

6. Conclusion

This paper has surveyed theoretical and empirical issues concerning the impacts of multilateral trade liberalization on DCs with particular emphasis on the agricultural sector.

The results obtained to date in the Doha negotiations are not ambitious trade reforms and there are no large positive impacts in favor of DCs, thus explaining the negotiation failure. Furthermore, the empirical investigations on potential impacts of Doha agreements have emphasized the existence of heterogeneous results for different groups of DCs. Welfare improvements and poverty reduction are not a common result for poor economies where some of the most vulnerable countries could face losses in a multilateral trade liberalization scenario. When comparing empirical results from global simulations with theoretical analysis

[27] The effectiveness of the mechanism could be reduced by restrictive terms if the country concerned by preference erosion is not able to satisfy IMF criteria, structural adjustments and so on. This is the case for many LDCs.

of trade and poverty relationships and the more specific issue of preference erosion, it would seem that poor countries will only gain from agricultural trade reform if additional policy measures are adopted. One important issue is clearly the need to increase trends in South-South trade flows. Increasing market access for goods exported by poorer DCs, even in dynamic economies such as Brazil, China and India, would provide significant welfare gains for poorest exporting economies. Other additional measures should be settled in order to compensate welfare losses due to preference erosion. Many alternative solutions have been proposed by developed and developing countries as well as academicians and international experts. Whatever solution is adopted, it must have positive long-term effects and help the poorest countries to reduce their sources of underdevelopment such as high income inequality, market failures and lack of infrastructures.

As a concluding remark, a true development round has to go well beyond agriculture. Despite the common view that agriculture is the dominant development issue, DCs clearly have interests in other areas. The agenda must include agriculture because successful agricultural reform will have a large development impact, but at the same time, DCs should also be pushing for progressive market access reform in manufactured goods, especially the elimination of tariff peaks on labor-intensive goods, and for significant progress in unskilled labor mobility.

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Chapter 2

VOLATILITY OF SHORT-TERM CAPITAL FLOWS AND SOCIO-POLITICAL INSTABILITY IN DEVELOPING COUNTRIES: A REVIEW

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Abstract

The paper reviews the theoretical and empirical evidence on the relationship between financial liberalization and socio-political risk by identifying the inter-dependent nature of socio-political and economic fault lines. In particular, the research examines the dynamic relationship between the volatility of short-term capital flows and socio-political instability. Accordingly, the socio-political risk is argued to be endogenously determined with the volatility of short term capital inflows such that increasing volatility by disrupting market activities, domestic investment and growth increases socio-political risk, which further feeds into the volatility of such flows. Using evidence from three major developing countries that are Argentina, Mexico and Turkey and applying Granger causality tests and Impulse Response Functions, the paper finds support for the presence of an endogenous relationship between the volatility of short-term capital inflows and socio-political instability. The results challenge the previous research regarding the use of political risk as a purely exogenous variable.

Keywords: Short Term Capital Flow Volatility, Socio-Political Instability, Developing Countries

JEL Classification: F21, F32, O16, O40, C32

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1. Introduction

> There is nothing so disastrous as a rational investment policy in an irrational world. (J. M. Keynes)

> … if capital markets can, in fact, bring about a collapse and its attendant costs for no external reason, then they are clearly counter productive and deserve restraint. If by contrast, they bring down currencies and policy packages that are unsustainable, then they deserve *three cheers* (Dornbush et al., 1995, p.255, emphasis is mine).

> The authorities in Argentina say half of the country's 36 million people are now living in poverty because of the deterioration of the economy in the worst crisis of the country's history (BBC, 2002)

The revival of international capital flows in the early 1990s combined with domestic far-reaching economic (and in some, political) reform programs along the neoliberal economic model generated a strong shift of mood in both developed and developing country markets regarding the long term outlook of the world economy. In this respect, the recovery of capital flows and accompanying reforms were expected to release foreign exchange and credit bottlenecks, decrease domestic and international real interest rate differentials, generate financial sector deepening and capital market development, minimize moral hazard problems and rent seeking behavior in the public and private spheres, and finally support long-term growth prospects of developing economies. After more than a decade of liberalization experience, however, some serious questions remain over the capacity of capital flows in achieving the initial policy projections. In addition to unmet expectations, there is a growing controversy over the direct role of such flows in generating or at least setting the stage for the consecutive financial crises in both developed and developing countries during the course of 1990s and early 2000s.

Nevertheless, despite a growing research on the causes and effects of international capital flows very little is written on their volatility. This general neglect is especially surprising given the sky-rocketing daily foreign exchange (FX) trading with an ever-increasing gap between real and financial sector activities. Accordingly, the annual FX trading to world trade ratio reached 10/1 in 1980 and 90/1 in 2004 from a mere 2/1 in 1973. Meanwhile FX trading/World GDP reached 17/1 as of 2004 (BIS, 2004). During this time, total sale and purchase of US treasury bonds *and* US corporate Bonds and Stocks between US residents and foreigners increased from around $97 billion and $84 billion in 1980 to $20 trillion and $11 trillion in 2005 respectively.

Despite this substantial expansion in capital flows, apart from a few studies, there is no comprehensive analysis of their volatility or its interdependent relationship with the domestic macroeconomic variables. In this respect, one of the issues that have been neglected in the current literature is the effects of capital flow volatility on socio-political instability in developing countries (political risk and socio-political instability will be used interchangeably from here on). This lack of research on developing country experiences is especially surprising given that macroeconomic volatility is expected to have a much stronger negative welfare effect in developing countries than in developed ones (Pallage & Robe, 2003). Given the interdependent nature of capital flows, country risk, private investment, and growth in

developing countries, the main question asked here is whether the effects of capital flows are limited only to the economic arena or spillover to the non-economic as well.

The current article suggests that uncontrolled domestic and external financial liberalization has given rise to an endogenously determined cycle among socio-political risk, international capital flows, and growth in developing countries. Accordingly, the volatility of short term capital flows and political risk are argued to be endogenously determined such that increasing volatility by disrupting market activities, domestic investment and growth increases political risk, which further feeds into volatility of such flows.

In order to explore the presence of such an endogenous relationship, the paper uses evidence from three emerging markets, Argentina, Mexico, and Turkey (AMT from here onwards), which appear as a trio where financial liberalization programs were first started (together with Chile[1]) and the experiences of which have formed the theoretical (and *ideological*) basis of the arguments (either for or against) on globalization and liberalization of markets in the developing world. The following figures also help emphasize the relative importance of these three countries among other emerging markets: Argentina and Mexico attracted 42% of total foreign direct investment (FDI) inflows, 56% of total IMF credit and 43% of total portfolio flows to Latin America between 1980-2000. Furthermore, between 1990-1994 and 1990-2000 AMT received 53% and 38% of total portfolio flows to middle and lower income countries in the world. In fact, Turkey itself received 23 cents out of every dollar invested in middle income countries in the form of portfolio investment in 2000. Moreover, Turkey is not only the largest debtor of IMF accounting for 46% of the total outstanding credits and loans from the General Resources Account, but also has the highest quota/usage ratio from this account with 1011% of its quota as of April, 2006.[2]

The empirical results using Granger causality tests and Impulse Response Functions suggest the presence of a causal relationship between short-term capital flow volatility and socio-political risk. The findings are of significant importance given the general neglect of this two-way relationship between macroeconomic volatility and socio-political risk.

The next section presents an overview of the existing research on the relationship between economic variables and socio political risk. The third section provides a critical review of the previous research and identifies the endogenous relationship between the volatility of short-term capital flows and socio-political instability together with the presentation of key hypothesis of interest, the data and measurement issues. The fourth section presents the empirical results. The final section provides a discussion of the findings and concludes the paper.

2. Economics of Socio-Political Risk

2.1. Political Risk, International Capital Flows, Investment and Growth

The relationship between domestic and international investment decisions and socio-political instability has been an attractive topic for researchers especially following the globalization of

[1] I excluded Chile from this analysis given the presence of capital controls during the 90s, which makes it impossible to compare with AMT in terms of capital flow volatility. In contrast, during this period AMT were among those with the most liberal capital account regimes.

[2] For a review of reform programs in AMT see Demir (2004, 2008b).

domestic markets for the last two decades. In particular, the existing research focused on the effects of political instability on: i) global asset allocation (for both debt and equity flows), and ii) domestic financial markets and macroeconomic fundamentals, and on growth.

The research in international finance mostly focused on the effects of political instability on the global asset allocation decisions of private investors. These models spread over a wide range of fields from measurement of risk premiums in equity returns to measuring country creditworthiness (e.g. Feder & Uy, 1985; Rivoli & Brewer, 1997; Bailey & Chung, 1995; Erb et al., 1995; Rivoli & Brewer, 1997; Bilson et al., 2002). In this group, it is argued that political risk factors are at least as important as economic variables in explaining foreign lenders' risk perceptions and countries' creditworthiness. In this respect, the countries experiencing higher levels of capital inflows are argued to have lower levels of political risk than others (Hernandez & Rudolf, 1994, Fedderke & Liu, 2002). Likewise, political risk and instability are pointed out to have a significantly negative impact on FDI flows to developing countries *(*Kobrin, 1978; Root & Ahmed, 1979; Nigh, 1985; Schneider & Frey, 1985; Wei, 1997; Biswas, 2002).

Moreover, the existing research suggests an economically and statistically significant negative relationship between political risk and stock market returns in developing countries while no such effect is found in the case of developed country markets (Erb et al., 1995; Diamonte et al., 1996; Bilson et al., 2002). In the case of capital flow volatility, while Alfaro et al. (2004) failed to detect any significant effect of institutional quality on the volatility of total net capital inflows in a cross-section of 97 countries between 1970 and 2000[3], Beck (2001) finds that rule of law has a statistically significant negative effect on volatility in the case of 56 emerging markets over the period of 1990-1998.

Likewise, in the growth literature political instability has been widely used as an explanatory variable.[4] The majority of research in this field finds a negative relationship between political risk, and investment and growth (Barro, 1991; Alesina & Perotti, 1994, 1996; Alesina et al., 1996; Sala-i-Martin, 1997; Asterio & Price, 2001). Furthermore, Venieris & Gupta (1986) identify an inverse relationship between political instability and the savings rate. In addition, Asteriou & Price (2001) find that socio-political instability not only negatively affects the growth rate but also increases its volatility in the UK.

Another related issue with political instability and growth connection is the income inequality and growth relationship. There are two opposite views on this issue. One is the classical view, which suggests that more inequality favors more accumulation, because the rich save more than the poor. The second view analyzes the effect of inequality on growth and investment through fiscal redistribution channels: Increasing social pressures because of growing income inequality diverts resources from investment to fiscal redistribution and hence generates an inverse relation between inequality and investment in physical capital (e.g. Persson & Tabellini, 1994; Alesina & Rodrik, 1994; Alesina & Perotti, 1996). These two

[3] However, apart from the problem of endogeneity, their analysis suffers from measurement error. Specifically, their measure of capital flows is based on the net flows (i.e. net of inflows and outflows by *residents* and *nonresidents* alike), which may lead to a biased volatility measure given that capital flows by nonresidents and residents goes in different directions depending on the time period covered (Gabriele et al., 2000, p.1037). This may also explain why according to their volatility estimates, volatility of net capital flows in developing countries is lower during 1990-2000 than during 1980-1990.

[4] Brunetti (1997) and Carmignani (2003) provide a thorough survey of existing research on the uses of socio-political variables in economic analysis. Both papers also offer a comprehensive survey of the respective measures of socio-political variables used in the previous research.

effects go in opposite directions and in principle they may cancel out. Perotti (1996) and Barro (1999) provide support for this thesis in their analysis of inequality-growth relationship where they find no significant effect of inequality on growth.

The central idea behind the above research is that socio-political unrest and instability disrupts market activities and investment decisions by increasing economic uncertainty and risk. Increasing violence, civil wars, political disorder and physical threats to workers and entrepreneurs can have direct effects on productivity and therefore on the rate of return on investment.[5] As a result, as Olson (1982, p.165), argued "instability diverts resources that would otherwise have gone into productive long term investments into forms of wealth that are more easily protected, or even into capital flight to more stable environments". Therefore, increasing social discontent and political uncertainty is expected to harm growth and investment while at the same time discouraging foreign capital inflows and encouraging outflows.[6]

2.2. International Capital Flows, Macroeconomic Volatility and Growth

Political sources of risk are not the only causes of uncertainty and instability for investors. In this respect, the effects of liberalization of financial markets on domestic macro variables (that directly or indirectly may affect socio-political risk) have also been among the most hotly debated topics in the recent economics literature.

Grabel (1995) and Oks & Wijnbergen (1995), for example, argue the presence of a direct a link between stock market fluctuations, and short-term capital flows and/or financial liberalization in several emerging markets. Likewise, Calvo et al. (1993) examine empirical evidence for 10 Latin American countries and concluded that foreign factors (such as interest rates, economic activity, and stock market returns in the US) accounted for 30-60% of the variance in real exchange rates and reserves. Similarly, Berg & Taylor (2000) and Frenkel & Ros (2006) find a direct link between capital flows and the appreciation of domestic currencies in Latin American countries that led to a shift of relative prices against tradable good sectors. Consumption volatility, on the other hand, has also increased in emerging markets following financial liberalization during the 1990s (Kose et al., 2003). Furthermore, it is also shown that the coefficient of variation of growth among developing countries is on average more than 6 times higher than among developed countries (Mobarak, 2005). The existing empirical evidence also shows an increase in the volatility of sales and earnings of firms in both developed and developing country markets for the last three decades (Grabel, 1995; Comin & Mulani, 2006; Wei & Zhang, 2006).

In the case of changes in the volatility of capital flows, Gabriele et al. (2000), find that between late 70s and 90s "capital flows to developing countries are characterized by high, rising and unpredictable volatility" (p.1051). Furthermore, as Weller (2001) points out emerging economies are systematically becoming more vulnerable to both currency and banking crisis after financial liberalization. Between 1980 and 1995 almost ¾ of 181 members of IMF had one or more periods of banking crisis or significant banking problems (Felix, 1998, p.164). UNCTAD (1998) also argue that many of the weaknesses in economic

[5] Ros (2003, p.264-302) provides a thorough analysis of the existing research on the relationship between income distribution and economic growth.

fundamentals such as currency appreciation, deterioration of the current account and increasing exchange rate risk is related with the capital flows. Excess volatility in exchange rates resulting from increasing capital flow volatility also raises inflation uncertainty, and encourage speculative financial investments by financial and real sector firms alike (Felix, 1998; UNCTAD, 2006; Demir, 2007a, 2007b). In this respect, from a Keynesian perspective, increasing volatility following financial liberalization may be self-reinforcing as investors shorten their planning horizons, which further feeds into the existing volatility (Keynes, 1964, Ch. 12; Grabel, 1995).

As a result of this increasing financial fragility and speculative crises during the 1990s such as the ERM crisis in 1992, Peso crisis in 1994-5, and Asian crisis in 1997, a new line of instability and crisis literature appeared that replaced the earlier *first generation currency crisis* models à la Krugman (1979) where an incompetent public sector with its irresponsible internal and external balance targets was seen as the root cause of financial instability and crisis. In retrospect, the first generation currency crisis models have often been used to provide theoretical support to such views that financial markets punish those countries with unsustainable and inconsistent domestic economic policies. In this narrative, a speculative attack, which deserves "three cheers", becomes inevitable once the investors realize the unsustainable nature of the economic policies implemented in the host countries (Dornbush, et al., 1995).

According to the new *second generation currency crises models*, on the other hand, as business portfolios become more and more diversified in the highly integrated international capital markets, the marginal benefit of acquiring expensive country specific in-depth information decreases which in return discourages investors from obtaining detailed information on each country they invest in. (Calvo, 1998; Calvo & Mendoza**,** 2000). Therefore, it is quite *rational* for investors to react even to small news, which means "small bad news" even if there is no change in fundamentals can generate a speculative attack and a reversal of international capital flows. As a result, foreign investors may not be as responsive to real sector changes in the short-run as they are to news, market rumours, and political risk variables and therefore good fundamentals may not be sufficient to avert a financial crisis (Eichengreen et al., 1995; Fitzgerald, 2001). According to this wave of models, over-optimism, which is followed by over-pessimism, is mostly explained by changes in investor expectations. The presence of asymmetric information and herd behavior, hence, play a key role in these models. The second-generation crisis models, as a result, by arguing for the possibility of multiple equilibria depending on investor expectations, introduced low growth traps and financial anarchy into policy discussions (Eichengreen et al., 1995; Obstfeld, 1986, 1994)

On the other hand, when looking at the effects of uncertainty and volatility (including volatility in real GDP growth, real exchange rate, relative prices of capital goods, and inflation) on investment and growth, the existing empirical evidence suggest an unambiguously direct negative link in both developed and developing countries (Driver and Moreton, 1991; Federer, 1993; Hausmann & Gavin, 1995; Ramey & Ramey, 1995; Price, 1995; Aizenman & Marion, 1996; Serven, 1998; Demir, 2008a). Also, Galeotti & Schiantarelli (1994) based on a panel of non-financial US firms found that firms' investment decisions are affected as much by optimist/pessimist moods of market participants as by

[6] Alesina & Tabellini (1989) provides a theoretical model explaining capital flight as a function of political risk.

fundamentals, which reflect the importance of *conventions* and *expectations*. Accordingly, the signals sent by the stock market are important even when fluctuations are caused by irrational investor behavior. Moreover, Moguillansky (2002) for 16 LA countries, and Demir (2008b) for Argentina, Mexico and Turkey, find that volatility of short-term capital flows has a statistically and economically significant negative effect on fixed investment.[7]

3. Capital Flows and Socio-political Risk: The Endogeneity Problem

What is common in a majority of research in the field is that they identify a linear relationship from political risk to international and domestic investment decisions, and to economic growth. As a result, most of the empirical evidence has been obtained without tackling the parameter endogeneity problem despite the fact that the joint endogeneity of some regressors and the regressed variable causes a misspecification problem in econometric analysis. Shortly, this implies that political risk variables are correlated with the residuals and thereby make the standard OLS estimators biased and inconsistent.[8]

Having observed a direct relationship from political risk to private investment, capital flows, and growth, some interesting results emerge when looking at the effects of changes in economic variables on socio-political instability. In this respect, the relationship between economic growth and poverty has long been an engaging topic in the field. In a recent paper, Adams (2004) find that economic growth elasticity of poverty is –2.79 and statistically significant when growth is measured by changes in mean survey income. Similarly, Hausmann & Gavin (1996) in a sample of 56 countries reported that GDP growth volatility has a significantly negative effect on income inequality.

In the case of the effects of income inequality on crime, Fleisher (1966), Ehrlich (1973), Soares (1999) and Fajnzylber et al. (2000) find that income inequality significantly increases crime rates. At this point, as reviewed by Freeman (1994), most of the research in the field also finds a positive relationship between unemployment and crime rates. Besides, Fajnzylber et al. (2000) based on a cross-country analysis established a statistically and economically significant negative relationship between GDP growth and violent crime rates. In this respect, Harms (2002) provides an analytical model that explains the negative correlation between poverty and political risk.

Regarding financial liberalization, and inequality and poverty relationship, the findings of Taylor & Vos (2000) who distinguish the effects of trade and financial liberalization on income distribution further indicate the presence of an endogenous relationship between social and macro-economic variables by linking financial opening with greater volatility that impedes sustained improvements in equity and poverty reduction. Likewise, Dutt &

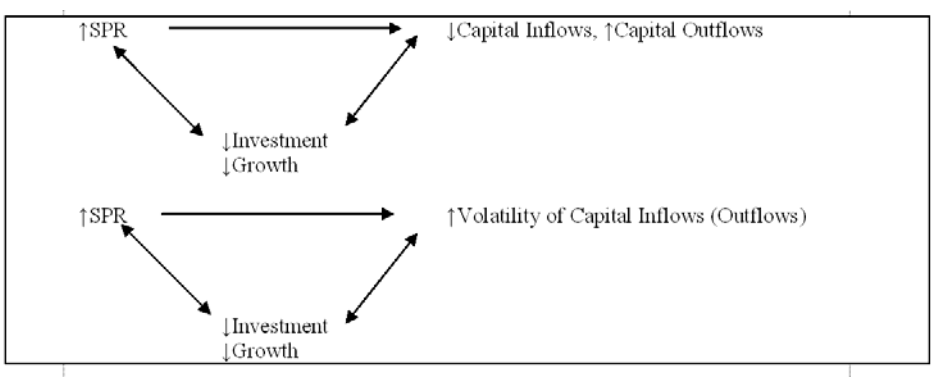
[7] In contrast, Easterly et al. (2001) found no significant effect of either financial openness or volatility of capital flows on output volatility in a sample of 74 countries between 1960 and 1997. Also, Buch et al. (2002) for 25 OECD countries found that there exists no consistent empirical relationship between financial openness and volatility of output.

[8] The issue of parameter endogeneity is discussed in detail in Carmignani (2003) where it is pointed out that econometric models with political variables suffer from several specification and estimation errors. The problem is more severe for those who employ political risk measures of institutional risk-rating firms without considering possible endogeneity between the risk ratings and market volatility. (for a discussion of procyclical risk ratings see e.g. Kaminsky & Schmukler, 2002).

Mukhopadhyay (2005) find that globalization (reflected by world trade and international capital flows) causes an increase in the inequality of per capita GDP across nations. Similarly, in an analysis of the effects of economic reform programs of the 1980s and 90s on income inequality in 17 Latin American countries (representing more than 90% of the region's population), Birdsall & Szekely (2003) show that financial liberalization significantly increased income inequality. Consistent with Hausman and Gavin (1996) they also find a significantly positive impact of macroeconomic volatility on inequality (i.e. worsening inequality). When turning to the financial crisis experiences, Fallon & Lucas (2002) point out the negative effects of the financial crises of the 1990s on labor markets in the form of cuts in real consumption wages and rising unemployment levels. Likewise, Halac & Schmukler (2003) find a significantly negative impact of financial crises on income distribution in Chile, Mexico, Ecuador, Argentina and Uruguay.[9] Senses and Koyuncu (2007), on the other hand, point out significantly negative socio-economic effects (especially regarding labor markets, and inequality and poverty) of financial crisis in Indonesia, Argentina and Turkey. Moreover, Rodrik (1999) suggests that external economic shocks generate domestic social conflicts that lead to growth collapses in countries with weak institutions of conflict management.

To sum up, the existing research suggests that increasing political risk discourages foreign capital inflows while increasing capital flight, and reduces private fixed investment and slows down economic growth. On the other hand, changes in the volatility and levels of capital flows hurt investment and economic growth, which then leads to increasing unemployment, real wage contractions and increasing income inequality and poverty. Increasing unemployment, income inequality and falling real wages then increases socio-political unrest in the form of regime instability, higher crime rates, threats to private property and increasing pressure on the political system for redistributional purposes.

In short, the relationship among international capital flows, private investment and growth, and socio-political risk (SPR) can be summarized as follows:



In this picture, both the direction and the volatility of international capital flows affect the political risk through domestic investment and growth variables.

In order to emphasize the size of the shock caused by external capital inflows, I turn to the evidence from AMT and compare *gross* capital inflows (that is the sum of the absolute value of monthly net capital inflows by nonresidents for the period covered) with the *net*

[9] For a review of existing literature on financial crisis-income distribution relationship, see e.g. Halac & Schmukler

inflows using the US treasury data (where monthly transactions between the US and corresponding countries are recorded). The reason for this is that the main challenge to developing countries comes not from the size of *net* flows but more importantly from the size of *gross* flows vis-à-vis domestic stock variables. In most cases, the high velocity of capital flows further increases the uncertainty and volatility in key domestic macro variables. Although the gross flows may overstate certain components of short-term capital flows such as lending to domestic banks (because of separate recording of rolled-over credits, that are registered as new lending), it is a functional measure especially given that "the rollover of short-run debts is not neutral in financial terms" (Ocampo, 2001:17). Therefore, focusing only on net flows will give a distorted or at best an incomplete picture of the real shock faced by the recipient countries.

As can be seen from Table 1 below, between 1984 and 2003, the net to gross inflows ratio was 0.36% for Argentina, 2.7% for Mexico and 4% for Turkey. When looking at the breakdown of the flows throughout this period, not surprisingly the majority of inflows took place following the capital account liberalization of 1989-1990. Between 1990 and 2003, gross inflows increased 50 times in Argentina, 21 times in Mexico and 42 times in Turkey compared to the 1984-1989 period. On the other hand the increase in net inflows (that reflect net resource inflow) remained much smaller. While gross inflows stand around $592, $553 and $188 billion in AMT, the net inflows remained at $5, $27 and $7 billion respectively between 1990 and 2003.

Table 1. Gross and Net Capital Inflows

	Millions of US Dollars in Current Prices							
	ARG		***MX***		***TR***		***TR****	
SUMS	**Gross**	**Net**	**Gross**	**Net**	**Gross**	**Net**	**Gross**	**Net**
1984-1989	11,685	-2,803	26,497	-11,921	4,511	295		
1984-2003	603,528	2,192	579,636	15,380	192,990	7,678		
1990-2003	591,843	4,995	553,139	27,301	188,479	7,383	198,895	48,449

Source: The US Treasury International Capital Reporting System and Author's calculations.

Notes: Gross stands for gross short-term capital inflows, which are the sum of the absolute value of monthly net capital inflows over the whole period. Net stands for net short-term capital inflows, which are the sum of the monthly net capital inflows for the whole period. ARG, MX and TR are Argentina, Mexico and Turkey respectively.

*The data are for the 1992-2003 period based on Central Bank of Republic of Turkey (CBRT) database.

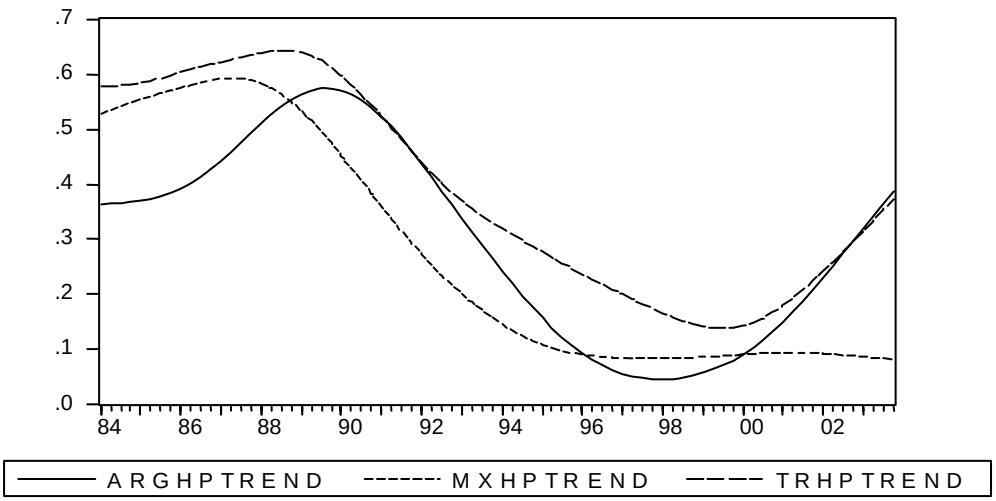
Figure 1 further highlights the discrepancy between the gross and net inflows by looking at the ratio between net capital inflows and gross inflows in AMT using the Hodrick-Prescott Filter (HP), which is used to obtain a smooth estimate of the long-term trend component of the series.[10] Accordingly, there is a sudden jump in the volatility of capital inflows to AMT

(2003).

[10] The Hodrick-Prescott filter is a linear filter that calculates the smoothed series of y and x by minimizing the variance of y around x, subject to a penalty that limits the second difference of x. More specifically, the HP filter chooses x to minimize the following equation:

$$\sum_{t=1}^{T}(y_t - x_t)^2 + \lambda \sum_{t=2}^{T-1}[(x_{t+1} - x_t) - (x_t - x_{t-1})]^2$$

following the capital account liberalization of 1989 as can be seen from the increase in *gross* inflows vis-à-vis *net* inflows. Moreover, the overall trend in the volatility of capital inflows in Mexico starts to diverge with the ones from Argentina and Turkey during the second half of the 1990s. Unlike the other two, net/gross inflows ratio stayed stable especially in the second half of the 1990s, reflecting the persistence of high volatility. The explanation, which is a topic for further research, may lie in the special relationship between Mexico and the US especially following the signing of NAFTA in 1994.



Source: The US Treasury International Capital Reporting System and Author's calculations.

Notes: ARGHPTREND, MXHPTREND and TRHPTREND stand for HP Trend of net/gross short-term capital inflows ratio for Argentina, Mexico and Turkey respectively. The ratio is calculated using quarterly data and is based on the *gross inflows* that are the quarterly sum of the absolute value of monthly net capital inflows, and *net inflows* that are the quarterly sum of the monthly net capital inflows. For convenience of interpretation, net inflows are given in absolute value. A decrease in this ratio reflects increasing volatility.

Figure 1. HP Filtered Net/Gross Capital Inflows Ratio in AMT between 1984-2003.

Nevertheless, despite the overwhelmingly contrary evidence, only a few studies have taken into account the endogenous nature of economic variables with socio-political risk and used appropriate econometric techniques. In this respect, Alesina & Perotti (1996) control for the endogeneity between socio-political instability and domestic investment in physical capital using a simultaneous equation setting in a cross-section of 71 countries for the period of 1960-1985 and find results supporting the view that income inequality increases socio-political instability, which then reduces investment. They point out that fiscal redistribution by increasing the tax burden on capitalists and investors reduces the propensity to invest. However, the same policies may reduce social tensions and create a social climate more conducive to productive activities and capital accumulation. Furthermore they find that

The λ variable is a penalty parameter that controls the smoothness of the series. As λ goes to infinity, x approaches a linear trend. The penalty parameter, λ, that controls the smoothness of the series is set equal 1,600, which is the default value of quarterly series in the Eviews 6.

income distribution does not have any additional effect on investment after controlled for political instability suggesting that income inequality hinders growth through its effect on political instability. Likewise, Alesina et al. (1996) in a simultaneous equation framework endogenizing political instability and economic growth in a sample of 113 countries for the period of 1950-1982 confirm the above findings by showing that political instability reduces growth at a statistically significant level. Yet, they fail to find the same effect from growth to political instability. Likewise, in two case studies, Asteriou & Price (2001) and Fielding (2003) in the case of UK and Israel respectively find that socio-political instability negatively Granger causes investment in nonresidential construction as well as equipment and machinery investment.

Likewise, Campos and Nugent (2002b) obtain results that to some extent challenge the traditional view: They construct an aggregate index of socio-political instability (SPI) for a sample of 98 countries over a period of 1960-1995. They run two separate analyses to test the relationship between political instability and rate of growth, one with standard OLS regression where the dependent variable is rate of growth and independent variable is political instability, and the other one with recognizing the endogeneity between these variables. Standard OLS regressions supports the findings of other papers on this subject; a negative correlation between SPI and growth. However, when they repeat the same exercise with Granger causality tests they find that SPI does not Granger cause growth for the case of whole sample. Campos and Nugent (2002b) repeat the same analysis to investigate the relationship between SPI and investment. They report that while socio-political uncertainty is contemporaneously associated with lower investment, socio-political uncertainty leads to greater investment in the future. On the other hand they found a contemporaneous negative effect of socio-political risk on growth at a statistically significant level even after controlling for the positive impact of risk through investment on growth.

In contrast, Limongi & Przeworski (1994) do not find any significant impact of either political instability on growth or vice versa in the case of ten South American Countries between 1946 and 1988. Similarly, Londregan & Poole (1990) endogenize the growth and political instability in their regression model without finding any evidence of reduced growth as a result of increased political instability.[11]

3.1. The Hypothesis

This section tests the presence of an endogenously determined relationship between political risk and volatility of short-term capital flows in developing countries using evidence from AMT. Unlike others, I employ monthly series on capital flows and country risk that enable the exploration of short term dynamics and help capture the actual levels of short term capital flow volatility. Despite the fact that there is a consensus in the literature over the speed with which short term capital flows across borders (see Table 1 and Figure 1), the existing research continues to use aggregated annual or in many cases averaged cross section data. Thus, one of the main contentions of the paper is the presence of a general lack of emphasis on the highly volatile nature of capital flows that leads to a measurement error in the net capital flows

[11] However their proxy for political uncertainty is restricted to military coups.

variable, especially when the variable is aggregated over 1 or 5 year periods.[12] This way, the current analysis will be able to uncover the immediate impact of capital flow volatility on socio-political risk ratings and expectations.

Similar to Campos and Nugent (2002a, 2002b) Asteriou and Price (2001) and Fielding (2001), I employ the Granger-causality framework to analyze the presence and direction of a causal relationship between the socio-political risk (*SPR)* and the short term capital flow volatility (*SCFV*). Accordingly, having two time series, $SCFV_t$ and SPR_t, $SCFV_t$ is said to Granger cause SPR_t if the lagged coefficients of $SCFV_t$ (i.e. β_{2i}) are jointly significant (equation (1)). And, SPR_t is said to Grange cause $SCFV_t$ if the lagged coefficients of SPR_t (i.e. ρ_{1i}) are jointly significant. Thus, the null hypothesis is that *SCFV* does not Granger-cause *SPR,* and *SPR* does not Granger-cause *SCFV*.

$$\begin{aligned} SCFV_t &= \alpha_1 + \sum_{i=1}^{j} \beta_{1i} SCFV_{t-i} + \sum_{i=1}^{j} \rho_{1i} SPR_{t-i} + \varepsilon_{1t} \\ SPR_t &= \alpha_2 + \sum_{i=1}^{j} \rho_{2i} SPR_{t-i} + \sum_{i=1}^{j} \beta_{2i} SCFV_{t-i} + \varepsilon_{2t} \end{aligned} \tag{1}$$

where t and i refer to the time period and the lag structure respectively, and ε_{1t} and ε_{2t} refer to the error terms. In this specification, $SCFV_t$ and SPR_t are assumed to be stationary so that depending on the time-series properties of the series, they denote the level or the first difference of the variables.

SCFV is volatility of short-term capital inflows and *SPR* is socio-political risk index (a higher value indicates lower risk).

Decreasing *SPR* (i.e. increasing risk) is expected to increase the volatility of short-term capital inflows. The intuition is that as political risk increases, international investors' sensitivity to small bad news increases as well. Also together with increasing risk investors are expected to decrease the term structure of their investments and increase the turnover rate and thereby further increase the volatility. On the other hand, increasing *SCFV* is expected to increase socio-political risk (hence reduce *SPR*). However, since the Granger Causality test only provides the direction of causality I also used an Impulse Response analysis. Accordingly, the Impulse Response analysis shows the dynamic response of the endogenous variables in the system equations to a one-time shock to one of the innovations of the system. As discussed by Pasaran & Smith (1998), I use the *generalized impulses* that constructs an orthogonal set of innovations, which does not depend on an arbitrary ordering of the VAR system variables.

[12] For the robustness of this claim, I looked at the annual capital flow volatility measured by net quarterly and monthly capital inflows as defined in the paper using US treasury data. This way we can test the robustness of annual volatility variable using quarterly and monthly data. If we got similar results, then using quarterly data would not cause any significant distortion. However, in the opposite case the results would imply an inconsistency and measurement error as well as efficiency loss from employing an aggregate data rather than high frequency data. The results provide further support to my methodology: the simple correlation between these two annual volatility measures (using quarterly and monthly data) is only 0.36 during the periods analyzed.

3.2. Data Sources and Measurement Issues

In order to test the above hypothesis, I use quarterly volatility of monthly short term capital inflows (by nonresidents) and the level of socio-political risk. As discussed before, the reasons for using such high frequency data are two-folds: a) Given the high velocity with which short term capital travels in and out of countries, annual or even quarterly flows measures do not capture the real magnitudes and the shock waves of these flows. As can be seen from Table 1 and Figure 1, there is a growing gap between gross and net flows in AMT. As a result, when trying to capture the volatility of the flows using these data, there will be a significant bias in the calculations, b) In order to capture the immediate impact of the volatility of these flows on socio-political risk perceptions and expectations in these markets.

However, the available data from domestic sources for AMT are not uniform in period coverage and frequency. For Argentina and Mexico, for example, the short-term capital flows data from balance of payments statistics are quarterly and there are no monthly data available. Therefore, the US Treasury International Capital Reporting System that provides monthly cross border investment transactions of short term and long term securities vis-à-vis the US and foreign countries is used.[13] The data coverage goes as far as 1977 and includes all countries that are reported to have transactions with the US.[14] Given the close proximity of Argentine and Mexican markets to the US the data series are assumed to be close estimates of the total capital inflows to these countries. Also, given the locomotive effect of capital flows from the US, the volatility of these flows is not expected to deviate significantly from the total flows. In addition, in the case of Turkey monthly balance of payments data, which is available from the Central Bank of Republic of Turkey (CBRT) starting from 1992, is also employed. Given that Turkey is not in close proximity to the US market as Argentina and Mexico possible biases caused by the way US treasury data are recorded will be avoided this way.[15] Both results are reported in the empirical section. As the measure of capital inflows, net monthly inflows are used. However, gross monthly inflows (measured as the sum of the absolute value of all capital flows in and out of the economy by nonresidents in absolute values) are also calculated to capture the total size of capital moving in and out of the economy by the nonresidents (Table 1 and Figure 1).

As the volatility measure, the quarterly standard deviations of net monthly inflows in constant prices are used (Figure 2)[16]. The net inflows are equal to net sale of long-term

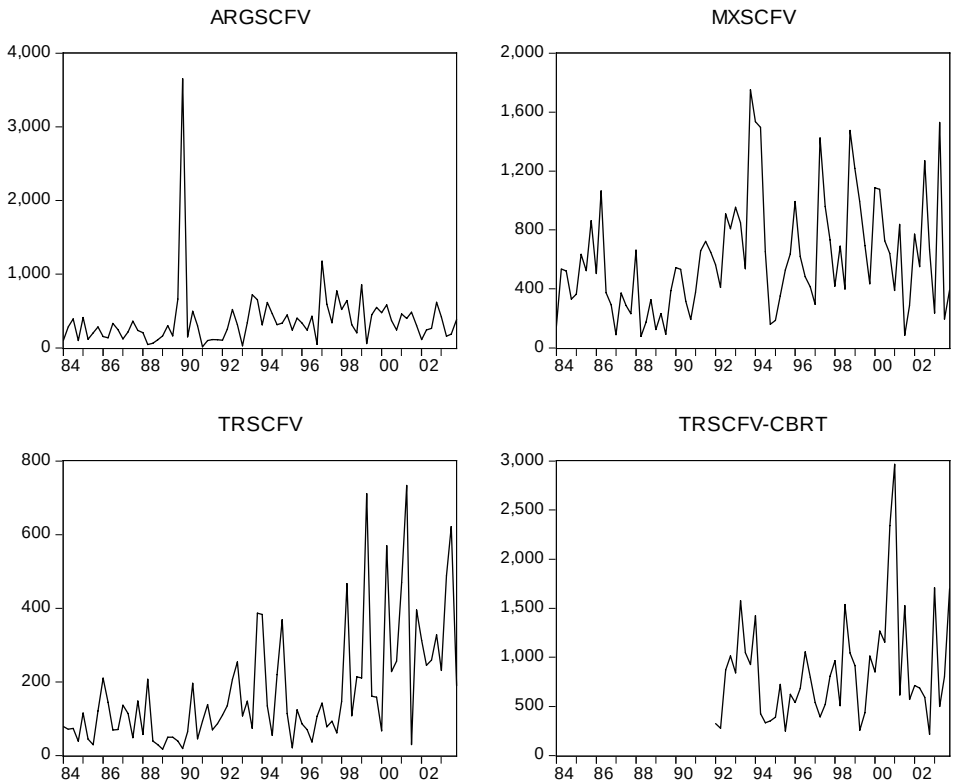
[13] For an analysis of the data as well as information on the US system for measuring cross-border securities investment see e.g. Griever et al. (2001). Also for information on data coverage and measurement issues of the data series see the treasury web site at http://www.ustreas.gov/tic/index.html.

[14] The most notable limitation of the data is that "for balance of payments purposes, the monthly transactions reports were designed to provide information on the country through which a transaction was made, and that country is not necessarily the same as the country in which the security's issuer, purchaser, or seller is a resident" (Griever et al., 2002, p.640). For example, when a US resident purchases Turkish stock through an intermediary in Britain, the transaction is recorded as a US purchase of foreign stock through Britain and not Turkey. Therefore "this reporting procedure results in a bias not only toward over-counting flows to countries that are major financial centers but also toward undercounting flows to other countries" (Ibid. p. 640).

[15] In order to clarify the above point, net quarterly short-term capital inflows figures from the IFS statistics are compared with the US Treasury data. The simple correlation between two datasets is 0.54 for Argentina, 0.52 for Mexico and 0.10 for Turkey. The results suggest that the use data for Argentina and Mexico may be a good substitute for the national BOP data, while for Turkey the precaution to repeat the analysis with the national data is justified. Also for a discussion of such limitations see e.g. Griever et al. (2002, p.640).

[16] Two other alternatives to measure the volatility of capital inflows are the coefficient of variation and normalization via GDP weights. While both methods are widely used in cross-country analysis, they don't

[Argentine, Mexican, Turkish] stock and bonds[17] plus changes in the sum of total US banks' claims on foreign public borrowers and unaffiliated foreigners and on own offices.[18] Also, in the case of Turkey the net inflows variable from the CBRT balance of payments data is calculated as the monthly sum of equity securities liabilities, debt securities liabilities, other investment liabilities-loans-banks and other sectors, other investment currency deposits-banks and other investment other liabilities.



Notes: ARGSCFV, MXSCFV, TRSCFV refer to short-term capital flow volatility in Argentina, Mexico and Turkey respectively using the US treasury data. TRSCFV-CBRT refers to the short-term capital flow volatility in Turkey using the CBRT balance of payments data.

Figure 2. Short-term Capital Flow Volatility.

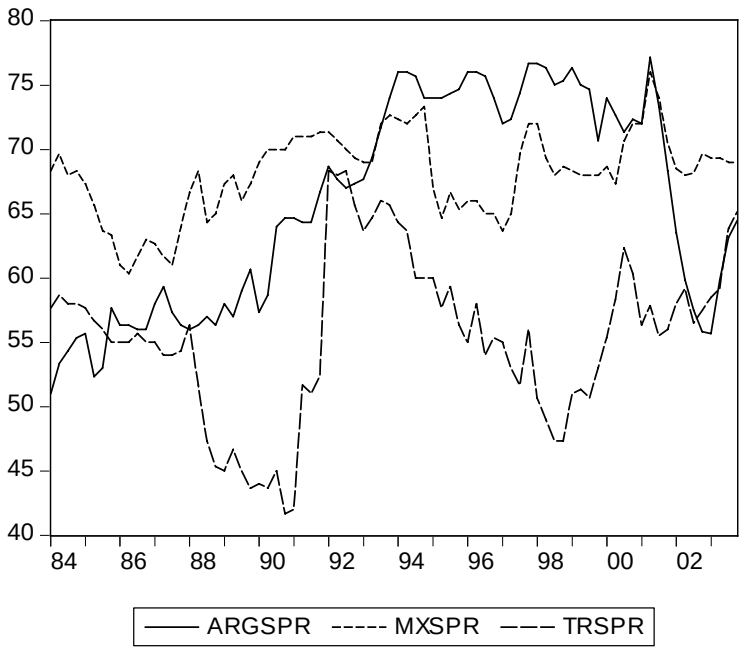
In addition, given the limitations of the US Treasury data discussed above, for robustness I developed a second volatility measure using quarterly data from the International Financial Statistics of IMF that is equal to the four-quarter moving average standard deviation of quarterly percentage change of real short term capital flows with respect to the same period of

affect the results in single country regressions. Also, an important drawback of the second method is that it is biased upwards during and after any economic turmoil where GDP contracts downwards.

[17] From Foreign Purchases and Sales of Long-Term Domestic and Foreign Securities by Type tables of the treasury, Data column titles correspond to column titles in Treasury Bulletin Table CM-V-4, excluding CM-V-4 columns (1) and (8).

previous year. The short term capital flow variable is measured as the sum of equity securities liabilities, debt securities liabilities, other investment liabilities-short-term loans of banks and other sectors, and other investment currency deposits of banks.

Figure 2 displays the *SCFV* measure for all three countries. The sudden spikes correspond to the financial crisis dates such as those in 1994-5 due to the Peso crisis and the Turkish crisis, 1997-8 due to the Asian and Russian crisis, and 2001 crisis in Argentina and Turkey. We also see a trend increase in volatility in Mexico and Turkey following the capital account liberalization in 1989.



Notes: ARGSPR, MXSPR, TRSPR correspond to ICRG composite socio-political risk index in Argentina, Mexico and Turkey respectively.

Figure 3. Socio-Political Risk Levels.

The socio-political risk (*SPR*)[19] measures, as shown on Figure 3, are from the International Country Risk Guide Composite Political Risk Index (ICRGP), which is a qualitative risk index varying within the range of 0-100, 100 representing the least risky country, and is based on expert analysis using the following components: Economic Expectations, Economic Planning Failures, Political Leadership, External Conflict, Corruption, Military in Politics, Organized Religion in Politics, Law and Order Tradition,

[18] There is a change in the data definitions following 2003:2, for a detailed description of the changes refer to Treasury International Capital Reporting System.

[19] International Country Risk Guide Political risk index scores vary within the range 0-100 and therefore conflict with the normality assumption underlying OLS. However, the scores may be interpreted as probabilities as suggested by Feder & Ross (1982), which then allows a logistic transformation on the risk scores such that

Racial and Nationality Tensions, Political Terrorism, Civil War, Political Party Development, Quality of the Bureaucracy.[20] Apart from its reliability and common usage in the empirical research (see, for example, Diamonte et al., 1996, Bilson et al., 2002), ICRGP has an important advantage over other methods of measuring socio-political risk, which is that of being available monthly starting from 1984. As a result, quarterly political risk and volatility data could be employed.[21]

On the other hand, there are certain disadvantages of working with such high frequency data as well as with an expert calculated measure of socio political risk. The most evident one is the fact that it might be difficult to catch the effects of economic growth variables on socio-political risk in such a high frequency data. Secondly, the risk ratings may be biased reflecting the raters' risk perceptions rather than the actual socio-political instability in a country. In this respect the ratings might be backward as well as forward looking (i.e. reflecting the raters' past experiences as well as future expectations based on the information available at time *t*). However, given that the current analysis is trying to capture the contemporaneous impact of the volatility of international capital inflows on socio-political risk, the second difficulty is indeed an advantage for us. To the extent that the ratings reflect current as well as expected risks in the future, the impact of the volatility of these flows on the risk perceptions for the future can be captured as well. The sudden jump in the political risk ratings in the aftermath of the capital account liberalization of 1989 in all three countries provides some support to this assumption by showing that the raters reflect the predicted effects of economic developments on socio-political risk levels in their political risk measurements.[22]

4. Empirical Results

4.1. A Granger Causality Analysis

This section presents the results from Granger causality tests between the two key variables, namely the volatility of short-term capital inflows and socio-political risk. Given that Granger test requires stationarity of both variables first-difference transformation is applied when needed.[23] Also, due to sensitivity of the test to different lag specifications, the following tables present the results up to four lags. Accordingly, Tables 2 and 3 show the results from the Granger causality test between *SPR* and *SCFV*.

adjusted SPR: ln((SPR/100)/(1-(SPR/100))). The transformed index is the one used in the following Granger causality analysis.

[20] Other measures for degree of political instability and risk in the literature include different, and sometimes subjective, measures of political unrest in society such as total number of strikes, demonstrations, riots, revolutions, the frequency of change in political leadership, frequency of change in the head of government or the governing group and military coups, assassinations, existence of war, ethnic divisions and ratio of different language groups and minorities to the dominant group, regional and personal income inequality, etc. Another common way of measuring political instability is through aggregating different individual instability indicators into a general index. (e.g. Barro, 1991; Alesina et al., 1996).

[21] As pointed out by Howell & Chaddick (1994) and Bilson et al. (2002, p.14) Political Risk Services indexes are more reliable and perform better in risk prediction than other major political risk ratings.

[22] For example, the political risk index between January 1991 and January 1992 has jumped up 74% in Turkey possibly reflecting the expected effects of financial reform programs.

[23] The stationarity of the series are tested by the Augmented Dickey-Fuller Test.

As can be seen from Table 2, there appears to be a dynamic relationship between political risk and volatility of short-term capital inflows. In particular, in Argentina and Mexico, a significant Granger causality is discovered from capital flow volatility to political risk. In Turkey, the relationship appears to be holding from political risk to capital flow volatility rather than the other way around. Although the Granger test results failed to show a two-way relationship, the results support the hypothesis regarding the effect of volatility on socio-political risk. However, the results should be taken with caution given the apparent limitations of the test and that Granger causality does not necessarily prove a cause and effect relationship.

Table 2. Granger Causality Test Results

Null Hypothesis:	**F-Statistics and Lags:**			
	1	**2**	**3**	**4**
Argentina: 1984:1-2003:4				
SCFV does not Granger Cause dSPR	0.1	2.8*	2.4*	1.7
dSPR does not Granger Cause SCFV	1.2	0.6	0.5	0.4
Mexico: 1984:1-2003:4				
SCFV does not Granger Cause SPR	5.2**	2.6*	2.0	1.8
SPR does not Granger Cause SCFV	0.1	1.0	0.9	1.4
Turkey: 1984:1-2003:4				
dSCFV does not Granger Cause dSPR	0.2	0.6	1.2	0.8
dSPR does not Granger Cause dSCFV	0.2	1.4	2.8**	2.3*
Turkey[a]: 1992:2003:4				
dSCFV does not Granger Cause dSPR	0.007	0.2	0.2	0.3
dSPR does not Granger Cause dSCFV	4.6**	2.2	2.4*	1.7

Notes: (*), (**), (***) refer to significance at 10, 5 and 1 percent level respectively; d refers to first differencing; *SPR* is the International Country Risk Guide Political Risk Rating subject to a logistical transformation as described in the endnote 19, *SCFV* is the standard deviation of real net short-term capital inflows (by non-residents) using the US Treasury data.

[a] *SCFV* is standard deviation of real net short-term capital inflows using Central Bank of Turkey monthly balance of payments statistics.

Table 3 shows the Granger causality test results using the alternative *SCFV* measure that is the four-quarter moving average standard deviation of quarterly percentage change of real short term capital flows with respect to the same period of previous year. The results using this alternative volatility measure confirm the presence of a causal link from capital flow volatility to socio-political instability in Mexico and Turkey. Unlike the findings from Table 2, however, I did not find any Granger causality for Argentina. Moreover, the causal link appears to be reversed for Turkey. The failure to find the Granger causality in the case of Argentina, and finding opposite results for Turkey also confirm the importance of the correct measurement of the volatility variable especially with regard to short-term fluctuations. The overall results call for a reevaluation of the empirical literature in which socio-political risk is taken as exogenous.

Table 3. Granger Causality Test Results: alternative definition

Null Hypothesis:	F-Statistics and Lags:			
	1	**2**	**3**	**4**
Argentina: 1984:1-2003:4				
SCFV does not Granger Cause dSPR	0.2	0.2	0.1	0.04
dSPR does not Granger Cause SCFV	2.4	1.5	0.7	0.6
Mexico: 1984:1-2003:4				
SCFV does not Granger Cause SPR	2.6*	7.2***	5.2***	3.8***
SPR does not Granger Cause SCFV	0.2	0.05	0.2	0.3
Turkey: 1986:1-2003:4				
dSCFV does not Granger Cause dSPR	0.7	1.3	4.9***	5.2***
dSPR does not Granger Cause dSCFV	0.3	0.4	0.3	1.4

Notes: *SCFV* is measured using the four-quarter moving average standard deviation of quarterly percentage change of real short term capital flows with respect to the same period of previous year.

4.2. Impulse Response Analysis

The results from the Impulse Response analysis using unrestricted VAR model provide some support to our initial hypothesis.[24] Table 4 reports the sums of the Impulse Response Function (IRF) coefficients over a period of 12 quarters. The sums can be used to show the response of *SCFV* and *SPR* to a persistent shock to innovations in the related variable. We find that in the case of Argentina a shock to the capital flow volatility has a negative effect on *SPR* (i.e. increases risk) in the first two period that becomes positive thereafter (i.e. decreases risk), which suggest a dynamic adjustment to increasing volatility. In the case of Turkey, however, as predicted I find a persistently negative effect of a shock to *SCFV* on *SPR* all through 12 quarters. In contrast, I find that a shock to *SCFV* causes a persistent decline in socio-political risk in Mexico.[25]

The positive effect of *SCFV* shock on *SPR* in Mexico may result from some structural characteristics and the special position of Mexico vis-à-vis the US and may be related to the divergent trend in terms of the volatility of capital flows displayed in Figure 1 with respect to Argentina and Turkey. However, given that I find a similar effect in Argentina too after the 2nd period, there maybe more in this result. One plausible explanation is that it is possible to have a nonlinear relationship between these variables. Accordingly, if the increasing volatility results from increasing capital market integration and capital inflows (as happened during the 1990s in these markets), then increasing volatility may decrease the socio-political risk through the channels discussed before. However, this interpretation requires further exploration and should be taken only as suggestive.

[24] We used the lag exclusion tests for each lag in the VAR to determine the lag structure and adopted 2-lags in final specification.

[25] We also find that a shock to SPR decreases SCFV in Argentina all through twelve periods while increasing it after the 2nd period in both Mexico and Turkey.

Table 4. Accumulated Response of SPR to one standard deviation shock to SCFV

	ARG	MX	TR
Period	*SCFV*	*SCFV*	*dSCFV*
1	-0.017	0.013	-0.014
2	-0.018	0.029	-0.006
3	0.008	0.038	-0.001
4	0.015	0.037	-0.006
5	0.017	0.032	-0.005
6	0.018	0.026	-0.004
7	0.018	0.020	-0.005
8	0.019	0.016	-0.005
9	0.019	0.013	-0.004
10	0.019	0.010	-0.005
11	0.019	0.008	-0.005
12	0.019	0.006	-0.005

Notes: In Argentina and Turkey the *SPR* variable is in first differences as in Table 2 and 3. *SCFV* is the standard deviation of real net short-term capital inflows (by non-residents) using the US Treasury data. For Turkey, the *SCFV* is measured using the CBRT data.

5. Conclusion

Caballero & Dornbusch (2002), following 2001 crisis in Argentina wrote the following lines:

> The truth is that Argentina is bankrupt, bankrupt economically, politically and socially…it is time to get radical… [Argentina] must temporarily surrender its sovereignty on all financial issues…give up much of its monetary, fiscal, regulatory and asset management sovereignty for an extended period.

A similar attitude was taken by Dornbusch et al. (1995) arguing that it was the domestic political events led to the 1994 Mexican crisis such as the Chiapas uprising, which drew international attention to a country divided between its business oriented north and its central American, guerilla-style south, and the assassination of the presidential candidate. Similarly, after more than two decades of experimenting with the neoliberal model in Turkey, it was again the domestic *policy failures*, which brought an end to the ongoing IMF designed stabilization program and led to the 2001 crisis (Deppler, 2001).

In contrast to such views that put all the blame on the crisis-ridden countries, the current paper explored the effects of uncontrolled financial liberalization programs on socio-political instability in developing countries. Overall, the theoretical and empirical evidence imply the presence of a dynamic relationship between the volatility of international capital inflows and political risk as well as the uniqueness of individual country experiences. Unlike the previous research, the current article suggests that domestic socio-political factors cannot be isolated from the fluctuations taking place in the economic arena. In this respect, the focus of attention has been on the socio-political impacts of volatility of capital inflows. The results also put the

previous research into question regarding their use of political variables as purely exogenous from economic variables.

The main objective here was to analyze short-term effects of the volatility of capital inflows on socio-political risk expectations, which is why high frequency short–term risk and volatility data are employed. Given that the risk variable used is calculated on a monthly basis, it has the advantage of analyzing the immediate effect of the volatility of capital flows on socio-political risk ratings in these markets. Overall, the results call for a reconsideration of the existing research on the relationship between financial liberalization programs and socio-political developments in developing countries.

In this respect, one limitation of the current analysis is that the expected medium and long term impact of the volatility of capital inflows is assumed to be reflected implicitly in the socio-political risk assessments of the country experts. Although the volatility of capital flows is not expected to immediately show its effects on the socio-political variables in monthly (quarterly) data, it is expected to affect the risk expectations/perceptions of the risk raters. In this respect, it is assumed that the raters take into account the (expected) future as well as the past and current impacts of the volatility variable in their risk assessments. For future research, a panel data analysis using directly observed socio-political risk variables might help test the robustness of this assumption about the behavior of the raters.

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Chapter 3

ADMINISTRATIVE QUALITY, STRUCTURAL REFORMS, AND CAPITAL ACCUMULATION IN DEVELOPING COUNTRIES

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Abstract

This paper empirically investigates the importance of administrative quality as one of the key dimensions of governance institutions on structural reforms and capital formation in developing countries between 1985 and 2004. The empirical results show that administrative quality has considerable effects on structural reforms. Furthermore, structural reforms and administrative quality have an effect on both on the aggregate and private investment decisions. Empirical estimation especially reveals the positive effects of administrative quality on capital accumulation both directly and indirectly through enhancing the structural reforms. Our estimations also stress the importance of human capital again both on structural reforms and capital accumulation. Even after controlling for structural reforms, human capital and GNP per capita, macroeconomic indicators like neoclassical accelerator model and real interest rate are still crucial for the capital accumulation decision. However, as compare advances in these macroeconomic indicators, the improvements in administrative quality, structural reforms and human capital yield much higher returns in developing countries.

Keywords: Administrative Quality, Governance, Investment, Institutions, Structural Reforms, Developing Countries, Capital Accumulation

JEL Classification: P4, E2, E6, D02

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1. Introduction

The paramount importance of governance institutions on growth and development has appeared to be better appreciated in recent years. In the developing countries, on the way of convergence to the developed countries, the perceived quality of governance institutions is commonly considered to be inadequate. This adverse outcome mainly emanates from economic and political instability and deficient human capital and infrastructure. In an effort to measure the quality of governance, Aysan et al. (2007a, 2007b) decomposes the perceptions of governance institutions into three dimensions, which are administrative quality, political accountability and political stability. This current paper particularly focuses on the administrative quality aspect of governance institutions. Administrative quality has a direct impact on both structural reforms and capital accumulation. The aggregate investment level is often low in developing countries compared to the developed world having sound governance institutions. In addition, investment decisions are also positively associated with the level of financial development in a country where governance institutions also affect financial development. Hence, the deficiency in governance institutions can account for the low capital accumulation in developing countries through its direct influence on private investment and its effect on structural reforms as well. Given that better governance institutions improve the adoption of new structural reforms, better administrative quality as an important dimension of governance institutions boosts capital accumulation directly and indirectly through improving the structural reforms. This paper focuses on testing the validity of this argument for the case of developing countries and finds affirmative results in confirming this broad idea.

There is a growing literature on the necessity of well-functioning governance institutions for successful free market economies[1]. Nevertheless, these studies to date mostly explained the impact of governance institutions on growth[2], GDP per capita[3] and the volatility of the market[4]. Little work has done empirically to investigate the effects of administrative quality and structural reform on capital accumulation. Most of the existing studies on governance institutions and capital accumulation have paid attention to the rule of law[5]. However, there is not much work empirically done on the other dimensions of governance institutions and especially on the role of administrative quality on structural reforms. This observation essentially pertains to the other dimensions of governance such as corruption, bureaucratic administration and the quality of democratic institutions[6].

We are more aware of the effects of the institutions in stable democracies, where scholars have devoted considerable attention on institutional differences and policy consequences (Cox 1997, Shugart and Carey 1992; Tsebelis 2000). However, developing countries tend to have weaker governance institutions. This paper is an attempt to fill this gap by focusing on

[1] See in particular Rodrik (1999) and Frankel (2002)

[2] See, for example, Knack and Keefer (1995), Acemoglu, Johnson, and Robinson (2001), Rodrik, Subramanian, and Trebbi (2002)

[3] See Hall and Jones (1999), Acemoglu, Johnson, and Robinson (2001), Easterly and Levine (2003), and Rodrik, Subramanian, and Trebbi (2002).

[4] See, for example, Acemoglu, Johnson, Robinson, and Taicharoen (2003).

[5] See North (1990), Knack and Keefer (1995), Calderon and Chong (2000), Easterly and Levine (2003), Rodrik, Subramanian, and Trebbi (2002)

[6] See, in particular, Keefer (2002).

the role of administrative quality as an indicator of governance institutions and structural reforms on capital accumulation in developing countries.

A line of research in the literature on governance institutions highlights the repercussions of political uncertainty and governance institutions on investment. These studies stress the importance of government instability, social unrest and political violence on investment. Brunetti, Kisunko and Weder (1997) suggest that perceived government instability, corruption and reliability of the judiciary affect aggregate investment. Forward-looking characteristics of the capital accumulation decision call for a stable and predictable business environment which requires high quality and steady governance institutions. North (1981) highlights that better quality governance institutions reduce uncertainty and promote efficiency. Furthermore, World Bank (2004) finds a strong connection between investment climate and capital accumulation decision. It reached a conclusion that good governance improves the private investment climate by promoting bureaucratic performances and predictability which in turn alleviated uncertainty and transaction costs. In spite of all these studies on governance and capital accumulation decision, there are not many studies focusing on the role of governance intuitions both on structural reforms and capital accumulation. In this study, the effects of structural reforms on capital accumulation are not overlooked while analyzing the role of governance institutions on capital accumulation. The main thesis of the paper is to explore the effects of governance institutions on structural reforms. This paper also argues that in addition to the direct effects of governance institutions on capital accumulation, better governance institutions also enable the developing countries to achieve more successful structural reforms. Given that structural reforms also improves capital accumulation, ultimately, governance institutions help improve the capital accumulation both directly and indirectly through affecting capital accumulation.

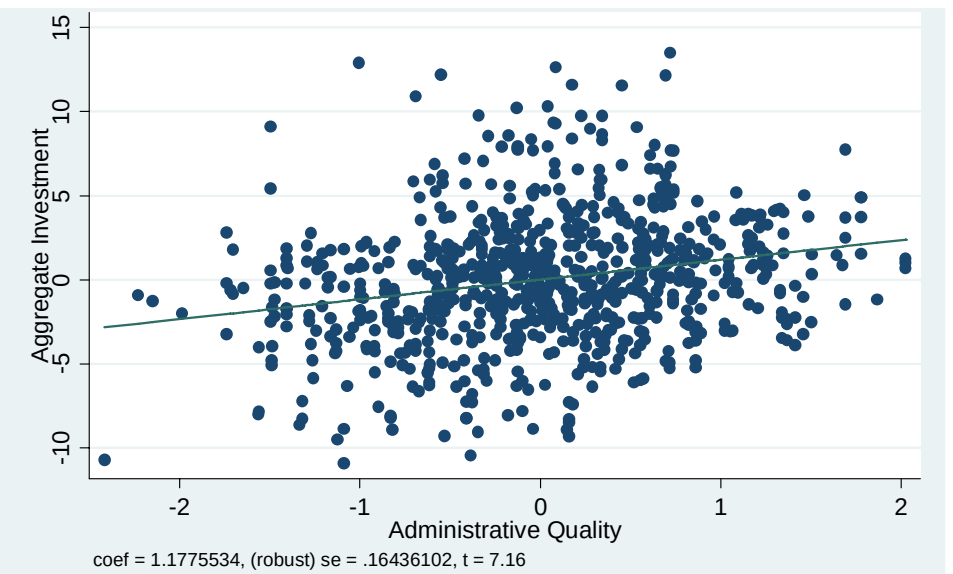

Figure 1. Aggregate Investment and Administrative Quality Panel Fixed Effect Regresion.

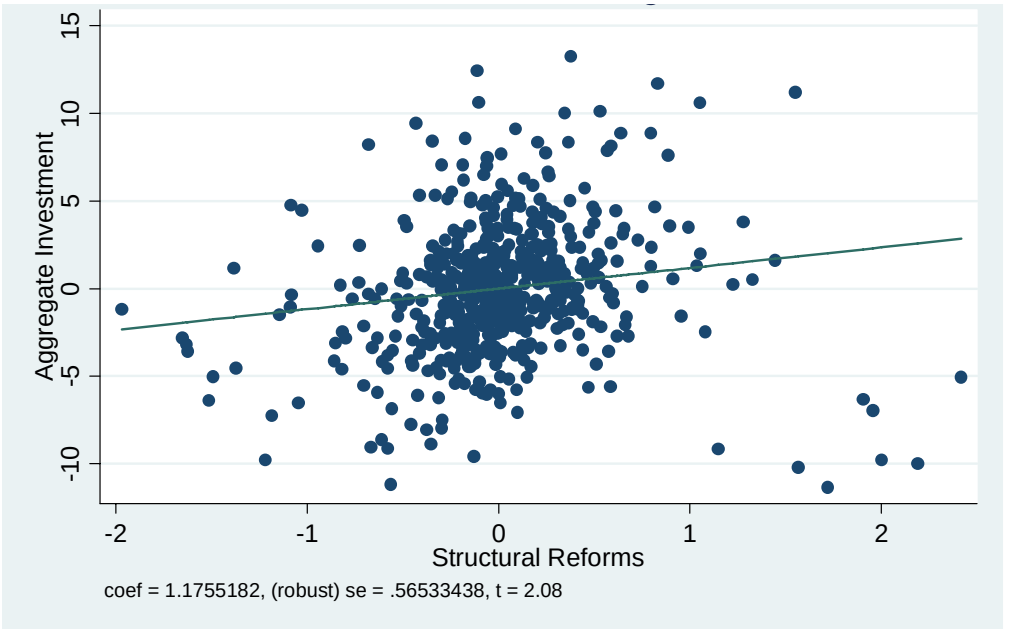

Figure 2. Aggregate Investment and Structural Reforms Panel Fixed Effect Regresion.

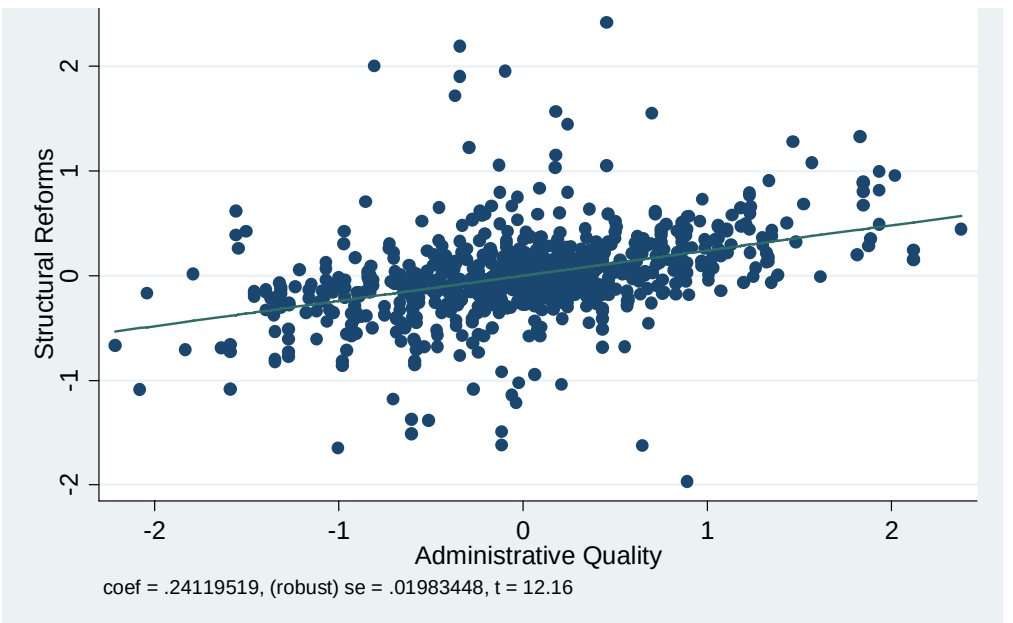

Figure 3. Structural Reforms and Administrative Quality Panel Fixed Effect Regresion.

To establish an initial diagnostic, we primarily run panel fixed effect regressions as an initial step before the rigorous analysis. First, panel fixed effect regression is run where endogenous variable is aggregate investment and explanatory variable is administrative quality along with the country fixed effects. Estimation results show that there is a significant and positive relationship between administrative quality and aggregate investment at 1

percent significance level (see Figure 1). The coefficient of administrative quality is quite high suggesting that an improvement administrative quality pays off considerably in developing countries.

The second regression specification assesses the relationship between structural reforms and aggregate investment is in line with our main thesis. Structural reforms boost aggregate investment according to our initial model. Structural reforms variable is considerably significant and robust at 5 percent significance level (see Figure 2). These results are in line with our expectations that structural reforms create a more investor-friendly environment.

The last central relationship that we want to test is the one between administrative quality and structural reforms. In the panel fixed effect regression, there is a positive relationship between administrative quality and structural reforms. The administrative quality variable is extremely significant and robust at 1 percent significance level. However, the regressions above are conducted without controlling other variables such as human capital and neoclassical determinants of capital accumulation. For a more reliable analysis we use there stage least squares (3SLS) estimation technique in the empirical model section of this paper. This estimation approach allows us to model the simultaneous effects of structural reforms and administrative quality on capital accumulation. Hence, this paper aims to establish a dynamic relationship between structural reforms, administrative quality and capital accumlulation.

We obtain the data for administrative quality from International Country Risk Guide (ICRG, 1999). It is an independent private firm providing data on various ground to international investors to assess the developing countries. This data set offers a good alternative to evaluate the perceptions of the investors about the administrative quality. In addition, it is vital to point out the existence of the difference between perceived and actual quality of the governance institutions. We interpret this data set on governance institutions as information on perceptions of institutions. In deed, the perception of institutions matters more than the actual institutions for the investors to contribute in the capital formation of the developing countries.

The organization of the paper is designed as follows. In section 2, the paper discusses how to measure structural reforms and the possible effects of structural reforms on capital accumulation. In section 3, we analyze the role of administrative quality on capital accumulation and structural reforms. Section 4 is devoted to the other determinants of capital accumulation and structural reforms. The econometric model is explained in section 5. The results of the econometric model and the sensitivity analyses are also covered in section 5 as well. The conclusion is delegated to section 6.

2. How to Measure Structural Reforms and the Role of Structural Reforms on Capital Accumulation

In this paper, structural reforms are measured as the congregation of two variables which are "Trade Openness" and "Financial Development." Structural reforms encompass various dimensions of policy reforms. However, trade openness and financial development are commonly accepted as crucial steps towards more private investment and capital accumulation. These two aspects are considered to be among the most crucial structural

reforms considering their relatively irreversible nature. Hence in this paper, we identify the structural reforms with improvements in trade openness and financial development.

Structural reforms are quite important in determining the capital accumulation process in developing countries. As pointed out above, structural reforms have high correlation with the quality of the governance institutions which we measure by the administrative quality. In addition, structural reforms have a direct effect on capital accumulation decisions as they bring about more market-oriented policies and boost incentives for capital accumulation.

The financial development offers more opportunities and provides more incentives for the entrepreneurs to indulge in new investment activities. Developed financial systems mobilize and distribute resources for the firms to carry out investment projects (Rama, 1993; Levine, 1997). Financial development in this paper is measured with the private credit by domestic banks and other financial institutions. This data set is derived from the World Development Indicators (WDI) of the World Bank. This indicator as a proxy for financial development is widely used in the literature (see Aysan et al., 2006). It is expected that when private credit by the domestic banks and other financial institutions improves, it becomes easier for the investors to fund their projects.

A sound financial system brings about efficiency improvements in resource allocation which is derived from the technological specialization and reduced "information, transaction, and monitoring costs." The latter brings about a better choice of projects and a more sophisticated diversification of risks. Consequently, the firms can finance more projects and increase the productivity of capital. It is apparent that emerging markets do not have developed financial systems. In addition, government policies may not be conducive to channel the available funds effectively (Blejer et.al., 1984; Rama, 1993). Public deficits and public debt which may cause financial repression and crowding out of investment are among the main factors behind these policies. Rama (1993) empirically reports the positive link between financial development and capital accumulation.

Generally, trade openness is defined as the combination of exports and imports as a percentage of GDP. In order to exclude the role of natural resources export on trade openness, we subtract the mining export from the trade volume. Trade openness then is explained as import plus export net of mining export in percentage of GDP. Trade of natural resources has little to do with the policy choices that are affected by structural reforms. Resource-rich countries may not implement structural reforms enthusiastically as they depend on an undiversified export portfolio consisting of a few items. In our study, structural reforms are typically related with trade openness that is created by policy change under the influence of these reforms. High values of this variable imply the existence of high competitiveness and better access to bigger markets (Balassa, 1978; Feder, 1982). Trade reforms can stimulate capital formation especially in developing countries.

It is also apparent that structural reform variable defined here as financial development and trade openness is also influenced by the governance institutions and in particular by the administrative quality. Given that in this paper, we are focusing on administrative quality, one may think of various channels in which administrative quality affects structural reforms. For example, better administrative quality leads to better financial regulation and enables the private credit to be distributed more effectively in private sectors. Finally, all these improvements enhance the capital accumulation in the economy. Administrative quality also helps improving the trade. Less corruption, better quality bureaucrats adopt better policies to

reap the benefits of trade. In line with this reasoning, in the empirical part of this paper, we show that better administrative quality leads to better structural reforms.

3. The Role of Administrative Quality on Capital Accumulation and Structural Reforms

Administrative quality is an essential dimension of governance institutions. This variable indicates the ability of government to deal with investors and to provide them an environment which is suitable for capital accumulation. In our study we aggregate four indicators from the International Country Risk Guide (ICRG, 1999) to measure the effects of administrative quality on structural reforms and capital accumulation. In aggregation, principal component analysis is employed and single variable is generated and used in final regressions to avoid collinearity issues. This variable representing the administrative quality includes: (a) Control over Corruption (b) "Quality of Bureaucracy", (c) "Investment Profile", and (d) "Law and Order". They are important determinants of capital accumulation and structural reforms in developing countries. They reduce the uncertainty and costs of doing business. They also help improve the financial development given that in countries with better administrative quality features, the financial credits are better channeled for more productive investment projects. Furthermore, these governance characteristics also enhance trade by allowing more competition in international markets.

Corruption is quite detrimental for economic activities. This fact is widely studied and is regarded as one of the main obstacles facing enterprises in the developing world (see the World Bank 2005). Mauro (1995), for example, points out that "corruption" is negatively associated with capital accumulation in his sample of countries. It is emphasized in the study of Gupta, Davooli and Alonso-Terme (2002) that corruption worsens income inequality and poverty. Mo (2001) establishes a connection between low growth and corruption due to the reduced human and physical capital. As one can predict, corruption increases the operational and transaction costs of doing business which adversely affect the private investment decisions because of low quality and insufficient infrastructure. Corruption is most common in the developing countries and emerging economies and causes economic, social, political and legal problems. It is unfavorable for the growth prospects of developing countries and can lead to inefficiencies and inequities in the developing countries. It is also an obstacle for both social and economic development (Rose-Ackerman, 2002).

The "Quality of Bureaucracy" index of the ICRG summarizes the ability of the government to formulate and implement sound policies. Moreover, this index shows that "countries where the bureaucracy has the strength and expertise to govern without extreme changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be rather autonomous from political pressure and to have an established mechanism for recruitment and training." Quality of bureaucracy is strongly related with the level of corruption and legal order. In many developing countries, public officers are low-paid and have educational problems. For instance, former Soviet Republics are often known as countries where bribery become an everyday practice. Low-paid bureaucrats in these countries are source of corrupt practices while high level bureaucrats and managers benefit from low transparency and inefficient judiciary.

The "Investment Profile" assesses the "government's attitude to inward investment as determined by the assessment of four sub-components: risk to operations, taxation, profit repatriation and labor costs." Risks to operations and other uncertainties about the future are harmful to private investment decisions as investors make long-term decisions. Taxation and labor costs primarily affect the private investment decisions though their effects on total cost. Government regulations and taxation are sensible and acceptable in order to shelter the general public and to engender revenues to finance the delivery of public services and infrastructures. However, overregulation and over-taxation discourage investments by raising business start-up and operating costs.

In the "Law and Order" index, the law sub-component provides an "assessment of the strength and impartiality of the legal system". On the other hand, the "order" sub-component concerns the "popular observance of the law." Several dimensions of the business environment shape capital accumulation in developing countries. However, the security of property rights appears to be the most essential and better-documented issue. Because of the forward-looking nature of the investment, investors need institutions that preserve property, rights and ensure equitable and consistent rule of law in protecting this right while providing effective incentives to respect and enforce it. A reliable judiciary, in particular, is an imperative in reducing the transaction costs for businesses. A reliable judiciary also launches positive signals to investors such that investors will be convinced about the equitable and consistent protection and enforcements of laws. Empirical research also reveals the importance of property rights and of rule of law for the capital accumulation, structural reforms.

4. Other Factors Affecting Capital Accumulation and Structural Reforms

4.1. Neo-Classical Accelerator Model

In the macroeconomics literature, the neoclassical flexible accelerator model is the most widely accepted model of capital accumulation. The theory of the firm (Jorgenson 1963) is the basis of this traditional model. The theory of the firm (Jorgenson 1963) takes for granted that enterprises indulge in investment in order to generate more profit in the future. The optimization problem of the firms is solved to determine how much investment to make. The optimization problem includes the current and expected profits and at the margin equates the production prices to their marginal costs. Firms increase the capital accumulation until the marginal benefit of doing so prevail over the additional cost. The net investment is the gradual adjustment of the actual capital stock to its desired level, which is derived from maximization of profit. The determinants of additional capital accumulation in the neoclassical flexible accelerator model include the expected aggregate demand (the accelerator), the user cost of capital, the wage rate, and the initial capital stock.

This model has, however, certain simplifying assumptions which contradict the structural and institutional factors existing in developing countries. For example, this model assumes that firms operate in competitive markets. Hence, there appears to be fewer problems in finding empirical evidence to justify this neoclassical accelerator model in several developed

countries. However, there is lack of strong evidence for this model in developing countries. The firms in developing countries confront with certain binding constraints that are not taken into account in the conventional neoclassical theory. For sure, the markets in developing countries are further away from the ideal case of perfectly competitive markets as compared to their counterparts in developed countries.

In the empirical section, we also focus on the influence of GDP per capita to account for neoclassical Solow growth model. This model assumes that countries with lower levels of GDP per capita invest more to catch up with developed countries. As a result, we expect a negative relationship between gross fixed capital formation decisions and GDP per capita. Moreover, structural reforms and improved administrative quality may explain the catch-up process through stimulating investment decisions.

4.2. Human Capital

Recent endogenous growth models have shown that human capital accumulation can be an important source of long term growth, either because it is a direct input for R&D (Romer, 1990) or because of its positive externalities attributable to knowledge spillovers (Lucas 1988). Moreover, human capital enhances better governance institutions and leads to adoption of better structural reforms. More educated people are expected to be more capable bureaucrats (Galor et al., 2005). Hence human capital is likely to improve gross fixed capital formation through its impact on the quality of governance institutions and on structural reforms. Furthermore, implementation of structural reforms usually calls for a coordination of bureaucrats and international institutions. Sophisticated bureaucrats facilitate the transformation through their ability to communicate with international entities.

Human capital also entails better administrative quality. Better educated people with more life expectancy appear to be more skilled bureaucrats. In addition to better supervision of the operations of government officials, better educated people ask more for a better bureaucracy (Galor, Moav, and Vollrath 2005). Besides, a group of well-paid, well-educated and highly motivated technocrats in the bureaucracy increase the prospects for successful structural reforms. An educated society brings about political stability which is a necessary condition for an investor-friendly environment. This is achieved through increasing the possibility to resolve the conflicting view points. The latter idea represents one of the conventional approaches in the literature to underline the significance of education in bringing better governance institutions (Lipset 1959). As governance institutions prosper in democratic societies, a more educated society is more likely to be enfranchised in terms of civil rights and liberties (Acemoglu and Robinson 2001). These considerations justify the idea that human capital also appears as an explanatory factor for the gross fixed capital formation through its effect on the administrative quality.

Human capital can also be at the origin of positive externalities[7]. Since skilled workers are better in dealing with new challenges, a skilled work force is essential for the firms to adopt new and more productive technologies. Besides, new technologies generally require significant organizational changes. These changes are also dealt with better by a skilled

[7] See in particular Acemoglu and Shimer (1999).

workforce. Human capital also gives the opportunity to the enterprises to expand or penetrate into new markets and in turn enhances the structural reforms as well.

4.3. Legal Origin

According to Gleaser, La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998), there is strong relationship between the legal origin of a country and its degree of investor-friendliness. French laws protect the investors less than the common law legal traditions. According to their findings, common law tradition is the most investor-friendly legal tradition. These legal traditions are very different from each other systematically as "civil law relies on professional judges, legal codes, and written records, while common law relies on lay judges, broader legal principles, and oral arguments" (Gleaser and Shleifer, 1998). Countries which have similar development levels differ in their approach to regulation. Common law countries prefer less regulation, more secure property rights, less corrupt and more efficient governments while French civil law countries are characterized by inflexible public administration with heavy regulation (La Porta, Lopez-de-Silanes, and Shleifer 2002; Djankov et al. 2002). In any case, countries that are following British legal tradition are more successful terms of financial development compared to those that adopted French legal tradition (La Porta et al. 1998). In our study, we employ a variable that stands for British legal system to measure the positive effect of this legal origin on structural reforms. This variable along with natural trade openness is used to identify the system of equations in the empirical section.

5. The Econometric Model

5.1. The Model Tested

The primary purpose of the empirical model is to disentangle the effects of structural reforms and administrative quality on gross fixed capital formation. In addition, in this paper we compute the effects of administrative quality as an indicator of governance institutions on structural reforms and aggregate investment simultaneously. Our Structural reform (SR) index is composed by aggregating trade policy and financial development indicator by using the principal component analysis. Financial development is measured by the private credit by banks and other financial institutions. Trade policy indicator is formed by subtracting the exports of oil and mining from the commercial openness and denoting it as a percentage of GDP. Structural reform is expected to enhance the level of capital formation while administrative quality is expected to have positive effects both on aggregate investment and as well as on structural reforms.

In the empirical model, endogenous variables are the share of aggregate investment and the measures of aggregated structural reforms, namely "financial development" (FD) and "trade policy" (TP). These endogenous variables are simultaneously determined by influencing each other. In order to account for this reverse causality, we establish a system of equations to estimate the share of aggregate investment in GDP and quality of structural reforms concurrently. In the aggregate investment equation, inadequate degree of structural reforms is expected to reduce the gross fixed capital formation. On the other hand, in the

structural reforms equation, aggregate investment enters into the right side with an expected positive sign. Administrative quality on the structural reform equation is also expected to exert positive influence over the adoption of structural reforms. This simultaneous system of equations also enables us to take into account other factors that affect both aggregate investment and structural reform simultaneously. Furthermore this set of simultaneous equations reveals the significance of administrative quality on aggregate investment both directly in investment equation and indirectly through affecting structural reforms.

Three-stage least squares estimation techniques are used to derive the empirical results for the role of structural reforms and administrative quality on aggregate investment. Our empirical specifications take into account of other determinants of endogenous variables. The correlations among the endogenous variables are used efficiency in three-stage least square (3SLS) estimations. Since endogenous variables (aggregate investment and structural reforms) emerge as regressors in other equations, they have to be instrumented out using exclusion restrictions. To complete the analysis, we have added the aggregate indicator of structural reforms (SR) in this system of equation, which is calculated as the principal component analysis of all the initial indicators and which provides a summary of the two measures of structural reforms (see the appendix for details).

The aggregate investment equation in our model includes real interest rate (Realr) to capture the user cost of capital. The GDP growth rate in last year (Growth) is also included to account for the accelerator effect. These two variables are assumed to have no direct effect on the level of the perceived administrative quality. Hence they are not included in the administrative quality equations. The following variables appear in both of the equations. GDP per capita variable enters into the aggregate investment and structural reforms equations with an expected negative sign due to the Solow's convergence hypothesis. Countries with lower GDP per capita are expected to gradually catch up with the more developed counterparts by having more capital investment over time. Moreover, GDP per capita variable captures possible externalities, such as greater market size on demand and supply of goods and services, and finally on aggregate investment. GDP per capita is also expected to exert influence over the structural reforms as well. For example, the richer countries rely less on international trade when the trade is measured as a percentage of GDP. The same reasoning applies for the financial development as well.

In the structural reform equation, Human Capital (HC) index is produced by aggregating life expectancy at birth and average years of primary, secondary and higher schooling variables. The British legal origin (LegBritish) variable is also added to measure the effects of the legal system on initiating structural reforms. We expect a positive relationship between structural reforms and British legal system. Moreover, structural reform equation also incorporates the constructed natural trade openness (Constructed) variable to assess the relationship between structural reforms and the trade volume. The natural trade openness concept comes from Sachs and Warner (1997). They argue that due to the geographical location, size and climate, some countries happen to be naturally more open in term of trade. In the empirical regressions, we employ their natural openness index in identifying the structural reform variable. In other words, both British legal origin and constructed natural trade openness are excluded from the aggregate investment equation to identify the simultaneous system of equations. In addition, we include aggregate investment and administrative quality variables in explaining the other dependent variable to highlight the correlation between aggregate investment and structural reforms. Not only structural reforms

(SR) but also administrative quality (AQ) variables are also included in the aggregate investment equation. Consequently administrative quality variable is controlled in both equations. It plays a key role in promoting both structural reforms and aggregate investment. In addition, administrative quality has also an indirect effect on aggregate investment through improving structural reforms.

5.2. Estimation Results

5.2.1. Empirical Results on Gross Fixed Capital Formation (Investment) Equation

In Table 1, when administrative quality and aggregate investment are jointly estimated, estimation results generate striking results[8]. One of the most interesting outcomes concerns the administrative quality index, which gives a positive and significant coefficient at the 1 percent significance level in the investment equation (1). This result confirms that a low level of corruption, a good quality of bureaucracy, a clear security of property rights, a reasonable risk to operations, a sound taxation and regulation as well as better law and order are extremely crucial for the enterprises' decisions to improve gross fixed capital formation. The empirical results demonstrate that one standard deviation improvement in administrative quality enhances the aggregate investment to GDP ratio by more than 0.8 percent in developing countries. This result is in line with and substantiates the empirical literature on governance and aggregate investment.

The 3SLS regression results in Table 1 also display that structural reforms affect private investment in a positive direction. Structural reform indicator as an aggregation of financial development and trade openness is highly significant in explaining aggregate investment equation. Structural reform indicator has a T-statistics of 1.89. More importantly, one standard deviation improvement in structural reforms in developing countries accounts for 0.58 percent increase in aggregate investment to GDP ratio. Hence, the empirical results vigorously prove the key role of structural reforms in boosting gross fixed capital formation.

Our 3SLS results are clear-cut and robust to the inclusion of other explanatory variables. Other explanatory variables in aggregate investment equation also turn out to give quite reasonable results. For example, human capital is highly significant in explaining the aggregate investment at 1 percent significance level. One standard deviation improvement in human capital augments the aggregate investment to GDP ratio by more than 0.15 percent in developing countries. This contribution is an important improvement for slowly changing components of human capital.

These last two results also disprove Easterly and Levine (2003). They question the roles of human capital and structural reform variables in explaining cross-country economic performance. Our regression results indicate a central role of human capital and structural reform on aggregate capital accumulation. For that reason, our estimations illustrate that although administrative quality constitutes a major factor in the capital accumulation decisions, the role of structural reforms in terms of financial development and trade openness and human capital cannot be overlooked. Hence, the mainstream argument of the endogenous

[8] See the Appendix 3, for the descriptive statistics and correlation matrix. In other appendices, the lists of countries in the regressions and principal component loadings of administrative quality, structural reforms and human capital are also given in detail.

growth models is justified in our model that human capital and structural reforms are extremely crucial factors in gross fixed capital formation.

Table 1. Endogenous Variables

Explanatory Variables	**Aggregate Investment (1)**	**Structural Reform (2)**
Administrative Quality	2.20 (5.91)***	0.21 (2.84)***
Aggregate Investment		0.48 (2.04)**
Structural Reform	1.04 (1.89)**	
Human Capital	0.69 (3.11)***	0.16 (3.64)***
GDP per Capita	0 (-3.53)***	0 (-0.88)
Real Interest Rate	-0.02 (-2.34) **	
Growth	0.31 (5.26)***	
British Legal Origin		0.60 (5.91)***
Constructed Natural Trade Openness		0.03 (11.80)***
Constant	20.15 (38.87)***	-1.88 (-3.83)***
Number of Observations	382	382

Notes: (*) indicates significance at 10%; (**) indicates significance at 5%; (***) indicates significance at 1%. See sources of data in footnote. Gross fixed capital formation (Investment) series have been processed from various national and international sources: International Finance Corporation (IFC), World Development Indicators (WDI), "Live Database." The "administrative quality" (AQ) index uses PRS (1999) data. The "structural reforms" index uses data from WDI. In the "human capital" indicator, the numbers of years of schooling are from Barro and Lee (1994, 2000) and from Barro (2000), and the life expectancy series is from WDI. Interest rates (Realr) have been calculated from the International Financial Statistics database (IFS). All other data are from WDI.

Another conclusion of our model provides a validating argument for the neoclassical theory of the firm in the case of developing countries. The accelerator variable appears to have an expected positive sign. This result implies that anticipations of economic growth stimulate more aggregate investment. This variable is highly significant at 1 percent significance level. However, economic significance of accelerator model of neoclassical theory of firm is quite minimal. One standard deviation improvement in growth rate only generates less than 0.2 percent aggregate investment to GDP ratio in developing countries. This result once again reveals the importance of other explanatory variables (in addition to

neoclassical determinants of aggregate investment) in explaining the gross fixed capital formation in developing countries.

The interest rate also appears to exert a negative and significant effect on aggregate investment. This result is in conformity with the user cost of capital theory. This variable is also highly significant at almost 1 percent significance level. Given that both growth and real interest rate variables are highly significant, one may conclude that at the final stage supply and demand considerations matter for the entrepreneurs to increase the existing gross capital formation. Our empirical model is also successful to substantiate the Solow hypothesis of decreasing return to scale of physical capital accumulation. The coefficient of the GDP per capita variable is negative and significant as expected at 1 percent significance level.

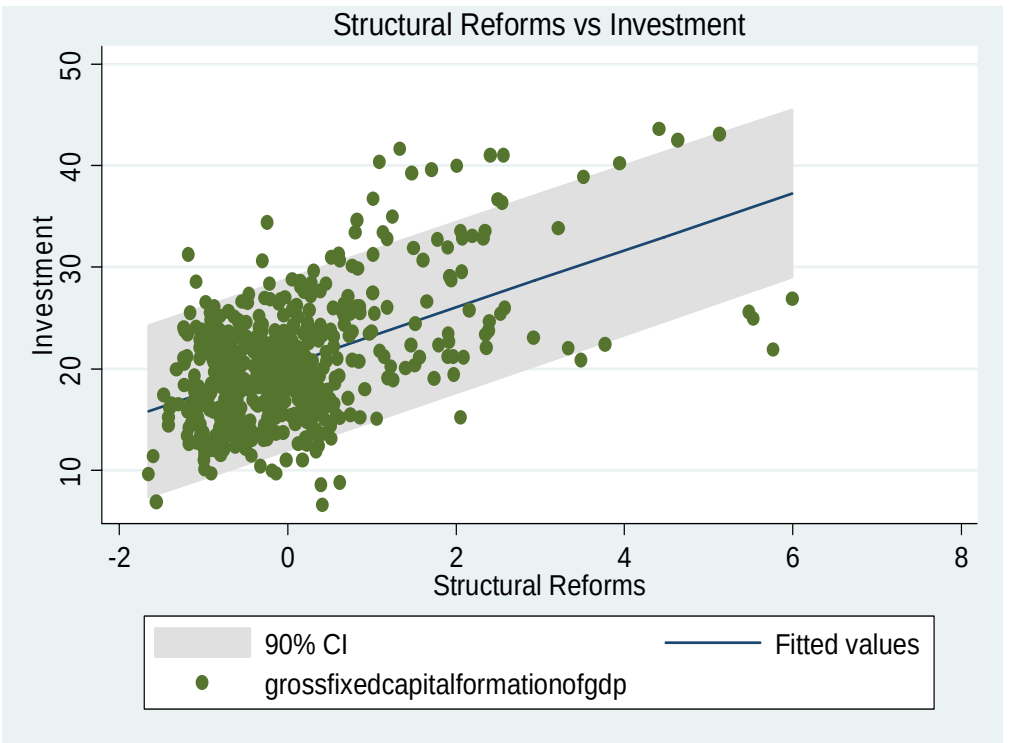

Figure 4. Goodness of Fit of Structural Reform.

In Figure 4, 5 and 6, we plot the predicted values and actual values of gross fixed capital formation when the dependent variable is explained by structural reforms, administrative quality and human capital respectively. All these figures illustrate the goodness of fit of our regressions results. First, almost all the actual values lie in the 10 percent standard deviation interval of predicted values. Secondly, we observe positive relationship between aggregate investment and the main explanatory variables like structural reforms, administrative quality and human capital. These figures display the robustness of our simultaneous regression results for aggregate investment.

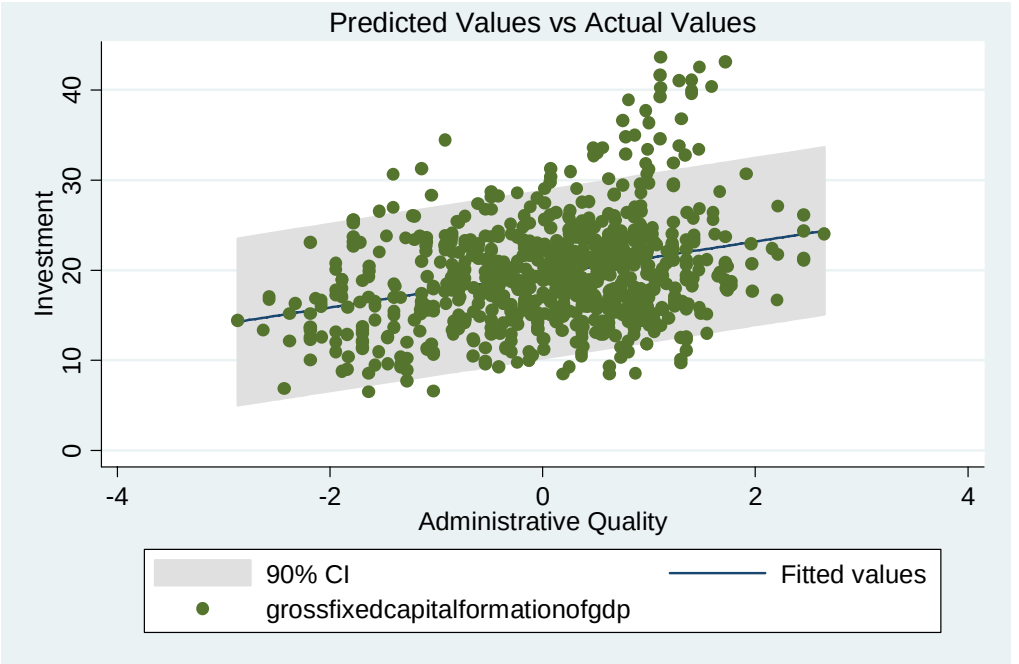

Figure 5. Goodness of Fit of Administrative Quality.

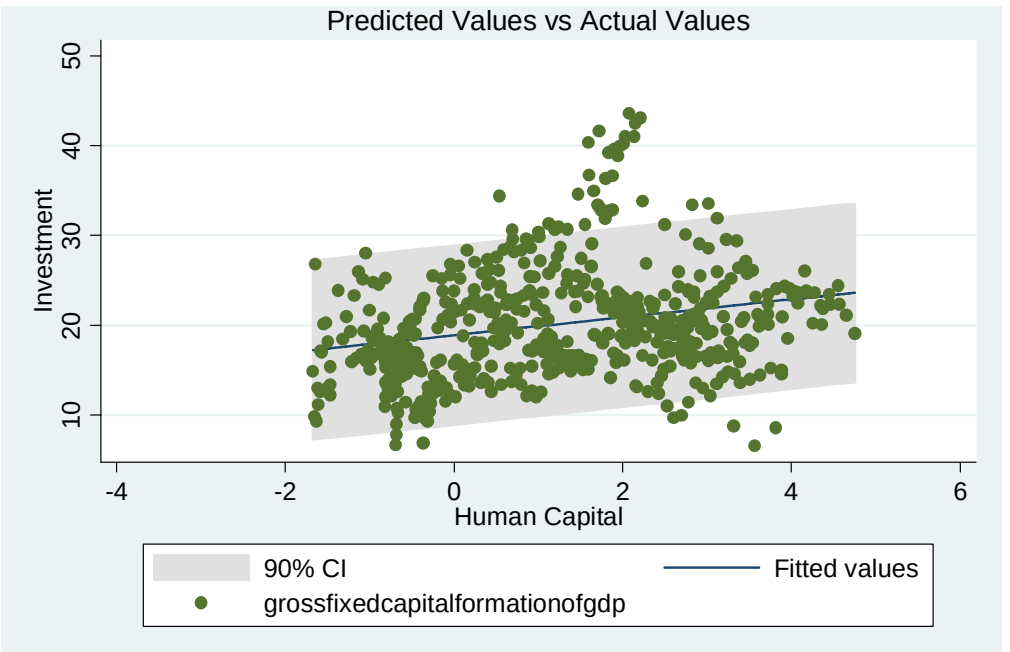

Figure 6. Goodness of Fit of Human Capital.

5.2.2. Empirical Results on Structural Reform Equation

Our estimation results confirm the positive relationship between structural reforms and administrative quality in developing countries. Consequently better governance institutions in the form of administrative quality comprising better control over corruption, more eminent bureaucracy, securer property rights, less risk to operations, predictable taxation and regulations and better law and order facilitate more developed financial markets and lead to more trade openness. Administrative quality is highly significant in improving the structural reforms at 1 percent significance level. Figure 7 display the fitted and actual values of administrative quality in explaining structural reform. Most of the actual values spread in the 90 percent confidence interval of predicted structural reform variables. Figure 7 also demonstrates the positive relationship between administrative quality and structural reforms.

Private Investment significantly affects the structural reforms as well. One standard deviation increases in aggregate investment of developing countries results in more than 0.11 percent improvement in structural reforms. Hence, if a developing country receives high amounts of private investment, it is expected that it will initiate structural reforms in line with private capital formation. This is the case for old centrally planned economies. The post-communist countries initiate structural reforms as they receive more private investment. Figure 8 display the fitted and actual values of aggregate investment in explaining structural reform. Most of the actual values lie in the 90 percent confidence interval of predicted structural reform variables. Figure 8 also reveals the positive relationship between administrative quality and structural reforms.

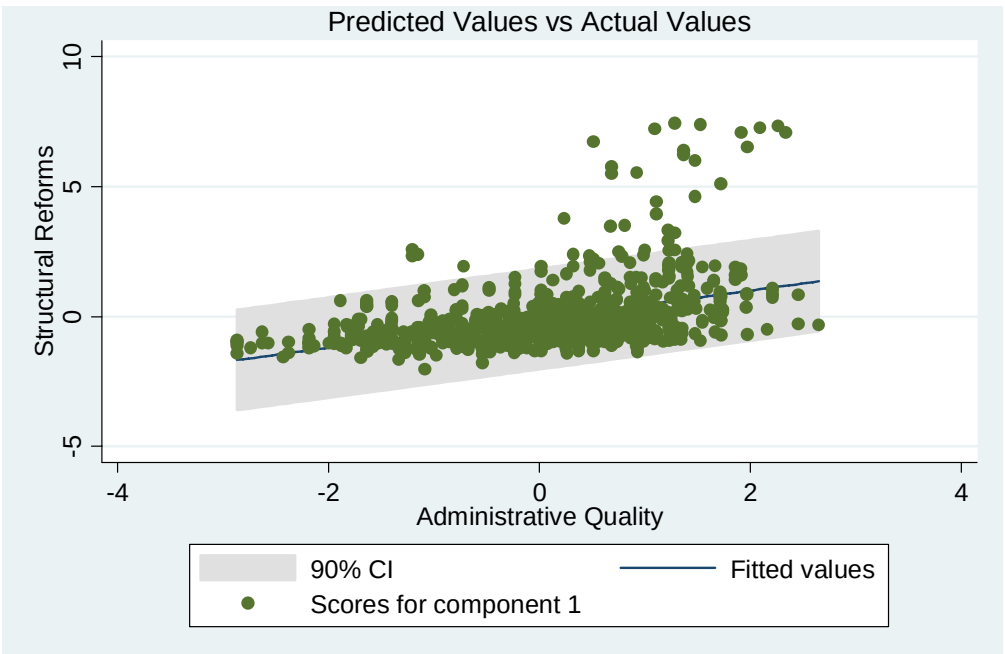

Figure 7. Goodness of Fit of Administrative Quality.

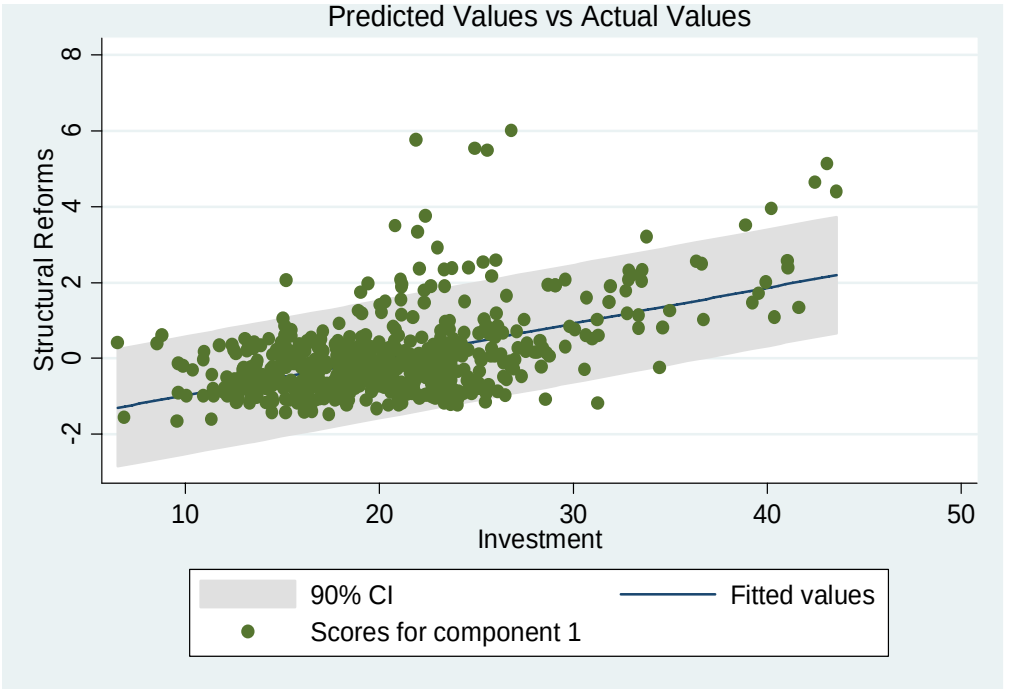

Figure 8. Goodness of Fit of Investment.

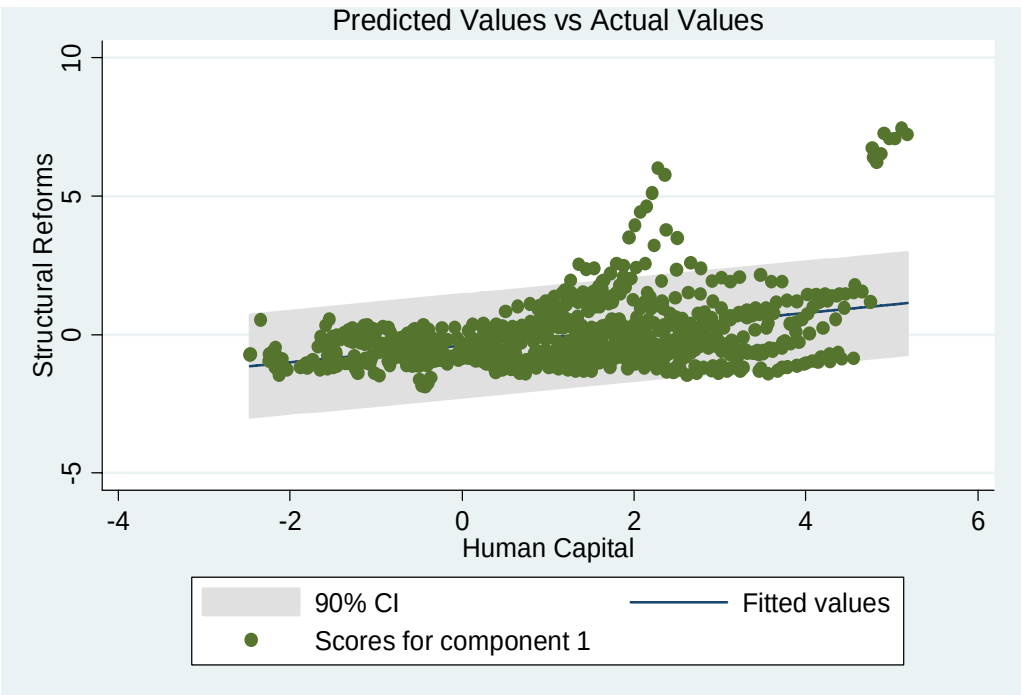

Figure 9. Goodness of Fit of Human Capital.

Another important variable in explaining the structural reform emerges to be human capital. As argued above, better educated population both demands and supplies more developed structural reforms. Human capital variable is highly significant in explaining the structural reform at 1 percent significance level. One standard deviation increases in human capital in developing countries bring about more than 0.73 percent improvement in structural reforms. Figure 9 presents the fitted and actual values of human capital in explaining structural reform. Most of the actual values lie in the 90 percent confidence interval of predicted structural reform variables. Figure 9 also depicts the expected positive relation between human capital and structural reforms.

Table 2. Endogenous Variables

Explanatory Variables	**Private Investment (1)**	**Structural Reform (2)**
Administrative Quality	0.70 (2.03)***	0.24 (3.85)***
Private Investment		0.48 (1.49)
Structural Reform	2.17 (4.24)***	
Human Capital	0.68 (3.31)***	0.16 (2.38)***
GDP per Capita	0 (-0.97)	0 (-1.50)
Real Interest Rate	-0.03 (-2.36)**	
Growth	0.20 (3.70)***	
British Legal Origin		0.63 (4.13)***
Constructed Natural Trade Openness		0.03 (9.34)***
Constant	12.28 (25.60)***	-1.50 (-3.74)***
Number of Observations	382	382

Notes: (*) indicates significance at 10%; (**) indicates significance at 5%; (***) indicates significance at 1%. See sources of data in footnote. Private Investment series have been processed from various national and international sources: International Finance Corporation (IFC), World Development Indicators (WDI), "Live Database." The "administrative quality" (AQ) index uses PRS (1999) data. The "structural reforms" index uses data from WDI. In the "human capital" indicator, the numbers of years of schooling are from Barro and Lee (1994, 2000) and from Barro (2000), and the life expectancy series is from WDI. Interest rates (Realr) have been calculated from the International Financial Statistics database (IFS). All other data are from WDI.

The relationship between GDP per capita and structural reforms is negative but not significant. British legal origin is very relevant in the context of structural reforms in our model. British legal tradition increases the possibility of introduction of structural reforms in developing countries. This variable is highly significant at 1 percent significance level as

well. In addition, these results confirm that British legal tradition is more investor-friendly than other legal traditions and leads to better developed financial markets and trade openness. Another variable which has a significant value is the "constructed natural trade openness" variable. This variable as well is significant at 1 percent significance level. British legal origin and constructed natural trade openness are used as instruments to identify the system of equations. Given that they have coefficients with expected signs and significance level, this result emerges as another evidence for the robustness of our empirical specification.

Lastly, we also analyze whether our results are sensitive for the different definitions of investment. In the main empirical specification, we focus on the gross fixed capital formation without differentiating the private and public investment. However, lack of differentiation between private and public investment may generate concerns especially for the developing countries with high level of public investment in capital formation. Moreover, the role of our main variables like structural reforms and administrative quality may exert different influence over private and public investment. In order to account for these concerns and to test the robustness of our results for the different definition of gross fixed capital formation, in Table 2, we run the same 3SLS regression by replacing the aggregate investment with private investment. Our private Investment series are derived from various national and international sources: International Finance Corporation (IFC), World Development Indicators (WDI).

The private investment regression specification gives pretty much the same results. Still, administrative quality plays a major role in affecting both structural reforms and capital formation in developing countries. Similar to earlier results, administrative quality is very much instrumental in enhancing private investment directly and indirectly through affecting structural reforms. Structural reform also exerts a positive influence on private investment. On the other hand, human capital contributes to improve both structural reform and private investment. Other control variables also appear to have similar coefficients with expected signs. Hence, these results permit us to conclude that our results are robust to alterative definitions of gross fixed capital formation.

6. Conclusion

This paper empirically investigates the importance of administrative quality as one of the key dimensions of governance institutions on structural reforms and capital formation in developing countries between 1985 and 2004. The empirical results show that administrative quality has considerable effects on structural reforms. Furthermore, structural reforms and administrative quality have an effect on both on the aggregate and private investment decisions. Empirical estimation especially reveals the positive effects of administrative quality on capital accumulation both directly and indirectly through enhancing the structural reforms. A very important feature of this paper is its emphasis on the mutual determination of capital accumulation and structural reforms. We used the "Administrative quality" variable as a proxy for governance institutions. Hence, our results show that a low level of corruption, a good quality of bureaucracy, a reliable legal system, a strong security of property rights, a reasonable risk to operations, along with an efficient taxation and regulation stimulates capital accumulation directly and indirectly though boosting structural reforms in developing countries. The empirical results demonstrate that one standard deviation improvement in administrative quality enhances the aggregate investment to GDP ratio by more than 0.8

percent in developing countries. This result is in line with and substantiates the empirical literature on governance and aggregate investment. On the other hand, one standard deviation improvement in structural reforms in developing countries accounts for 0.58 percent increase in aggregate investment to GDP ratio in developing countries.

Our estimations also stress the importance of human capital again both on structural reforms and capital accumulation. One standard deviation improvement in human capital augments the aggregate investment to GDP ratio by more than 0.15 percent in developing countries. This contribution is an important improvement for slowly changing components of human capital.

Even after controlling for structural reforms, human capital and GNP per capita, macroeconomic indicators like neoclassical accelerator model and real interest rate are still crucial for the capital accumulation decision. However, economic significance of accelerator model of neoclassical theory of firm is quite minimal. One standard deviation improvement in growth rate only generates less than 0.2 percent aggregate investment to GDP ratio in developing countries. This result reveals that as compared to advances in these macroeconomic indicators, the improvements in administrative quality, structural reforms and human capital yield much higher returns for developing countries.

7. Appendices

Appendix 1

Table A1. List of Countries with High Quality Data (63 countries)

Argentina	*Kenya**
*Bangladesh**	*Lithuania*
*Barbados**	*Malawi**
Belize	*Malaysia**
*Benin**	*Mauritius**
*Bolivia**	*Mexico*
*Brazil**	*Moldova*
Bulgaria	*Morocco**
Cambodia	*Namibia*
*Chile**	*Pakistan**
*China**	*Panama*
*Colombia**	*Papua New Guinea**
Comoros	*Paraguay**
*Costa Rica**	*Peru**
Cote d'Ivoire	*Philippines**
Croatia	*Poland**
Dominican Rep.	*Romania*
*Ecuador**	*Serbia and Montenegro*
*Egypt, Arab Rep.**	*Seychelles*
El Salvador	*South Africa**

Table A1. Continued

Estonia	*St Lucia*
Ethiopia	*St. Lucia*
*Guatemala**	*St. Vincent and the Grenadines*
Guinea-Bissau	*Thailand**
Guyana	*Trinidad & Tobago**
Haiti	*Tunisia**
*Honduras**	*Turkey**
*India**	*Uruguay**
*Indonesia**	*Uzbekistan*
Iran, Islamic Rep.	*Venezuela**
	Yugoslavia (FR)

Note: Due to missing data for some explanatory variables only 33 countries marked with a dagger (*) are included in the final regressions.

Appendix 2. Principal Component Analysis

Table A2.1. The Administrative Quality Indicator

Component	Eigenvalue	Cumulative R^2
P1	2.23	0.56
P2	0.83	0.76
P3	0.51	0.89
P4	0.43	1

Loadings	P1	P2	P3	P4
Corruption	0.49	−0.57	0.06	0.65
Bureaucratic Quality	0.54	−0.08	0.64	−0.54
Investment Profile	0.41	0.81	0.08	0.40
Law and Order	0.54	−0.02	−0.76	−0.36

Administrative quality (QA) = $P1 \times (0.5577/0.7640) + P2 \times (0.2063/0.7640)$.

Table A2.2. The Structural Reform Indicator

Component	Eigenvalue	Cumulative R^2
P1	1.52	0.76
P2	0.48	1.00

Loadings	P1	P2
Trade Policy	0.71	0.71
Private Credit	0.71	-0.71

Structural reform (SR) = $P1$.

Table 2.3. The Human Capital Indicator

Component	Eigenvalue	Cumulative R^2
P1	3.14	0.78
P2	0.38	0.88
P3	0.31	0.96
P4	0.18	1

Loadings	P1	P2	P3	P4
Life Expectancy	0.52	−0.33	0.03	−0.79
H1	0.5	−0.41	0.55	0.53
H2	0.5	−0.05	−0.80	0.32
H3	0.48	0.23	−0.76	−0.03

Human Capital *(H)* = *P*1

Appendix 3

Table A3.1. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Aggregate Investment	*385*	*20.9990*	*6.2589*	*6.8530*	*43.5862*
Private Investment	*382*	*13.6820*	*5.5669*	*2.4000*	*34.4000*
Administrative Quality	*385*	*0.1267*	*0.9507*	*-2.8687*	*2.6501*
Control over Corruption	*385*	*3.0026*	*1.0270*	*0.0000*	*6.0000*
Quality of Bureaucracy	*385*	*1.9870*	*1.0012*	*0.0000*	*4.0000*
Investment Profile	*385*	*6.0286*	*1.6682*	*1.0000*	*11.0000*
Law and Order	*385*	*3.1688*	*1.1990*	*1.0000*	*6.0000*
Structural Reform	*385*	*-0.0097*	*1.0034*	*-1.5666*	*4.6286*
Trade Openness	*385*	*54.7350*	*27.7206*	*12.1425*	*185.1884*
Private Credit	*385*	*34.2701*	*23.9203*	*2.0000*	*138.0000*
Human Capital	*385*	*1.4341*	*1.4878*	*-1.6727*	*4.7503*
Life Expectancy	*385*	*64.2312*	*7.8626*	*40.4000*	*77.1667*
Primary Education	*385*	*3.7721*	*1.0541*	*1.6600*	*7.7000*
Secondary Education	*385*	*1.3544*	*0.5888*	*0.1800*	*2.9000*
Tertiary Education	*385*	*0.2127*	*0.1619*	*0.0100*	*0.7100*
GDP per Capita	*385*	*1967*	*1504*	*135*	*6803*
Real Interest Rate	*385*	*-0.2904*	*35.0969*	*-477.4883*	*70.7136*
Growth	*385*	*3.7044*	*4.4865*	*-13.5000*	*18.8000*
British Legal Origin	*385*	*0.3429*	*0.4753*	*0.0000*	*1.0000*
Constructed Natural Trade Openness	*385*	*15.5749*	*13.5823*	*2.3000*	*68.1800*

Table A3.2. Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aggregate Investment	1	1.00																			
Private Investment	2	0.81	1.00																		
Administrative Quality	3	0.38	0.31	1.00																	
Control over Corruption	4	0.10	0.03	0.62	1.00																
Quality of Bureaucracy	5	0.37	0.29	0.73	0.46	1.00															
Investment Profile	6	0.15	0.14	0.64	0.17	0.15	1.00														
Law and Order	7	0.40	0.33	0.78	0.40	0.46	0.29	1.00													
Structural Reform	8	0.60	0.50	0.39	0.19	0.26	0.20	0.41	1.00												
Trade Openness	9	0.43	0.45	0.23	0.18	0.09	0.10	0.28	0.79	1.00											
Private Credit	10	0.57	0.41	0.41	0.15	0.31	0.23	0.40	0.91	0.46	1.00										
Human Capital	11	0.15	0.24	0.24	0.20	-0.03	0.22	0.29	0.20	0.11	0.21	1.00									
Life Expectancy	12	0.28	0.27	0.31	0.20	0.09	0.21	0.37	0.24	0.11	0.28	0.83	1.00								
Primary Education	13	0.15	0.19	0.39	0.33	0.13	0.26	0.42	0.22	0.08	0.26	0.79	0.61	1.00							
Secondary Education	14	0.13	0.17	0.19	0.09	-0.02	0.18	0.27	0.24	0.12	0.27	0.83	0.68	0.60	1.00						
Tertiary Education	15	0.02	0.18	0.05	0.10	-0.17	0.14	0.07	0.04	0.07	0.01	0.86	0.58	0.54	0.56	1.00					
GDP per Capita	16	0.02	0.13	0.36	0.35	0.15	0.27	0.28	0.16	0.06	0.20	0.60	0.66	0.59	0.57	0.33	1.00				
Real Interest Rate	17	-0.02	-0.02	0.22	0.05	0.08	0.24	0.18	0.14	0.12	0.12	0.08	0.14	0.05	0.12	0.00	0.23	1.00			
Growth	18	0.31	0.21	0.22	0.15	0.10	0.15	0.20	0.12	0.10	0.11	-0.03	0.06	-0.01	-0.04	-0.07	-0.06	0.14	1.00		
British Legal Origin	19	0.14	0.15	0.26	0.20	0.45	-0.01	0.10	0.23	0.17	0.21	-0.45	-0.41	-0.15	-0.30	-0.52	-0.09	0.01	0.05	1.00	
Constructed Natural Trade Openness	20	-0.06	0.01	-0.08	0.03	-0.15	-0.03	-0.04	0.34	0.52	0.14	0.06	0.07	-0.10	0.17	0.04	0.05	0.11	-0.08	-0.14	1.00

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Chapter 4

CAPITAL ACCUMULATION IN LESS DEVELOPED COUNTRIES: DOES STOCK MARKET MATTER?*

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Abstract

Our panel data analysis (1988-2002) of a sample of 31 less developed countries shows that the stock market capitalization as a percentage of GDP- an important indicator of stock market development- has no relationship with the growth rates of gross fixed capital formation. Our time series analysis (1976-2005) of 15 countries shows that in at least 10 cases we observe no positive long-run relationship between the stock market turnover ratio and the growth of capital accumulation. Interestingly the countries experiencing the developmental function of stock market are by and large civil law origin countries with alleged poor shareholder protection.

I. Introduction

In the present era of financial liberalisation under the aegis of the three pillars of the Bretton Woods system (IMF, World Bank and WTO) stock market development has been an important part of both internal and external financial liberalisation in the less development countries (LDCs). There is now a call for better corporate governance in order to protect the interests of the shareholders leading to stock market developments and capital accumulation. In a well-known paper La Porta *et al* (1998) – nicknamed LLSV - observed that countries with a 'common law origin' (such as UK) have a higher level of shareholder protection than countries with a civil law origin (such as France) and accordingly, the former group of countries has a lower concentration of stock ownership. In a subsequent paper (Djankov *et al* 2005), the similar line of reasoning is used to explain a positive correlation between the level

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of shareholder protection and stock market developments. The question is: is there any link between stock market development and economic growth through capital accumulation?

There are many studies supporting the positive link between stock market development and growth. One important study was undertaken by Levine and Zervos (1998). Their cross-country study found that the development of banks and stock markets has a positive effect on growth. In another study Levine (2003) argued that although theory provides an ambiguous relationship between stock market liquidity and economic growth, the cross-country data for 49 countries over the period 1976-93 suggest a strong and positive relationship (see also Levine, 2001). Henry (2000) studied a sample of 11 LDCs and observed that stock market liberalisations lead to private investment boom. Recently, Bekaert *et al* (2005) analysed data of a large number of countries and observed that the stock market liberalisation 'leads to an approximate 1 % increase in annual real per capita GDP growth'. Arestis *et al* (2001) analysed time series data for 5 developed countries and found a favourable role of stock market along with bank in economic growth; but they observed that the favourable role of stock market is exaggerated in different cross-country studies.

There are some economists who are sceptical. Long time back Keynes (1936) compared the stock market with casino and commented: 'when the capital development of a country becomes the by-product of the activities of a casino, the job is likely to be ill-done'.

Referring to the study of World Bank (1993) Singh (1997) pointed out that stock markets have played little role in the post-war industrialisation of Japan, Korea and Taiwan. He argued that the recent move towards stock market liberalisation is 'unlikely to help in achieving quicker industrialisation and faster long-term economic growth' in most of the LDCs.

In this perspective we shall examine the relationship between stock market development and capital accumulation in the LDCs (Section II). We first undertake a panel data analysis of the experience of the LDCs. It will be followed by the time series study of individual country cases. Section III concludes.

II. Relationship between Stock Market Developments and Capital Accumulation

A. Panel Data Analysis

From World Bank (World Development Indicators, various issues – hereafter called WDI) source we obtained a series on stock market capitalization of listed companies (the aggregate market value of stocks of all the companies listed in the domestic stock market) as percentage of GDP (SMC) for 31 LDCs (the full list of countries is in the Appendix) covering 1988-2002 (for some countries we get data for shorter periods). In our study these SMC data are used to indicate the development of stock market in these countries. Since the channel through which stock market development is expected to influence growth is capital accumulation, we would like to examine the relationship between the two. From the above-mentioned source we collected data for the growth of gross domestic fixed capital formation (GKFG).

We have considered three alternative models between the growth of gross domestic fixed capital formation (GKFG) and stock market capitalization of listed companies as percentage of GDP (SMC): between-effects model (BE), the country-fixed effect model (FE) and the random-effect model (RE). The BE model is equivalent to taking the average (mean) of each variable for each case across time and running a regression on the data set of averages. As this averaging procedure results in loss of information, it is not used much in the current literature. Nevertheless we have estimated this BE model and did not observe any significant relationship between the two (details are skipped).

Table 1. Stock Market Development and Capital Accumulation in the Less Developed Countries, 1988-2002[1, 2]

Intercept (a)	SMC (b)	LPCY91 (c)	EDUSE (d)	TRD-GDP (e)	FDI-GDP (f)	DCP-GDP (g)	D (h)	SD (i)	R^2	LM Stat[3]
5.02**	0.01								0.002	3.03
-4.03	0.003		0.18*	0.06	0.47	-0.16*			0.04	1.66
2.24	0.009	0.34							0.002	3.04
-0.68	0.02		0.15*		0.58	-0.11*			0.03	3.02
6.37**	0.02			0.02	0.43	-0.11*			0.02	5.15
4.64**	-0.01			-0.003	0.49				0.007	3.91
							(Dx)	(SDx)		
-2.42	-0.11		0.16*	0.05	0.53	-0.16*	1.58	0.11	0.05	0.57
							(Dy)	(SDy)		
-3.74	-0.01		0.18*	0.06	0.5	-0.16*	1.14	0.01	0.04	1.65
							(Dz)	(SDz)		
-4.53	0.02		0.22*	0.05	0.5	-0.17*	-4.02	-0.01	0.05	0.82
-0.87	-0.03		0.08	0.01	0.6				0.02	1.53

[1] The following equation is fitted:

Growth of Gross Domestic Capital Formation (GGKF)

= a + b. SMC + c. log (PCY91) + d.SE + e. TRDGDP + f.FDIGDP + g.DCPGDP + h.D + i.SD

where D is intercept dummy and SD is the slope dummy = D.SMC. We have used different alternative intercept dummies, Dx, Dy and Dz and SD (SDx, SDy and SDz varies accordingly: Dx = 0 for 15 LO-SMC LDCs with 1992-99 average SMC < 25 per cent and Dx = 1 for other 16 HI-SMC LDCs; Dy = 0 for 24 LDCs with SMC < 50 per cent and Dy = 1 for the seven VHI-SMC LDCs; Dz = 0 for 18 LDCs with 1991 per capita GDP < $ 5000 and = 1 for 13 other rich LDCs.

Setting one or more parameters (b to i) equal to zero, we have fitted alternative regression equations. Details of some of the regression equations are skipped, as the basic conclusion remains unchanged.

[2] Due to the non-availability of data on FDIGDP, DCPGDP and EDUSE, some of the years are deleted for some of the countries.

[3] The Breusch-Pagan Lagrange Multiplier (LM) test statistic is reported in this column.

* Significant at 5 per cent level.

** Significant at 1 per cent level.

The FE is designed to control for omitted variables that differ across countries but are constant over time. This is equivalent to generating dummy variables for each country-cases

and including them in a standard linear regression to control for these fixed country-effects. The RE is used if there is a reason to believe that some omitted variables may be constant over time but vary between cases, and others may be fixed between cases but vary over time. The Breusch-Pagan Lagrange multiplier (LM) test has been conducted to choose the appropriate model. It supports the RE model in some cases and the FE model in some other cases. The Hausmann test gives different results not always tallying with the outcome of the LM test. Our conclusion, however, does not change irrespective of whether we choose an RE model or an FE model. We have reported the estimates of the RE model in all the cases (Table 1).

Our estimates show that the growth of capital accumulation has no significant (positive or negative) relationship with stock market capitalisation. The result does not change if we include the log values of 1991 GDP per capita (purchasing power parity constant 2000 international $), LPCY91 (obtained from the WDI source) in the regression to control for the influence of initial condition in the tradition of 'Barro regression' of convergence/catching up debate literature.

We have also considered other factors such as openness index (share of trade – export plus imports – in GDP, TRDGDP), the importance of foreign direct investment in GDP (FDIGDP) and the indicator of banking sector development as measured by the ratio of domestic credit provided to the private sector to GDP (DCPGDP), which may be expected to influence growth and capital formation (1992-99 averages of all these data are presented in the Appendix). Furthermore to accommodate the state of human capital development we have included educational factor – secondary school enrolment ratio (SE) in 2000 or 2001 (available from the same WDI source for 27 countries of our sample). Only this factor has been found to have a positive relationship with the growth of capital accumulation in many alternative models (fitted by changing the set of independent variables considered here). Surprisingly we got significant negative relationship between domestic credit (DCPGDP) and the growth of capital accumulation. But the basic conclusion of no relationship between stock market developments and capital accumulation remains.

This finding is important in view of the fact that the independent variables (expected to have positive relationships with capital accumulation) considered here have high positive correlations among themselves favouring the case for a positive relationship between GGKF and SMC. As we observed a negative relationship between DCPGDP and GGKF, we have dropped it from the set of independent variables and re-estimated the regression. Similarly many other alternative regressions are fitted (including or excluding a number of independent variables). Our basic conclusion remains (details are skipped).

In the next stage we have divided the sample into two groups – 'developed' and 'less developed' stock market - on the basis of the 1992-99 average values of SMC - 16 'HI-SMC' (SMC > 25 per cent) countries and 15 'LO-SMC' (others) countries. Within the HI-SMC group, we have made a further division – seven countries (Chile, Hong Kong, Jordan, Malaysia, Singapore, Philippines and Thailand) belong to the category of 'very highly developed stock market' ('VHI-SMC') with 1992-99 average SMC greater than 50 per cent. Remaining nine countries belong to the HI-SMC category (with SMC greater than 25 per cent and less than or equal to 50 per cent): Brazil, India, Indonesia, Jamaica, Korea, Mexico, Mauritius, Trinidad & Tobago and Zimbabwe.

We have used a binary variable intercept dummy (for example, intercept dummy = 1 for 'HI-SMC' and = 0 for 'LO-SMC') and/or slope dummy (intercept dummy multiplied by

SMC) and observed that none of the dummies are significant. Similar is the outcome if we use dummies for the VHI-SMC group.

Furthermore our conclusion does not change if we use dummies for 13 rich countries (as indicated by higher than $5000 per capita GDP in 1991 – the countries belonging to this category are underlined in the Appendix). We have considered all the dummies or a sub-set of dummies with or without other independent variables (such as DCPGDP and/or FDIGDP etc). In no case do we find a significant relationship between GGKF and SMC.

B. Time Series Analysis

With this over-all picture of panel data analysis we set ourselves to examine individual country experiences. It is, however, very difficult to get a long time series data for different indicators of stock market development. From the Financial Structure Dataset of World Bank (available on-line) we have been able to collect annual data on the most important indicator of stock market development for 15 countries (out of 31 countries covered in our panel data study) since the mid-1970s (for some countries since the early 1980s). It is the turnover ratio (TURN) defined as the ratio of the value of total shares traded in a country's stock market to average real market capitalization.[1] We have collected the WDI data for the growth of gross capital formation (GKFG) for all these countries.[2] Our objective is to examine whether there is any meaningful long-run relationship between this indicator of stock market development (TURN) and the growth of capital accumulation (GGKF) for all these 15 LDCs over the period since the mid-1970s or early 1980s till 2005 for which we have the relevant data.

We shall use Autoregressive Distributive Lag (ARDL) approach to cointegration developed by Pesaran and Shin (1999) to test for the existence of a long run relationship between two variables irrespective of whether they are stationary or stochastic. This approach does not require any pre-testing of the variables to determine the order of their integration (how many times the data are to be differenced to achieve the stationary property of the data). This approach is especially useful here as the standard tests of stationarity have very low power for a small sample.

First, we shall include no other variables that are expected to influence capital accumulation. The following ARDL (p, q) model is fitted:

$$G_t = a + b.t + \sum_{i=1}^{p} b_i G_{t-i} + \sum_{j=0}^{q} c_j S_{t-j} \qquad (1)$$

where G is the growth rate of gross capital formation (GKFG), S is the stock market turnover ratio (TURN), t is the time trend which captures the effect of other explanatory variables (it is omitted from the ARDL equation when its coefficient is found to be insignificant), the subscripts t, t-i, t-j, indicate different time periods and p and q are unknown lags to be determined by Schwarz Bayesian criterion (SBC) as suggested by Pesaran and Shin (1999).

[1] Turnover Ratio (TURN) is the ratio of the value of total shares traded to average real market capitalization. It is calculated using the following method: $T_t/P_a_t/\{(0.5)*[Mt/P_e_t + M_{t-1}/P_e_{t-1}]$ where T is total value of stock trading, M is stock market capitalization, P_e is the end-of period CPI, P_a is average annual CPI.

Table 2. Capital Accumulation and Stock Market Development: Estimates of Long-term Relationships through ARDL Method[1], 1976-2005

Country/Period (Model)	TURN	DCBGDP	FDIGDP	a	t
I. *HI-SMC Group*					
BRAZIL					
1977-2005 (0,0)	20.34			-8.42	
1977-2005 (0,0,0,0)	19.59	0.001	-0.48	-7.29	
CHILE					
1978-2005 (0,0)	64.95			4.77	
1978-2005 (4,3,4,3)	329.05**	0.3	-3.87**	-4.21	
INDIA					
1976-2005 (2,0)	0.58			-3.2	0.22*
1976-2005 (3,4,2,3)	-4.16*	0.41**	26.21**	14.48*	-0.75**
1976-2005 (2,1)[2]	-5.36			22.07**	
1976-2002 (4,3,4,1)[2]	-5.08	-1.24	10.43	10.43	
INDONESIA					
1977-2005 (0,0)	0.06			4.69	
1977-2005 (3,4,4,4)	-4149.5	110.05	-2488.2	-340.42	
JORDAN					
1977-2005 (1,0)	91.29**			-13.17**	
1977-2005 (1,0,0,0)	92.99**	-0.01	-0.22	-12.35	
KOREA					
1976-2005 (3,4)	-6.32*			15.31**	
1976-2005 (2,4)[3]	-1.23			11.49**	
1976-2005 (3,4,4,4)[4]	-12.79**	-0.04	25.25**	20.19**	
MALAYSIA					
1976-2005 (0,0)	16.17			1.99	
1976-2005 (0,0,0,0)	21.27	-0.24	1.21	26.31	
MEXICO					
1977-2005 (0,0)	3.38			0.93	
1977-2005 (0,0,1,0)	19.79*	-1.86**	-5.63	83.74	
PHILIPPINES					
1976-2005 (0,0)	29.77			-4.27	
1976-2005 (5,5,5,5)	203.92	0.79	-10.42	-70.15	
THAILAND					
1976-2005 (0,1)	28.74*			37.14	-1.15*
1976-2005 (0,1,0,0)	21.76*	-0.21	-2.71	18.23	
ZIMBABWE					
1980-2005 (2,0)	-116.58**			10.35**	
1980-2005 (4,2,3,4)	-58.7	-0.72	4.35	37.41	

[2] For Korea we have calculated GKFG from the data on gross capital formation available in International Financial Statistics published by IMF.

Table 2. Continued

Country/Period (Model)	**TURN**	**DCBGDP**	**FDIGDP**	**a**	**t**
II. *LO-SMC Group*					
ARGENTINA					
1977-2005 (0,0)	24.37			-3.49	
1977-2005 (1,0,2,4)	24.41	-0.63	2.61	18.45	
PAKISTAN					
1984-2005 (1,0)	-1.22**			4.12**	
1984-2005 (1,1,2,3)	0.43	0.39	-3.61	-13.76	
PERU					
1981-2005 (3,0)	38.31*			-2.46	
1981-2005 (4,4,4,4)	-119.96	-4.36	-10.01	134.28	
VENEZUELA					
1977-2005 (2,0)	69.08*			-5.81	
1977-2005 (3,1,0,0)	71.04**	1.12*	2.19	-134.53*	1.99

[1] The following ARDL (p, q, r, s) model has been fitted:

$$G_t = a + b.t + \sum_{i=1}^{p} b_i G_{t-i} + \sum_{j=0}^{q} c_j S_{t-j} + \sum_{k=0}^{r} d_k F_{t-k} + \sum_{l=0}^{s} e_l B_{t-l}$$

where G = GKFG, S =TURN, F = FDIGDP and B = DCBGDP; the subscripts t, t-i, t-j, t-k, t-l, indicate different time periods and p, q, r and s are unknown lags to be determined by the SBC.

Setting the coefficients such as b, d_k and e_l (for all k, l) we have fitted alternative ARDL equations such as ARDL (p, q), ARDL (p, q, r, s) with or without time trend.

[2] Instead of GGKF data we used data on growth of private fixed capital formation, GPGKF.

[3] Intercept dummy, D97 is added to the ARDL equation; it is 0 for 1976-96 and =1 for 1997-05. Its estimate is -8.95 significant at 10 per cent level.

[4] We have used intercept dummy (D97) and/or slope dummy (SD97=D97*t) and observed that the basic conclusion holds.

** Significant at 1 per cent level (based on asymptotic standard errors).

* Significant at 5 per cent level (based on asymptotic standard errors).

The estimates of the long-term coefficients are reported in Table 2. Estimates show that for 4 countries (2 from HI-SMC group: Jordon and Thailand and 2 from LO-SMC group: Peru and Venezuela) a positive long-run relationship exists between stock market development (indicated by turnover ratio, TURN) and capital accumulation (GGKF).

For three countries, Korea, Zimbabwe and Pakistan we find negative relationships! For all others there is no significant relationship.

Next we have extended the ARDL analysis to accommodate other factors that are often expected to influence the growth of capital accumulation such as domestic credit provided by the banking sector (relative to GDP), DCBGDP and foreign direct investment (relative to GDP), FDIGDP. We have not considered trade openness (TRDGDP) as we find very strong positive relationships between FDIGDP and TRDGDP in most of the cases: a higher openness attracts more FDI and vice versa.

The following ARDL (p, q, r, s) model has been fitted:

$$G_t = a + b.t + \sum_{i=1}^{p} b_i G_{t-i} + \sum_{j=0}^{q} c_j S_{t-j} + \sum_{k=0}^{r} d_k F_{t-k} + \sum_{l=0}^{s} e_l B_{t-l} \qquad (2)$$

where G = GKFG, S = TURN, F = FDIGDP and B = DCBGDP; the subscripts t, t-i, t-j, t-k, t-l, indicate different time periods and p, q, r and t are unknown lags to be determined by the SBC.

The estimates of the long-term coefficients show that our observation of positive relationship based on our earlier analysis can be maintained for Jordon, Thailand and Venezuela. Two more countries join the list: Chile and Mexico. India, however, joins with Korea to exhibit a negative relationship (Zimbabwe and Pakistan now exhibit no relationship).

For Korea the negative relationship vanishes through the re-estimate of the ARDL (p, q) equation by incorporating intercept dummy for the 1997 crisis. But the negative relationship remains for the ARDL (p, q, r, s) equation in spite of using intercept and/or slope dummies for the 1997 crisis. This requires further investigation beyond the scope of the present paper.

For India we observe that during our period of analysis (since the mid-1980s) the importance of public capital formation started declining (our GGKF data covers both private and public capital formation). We have looked into the Indian data on the growth of private fixed capital formation (calculated from the relevant data available from Government of India, Economic Survey). Fitting both ARDL equations to these data we observed neither negative nor positive relationship between private fixed capital formation and stock market turnover ratio. In our earlier study on Indian experience (Sarkar, 2007a) we have used many other indicators of stock market development and found no relationship between stock market behaviour and private capital accumulation.

To sum up our time series analysis, only for four to five out of 15 countries we have observed a positive link between growth of capital accumulation and stock market developments (as indicated by the turnover ratio). All these countries (excepting Venezuela) belong to the HI-SMC group. Among these countries, Chile, Jordan and Thailand belong to VHI-SMC group.

Another interesting feature is that all these countries (excepting Thailand) are so-called 'civil-law' countries with relatively 'poor' protection of shareholders compared to 'English-origin common law' countries *a la* the controversial theory of LLSV (La Porta *et al*, 1998). There are some leximetric studies, which question this LLSV proposition (see Fagernas-Sarkar-Singh, 2007, Sarkar, 2007a). It is beyond the scope of the present paper to go into the details. But we have done some casual empiricism on the basis of some available leximetric data on shareholder protection for seven countries out of these 15 countries.

Available data (presented in Table 3) show that India and Malaysia belonging to 'English' heritage had high levels of shareholder protection while Pakistan with the same heritage had a very low level of shareholder protection. None of them experienced a positive link between stock market development and capital formation. Chile, Mexico, Brazil and Argentina had the other heritage and had a much lower level of shareholder protection. For Chile and Mexico we observed a positive long run relationship between capital formation and stock market development while for Argentina and Brazil we get no relationship between

stock market development and capital accumulation. All these provide some evidence against the LLSV-Djankov (*et al.*, 2005) type generalisation (see also Sarkar, 2007b).

Table 3. Shareholder Protection index, 1995-2005: Selected Countries

Countries	Average Shareholder Protection Index[1]
I. 'Common law' origin countries	
Malaysia	6.05
India	5.35
Pakistan	2.23
II. 'Civil Law' origin countries	
Brazil	4.89
Argentina	3.91
Chile	3.25
Mexico	2.67

[1] Legal scholars of Centre for Business Research (CBR), University of Cambridge have compiled a large time-series dataset on shareholder protection as a part of the project on Law, Finance and Development. For details of the construction of these leximetric data see Lele and Siems (2007). In these CBR data, originally 60 indicators of shareholder protection were considered and finally these were reduced to 10 important variables. We have added the 10 variables to get the aggregate index. Then it is averaged over the period for which the data are available. For maximum protection the index would assume the value 10 (as 1 is the maximum value for each of the 10 indicators). So the lower the value the lower is the level of protection

III. Conclusion

The stock market has become an integral part of a mature capitalist society. It is expected to provide a market mechanism for financing a new venture, which is profitable on the basis of private cost calculations. As a part of the development strategy many less developed countries try to promote the growth of stock market, often under the advice of the proponents of the Washington Consensus. However a lot of speculative activities and movements of speculative capital take place in the stock market particularly for stock trading. Accordingly stock prices move up and down and in many cases it has no connection with real economic activities. That's why Keynes compared this with casino and long-term investment decision taken on the basis of this gambling is harmful for the economy. Stock market booms and slumps do not guide long-term investment decisions. The source of long-term real growth does not lie in the activities of the stock market.

Our panel data study finds no positive link between the indicator of stock market development (SMC) and growth of fixed capital formation (GGKF) even after controlling for the level of per capita GDP, trade openness, FDI and banking sector development.

In our time series study of individual country cases of LDC group, based on the ARDL method, we observe that in the majority of cases there is no positive relationship between the growth of capital formation and stock market turnover ratio- an important indicator of stock market development incorporating both market capitalisation and the value of stock trade. Given this lack of relationship between stock market development and capital accumulation,

there is a limited usefulness of the policy of promoting stock market for achieving the developmental goals of the LDCs.

Appendix

Per Capita GDP, Capital Accumulation and the Ratios of Stock Market Capitalisation, Trade, Foreign Direct Investment and Bank Credit to GDP, 1992-1999: Selected Less Developed Countries

Country[1]\Series*	DCP-GDP	FDI-GDP	PCY-91	TRD-GDP	GGKF	SMC	SE
I.HI-SMC Group (1992-99 SMC > 25 %)							
BRAZIL	49.56	1.92	6425	18.54	2.39	26.62	69
CHILE	56.75	5.81	6167	57.86	9.14	96.79	75
HONG KONG[2]	153.7	12.12	20872	268.8	4.35	252.9	71
INDIA	24.28	0.48	1687	22.16	7.87	33.47	--
INDONESIA	48.76	1.06	2675	59.57	-1.41	26.45	54
JAMAICA[3]	26.38	3.47	3897	102.2	29	36.55	74
JORDAN	71.96	1.43	3639	121.8	5.38	72.47	81
KOREA[3]	68.69	0.69	9985	62.16	8.67	38.65	91
MALAYSIA	132.0	5.61	5937	184.4	4.34	215.5	69
MEXICO	27.14	2.48	7662	51.98	6.56	34.45	58
MAURITIUS	49.91	0.7	6759	125.9	5.04	34.95	70
PHILIPPINES	44.44	2.03	3734	87.57	4.17	65.5	52
SINGAPORE	108.8	11.46	15285	275	7.59	165.7	--
THAILAND	134.8	2.61	4791	89.55	-2.54	60.22	87
TRINIDAD & TOBAGO	44.69	9.08	7100	91.66	8.8	32.74	72
ZIMBABWE	32.22	1.77	2795	77.24	-1.88	27.6	37
II.LO-SMC Group (1992-99 SMC < 25 %)							
ARGENTINA	20.64	2.91	9766	19.78	8.42	17.14	79
BANGLADESH	19.77	0.16	1190	27.17	9.51	3.51	43
BOTSWANA	12.62	0.09	5704	92.18	4.88	10.58	55
COLOMBIA	34.44	2.38	5889	35.47	3.34	15.94	56
COTE D'IVOIRE	20.19	1.61	1733	69.3	9.24	8.23	21
ECUADOR	24.62	2.88	3527	54.01	-1.64	7.7	48
EGYPT	40.62	1.27	2842	49.25	7.16	19.06	78
GHANA	7.03	2.03	1678	67.8	1.37	16.45	30
KENYA	32.84	0.22	1128	65.85	3.18	20.16	23
PAKISTAN	27.31	0.95	1630	36.2	1.66	16.53	--
PANAMA	74.78	6.05	4940	175.1	26.76	16.59	61
PERU	19.51	3.82	4026	30.52	7.61	20.04	66
SRI LANKA	22.28	1.38	2445	78.41	6.97	15.87	--
TUNISIA	66.12	2.43	4653	89.14	4.53	13.57	70
VENEZUELA	15.51	2.8	6150	49.81	4.5	10.45	58

[1]Relatively Rich (with PCY91 > $5000) countries are underlined.

[2]FDIGDP data for 1998-99.

[3]GGKF data are calculated from the data available in International Financial Statistics (IMF).

Source: Calculated from World Development Indicators (World Bank).

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Chapter 5

DETERMINANTS OF CHILD HEALTH IN DEVELOPING COUNTRIES: THE EXPERIENCE OF CHINA AND VIETNAM

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Abstract

In the first section of the chapter, having identified the main clusters of food insecure households worldwide and their prevailing livelihood profiles, we discuss the interaction and relevance of key economic and social factors affecting child health in developing countries. Using the World Bank WDI database, we carry out a cross-country econometric analysis on the impact of income and non-income factors on child health in developing countries. Our main findings are threefold. First, among income factors, each country's overall level of economic development is paramount, but income distribution also plays an important role. Second, each country's relative propensity to spend on basic services is significantly and negatively correlated with child malnutrition and mortality. Third, women's level of education and relative status play an important role. In the second section, on the basis of this general framework of interpretation of child health and human development outcomes in the developing world, we focus specifically on the performance of China and Vietnam in reducing under-five child malnutrition and mortality. Under the market socialist model, both countries achieved very high rates of GDP growth, and managed to decrease significantly the prevalence of malnutrition. However, China's progress in reducing child mortality was relatively slow in the 1980s and 1990s, before improving in the early 2000s. Vietnam's record was markedly better, notwithstanding the fact that Vietnam is still much poorer than its giant Northern neighbour. We show that this apparent paradox is due mainly to the negative side-effects of market-oriented reforms, which have reached a more advanced stage in China than in Vietnam. Our results also suggest that the relatively better status of women in Vietnam with respect to China is an additional factor. This phenomenon appears to have been exacerbated

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by the perverse effects of China's rigid population control policies, and by the increasingly, uncontrolled and quasi-privatized availability of advanced medical services. In the policy conclusions, we criticize the market-oriented bias of social sectors reforms, and advocate in favour of recovering some essential features of the original socialist approach, which had been particularly effective in the crucial task of providing universally accessible basic public services.

Keywords: Child Health, Malnutriton, Mortality, Millennium Development Goals, Food Insecurity, Simultaneous Equations, China and Vietnam

JEL Classification: I18, I32, O15

Section I. Income and Non-income Determinants of Child Malnutrition and Mortality in Developing Countries

1. Introduction: Factors Affecting Child Malnutrition and Mortality

Each individual's nutrition status is the outcome of a complex causative process depending on a number of physical, social, economic, institutional, and cultural factors (see Sen (1981)). In turn, child malnutrition is a powerful determinant of child mortality, along with other factors - many of which, with different intensities, are the same ones affecting child malnutrition itself (see Pelletier and Frongillo (2003)). To identify the main determinants of child health it is necessary to adopt a quasi-Rawlsian approach, analyzing the causal processes flowing from the macro- to the micro-level from the vantage point of food insecure[1] households, which tend in practice to be the most destitute ones living in the developing world. The key factors affecting child malnutrition and mortality are represented in Diagram 1, in a descending vertical order corresponding to a decreasing remoteness of various sets of factors from the point of view of households[2],[3].

In each historical and geographic context, physical and environmental factors, jointly with technology, impose an upper bound to the maximum potential level of production of commodities and services, including food. In those circumstances where food production and other human activities are not ecologically sustainable, this bound is lowered, progressively or catastrophically. Structural characteristics of production and exchange patterns are not neutral with respect to environmental sustainability, and can be conducive to a gradual or

[1] Food insecure households include households actually suffering from hunger in the form of material food deprivation and households that under normal circumstances face a structural risk of falling into that situation.

[2] Diagram 1 has some elements in common with Figure 1 in Smith and Haddad 2000. However, there are many differences. Our diagram attempts to identify a causal chain leading to both child malnutrition and child mortality, while Smith and Haddad only focus on the former. Another major difference is that Smith and Haddad assume the clear-cut existence of only two classes of determinants: basic determinants and underlying factors... Our diagram, conversely, tries to illustrate a more complex causal chain, distinguishing four basic stages of causation and stressing as a key feature the positioning of each factor in the market-non market range.

[3] The same factors, and their reciprocal linkages, could also be an also be conceptually positioned horizontally in the same diagram over a continuum range. This range would features market forces (seen as the realm of non-coordinated, self-interest-driven, atomized transactions) on the right side, and non-market forces (such as culture and institutions, including the State), on the other side...

sudden worsening of hunger (Moorehead and Wolmer 2001). This is, conceptually, the highest and broadest level where it is possible to identify a macro-microeconomic linkage between macroeconomic factors and human development outcomes.

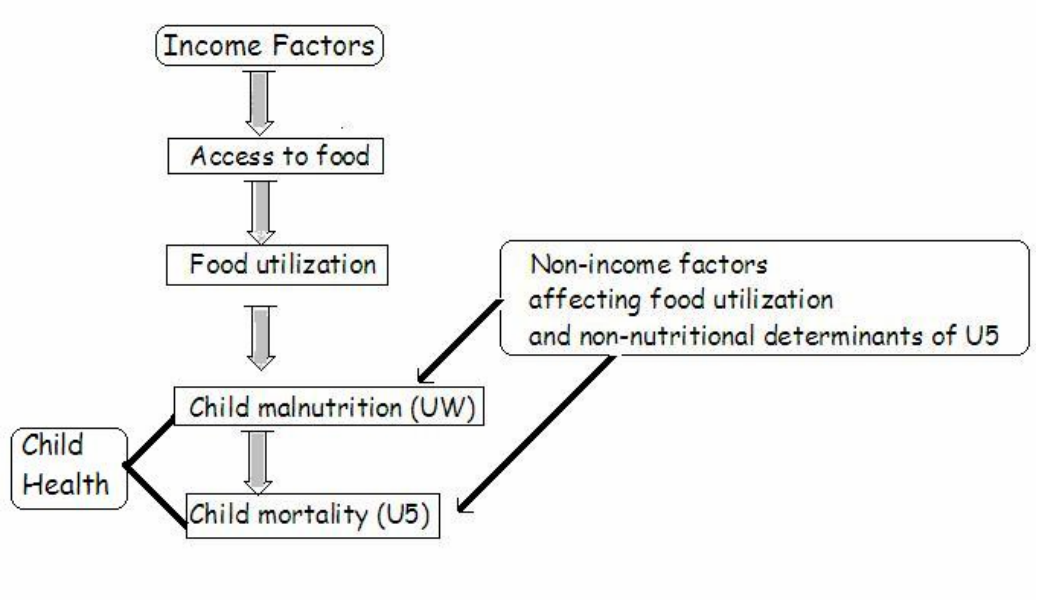


Diagram 1. Conceptual Scheme.

Economic growth is the engine leading to wider availability of goods and services. It is the single most important factor influencing income-based poverty (see Ames et al., (2001)). By the same token, economic growth has long been regarded as key to decrease food poverty, and to enhance human development, reducing hunger, and child mortality. However, growth only tells part of the story, especially if the concept of poverty is broadened to include physiological and social deprivation, and, a fortiori, hunger. The main reason is that, even in the relatively long run (i.e., 20-30 years), the linkage between GDP growth and income poverty[4] is mediated by the evolution of income distribution (Datt and Ravallion 1992, Kakwani 1993, Ravallion 1997, 2001, 2004, 2005a, 2005b). Moreover, the linkage between (income) poverty, child malnutrition, and child mortality must be complemented by the impact of public provision of basic services and other hunger- relieving and other pro-poor interventions (including food aid, targeted nutrition, health, and educational programs, safety nets etc)[5].

[4] The term income poverty refers to the lack of purchasing power deriving exclusively from the total amount and the distribution of primary incomes, without taking into account the impact of direct provision of public services on the part of the state.

[5] The complexity of the linkages between economic growth, malnutrition, and human development is at the root of a number of well-known and less well-known "development puzzles". Some examples are as follows. Positive trends in child malnutrition were recorded in Chile during the early Pinochet regime years, in spite of mounting income poverty (Amigo et al. 1994). Cuba's child malnutrition and mortality indicators improved in the late 1990s (FAO 2003a, FAO 2003b, WBWDI 2006). Kerala's human development indicators are exceptionally good, in spite of the fact that it is one of the poorest Indian states (Chen 2001, ISAE 2004; Marmot 2005; UNDP Kerala 2005). Vietnam's child mortality is lower than China's (Gabriele and Schettino 2006).

The availability and distribution of productive assets (including non-material ones, such as knowledge), and the role of the State constitute the structural background of macro-to-microeconomic linkages at the immediately lower level. The interaction of market forces and state intervention is key in determining economic development and the primary distribution of personal (labor and non-labor) monetary incomes.

National marketed food supply, in particular, is determined by food production and trade. It is primarily a reflection of the level of development of both food-producing and non food-producing sectors, and to a lesser extent of the state's propensity to intervene in food trade. Income distribution, along with nutritional habits and the impact of state intervention on the prices of food and other goods and services (using policy tools such as taxes, subsidies, state-owned enterprises, and others), determines the structure of national food demand, and hence each household's income-based access to marketed food supplies. .

Income-based access to food depends on each household's purchasing power, which is constrained by the prevalence and severity of income-based poverty (see Baulch and Masset (2003), Hulme (2003), and the upper part of Diagram 1.). Food poverty is due to insufficient economic development and/or to unequal income distribution, and its magnitude can be partly modified by food subsidies and other price-distorting state interventions. Access to food, however, is also conditioned by people's knowledge and awareness of food quality (Webb and Thorne-Lyman (2006)), as well as by other factors. As hunger and poverty are different, albeit closely related phenomena, there are factors (such as diverse consumption and intra-household distribution patterns[6], dietary habits and climatic conditions, and cultural factors) that cause significant differences in malnutrition among members of households at similar levels of poverty (see Baulch (2001), Devereux S. and Maxwell S. (2001), Hulme (2003), Hulme and Sheperd (2003), Baulch and Masset (2003), Gentilini and Webb (2006)).

From a causal point of view, poverty affects the effective demand of food, but poverty itself is influenced by food market prices. Moreover, poverty also influences malnutrition and child mortality through other channels, which constrain household's market-based access to non-food commodities and basic services affecting child mortality (such as drugs, sanitary facilities, health and education services).

Availability of and access to food are also influenced by subsistence food production and other non–market factors (such as the state of transport infrastructure, or the existence of food aid programs). Food utilization patterns determine the linkage between access to food and nutrition (see Diagram 1). They are shaped by a set of subjective (largely cultural and behavioral) and objective (dependent mainly on the development of health and sanitary services) factors. Ultimately, people's nutritional status is determined jointly by two main sets of factors. One of them governs market- and income-based access to food. The other set of factors is constituted by the overall array of public policies affecting non–income[7] based access to and utilization of food (see Amigo et al., (1994), Balk et al., (2005)). In the specific case of children, an inadequate nutritional status (reflected by anthropometric indicators of

[6] Recent empirical research provides sometimes contradictory hindsight. For instance, Aromolaran 2004 fails to find evidence of a positive impact on calorie intake of women's share of household total income in South Western Nigeria. Gabriele and Schettino 2006a,b, on the contrary, using a cross-country model, find a significant and strong positive impact of women's status on children's malnutrition and child mortality.

[7] The term "non-income" refers to income in a narrow sense, only as a budget constraint. Of course, relative income and class also affect behaviour, and thus also tastes and nutritional habits, quite apart from their obvious impact of budget constraints.

child malnutrition, such as the prevalence of wasting, stunting, and underweight) is a major determinant of child mortality. However, child mortality is also affected by non-nutritional factors. The most important is the availability of basic services (which is influenced essentially by public policies, but cultural, behavioural, and environmental factors also play an important role, see Aromolaran (2004), Balk et al. (2005), Gabriele and Schettino (2006)).

According to the approach sketched above, market-determined income and distribution patterns are fundamental determinants of child malnutrition and mortality. Yet, a crucial complementary factor is constituted by the economic and social role of the state, which belongs essentially to the realm of political economy. It is shaped by parameters such as the share of national resources commanded by the state[8] (i.e., on its relative strength *vis a vis* the private sector) and the propensity to spend these resources on anti-hunger interventions and the provision of basic services. In a broad sense, such a "propensity to spend" can be understood as including the government's propensity to spend political capital, intervening proactively in domestic food markets (see Dreze and Sen (1989), Maxwell (2001), Ford Runge et al. (2003)).

Policy changes in the domain of domestic markets can affect the price of food inside the country, or cushion it from changes in the world price. In India and China, for instance, public distribution systems for foodgrains, albeit imperfect, have effectively contributed to reduce hunger and food insecurity (see Zhou Z. and Wan G. (2006), Cheriyan (2006)). Besides interfering directly in domestic food markets (through subsidies, price caps, export bans, etc.) governments also affect domestic food prices via a number of other policy interventions, such as investments in transport and storage infrastructure and reforms in domestic food markets aimed at fostering competition and lowering risks and transaction costs (see Pinkney (1993)). Food-focused interventions in domestic markets exert a direct impact on access to food, and, if effective, tend to improve hunger indicators more than poverty indicators. However, their market-distortionary nature makes them more complex and riskier than direct, targeted anti-hunger and anti-poverty programs[9].

By the same token, public provision of basic infrastructure and services (such as sanitation facilities, health and education services) affects a wide range of factors different from malnutrition which contribute to determine the level of child mortality.

2. Methodology

There is a vast literature on the econometric evaluation of the interaction of different classes of economic, social, and other factors, and on their impact on mortality and other human development indicators. Caldwell (1986) and (2006), for instance, has analyzed the evolution of mortality and demographic transition since the 1970s, emphasizing the role of government programs and of both private and public investment in education. Davis and Blake (1956), Mosley and Chen (1984), Hill et al. (1997) investigated child survival and trends in child

[8] Macroeconomic conditions constrain the state's capacity to provide basic services and to engage in other anti-hunger public interventions. During Peru's crisis in the late 1980s, for instance, malnutrition and infant mortality rose also due to the collapse in public expenditure on health (Paxson and Schady 2005).

[9] Targeted anti-hunger programs, if properly designed and implemented, can be very effective even if their cost (and, therefore, the sacrifice they imply for non-beneficiaries) is marginal for the society as a whole. For example, the cost of the Fome Zero program in Brazil - which benefits over 30 million people and has been contributing significantly to combat mass hunger - is less than 0.2% of the country's GDP (Coggiola 2007).

mortality in the developing world. Among other things, they showed that "child mortality and child growth are affected by the same set of underlying nutritional and infectious conditions, such that weight-for-age can be regarded as a measure of health status rather than solely of nutritional status", and that " …background social, economic, cultural, and health system variables influence a parsimonious but exhaustive set of … determinants" (Hill (2003))[10], and explored the complex relationship between income and mortality (Hill et al (1997)).

Many cross-country studies on the factors determining human development indicators employed Ordinary Least Squares (OLS) regression techniques on cross-sections and/or panel data, in some cases refining the analysis with tools such as country fixed-effects and instrumental variables. Anand and Ravallion (1993) ran OLS regressions to explore the impact of national income, poverty, and public health on life expectancy and infant mortality in 22 countries. Pritchett and Summers (1996) used instrumental variables to estimate the impact of income and other factors (such as education) on infant mortality and life expectancy. Two studies by the U.N. Administrative Committee on Coordination's subcommittee on nutrition (UN ACC/SCN (1993), (1994)), as well as Frongillo, de Onis and Hanson (1997), analyzed the determinants of child malnutrition in developing countries. Osmani (1997) focused on the "South Asian Puzzle" (why are malnutrition rates higher in South Asia than in Sub-Saharan Africa, while poverty rates are similar and child mortality rates are lower?), identifying the high prevalence of low-birth-weight rates and women's low status as the most important explanations. Martorell (1999), Svedberg (2000, 2004) and Behrman, et al. (2006) examined the relationship between economic growth, poverty and child malnutrition.

Smith and Haddad (1999, 2000, 2001 and 2002) carried out a particularly accurate research on the main causes of child malnutrition in developing countries. In Smith and Haddad (1999, 2000) they applied country fixed-effects multivariate regressions on a 63 country sample with 1970-1995 data. The authors identified four underlying (or proximate) factors (health environment, women's education, women's relative status, and per capita food production) and two "basic" factors (per capita national income and democracy), with the latter affecting child malnutrition via their impact on the former. In Smith and Haddad (2001) and (2002) they used the same conceptual framework to analyze the impact of food availability and economic growth, finding that such impact is positive but progressively declining, and that other non-income, non-food factors are also very important.

Our own statistical exercise consists in a cross-country analysis covering all developing countries (i.e., those classified by the World Bank as low income, lower middle income, and upper middle income countries). With one minor exception, the data used in our cross-country analysis were obtained from a single database, the World Bank World Development Indicators 2006 (WBWDI 2006). In our view, data in WBWDI 2006 present three main advantages. First, they are reliable, and updated. Second, they are homogeneous and therefore easily comparable with each other. Third, they cover all developing countries for which data are available.

[10] See also Sen, 1981, and see Pelletier and Frongillo 2003.

Table 1. Pearson correlations among explanatory variables

	GDPPC	GINI	HP	SANIT	PCRF	RATIO	BA
GDPPC	1						
GINI	-0.061	1					
HP	0.5576	0.0609	1				
SANIT	0.7032	-0.173	0.2724	1			
PCRF	0.5781	-0.0991	0.4078	0.6701	1		
RATIO	0.4914	-0.2115	0.1744	0.3869	0.4139	1	
BA	0.6651	-0.1649	0.4055	0.7057	0.7026	0.4684	1

Realizing the limited availability of annual data for many of the series reported in WBWDI 2006 (such as those with anthropometric indicators of malnutrition), we preferred to avoid the interpretative ambiguity that could be implied by analyzing an "unbalanced" panel including for each country few data quite scattered over time[11]. Therefore, we conducted most of our analysis in levels, utilizing the latest values available for each indicator (most of which refer either to 2004 or to the early 2000s) and applying the OLS and simultaneous equations (SUR) methodologies. Our results can be interpreted both in a static and in a dynamic framework. In the former, they identify the factors determining malnutrition in the early 2000s. Dynamically, they show the outcomes of a very long historical process, which led over time to a different evolution of various relevant factors, and thus to different outcomes in terms of malnutrition and child mortality in different countries. Taking into account the paucity of available data, we also estimated some models in growth rates, attempting to single out a few basic factors common to all countries which affected trends in malnutrition and child mortality over the 1990s and early 2000s.

Table 2. The reciprocal interrelationships among undernourishment, child malnutrition, and child mortality

Model	No. Obs	Dep. Var.	Explanatory var.	Coeff.	Std.err.	Signif	Adj.R2	White C. (needed)	Reset T. (passes)
1	79	UW	UN	0.498	0.065	***	0.320	y	y
			C	9.100	1.744	***			
2	79	U5	UW	9.208	1.607	***	0.440	y	y
			UW2	-0.134	0.034	***			
			C	-13.799	10.230	ns			
3	135	U5	UN	5.297	0.795	***	0.470	y	y
			UN2	-0.045	0.014	***			
			C	4.572	6.053	ns			

Note to table 6

*** Significant at 1% level of probability

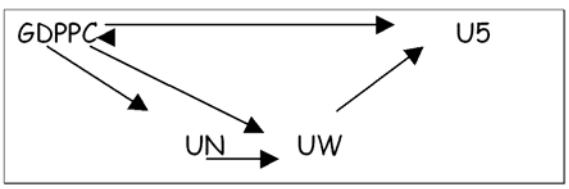
Ns Not significant

[11] This type of panel analysis has the advantage of using more information, but its results cannot properly take into account the changes occurring over time. i.e., if two data are taken for country A, one in 1992 and another in 2001, and two for country B , in 1994 and 1999, the result of the analysis will reflects underlying patterns working in both countries over the last 10-15 years, but it will not properly reflect the situation in any single year.

The analysis in levels was conducted in successive steps, focusing initially only on income–based factors (economic development and income distribution), and widening successively the scope to include non-income factors. Thus, we first analyzed the basic statistical interrelationship between GDP per capita in purchasing power parity terms (GDPPC) and two human development indicators, underweight (UW), and under-5 child mortality (U5), applying OLS to our data (see table 2). In some cases, we also included in our models the FAO's undernourishment (UN) indicator. According to the conceptual framework proposed in the previous section, we expect GDPPC to be a key determinant of access to food (reflected by the UN indicator). Inadequate access to food, in turn, is the most obvious cause of malnutrition, measured by the underweight (UW) indicator. Malnutrition is a primary factor influencing child mortality (U5).

GDPPC → UN → UW → U5

However, we also expect these causal linkages to explain only part of cross-country variability in the malnutrition and child mortality indicators[12], taking into account the roles of inequalities in (primary) income distribution and of non-income factors. The latter, in turn, are partly determined by the level of income per capita. Thus, the "true" causal flow is in fact:



The second step consists in considering, along with GDPPC, the other factor determining people's market-based access to food: income distribution. To this purpose, we added GINI (the most recent figure for the Gini coefficient reported in the WDI database) as an additional explanatory variable

In the third step we analyze the impact on child malnutrition and mortality, (*i.e.* on child health) of factors different from those affecting the distribution of primary incomes, and therefore different from those governing households' market-based[13] access to food and basic services[14]. They affect both food utilization (i.e., child care, sanitary conditions, and other elements governing the translation between access to food and nutritional status) and

[12] The paucity of data and the intrinsic imperfection of some of our indicators (especially in the case of UN) must also be taken into account.

[13] Market-based access to food can be seen as including market-based access to inputs needed for subsistence production, and is by far the most important element governing access to food in general. Overall access to food on the part of households, however, is also influenced to some extent by other factors, such as non-market access to inputs and assets needed for subsistence production and food aid programs.

[14] Undernourishment only concerns the access dimension of nutrition, and is essentially determined by the level and distribution of primary incomes analyzed above. Thus, in this third step UN is not examined along with UW and U5 as a dependent variable. Rather, it is taken in some models as a right end variable to discuss its impact on underweight and child malnutrition.

determinants other than nutrition contributing to influence the prevalence of child mortality[15] (see Diagram 1, p.121).

Previous research has shown that the main non-income factors affecting child malnutrition and mortality are likely to be the availability of basic services and cultural factors affecting women's status (see Smith and Haddad, 1999, 2000). Taking into account data availability constraint in the WB WDI data base, we selected four indicators of basic services supply, plus one indicator of women's status. The services variables are as follows[16]: HP (the share of public health expenditure on GDP); SANIT (the percentage of the population having access to improved sanitation facilities); BA (Percentage of births attended by skilled health staff); PCRF (female primary school completion rate).[17] The proxy for the relative status of women is the ratio between female and male life expectancy (RATIO). Having identified them, we tested SUR models including only variables representing non-income factors on the right hand side (see table 4)[18].

Then, we wanted to test income- and non-income variables together. However, we realized that, as most explanatory variables are all highly correlated with GDPPC (see Svedberg 2004 and table 1), a problem of collinearity arises. This finding reflects a true stylized fact: although many differences exist among developing countries, economic, social, and cultural development tend to be positively correlated in the long run. Without underestimating the myriad of reciprocal interactions among different factors[19], economic development is to be seen as the main underlying force, creating the material conditions needed for the development of social services and also, to some extent, favouring the evolution of gender relations towards a higher degree of equality. As we are actually interested in the above-mentioned national differences, we regressed each of the seven variables on GDPPC, and took the residuals as additional explanatory variables (see table 5). The residuals can be interpreted as representing each country's willingness to earmark resources towards health, education, and other services, depurated from the – often overwhelming – influence exerted by sheer economic development. As such, these new variables have two important advantages. First, they are not correlated with GDPPC, and therefore overcome the problem of collinearity[20]. Second, in the case of HP, SANIT, BA, and PCRF in residuals (represented in table 5 as HPRES, SANITRES, BARES, and PCRFRES)

[15] Most non-income factors affect child malnutrition both indirectly (via their impact on child malnutrition and directly .

[16] For all the variables, we used the latest available figure in WB WDI.

[17] We also tested the significance of two other variables, representing respectively the percentage of the population having access to improved water sources and the percentage of children aged 12-23 months immunized against measles. However, they did not turn out as significant, even if they had the right sign.

[18] Many researchers have argued that political factors, and the each country's degree of democracy in particular, are also paramount, as they affect the state's propensity and ability to earmark public resources in favour of the poor (see, Smith and Haddad 1999, 2001; Mc Guire 2002; Shandra et al 2005). Smith and Haddad, in particular, have utilized a democracy index as a key underlying variable, along with economic development, which in turn affects in a virtuous way other variables ultimately determining child malnutrition. We also probed the significance of an index of democracy. It is the Economist Intelligence Unit's Index of Democracy (see EIU 2007) , and is thus the only one among our variables which was not taken from the WBWDI database. However, this democracy indicator never turned out as significant.

[19] The most relevant of these interaction is given by the opposite causation flow running from the availability of social services to growth (mainly via their impact on human capital and labor productivity). This very important and often overlooked causal linkage implies that the trade off between growth and social expenditure is easily overstated. Cultural factors also affect economic development.

[20] Table 1 shows that the variables are also correlated with each other, but their reciprocal correlation coefficients are much lower than those between each of them and GDPPC.

are true policy-related variables, because they reflect each country's government authentic (log-term) propensity to spend on each service, beyond (or less)[21] than what could be predicted only on the basis of each country's GDPPC[22]. The other component of public social expenditure, conversely, can be seen as the physiological amount which is normal among developing countries for each level of GDPPC, and does not indicate any prioritizing effort on the part of the government. In this respect, an interpretative caveat is also warranted. A corollary of the way these models are constructed is that the coefficient of the GDPPC variable captures not only the impact on the dependent variables stemming directly from income per se, but also those of the second component of social public expenditure, i.e., the average amount of services which the typical developing country provides at each level of development. That's why, for instance, in the simple models, where GDPPC is the only explanatory variable, its coefficient is so high (see below, section 3, table 6). Even with the inclusion of the residual services variables on the right side of the equation, GDPPC still captures the impact of the "normal" supply of basic services typically associated to that level of development, while the residual variables only reflect the impact of each country's own autonomous propensity to prioritize these services. Therefore, an even modest magnitude of their coefficients (as far as they are significant) would strongly underscore the relevance of national governments' relatively autonomous social policy choices, quite independently from each country's level of economic development. Conversely, GDPPC coefficients must be seen as embodying also the impact of the "normal" supply of basic services that is, on average, attached each level of economic development.

3. Results

3.1. Basic Relationships between the Level of Economic Development and Social Outcomes Indicators

Charts 1-3 show graphically the relationship between GDPPC and UN, UW, and U5 respectively. Most points are condensed along the axis, showing that the negative correlation between income, undernourishment, and human development is very strong in very poor countries and then weakens progressively at higher levels of development. These charts can be interpreted as follows. Economic development strongly affects access to food, child malnutrition and child mortality in developing countries. However, the impact of GDPPC impact is highly non-linear. It decreases sharply at increasing levels of economic development, and it manifests itself also indirectly, via the action of other factors which are in turn associated to each country's income per capita.

The OLS models in Table 2 illustrate the basic causal relations among the UN, UW, and U5. The impact of UN on UW appears to be a linear one (model 1 passes the RESET test[23],

[21] As they are constructed as series of residuals, these indicators do exhibit also negative values, indicating that some countries accorded to a given service a degree of priority lower than the average of other developing countries at a comparative level of economic development.

[22] This methodological approach is aimed at addressing the issue of variable endogeneity (see Behrman and Deolalikar 1988, Simth and Haddad 1999).

[23] Model 1 passes the RESET test, a test for specification errors which is frequently used to check whether power transforms need to be added to the model. Conversely, a RESET test performed on the simplest model

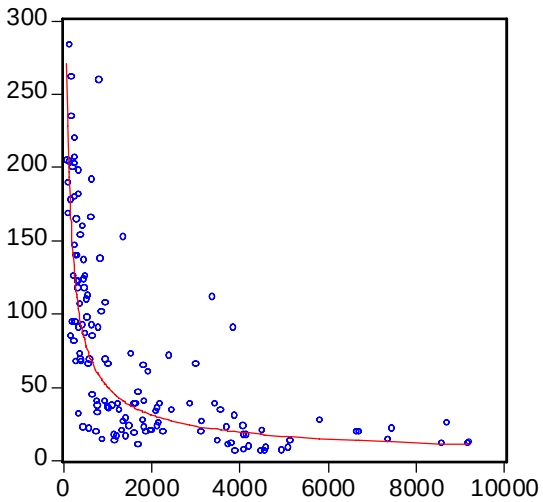


Chart 1. U5 and GDPPC (all countries).

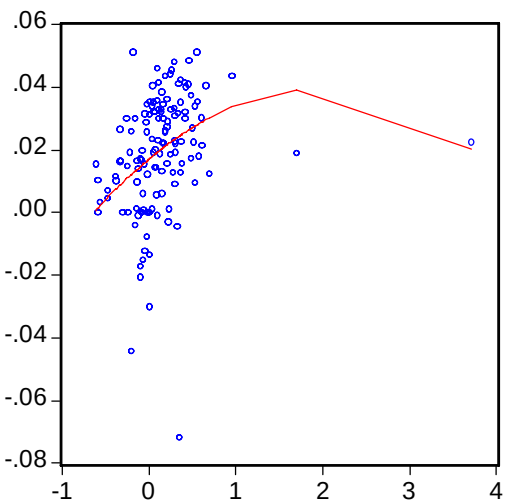


Chart 2. U5 RATE and GDPPCR (all countries).

and does not differ much from the following model in logs), but the regression explains only about one third of inter-country variability in child malnutrition. This result is due in part to data limitations[24] and in part to the fact that malnutrition is affected not only by availability of

including U5 as the dependent variable and UW as the explanatory variable (not reported in Table 6) showed that the causal relationship between malnutrition and child mortality is a non-linear one.

[24] Due to factors related to the frequency and difficulty of data measurement and reporting, the degree of availability, accuracy, and comparability of child mortality, malnutrition, and undernourishment indicators is uneven. Child mortality is computed from censuses, is reported regularly for most countries and is the most trustworthy indicator. Underweight data are only available for some countries and their quality is lower, due to the limited size of samples and to difficulties in measurement. Undernourishment data are calculated by FAO on the basis of nationwide food balances.

and access to a sufficient quantity of food, but also by food quality and by factors shaping food utilization (such as health and child care). The quadratic model shows that differences in malnutrition explain about one half of inter-country differences in child mortality – a result in line with the findings of previous studies (see Smith and Haddad 1999) – and that hunger is still a major factor causing child mortality. A similar (and, in fact, statistically more robust)[25] result holds for the causal relationship between undernutrition and child mortality (Model 3).

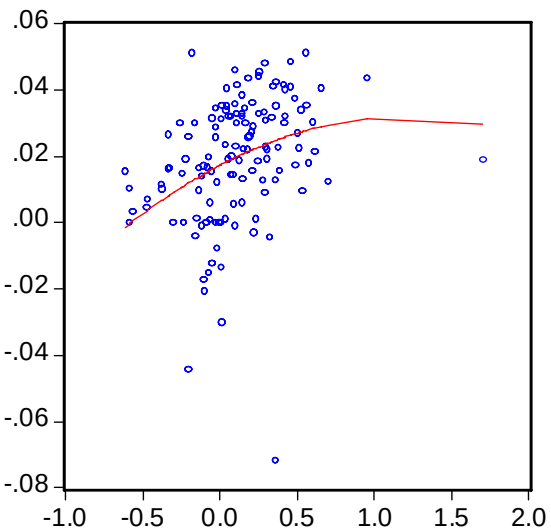


Chart 3. U5 RATE and GDPPCR (Equatorial Guinea excluded).

3.2. GDP per capita and Primary Income Distribution: Income Factors

The second step of our analysis considers, along with GDPPC, the other key factor determining people's market-based [26] access to food: income distribution. To this purpose, we added GINI (the most recent figure for the Gini coefficient reported in the WBWDI database) to the right side of the equations.[27]

In order to analyze simultaneously the impact of both income factors on our two dependent variables (UW and U5)[28], we employed the SUR technique (see Zellner 1962). The

[25] The "true" causal relationship between undernourishment and child mortality passes through malnutrition, and thus the linkage between UW and U5 should be stronger than that between UN and U5. However, UN estimates in our database are more numerous and (notwithstanding their own imperfections) probably closer to the (unknown) true value than child malnutrition estimates. This explains why in our models UN turns out as more significant and robust than UW.

[26] Food subsistence production and consumption, for which no data are available in WDI, is not statistically taken into account in this exercise.

[27] The Pearson correlation coefficient between GINI and GDPPC is only -0.06, showing that inequality in income distribution across developing countries is not systematically correlated with their respective level of economic development (See Table 1). Therefore, including GINI in the equation along with GDPPC does not raise problems of multicollinearity.

[28] At this stage of our analysis, we are only interested in UW and U5, as they are easily interpretable direct indicators of human development outcomes (i.e., undernourishment and under-5 child mortality

results are reported in table 3. They show that GINI is a highly significant determinant of U5, but not (even if it has the right sign) of UW[29]. Thus, income inequality strongly affects child mortality, but its direct impact on child malnutrition cannot be statistically confirmed. This negative result might be partly due to the statistical quality of U5, which is intrinsically better than that of UW (it is much easier to measure ex post child mortality than to estimate child malnutrition), which is also reflected in a higher R2 in the correspondent regression.

Table 3. Income factors

Seemingly unrelated regression (SUR)		
	(1)	**(2)**
	U5	**UW**
GDPPC	-0.058***	-0.009***
	(0.006)	(0.002)
GDPPC2	0.000***	0.000***
	(0.000)	(0.000)
GINI	1.277***	0.038
	(0.421)	(0.116)
Constant	157.404***	37.063***
	(22.001)	(6.043)
Observations	65	65
Adjusted R-squared	0.72	0.48
Standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

3.3. Non-income Factors

The next step of our analysis focuses on the impact of public services and of other cultural and political factors, separately from that of income factors analyzed above. Non-income factors are represented by the variables HP, SANIT, BA, PCRF, and RATIO. The SUR models in table 4 show that SANIT is a significant determinant of both UW and U5 (more so in the case of the former). Each of the other variables is significant only in one of the two models. HP and BA are significant determinants of UW, PCRF and RATIO of U5. These finding are probably due the fact that children's malnutrition status is affected directly (apart from the insufficiency of food intake) by the lack of health and sanitary services. Conversely, child survival chances at age five are affected (in a more indirect way) by the quality of the care they receive from their mothers, which in turn is positively related to women's education and relative status. In both models R2 is higher (around 0.74) than in the income factor

respectively). Conversely, we drop the UN variable, which is a nationwide, aggregate proximate indicator of overall food availability, and suffers of the statistical limitations referred to above in note 24.

[29] In both regressions GDPPC2 is significant. Such non-linearity largely reflects the influence of non-income factors not included in this model.

models, showing that the availability of key services has a more powerful impact on infant malnutrition and mortality than the level and distribution of income[30].

Table 4. Non-income factors

Seemingly unrelated regressions (SUR)	U5	UW
SANIT	-0.802***	-0.243***
	(0.273)	(0.057)
HP	-3.456	-1.985***
	(3.639)	(0.765)
BA	-0.051	-0.216***
	(0.223)	(0.047)
PCRF	-1.337***	0.012
	(0.242)	(0.051)
RATIO	-344.983**	-27.452
	(141.226)	(29.679)
Constant	610.897***	80.204***
	(144.805)	(30.431)
Observations	63	63
Adjusted R-squared	0.74	0.74
Standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

3.4. Income and Non-income Factors

The fourth step of our analysis focuses on the joint impact of income and of non-income factors on child mortality and malnutrition. The latter are represented by the five public services variables expressed as residuals (HPRES, SANITRES, BARES AND PCRFRES[31]) and by RATIO. The results are presented in table 5.[32] In both regressions R2 is pretty high, close to 0.8. GDPPC, GDPC2 and SANITRES are very significant determinants of both UW and U5, showing that improvements in both indicators are strongly affected by economic development (albeit at a diminishing rate) and by each country's propensity to invest in sanitation.

Other key determinants differ markedly, following a pattern largely similar to that of the previous models. Child malnutrition is significantly affected by the availability of basic "hard" (i.e., mainly related to the state's willingness and capacity to materially provide the necessary infrastructure, staff, maintenance and organization) health and health-related

[30] Owing to the collinearity problem mentioned above, this finding must be interpreted as purely indicative.

[31] PCRF reflects the provision of educational services to girls, but also the demand for such services on the part of households. Thus, it is an indicator of the state's propensity to spend on providing education services, and on acting in several areas (such as those of economic and social policies, cultural policies, and legal and institutional interventions) to improve households' willingness to send girls to school. However, it is also a culture-, gender-related indicator.

[32] In Table 5, we chose a specification including only explanatory variables with coefficients exhibiting at least a 15% significativeness level.

services, as is shown by the significance of HPRES and BARES in the second equation. Conversely, in the first equation, U5 is strongly affected by PCRFRES and RATIO, two "soft" (i.e., related to culture and education) gender-related factors affecting children's maternal care. GINI is also marginally (at 15%) significant, providing weak evidence that income inequality per se is bad for child mortality.

These findings shows that child mortality is determined jointly by each country's level of economic development[33], by income distribution, by the provision of basic hygienic services[34], and by women's status and education (with the first and the last being particularly important), and that each of these factors can be separately identified in a statistically significant fashion[35]. Conversely, neither income- nor gender-related factors appear to be significant determinants of child malnutrition, as their impact is statistically obscured by the overwhelming role of sanitation and birth attending services.

Table 5. Income and non-income factors

Seemingly unrelated regression (SUR)		
	(1)	**(2)**
	U5	**UW**
GDPPC	-0.044***	-0.007***
	(0.007)	(0.001)
GDPPC2	0.000***	0.000**
	(0.000)	(0.000)
GINI	0.548§	
	(0.418)	
SANITRES	-0.702**	-0.213***
	(0.280)	(0.063)
RATIO	-292.502**	
	(132.094)	
PCRFRES	-0.940***	
	(0.232)	
HPRES		-1.692**
		(0.825)
BARES		-0.212***
		(0.045)
Constant	473.210***	36.824***
	(137.423)	(2.363)
Observations	55	55
Adjusted R-squared	0.82	0.77
Standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1	§ p<0.15	

[33] In this model, as in that presented in Table 6, GDPPC2 is significant and has a sign opposite to that of GDPPC. This shows that economic development per se contributes to decrease child mortality, but with diminishing returns. A corollary of this finding is that the relative role of the other factors, all of which are to some extent policy-related, increases along with economic development itself.

[34] HP has the right sign, but it is not a significant determinant of U5 in the first equation of Table 5.

[35] With the partial exception of income distribution.

3.5. Regional Fixed Effects

To test for the existence of fixed regional effects, we added two dummy variables, SSA and SA. SSA takes value 1 for countries in Sub-Saharan Africa - the macro-region with the highest level of child mortality - and 0 for all other countries. SA takes value 1 for countries in South East Asia - the macro-region with the highest level of child malnutrition - and 0 for all other countries. The results are reported in Table 6. Both regional dummies are highly significant[36], and have opposite signs. This result confirms the existence of the so-called "South Asian Puzzle"(see Osmani 1997, Srinivasan 2000), i.e. the presence of region-specific structural factors which contribute to exacerbate the prevalence of child mortality and malnutrition in Sub-Saharan Africa and in South Asia respectively.

Table 6. SUR with regional fixed effects

Seemingly unrelated regression (SUR)		
	(1)	**(2)**
	U5	**UW**
GDPPC	-0.026***	-0.008***
	(0.006)	(0.002)
GDPPC2	0.000**	0.000**
	(0.000)	(0.000)
GINI	0.052	-0.067
	(0.392)	(0.106)
SANITRES	-0.510**	-0.210***
	(0.244)	(0.066)
HPRESID	-1.490	-0.973
	(3.113)	(0.839)
RATIO	-90.974	-1.865
	(126.126)	(33.999)
PCRFRES	-0.535***	-0.058
	(0.199)	(0.054)
BARES	-0.101	-0.191***
	(0.180)	(0.049)
SSA	59.420***	-2.081
	(12.217)	(3.293)
SA	-17.411	11.392***
	(16.393)	(4.419)
Constant	221.461	42.839
	(135.639)	(36.563)
Observations	55	55
Adjusted R-squared	0.89	0.81
Standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

[36] The inclusion of the dummies renders some of the other variables no longer significant. One of them is RATIO. We carried out a test on equal average that shows that this variable is significantly lower in Sub-Saharan Asia and South Asia than in the rest of the developing world. These findings suggest that the particularly negative records of Sub-Saharan Asia and South Asia are both related to an unfavorable relative status of women.

3.6. Models in Growth Rates (1990-2004)

The statistical information available in the WB WDI database allows to extract or to estimate[37] two values for many (not all) of our variables, one for 1990 and one for 2004, for a limited number of developing countries. On this basis, we computed the annual growth rates for our dependent and explanatory variables and tried to identify the main statistically significant relations among them (if any). We realize that this exercise was being carried out for a rather limited sample (in fact, a subset of the large sample used in the previous models in levels), and that this and other statistical limitations do not allow even elementary theory-consistent relations among variables to be adequately captured by the data. This problem emerges clearly, for instance, from table 7, which shows the simple Pearson correlation coefficients between the rates of reduction of undernourishment (UNR), child malnutrition (UWR) and child mortality (U5R) respectively.[38] Moreover, the relative shortness of the time period considered could not have allowed changes in many factors to be fully captured statistically, on one hand, and to produce a clearly recognizable impact on the dependent variables, on the other hand (see Svedberg 2004, pp.11-12). Notwithstanding these caveats, we present some results.

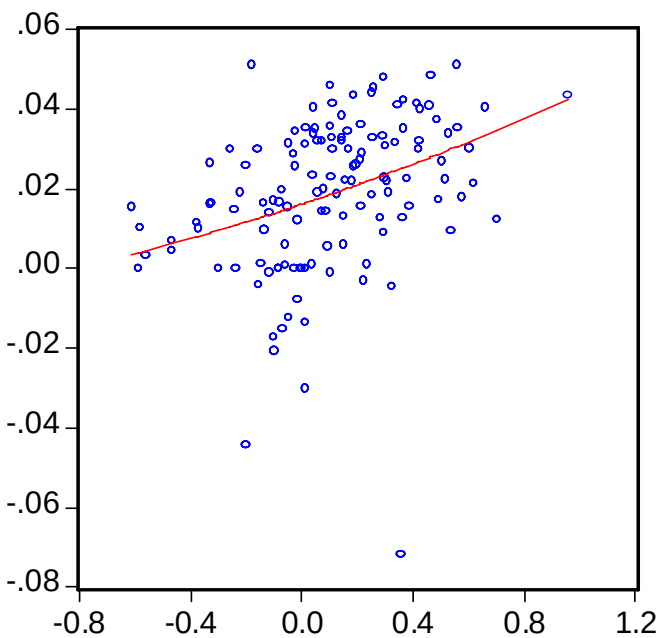


Chart 4. U5 RATE and GDPPCR (Equatorial Guinea and China excluded).

However, for reasons not captured by our model, the role of gender inequality is partly different in the two regions, as it affects more strongly child mortality in Sub-Saharan Africa and child malnutrition in South Asia.

[37] Interpolating values reported for the late 1980s/early 1990s and for the early 2000s.

[38] Not only all coefficients are lower than they could be expected to be (given the strong long-run causal relations running from access to food to child malnutrition and child mortality discussed above), but one of them (the one between UN and UW) is even negative, a clearly implausible result.

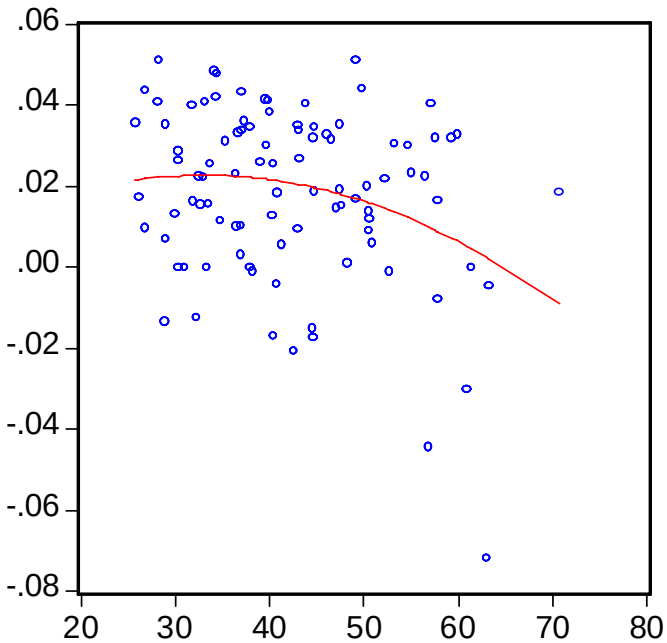


Chart 5. U5RATE and LASTGINI (all countries).

Table 7. Pearson correlations between variables in growth rates

	U5R	UWR	UNR
U5R	1		
UWR	0.2423	1	
UNR	0.1892	-0.1346	1

Charts 4 and 5 and the two OLS models in table 8.I. confirm that – in very general terms – economic growth did contribute to improvements in social outcome indicators in the 1990-2004 period. However, the *adjusted R squared* are very low, indicating that the models only capture a small part of the story, and that each country's rate of reductions in child malnutrition depended on many factors different from economic growth per se. The charts and the models also show that the positive impact of economic growth on our two human development indicators was linear in the case of UW, and non-linear in that of U5. Such a non-linearity implies that the best results in terms of reduction in child mortality were achieved by countries with sustained rates of economic growth, while those with low or negative growth fared poorly. However, the (few) countries with particularly high growth rates did not obtain exceptionally good results in terms of child mortality reduction either, suggesting that a trade off might arise between economic and social goals in countries that single-mindedly push growth too far (see below, Section II) .

Table 8. Models in growth rates

I. – Univariate OLS Regressions

Dep. Var.	Explanatory var.	Coeff.	Std.err.	T-stat.	Signif	Adj. R^2	F-Stat	White C.	Reset T.
UWR	GDPPCR	0,28	0,11	2,53	***	0,1	6,37	N	y
	C	0,73	0,40	1,84	*				
U5R	GDPPCR	0,28	0,08	3,34	***	0,07	5,65	N	y
	GDPPCR2	-0,02	0,01	-2,15	***				
	C	1,58	0,19	8,47	***				

II. – Seemingly Unrelated Regressions (SUR)

	U5R	UWR
GDPPCR	0.195	0.246**
	(0.131)	(0.097)
GDPPCR2	-0.014	0.005
	(0.010)	(0.007)
SA	-0.224	0.402
	(0.835)	(0.615)
SSA	2.766***	-0.784**
	(0.431)	(0.318)
Constant	2.945***	0.865***
	(0.344)	(0.254)
Observations	55	55
Adjusted R-squared	0.47	0.48
Standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

III -Multivariate OLS Regressions

Dep.Var.	Explanatory var.	Coeff.	Std.err.	T-stat.	Signif	Adj.R^2	F-Stat
U5R	GDPPCR	0.4538	0.15	3.06	***	0.64	12.91
	SERVR	0.4403	0.15	2.95	***		
	GINI	0.0063	0.00	2.20	***		
	GINI2	-0.0001	0.00	-2.63	***		
	RATIO	0.4365	0.10	4.19	***		
	HPMIDDLE	0.0042	0.00	2.04	**		
	C	-0.5770	0.11	-5.44	***		

In the SUR models presented in Table 8.II, we added to each equation the SSA and SA dummies. Only SSA turned out significant. In the first model it has a very high negative coefficient, while GDPPCR is no longer significant. This finding shows that most countries in Sub-Saharan Africa are falling further and further behind the rest of the world in the endeavour to reduce child mortality, for reasons due largely, but not exclusively, to a lack of economic growth. In the last model SSA's coefficient is lower, and GDPPCR is still significant, but GDPPCR2 is not. This result suggests that also the reduction of child malnutrition is being hampered by region-specific factors in Sub-Saharan Africa[39], [40].

Finally, we also tested a more comprehensive multivariate model, including other explanatory variables in the right-hand side. However, this exercise was possible only to explore the determinants of the reduction in child mortality, for which more data are available, and required the inclusion in the model of two new variables. One is SERVR, an additive variable constructed as the (unweighted) average of the growth rates (1990-2002) of four basic services indicators (access to improved sanitary facilities[41]; access to an improved water source[42]; child immunization rate against measles[43]; female primary school completion rate), minus the growth rate of GDPPC:

$$SERVR = (SANITR + WATERR + IMMR + FPSCR)/4 - GDPPCR$$

Where:

SANITR = rate of growth (1990-2002) of the access to improved sanitary facilities

WATER = rate of growth (1990-2002) of the access to an improved water source

IMMR = rate of growth (1990-2002) of the child immunization rate against measles

FPSCR = rate of growth (1990-2002)of the female primary school completion rate

GDPPCR= rate of growth (1990-2002) of the per capita GDP

Thus, SERVR is an indicator of the evolution of each country's propensity to invest in basic services. The other variable is MIDDLE, a dummy with value 1 for middle income countries and 0 for the other (low income) developing countries

Only GDPPCR and SERVR could be computed as growth rates variables. Therefore, the other explanatory variables are included in levels form, as in the previous models. This amounts to assume that income inequality, public health expenditure, and the status of women have also a dynamic impact on the evolution of child mortality, even if they do not change over a given period of time. The best fitting specification resulted to be one where the health policy variable is represented by HPMIDDLE (the product of HPMEAN by the MIDDLE dummy)[44], and the square of the Gini coefficient (GINI2) was also included.

$$U5R = \alpha\,(GDPPCR) + \beta(SERVR) + \gamma(GINI) + \delta(GINI2\ ) + \lambda(HPMIDDLE) + \varphi(RATIO) + \varepsilon$$

[39] These region-specific factors also appear to be the cause of the non-linearity of the second model in Table 8.
[40] Adding the regional dummies also has the effect of increasing markedly the R squared in both regressions.
[41] Share of population
[42] Share of population.
[43] Percentage for children ages 12-23 months.
[44] In a trial regression, the variable HPMEAN turned out as not significant.

The results obtained with this specification are showed in table 8.III. R-squared improves significantly with respect to the previous models, showing that the regression explains about 2/3 of inter-country variability in child mortality reduction. The additive services variable is highly significant, and its coefficient is similar to that of GDP growth. The negative impact of income distribution is non-linear, and becomes relevant only when the Gini coefficient reaches the mid-30s (Chart 5). The public health variable is significant only in middle income countries.[45]

Section II. Child Health in China and Vietnam

4. Poverty, Malnutrition, and Child Mortality in China and Vietnam

In this section we apply the general framework of causation of child health and human development outcomes in the developing world to analyze specifically the performance of China and Vietnam in reducing child malnutrition and mortality.

During the central planning period, both countries achieved a relatively good record in terms of human development, thanks chiefly to a very egalitarian income distribution and to the development of free (albeit basic) health systems and of other essential public services (see, for instance, the data on child mortality in 1960, 1970, and 1980 in Table 9.10.). However, both countries were still very poor by the end of the 1970s[46].

Table 9. China's and Vietnam's basic economic and social indicators in a comparative perspective

9.1. Growth of GDP, agriculture and food production

	Vietnam	China	Cuba*	Middle Income	East Asia & pacific	World	Low Income
GDP 80-90	4.6	10.3	na	2.8	7.9	3.3	4.4
GDP 90-03	7.5	9.6	-1	3.5	7.6	2.8	4.7
AGR 80-90	2.8	5.9	na	3.6	4.9	2.7	2.8
AGR 90-03	4.2	3.5	na	2.2	3.1	1.9	3
Food production	67	68	na	83	77	84	82
(index 1999-2001=100)	115	110	na	110	111	105	103

* The figure for GDP growth is from CEPAL and refers to 1990-2002. WB 2005 reports for 1990-2003 a figure of 3.9: it is obviously incorrect and therefore it was not utilized. WB 2005 also reports data on Cuba's agricultural and food production growth but we did not consider them to be sufficiently trustworthy.

[45] The status of women also exerts a recognizable impact.

[46] We are not implying that the central planning form of socialism was a total failure in the purely economic terms. Economic growth in China in the 1950s, 1960s, and early 1970s was unstable, but on average more sustained than in most other developing countries. In the case of Vietnam, of course, it would be absurd to underestimate the economic impact of the war.

Table 9. Continued

9.2. Nutrition

		Vietnam	China**	Cuba	World	Low income	Low and middle	East Asia and Pacific***
Undernourishment (%prevalence)	1990-92	31	16	8	20	27	20	17
	2000-02	19	11	3	16	25	17	12
	Reduction (%)	38.7	31.3	31.3	20.0	7.4	15.0	29.4
Child malnutrition% (Stunting)								
	Latest	36.5	14.3	4.6	na	43.1	na	15
	1992-93	49.5	31.4	na	na	na	na	19
	1987-89	56.5	na	na	na	na	na	na
	1983-84	59.7	na	na	na	na	na	na

* For Vietnam, the latest figure for stunting refers to the 2003 survey

** For China, the latest figure for stunting refers to the 2002 survey, and the one for 1992-93 to the 1992 survey.

*** For East Asia and the Pacific, the earlier figure refers to surveys conducted between 1989 and 1994

9.3. Disease prevention

		Vietnam	China	Cuba	World	Low income	Low& middle
Access to an improved	90	66**	70	na	75	64	72
water source (% of population)*	2002	79***	77	91	82	75	79
	Increase (%)	19.7	10.0	na	9.3	17.2	9.7
Access to improved	1990	22	23	98	43	20	50
sanitation facilities	2002	41	44	98	54	36	76
		86.4	91.3	0.0	25.6	80.0	52.0
Child immunization rate	Measles	93	84	99	77	65	76
	DPT	99	90	71	78	67	77
Consumption iodized salt	Latest	83	93	83	67	53	17
Vitamin A Supplementation	2002	55	na	na	na	na	56

*Data on access to an improved water source are only tentatively comparable among different countries

** 1992-93

*** 2000

Table 9. Continued

9.4. Educational, behavioral and gender variables

			Vietnam	China	Cuba	World	Low income	Low and middle
Exclusive breastfeed			15	67	41	na	na	na
Primary completion rate females	1988/89-1993/94		na	99	93	na	57	88
	2000/01-2003/04		95	95	94	na	66	94
Youth literacy rate	1990	female	94	93	99	87	73	87
good		male	94	97	99	79	55	78
		ratio	1.000	0.959	1.000	1.101	1.327	1.115
Adult literacy rate	1990	female	87	69	95	63	38	73
		male	94	87	95	74	60	62
		ratio	0.926	0.793	1.000	0.851	0.633	1.177
Life expectancy at birth 2003		female	72	73	79	69	59	66
		Male	68	69	75	65	57	63
		ratio	1.059	1.058	1.053	1.062	1.035	1.048

9.5. Health expenditure

		Vietnam	China	Cuba	World	Low income	Low&middle
Total % GDP 2002		5.2	5.8	7.5	10	5.5	6
Public	% GDP	1.5	2	6.5	5.8	1.5	3
	% of total	29.2	33.7	86.5	60	27.8	49.4
Out of pocket % of private		87.6	96.3	75.2			

9.6. Poverty

		Vietnam	China	World
% below 1$ line	1981	70*	63.8	40.4
	2001	24.1	16.6	21.1
% below 2 $ line	1981	na	88.1	66.7
	2001	na	46.7	22.9
Population below	1998	37.4	4.6	
national poverty line %**	2003-04	19.5	3.1	

* **Source**: World Bank, quoted in http://perso.wanadoo.fr/patrick.guenin/cantho/vnnews/poverty1.htm
** **Source**: Wikipedia (http://en.wikipedia.org/wiki/List_of_countries_by_percentage_of_population_living_in_poverty)

Table 9. Continued

9.7. Under 5 mortality rate by quintile and Gini index

	Vietnam	China
Under 5 mortality rate		
Poorest quintile	63	
Richest quintile	23	
Gini (latest)	37	44.7

9.8 Child malnutrition

	Vietnam	China	Cuba	East Asia&Pacific
Underweight % children under 5 (early 2000s)	34	10	4	14.7
Reduction (%, early1990s-early2000s)	24.4	41.2		22.6

9.9. Selected Millennium Development Goals

		Vietnam	China	Cuba	World	Low income	Low and middle	East Asia Pacific
Achieve universal primary education	1988/89-1993/94	na	105	94		65	81	97
Primary completion rate	2000/1-2003/4	95	98	94		71	84	97
Promote gender equality								
Ratio male/female enrolment ratio1	1990-91	na	87	106		74	84	89
	2003-4	93	97	97		84	91	97
Improve maternal health								
Maternal mortality ratio/100000	2000	130	56	33	407	689	444	116
Birth attended by skilled heath staff	2000-03	85	97	100	na	na	na	91

* UNICEF 2006 reports a more favorable figure forunder-5 mortality in China in 2004 (31/1000)
Source : WB 2005 (unless differently specified)

Table 9. Continued

9.10. Under-five child mortality rate (per 1000 live births), 1960-2005

		1960	1970	1980	1990	1995	2000	2005
Under-five child mortality rate (per 1000 live births)	China	225	120	64	49	46	40	27
	Viet Nam	112	87	66	53	44	30	19
	Cuba	54	43	22	13	10	9	7
	Sub-Saharan Africa	274	239	196	186	184	176	169
	Latin America & the Caribbean	153	123	82	54	43	36	31
	Eastern Asia	220	117	62	48	45	39	
	South Asia	245	206	173	126	108	97	84
	South-eastern Asia	176	136	103	78	63	51	
	Western Asia	215	179	112	68	69	63	
	Oceania	198	135	97	86	83	79	
	DEVELOPED regions	43	29	17	11	9	8	6
	EURASIA (Countries in CIS)	68	40	48	41	45	44	35
	DEVELOPING regions	224	167	133	105	98	91	83
	WORLD	198	147	118	94	89	83	76
% of world average	China	1.14	0.82	0.54	0.52	0.52	0.48	0.36
	Viet Nam	0.57	0.59	0.56	0.56	0.49	0.36	0.25
	Cuba	0.27	0.29	0.19	0.14	0.11	0.11	0.09
% of DEVELOPING REGIONS AVERAGE	China	1.00	0.72	0.48	0.47	0.47	0.44	0.33
	Viet Nam	0.50	0.52	0.50	0.50	0.45	0.33	0.23
	Cuba	0.24	0.26	0.17	0.12	0.10	0.10	0.08

Source: Unicef 2006

Since the beginning of market-oriented reforms, rapid and broad–based[47] economic growth and a low level of initial inequality[48]jointly allowed for exceptional progress in reducing poverty and hunger in both countries (see Table 9.1.,9.2., 9.6.,9.8. and, among others, Masina 2006, UN Country Vietnam Team 2003a, 2005). Yet, malnutrition is still a severe mass phenomenon, hitting hundreds of millions in China and tens of millions in Vietnam, most of them poor farmers (see Table 9.2.). For China, this was confirmed recently by the China Health and Nutrition Survey (CHNS) national survey carried out by the Beijing–based Institute of Nutrition and Food Safety.[49] 29 % of children younger than 5 and living in

[47] China and Vietnam exhibit a very good record in terms of growth of the agricultural sector and of food production in particular (Table 9.1.).
[48] The low level of initial inequality implied a high, though declining, growth elasticity of poverty reduction.
[49] See the website http://www.cpc.unc.edu/projects/china

poverty–stricken regions were malnourished. By contrast child malnutrition in urban areas stood at only 1 percent. The prevalence of growth retardation and low body weight in children has diminished, yet they still make 17.3% and 9.3% nationwide and 29.3% and 14.4% in rural areas[50] .

Overall food availability nationwide has ceased to be a problem and the quantity and quality of food supply has improved enormously. Notwithstanding increasing income inequalities, all social groups have strengthened their energy and protein intake, which is now basically satisfactory. Food insecurity – a condition measured by various indicators, that measures the risk of not having enough food – improved, with 350 counties (most of them in rural areas of central and western provinces) identified as "vulnerable" in the latest (2003) survey, against 450 in the previous (2000) one (WFP/IFAD 2003).

However, numerous studies have shown that – due to the speed and unevenness of economic, social, behavioral, and dietary patterns, and to the inadequacies of nutrition policy programs[51] – different social groups in China are now experiencing various forms of malnutrition typical of both poor and rich countries, such as inadequate vitamins and micronutrients intake, excessive consumption of fats, and obesity (see Zhai et al., 2002; Mendez M.A. and Popkin B. M., 2004).

Vietnam is much poorer than China, and hence the dietary transition in Vietnam is at a much earlier stage, notwithstanding the remarkable progress achieved so far. The prevalence of underweight and stunted children has been halved over the last two decades, but sheer undernourishment is still widespread in the countryside and constitutes the core of a malnutrition problem that remains severe (see Table 9.2., 9.8.). In the early 2000s, thanks mainly to the halving of poverty rates in little more than a decade, malnutrition rates[52] fell to around 30% (down from 50% in 1990), and the share of households unable to meet minimum dietary energy consumption was about 11% (30% in 1990). Undernutrition is particularly acute among ethnic minorities and rural households in which women are less educated (see U.N. Country Team Vietnam 2005; DFID 2006).

With respect to the progress achieved so far towards achieving the Millennium Development Goals, China's and Vietnam's record is broadly positive vis a vis most other developing countries (see Table 9.9.). Focusing on under-five mortality, in particular, both China's and Vietnam's record in 2005 was much better than the average for developing countries (see Table 10). Yet, it is striking to observe that China's under-five mortality rate was much higher than Vietnam's.

In historical terms, progress in reducing child mortality in China (from a very high initial level) was very fast in the 1960s and 1970s, under the traditional central planning regime. In 1960, child mortality in China was about the same as the average for all developing countries, and close to the levels of Sub-Saharan Africa and South Asia. By 1980, when the economic reform where still in an embryonic stage, it had been reduced to less than half the developing countries' average (see Table 9.10., Part III). However, progress in reducing child mortality in

[50] Source: Xinhua News Agency October 10, 2005

[51] This is not to say that no efforts have been carried out. Awareness on improper nutrition patterns and interventions aimed at improving dietary patterns are on the rise in China, some of which are very effective (see Zhai et al 2002)

[52] For the population as a whole.

China slowed down in the 1980s[53] and virtually stagnated in the 1990s. A more positive trend emerged in the 2000s, possibly due both to an acceleration of economic growth and to the (minor) measures carried out by the government in order to begin reverting the deterioration of health and other public services.

Conversely, since the end of the American War, Vietnam achieved an extremely good result, having reduced child mortality by more than 50% over little more than a decade. Vietnam is still a rather poor country, notwithstanding the enormous economic progress achieved since the inception of the dai moi, but its child mortality indicator is less than ¼ than the developing country average (it was ½ in 1980) (see Table 9.10., Part III)[54].

Table 10 presents China's and Vietnam's relative ranking among developing countries, for a number of economic and social variables[55]. Part A reports rankings in levels for 2002. In terms of GDP per capita, China's ranking is intermediate, while Vietnam is still very poor. The GINI score shows that the deterioration of income distribution has gone much further in China (where it is by now more unequal than most of other developing countries) than in Vietnam. China and Vietnam score well in terms of female primary schooling. However, both countries perform very poorly in terms of public health expenditure and are not particularly impressive (even taking into account their modest level of economic development) in terms of water, sanitation, and immunization[56]

The ratio of female/male expectancy (RATIO), a proxy indicator of women's relative status, suggests that gender problems are presently more severe in China than in Vietnam, and that this difference might have an impact on the quality of maternal care received by children in the two countries. At the root of women's inferior relative status stands a centuries-old tradition of discrimination against girls, which is widespread, to different degrees, in most countries in Eastern and South Asia (including Vietnam)[57]. However, this tradition - like all traditions - should not be seen as an immutable, innate cultural characteristic of Asian peoples[58]. Rather, it has been interacting with the forces of modernization, economic development and technical change, leading to new phenomena that are sometimes virtuous and sometimes perverse, and have an uneven impact on different countries and social groups. An example can be constituted by demographic policies: China's preference for boys might have been strengthened by the rigid "one child policy" carried out until recently, especially in rural areas (see Greenhalgh S. 2005, 2007). Additional factors could be the agricultural household responsibility system (which made rural households' welfare more dependant on its

[53] These trends are largely due to the well-known fact that the initial phase of market-oriented reforms mainly benefited the rural majority (see Chen and Ravallion, 2004b) , and the social problems related to the dismantling of the traditional socialist planning system in urban areas did not materialize on a large scale until the 1990s.

[54] Also Cuba, which started from a very low base and experienced negative GDP growth during the 1990s, managed to reduce under-5 mortality much faster than China during the last two decades of the XXth century (see Table 1.10., Part III).

[55] Source: World Bank 2005. For each variable, rankings refer to all low and middle income countries for which data are reported.

[56] In the area of immunization, Vietnam's score is rather good, while China's one is poor.

[57] On the respective role of women and other historical, sociological, and cultural differences between Vietnam and China, see by Nhung Tuyet Tran and Reid A. (Editors), 2005.

[58] Of course, to varying degrees, the discrimination of women, far from being a unique Asian prerogative, is common to all traditional societies. For instance, the relative status of women in Classical Greece was particularly low (see Sealey 1990, and Vivante 1999, Ch.8).

members' labor force), and the virtual absence of a social security network for old people in rural areas (see UNFPA 2007b)[59],

Vietnam's population policies were never as strict as China's (see Scornet, 2001, and Goodkind 2005), and most of the social and economic changes mentioned before as indirect causes of the increasing sex ratio[60] in China[61] are still in an initial stage. However, trends similar to those manifesting themselves in China, India, and other Asian countries are beginning to be felt also in Vietnam: for instance, selective abortions are on the rise, and they appear to be starting to push up the sex ratio[62] (see Bélanger et al., 2003, UNFPA 2007c, White 2007). They are still embryonic so far, but, if left unchecked, they might become a serious challenge in the medium term.[63]

Scores in undernourishment[64], stunting and wasting show China performing quite well, and much better than Vietnam. Yet the opposite is true in the case of infant and under–5 mortality, where Vietnam's score is very good (as usual, taking into account it is still a very poor country), while China's is only moderately better than average[65]. Besides the role of the gender factor, the lackluster record of China is likely to be due to the fact that some aspect of social underdevelopment that have accompanied so far market–oriented reforms have been

[59] Taking care of old parents is traditionally seen mainly as the responsibility of sons .

[60] The sex ratio at birth and the ratio of female over male life expectancy (RATIO) are two quite different indicators. Generally speaking, however, they tend to be positively correlated. Preference for males induces households both to try to have more male babies (in the past, through female infanticide, and in the present mainly through selective abortion) and to treat relatively better men rather than women under any circumstances. The first phenomenon leads to a biased sex ratio at birth. The second phenomenon, which reflects the way women are treated all over their life and is thus a crude indicator of their relative status, tends to reduce females' life expectancy with respect to males', and thus leads to a relatively low RATIO indicator

[61] After the Chinese Revolution, "the incidence of excess early female mortality (probably infanticide) declined precipitously… but not to zero… (conversely)…the recent escalation in the proportion of young females missing in China has been caused, in large part, by rapidly escalating sex-selective abortion."(Banister and Coale 1996, p.421). This worrying development, in China as elsewhere, was made possible by "the arrival of ultrasound and amniocentesis technologies in the late 1970s, which made it possible for parents to know in advance the sex of their child" (UNFPA 2007b). Moreover, also traditional "demand factors related to son preference (social customs, marriage costs, old-age support) can evolve according to changing social and economic circumstances.

The reasons behind China's fast-climbing and uneven sex ratio (it is abnormally high in rural areas and in provinces with strong traditional culture, while in modern cities such as Shanghai it approaches European levels) are complex and multifarious. Among the most important, however, a few have been identified as likely by many scholars. One is certainly the new availability of sex-selection services in a still quite traditional but more affluent rural society, compounded by the deterioration and unruly marketization of health services (Banister and Coale 1996, UNFPA 2007b) and by the rigid population control policies (see Greenhalgh S. 2005, 2007). The Chinese Government is aware of the gravity of the phenomenon and is beginning to act forcefully to control it (UNFPA 2007 b). Therefore, the present, alarming trend might start to be reversed in the near future.

[62] The relationship between selective abortions, sex ratio, and women's status, however, is far from simple Goodkind (1999), for instance, argues that, especially in a framework of strict population policies, selective abortions which allow parents to avoid unwanted daughters could help to create a situation where females are not - or less - undesired, and thus ultimately might end up improving relative women's status.,

[63] "Viet Nam is in almost the same situation now as China was ten years ago, in terms of the socio-cultural context of its sex-ratio imbalance…Sex ratio at birth is not a significant problem now, but could be within a decade"(UNFPA 2007c).,

[64] Prevalence of undernourishment is a measure of basic access to food estimated by FAO, with a particular methodology that renders it difficult to compare it on one hand with macroeconomic income and distribution variables, and, on the other hand, with anthropometric malnutrition indicators. We did not use it in our econometric analysis as we focused on the social and economic factors determining income-based market access to food.

[65] The most recent (2005) data on under-5 mortality in China are more favourable, yet it is still not as good as Vietnam's (see Table 1.9.).

more dramatic and have been operating for a longer time than in Vietnam. The most severe are the ever-increasing geographic and class inequalities, the decay of public health services, and even the lack of access to basic education on the part of poor peasant girls in some rural areas. Moreover, deepening social inequalities further reverberate on human development, as the access to health and other basic services on the part of poorer and weaker population groups is jeopardized not only by lack of purchasing power, but also by lack of education, information, and social connections (see Hamrin 2006 on China and London 2004 on Vietnam)[66]

This interpretation is confirmed by part B of Table 10, which shows rankings in terms of annual growth rates, over the 1990s and early 2000s. China's and Vietnam's performance in terms of per capita GDP growth are exceptionally good, especially so in the case of China.. Both countries did well in the expansion of sanitation facilities, less so with respect to the access to clean water (especially in the case of Vietnam)[67]. Yet, Vietnam clearly outperformed China both in terms of expansion of immunization and female education[68], and in terms of gains in the areas of undernourishment, infant and under–5 mortality. Actually, Vietnam's record in reducing child mortality is among the best in the world. Conversely, in the 1980s and 1990s (before the improvement of the early 2000s), China's progress in this area has been just about average.

5. Economic and Social Determinants of Child Mortality: An Econometric Analysis

To discuss China's and Vietnam's record in reducing child mortality a comparative perspective, we start by focusing again in general terms on the relationship between economic development and child mortality in developing countries, according to the same analytical framework proposed in section I,

Models 1 and 2 in levels have GDP per capita in 2002 (GDPPC) as the only explanatory variable, and under-five child mortality (U5) as the dependent variable[69]:

$$U5 = \alpha + \beta\ GDPPC + \varepsilon \quad (1)$$

$$\log U5 = \alpha + \beta\ (\log GDPPC) + \varepsilon \quad (2)$$

When tested on the WB-WDI database, Model 2 fits much better than model 1, showing that the relationship between economic development and child mortality is not a linear one[70]. Chart 1 illustrates the logarithmic relation between the two variables. At low levels of

[66] The importance of social connections for acceding to most public and even private services is typical of many other countries, among them Italy.

[67] The interpretation of the rankings for the annual growth of rate of sanitation, water and immunization must take into account that some countries show zero or negligible growth simply because they already reached total or quasi-total coverage.

[68] Data on primary female primary school completion in Vietnam in 1990 are not available in WB 2005. However, data on another indicator of female education, the gross enrolment ratio of girls in secondary school, show a much faster improvement in Vietnam than in China.

[69] Data for U5 refer either to 2002 or to the latest available figure.

development, very poor countries exhibit quite different levels of child mortality, while at higher levels the opposite is true, with middle- and higher-income countries sharing similar levels of child mortality. This finding is consistent with the non-linearity of the relationship between economic growth and reduction in child mortality over the 1990-2002 period (see Section I), which is represented graphically in Chart 2. The function is strongly concave (downward), but is also heavily influenced by two outliers, Equatorial Guinea and China. Excluding from the sample Equatorial Guinea (a scarcely representative country with less than 1 million inhabitants, where GDP growth was exclusively determined by the recent discovery of oil), the function is still concave downward (Chart 3). However, if also China is excluded, the function becomes slightly convex (or concave upward) (Chart 4). These findings show that in China the elasticity of child mortality reduction with respect to GDP growth tended to decrease markedly with growth acceleration, while this was not the case for most other countries (including Vietnam[71]) (see Section 3.).

Some of the results of the last model presented in Section I (See para 3.6., table 8. III, and chart 5) also bear particular importance to analyze China's performance. We refer to the finding that the GINI coefficient and the public health expenditure/GDP ratio were significant determinants of the rate of reduction of child mortality in 1990-2002 (with opposite signs) only for developing countries having already reached relatively high levels of economic development and income inequality respectively. One of them is in fact China, a country that during the 1990s became a middle income one thanks to its exceptional growth performance, and where in the same period the Gini coefficient increased progressively and entered the critical zone identified in Chart 5. These findings also contribute to explain why Vietnam, which followed a similar development path, performed much better than China in reducing child mortality.

6. Asian Market Socialism: Strategic Control of the Surplus, Fast Growth, and Rapid Decrease of Poverty

The quantitative analysis carried out in Section 1 and in sub-section 5 has shown the relevance of various social and cultural factors different from per capita GDP per se in determining child mortality. China's and Vietnam's record in fighting this evil in the last quarter century is better than that of most other developing countries, yet not as good as their exceptional growth performance might have allowed. As child mortality is a synthetic indicator of overall human well-being, it can be argued that these two Asian countries exhibit, along with a remarkable economic dynamism, a peculiar form of (relative) social underdevelopment. In the remainder of the paper we propose an explanation of this apparent paradox, arguing that its roots are to be found in the contradictions typical of the specific form of market socialism model presently existing (notwithstanding obvious and significant differences) in both Asian countries.

[70] Model 1 does not pass the RESET test, suggesting the existence of non-linearities in the relationship between per capita income and child mortality. Non-linearities have also been found in the relationship between income per capita and other hunger and deprivation indicators (see, for instance, IFPRI 2006).

[71] In Chart ?, Vietnam is represented by the last point on the right (the fastest-growing country after Equatorial Guinea and China), which lies practically on the curve.

In China and Vietnam, the direct and indirect control of the main means of production on the part of public bodies determines social production relations different from those typical of capitalist countries. This key feature is significant at the macroeconomic and systemic levels[72], and therefore justifies the use of the term "socialism"- to be interpreted in a weak, structural and positive sense, and not one directly related to the normative goals traditionally associated to socialism.

In the market socialism framework, the state determines the rate of accumulation to a degree that is significantly higher than in capitalism, as it can count on more and more effective instruments to control the generation and allocation of the surplus and the speed and broad patterns of technical progress. These fundamental characteristics of market socialism have contributed to achieve an intermediate goal of decisive importance, especially in poor countries: fast economic growth. Growth is, in the long run, a necessary condition to reduce poverty. China and Vietnam , thanks to rapid GDP growth and to specific policy interventions that contributed to lift the incomes of the rural majority,[73] have achieved so far an impressive record in poverty reduction. If they were considered jointly as a sort of "Asian market socialist macro-region" (with more than one fourth of the total population of the developing world), this macro-region would be the only one in the developing world to show significant progress in combating poverty (on the history of market-oriented reforms in China and Vietnam see, for instance Selden, William S. Turley 1993;Chan, Kerkvliet, and J Unger 1999; Beresford, Melanie and Dang Phong. 2000;Chan and Wang Hongzen 2004;. Masina 2002, 2006; Lin B.Q. 2003; Beresford, Melanie and Dang Phong. 2000). Consistently, China and Vietnam account jointly for the bulk of (income- based) poverty reduction worldwide since the 1980s[74] (see Edward P., 2006, Chen and Ravallion and 2004a,b; Li and Piachaud 2004; Lin 2003).

Market socialism might - in principle - allow to extend the public control of a large share of the surplus to the area of final consumption, minimizing the superfluous consumption of privileged social groups, to earmark it to various forms of public and social consumption. In fact, this potentiality is not presently realized. On the contrary, the perverse spiral towards an ever–worsening income distribution pattern has largely gone out of hand, with severe consequences also in terms of basic needs satisfaction, as is shown by the high inequalities in under–5 mortality rate among households belonging to different income classes. Moreover, essential public services have been largely abandoned to market forces, so that access to them is based on income and wealth instead of being free and universal.

[72] Conversely, it is scarcely relevant in the domains that are subjectively important for most individuals. Most non-agricultural workers in China and Vietnam, as well as salaried workers in the public or private sector, have a very low degree of control on either wages or working conditions, and many are severely exploited.

[73] Among them, agricultural de-collectivization (notwithstanding its multiple negative and uneven side effects), agricultural pricing policies, and targeted antipoverty programs. These interventions partly compensated the negative impact on poverty of deteriorating income distribution.

[74] Chen and Ravallion (2004a), in a milestone study, showed that worldwide reduction in headcount poverty (using the conservative 1$-a-day poverty line) was 390mln between 1981 and 2001. Out of them, only 30 million took place outside China (in net terms: poverty increased in some countries and decreased in other countries). According to Edwards 2006, these figures show that "the only really significant impact on poverty that occurred in the world was in China."(p.1682). We agree, although observing that the sentence should be completed with the words "and Vietnam", suggesting that such a large-scale poverty reduction was attributable to unique features of Asian market socialism, rather than of China alone.

The factors behind the increase in income inequality in China and Vietnam (starting from a very low initial level) have been the object of numerous studies[75]. The focus of the following section is on the underdevelopment of social services.[76]

7. Relative Underdevelopment of Social Services under Market Socialism

Under the socialist centrally–planned economic regime, the Chinese and Vietnamese states strived to provide social services free of charge to all the population. As the resources available for that purpose were quite scarce, actual social services supply was extremely limited both in quantity and in quality. Nevertheless, basic social services provision was very egalitarian and, on the whole, distinctively superior to that of most countries with a similar level of economic development. As result, China and Vietnam's human development indicators were also significantly better than other poor countries with similar levels of economic development (see table 10, Ministry of Health 2005, Gabriele 2006)).

Since the inception of the market–oriented economic reform process, provision of basic social services seriously deteriorated in both countries. Moreover, these sectors lost what was previously their most valuable feature – their egalitarian nature – that had allowed virtually free and universal access to the (modest indeed) services made possible by the very low level of economic and technological development prevailing at the time.

After recovering from an initial disruption caused by the transition to new forms of financing, basic public services infrastructure has been further expanded and strengthened. Yet, the amount of resources channeled to public services has been insufficient. The overall inadequacy of social services policies in China and Vietnam had an uneven impact in the various areas that affect nutrition, directly and indirectly.

The area of health was the most jeopardized. Since the beginning of economic reforms, public health systems almost collapsed in the countryside, along with rural communes, and deteriorated seriously even in urban areas (see Zhao 2006). By the early 2000s, China's and Vietnam's share of expenditure on public health was exceedingly low.

To a lesser extent, the introduction of fees and the increased cost of books and other education material also slowed (and, in some circumstances, reverted) the progress towards universal access to primary education in rural areas[77]. These mistakes in basic education policies (common to China and Vietnam) are likely to have negatively affected nutrition as well, albeit indirectly, weakening the virtuous impact of mothers' basic education status on their ability to provide improved care to their children, besides negatively affecting rural productivity growth.

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[75] See, among others, Ravallion 2005a,b;Perloff and Wu, 2005, 2004a,b; Chen and Ravallion 2004, 2001; Gustafsson and Shi,2002; Jalan. and Ravallion, 2001; Masina (ed.) 2002;; Swinkels and Turk 2003; Trin Duy Luam, 2003; Xuan Nam P., 2002; Brandt L. and Benjamin D., 2002. Chen and Ravallion 2004 is a particularly illuminating contribution on the key issue of evaluating the poverty-inequality trade off in China. The authors show that Chinese provinces with a lower initial level of rural inequality achieved the best record in poverty reduction, due both to faster growth and higher growth elasticity of poverty reduction.

[76] Of course, the two negative social phenomena are mutually reinforcing. Taking into account the disproportionate weight of health and nutrition disbursements in the poor's expenditure, and the dramatic impact on their well-being of the inability to cover them adequately, the underdevelopment of social services strongly aggravates the human suffering caused by income inequality.

[77] WB 2005 figures reported in Figure 1.8. appear to show a decrease in female primary education completion rate in China.

On the bright side, China and Vietnam kept increasing the provision of basic infrastructural services affecting nutrition and health status (such as sanitation services and – less so – provision of drinkable water), and expanding immunization and specifically nutritional programs.[78] Finally, there is another factor – difficult to quantify – that induces to expect social services to perform better in China and Vietnam than in most other countries at similar levels of economic development. In both countries, the construction of the socialist state has implied a sustained build–up of collective human, institutional and organizational capital, and the extension of basic state and public structures to the most remote areas at village and communal levels. Therefore, it is logical to assume the overall "cost effectiveness" of social services in China and Vietnam to be rather high.

8. Conclusions

Each country's overall level of economic development constrains the amount of resources potentially available for combating hunger and destitution. Inequalities in income distribution further restrict income-based access to marketed food supplies on the part of the poor. Markets, along with appropriate infrastructural, sectoral, and trade policies, can contribute to fostering food production and, more broadly, economic growth. Yet, they are of little help in other areas of crucial importance in determining children's nutrition and health (which are measured ex post by malnutrition and mortality rates). Conversely, public policies affect non income-based access to and utilization of food on the part of households, as well as non-nutritional factors affecting child mortality.. Other cultural and environmental factors also play a role. The role of public intervention is paramount in influencing income distribution, non-income access to food, access to health and other basic services, and even - in the long run - gender relations and cultural habits.

We carried out a cross-country analysis utilizing a homogeneous database extracted from the World Bank World Development Indicators 2006. Our main findings are as follows. When child malnutrition and mortality indicators are regressed only on GDP per capita indicators, the results show a strong but very non-linear causal relation. Such non-linearity suggests not only that the impact of economic development on human development decreases at higher levels of GDP per capita, but also that this impact manifests itself also indirectly, via the action of other factors which are in turn associated to each country's level of income per capita. Inequalities in income distribution are also a very important determinant of household's market-based access to food and basic services.

Our results also show that child mortality is caused chiefly by two classes of economic and social factors. The first one is constituted by (personal) income-based factors affecting households' ability to purchase food and basic services on the market, which depend essentially on the level and distribution of purchasing power. They are synthetically represented by two indicators, GDP per capita and the Gini coefficient. Both of them were showed to be significant both in static terms (as determinants of the present level of child mortality in each developing country) and in dynamic terms (as determinants of the evolution

[78] Immunization is a basic preventive action directly affects children's health status, and can therefore be considered also a nutrition service. On targeted nutrition programs in China and Vietnam see Zhai et al. 2002; World Bank 2006;; Dickey et al 2002;,Dung et al 2003; Pachon et al 2002; Schuftan C. and Le Dinh Cong 2001; Sripaipan et al 2002; Tuan et al 2003.

of the dependent variables since 1990). The impact of income inequality on child mortality reduction, however, was relevant only for countries with a Gini coefficient in the mid-30s or higher. The second class is constituted by non–income factors related to the availability of and access to basic health, sanitary, and education services, and to women's relative status. All of them are amenable to state intervention, albeit to very different extents and with different time lags, and implying different degrees of freedom on the part of national governments. In a medium–term time horizon, governments can be assumed to enjoy a relatively ample degree of policy discretion to earmark higher shares of GDP to public health expenditure, immunization services and water and sanitation facilities. In the long run, governments can also promote primary education for girls and implement policy initiatives aimed at improving the status of women.

As the degree of public provision of basic services is positively correlated with per capita GDP, we regressed series of indicators for five of them on GDP per capita, and took the residuals as our main explanatory variables for policy-related non-income factors affecting human development. These variables, in fact, can be interpreted as each country's propensity to spend on basic services. The results showed that child health is strongly affected by the availability of basic services. The state's propensity to spend on public health in general and to provide sanitation facilities and birth attendance services are the most significant non-income determinants of child malnutrition, while the propensity to spend on clean water provision and women's education are more relevant in the case of child mortality. Women's status is also a significant determinant of child mortality, while democracy is not. Other results showed that the impact of both GDP per capita and services is higher in the case of child mortality than in that of child malnutrition, and that region-specific factors contribute to aggravate child mortality in Sub-Saharan Africa and child malnutrition in South Asia..

Models in growth rates showed that economic growth was a major force driving human development in the 1990-2004 period, and that region-specific factors worked against progress in improving child health in Sub-Saharan Africa. However, the best results in terms of reduction in child mortality were achieved by countries with moderately high rates of economic growth, while countries with particularly high growth rates did not obtain exceptionally good results. This finding suggests that a trade off might arise between economic and social goals in countries that push growth too far.

Summarizing the results, we argue that our analysis demonstrates the relevance of non–income factors, and of governments' propensities to invest in basic services in particular, as important (static and dynamic) determinants of child mortality. It also shows that public health expenditure becomes key beyond a certain threshold of income. The latest findings show that non–income factors, and especially public expenditure on health and other key basic services, become even more crucial determinants of child nutrition and mortality in countries which have already achieved an intermediate level of economic development.

China's and Vietnam's performance in reducing child mortality is examined in Section II in a comparative perspective. Their overall results so far are good, yet less so than what could have been achieved with an optimum policy mix. Thanks to the structural characteristics of their market socialist economies, China's and Vietnam embarked on an exceptionally rapid path of economic growth. Income distribution deteriorated steadily, but as it started from a very egalitarian level the impact of growth on the incomes of the people was broad–based, albeit progressively less so. As a result, absolute poverty shrank dramatically and both China and Vietnam made enormous steps forward in improving people's access to food, and

therefore in combating income- and food-based factors affecting child malnutrition and mortality. However, as China's income distribution has worsened so far much more than in Vietnam, the negative impact of income inequalities on child mortality reduction was much worse in China.

China's and Vietnam's performance in terms of tackling non-income factors was more mixed. Immunization and sanitary infrastructure expanded – a progress made possible by economic growth, but also by the maintenance of a satisfactory degree of priority for these types of social expenditure. Non (econometrically) quantifiable,scattered evidence on the expansion and effectiveness of targeted nutrition and sanitary programs is also positive, suggesting that virtuous policy and institutional forces (partly identifiable with legacies from the pre–reform period) are still at work in China and Vietnam, helping the overall progress in combating child malnutrition and mortality. Conversely, China's and Vietnam's performance was very bad (at least, until very recently) in the area of public health policies.

In sum, China and Vietnam experienced an extraordinary economic development, yet a relative underdevelopment in the social area (due to the deterioration of income distribution and the inadequate provision of basic public social services). In a way, they throw out the baby with the dirty water. These contradictory trends were reflected in their path of progress towards reducing child mortality. Vietnam's performance was very good, in spite of having still relatively high rates of undernourishment. China fared very well in reducing undernourishment, less so in decreasing child mortality, in spite of its exceptional rate of economic growth - notwithstanding the emergence of an encouraging, improving trend in the early 2000s. This divergence is to be attributed mainly to two factors. First, the perverse social effects of ill-conceived market-oriented reforms have gone much further in China than in Vietnam. Second, gender discrimination is a serious problem in rural China, but not (yet) in rural Vietnam, although Vietnam too is at risk of following China's path in the future also in this domain.

Taking also into account the size of their populations and the severe political and military challenges they had to face during their post-revolutionary history, it would be foolish not to acknowledge that the scale of the progress already realized in China and Vietnam in combating hunger and deprivation is historically unprecedented. Yet – as our analysis has showed – the level already achieved by the Gini coefficient, the continuing trend towards a further deterioration of income distribution, and the under-funding of public health (an area of increasing centrality for countries at an intermediate level of development) are persistent and increasingly worrying negative factors[79]. If unchallenged, they would inevitably imply that future economic growth will deliver progressively diminishing returns in terms of reducing child malnutrition and mortality, and more broadly to foster human development . The urgency of fighting social underdevelopment is strengthened by the mounting evidence on the multiple virtuous synergies linking nutrition, health, and economic growth, showing that trade–offs between social and economic development are much smaller than what could be assumed still 10–15 years ago[80]. To tackle the severe contradictions of their presently-existing market socialist systems, both China and Vietnam require profound policy changes aimed at combating inequalities and prioritizing public social expenditure.

[79] See Zhao 2006.

[80] In China, taking into account the structural imbalances leading to an excessive accumulation of foreign exchange reserves, there are also strong macroeconomic reasons militating in favour of shifting resources from savings to social services (see Blanchard and Giavazzi 2005).

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Chapter 6

ADHERING TO THE PRINCIPLES OF KNOWLEDGE: THE ONLY GAME IN TOWN

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Abstract

The chapter deals with knowledge solely as an economic resource and a commodity, it deals with knowledge of the material and that part that can be used for economic progress, that part of knowledge that is a commodity, and the beginning of the chapter very clearly defines this concept. This chapter deals with key components of the knowledge theory in regards to more specifically the need of understanding for the less developed countries. The paper begins with why in terms of knowledge economics that developed countries are said to be behind, this leads to the discussion of the concept of time. Time is analyzed both as an independent variable as well as a dependent variable. Having analyzed the variable time, we need definitive prove of why less developed countries have less knowledge, this is done using the concept of point X and point U developed in the paper "Point X and the Economics of Knowledge.", written by the author. The paper then leads on to discuss the issue of systems potential and asks the questions why systems potential in less developed countries are lower than the more industrialized societies. Finally the paper asks and answers the question what needs to be done in terms of knowledge for less developed countries to improve themselves and contribute more effectively to humanity, this needs a look at using the knowledge that is available to the best use, maximizing knowledge and reducing the opportunity costs of decisions.

Introduction

Knowledge economics is basically still in its infancy, understanding knowledge is the key to knowledge economics. Though for centuries people have understood that 'knowledge is power', knowledge as a commodity has not been truly understood because of the manner in what knowledge was taken to be. Great economists like Hayek and Machlup attempted to discuss knowledge, but in all most manners as shall be seen in this chapter, knowledge was to

broad, hence we missed the essence of knowledge as a resource, the strictly economic aspect of knowledge versus the broad epistemological sense of knowledge.

Knowledge must be understood in a scientific manner rather than in abroad philosophical manner. To be scientific we must first try to measure knowledge, science after all is about measuring, from measuring only then can knowledge as a commodity be understood, only then the economical aspect of knowledge can then be understood.

This chapter looks at knowledge solely as a commodity and it deals with theory already developed to look at how knowledge is the best assistance for developing countries. Developing countries need to understand the theory of knowledge and this chapter purposefully slants knowledge economic theory towards aiding understanding and possibly policy towards sustainable knowledge based economies.

The reality of the developing countries is that prevalent economic theory has deliberately emphasized and rightly so more policies towards free markets, more competition in the economy and policies that seek more foreign direct investment, FDI. The stumbling block however is that one can only participate in the market if and only if they have something to offer. In most cases developing countries have resources and unprocessed agricultural goods to offer the global market, and hence their fortunes depend on demand for these commodities. The market structures of developing countries for most part have failed except for the few in the urban areas, the reason being that nothing is produced using more levels of knowledge. The market to be a success and most of all to be appreciated by less developed countries knowledge economics becomes of most benefit.

Foreign direct investment, FDI, has many drawbacks as a savior of less developed countries. It must be understood that any investment from anywhere must be appreciated by less developed countries, indeed by even the most developed of societies but FDI by its nature looks for the most returns. It prefers to go to where the returns would be highest. Preferring lowest costs of production, not every developing country is likely to have FDI, unless a country is richly endowed with natural resources, but it is unlikely a manufacture will set up a plant in areas that have labor problems or higher wages than other areas. Hence though most developing countries have entire staff and government departments dedicated to the question of FDI, it was never ever going to be a savior of most developing countries, there just is not enough money/ capital around to set up manufacturing plants in every country in the world. The capital that is available has to be competed for.

Therefore FDI, is desirable but not something to be relied upon for the simple reason as explained above there is not enough capital in the world. Capital is a key word, capital in all instances has its origins in the mind of mankind, capital is an expression of knowledge, especially that part of capital that is not liquid, the machines that aide in production, they are developed in the minds of mankind, they are developed by the key resource knowledge. This chapter will look at knowledge economics and answer basic question that might not be understood that easily without the explanation. By the end of the chapter the need for comprehensive knowledge policies in less developed countries would be understood. It would also be understood that knowledge economics does not and can never relegate replace economic theories that have been proven to be consistent with the simple facts of supply and demand.

Knowledge economics merely solidifies why the market is so important, knowledge policies it will be understood by the end of the chapter are meaningless if a society plays scant or no regard to the understanding of the market. If a society over tampers with the basic

market forces of supply and demand knowledge economics will be useless. Knowledge as such can not be legislated, however government policies can aide a society on the path of a sustainable knowledge gathering and towards a sustainable economy. A Sustainable economy is one that has more immunities to economic cycles, the business cycles are not as violent as with unsustainable economies, relying on a single commodity is basically unsustainable, relying on creativity is more sustainable because when one creation is no longer in demand, a creative culture will think of another creation.

1. Knowledge Economics

1.1. Knowledge What is it.

Knowledge has many definitions, but all the definitions follow the same thread, take the 9 definitions of knowledge as found in www.dictionary.com, these being:

1. acquaintance with facts, truths, or principles, as from study or investigation; general erudition: knowledge of many things.
2. familiarity or conversance, as with a particular subject or branch of learning: A knowledge of accounting was necessary for the job.
3. acquaintance or familiarity gained by sight, experience, or report: a knowledge of human nature.
4. the fact or state of knowing; the perception of fact or truth; clear and certain mental apprehension.
5. awareness, as of a fact or circumstance: He had knowledge of her good fortune.
6. something that is or may be known; information: He sought knowledge of her activities.
7. the body of truths or facts accumulated in the course of time.
8. the sum of what is known: Knowledge of the true situation is limited.
9. Archaic. sexual intercourse.

Though all the definitions are suitable, the first definition is just suitable, “acquaintance with facts, truths, or principles, as from study or investigation; general erudition: knowledge of many things.” How then the question arises do economists make a subject matter out of this topic, this sub section that we have called knowledge. There are two key economists who have attempted to infuse knowledge into economics. The first would be Friedrich August Hayek. Hayek wrote and published a groundbreaking paper on knowledge in 1937, the paper was entitled, “Economics and Knowledge”, importance of knowledge into economics. In this paper Hayek took knowledge as that of knowing conditions in the market, he discussed knowledge mainly as showing that there are always people who take advantage of a situation because of the knowledge that they possess that other people do not. The paper dealt with how knowledge affects the market, that there is nobody really with total knowledge, people have what can be considered specialized knowledge. Here are Hayek’s concluding remarks, “The conclusion, then, which we must draw is that the relevant knowledge which he must possess in order that equilibrium may prevail is the knowledge which he is bound to acquire in view of the position in which he originally is, and the plans which he then makes. It is

certainly not all the knowledge which, if he acquired it by accident, would be useful to him and lead to a change in his plan. We may therefore very well have a position of equilibrium only because some people have no chance of learning about facts which, if they knew them, would induce them to alter their plans. Or, in other words, it is only relative to the knowledge which a person is bound to acquire in the course of the published in Economica IV. The paper was groundbreaking in so far as attempting to introduce the attempt to carry out his original plan that an equilibrium is likely to be reached."

Clearly Hayek in the above paper and from the above conclusion, though drawing attention to the world of the power of knowledge was not analyzing knowledge as such, he was rather analyzing the power of knowledge in influencing the market, in influencing the final price as concerning the forces of supply and demand. Knowledge to Hayek was not the resource, it was something to aide analysis but itself not to be analyzed, though a pioneer in knowledge and economics, Hayek never endeavored to be a knowledge economist. To have endeavored into this branch of economics would have meant taking knowledge as a resource, as the prime resource, he took knowledge rather as knowing of events. The basic limitation of Hayek's paper was that though attempting to explain economically relevant knowledge he remained gripped in studying knowledge not as a stand alone discipline.

The next economist was more daring in his analysis of knowledge than Hayek ever was. Fritz Machlup attempted to discuss knowledge as a separate discipline in economics, the term knowledge economy is from Machlup as well as popularizing the term information society. Machlup could be daring because he studied under economists who respected the mind rather than studying of each others work as promoted by the economists of today because they fear each other and therefore try to keep each other on track. Having studied under Hayek and Ludwig von Mises, Machlup had the mind set to move the discipline of economics further without caring for the retributions of those who study each others work.

Machlup unlike Hayek wanted to measure knowledge, was looking for a system of categorizing and enumerating knowledge, a major break through for the time even though in recent times many flaws have been picked up in his works, nevertheless he remains very important in knowledge economics. It is for this reason that Machlup is known as the founder of knowledge economics or at the least must be credited as one of its main influencers. Machlup's groundbreaking works was his book "The Production and Distribution of Knowledge in the United States." Machlup identified five types of knowledge, these being:

1. Practical Knowledge
2. intellectual knowledge, that is, general culture and the satisfying of intellectual curiosity.
3. pastime knowledge, that is, knowledge satisfying non – intellectual curiosity or the desire for light entertainment and emotional stimulation.
4. spiritual or religious knowledge.
5. unwanted knowledge, accidentally acquired and aimlessly retained.

Though groundbreaking Machlup's analysis does not give un knowledge economics, knowledge economics can only deal with that part of knowledge that influences economics, that part of knowledge that is an economic resource, that part of knowledge that can be acquired and sold in the market. Clearly spiritual knowledge has nothing to do with the

market, though clearly there is a great market for spiritual advise, people paying in some instances 10% of their incomes to those who propose they have secret spiritual leadership secrets. That knowledge that is an economic resource must be considered strictly knowledge of the material, that is the only knowledge that creates goods. A spiritual good can not be defined, but a material good can be defined.

Machlup also has credit in his discussion of the exponential decay of knowledge a term that was discussed as obsolete knowledge in the original book by Bhekuzulu Khumalo, "The Fundamental theory of Knowledge."

1.2. Knowledge of the Material

The material is the non spiritual. A good definition of the material is again found in the internet dictionary, www.dictionary.com, it defines the material as "the substance or substances of which a thing is made or composed: Stone is a durable material.", still another great definition of the material for scientific purposes is "any constituent element.". Clearly the material is the building blocks of the goods that are found on the market and the services that are derived from distributing and creating these goods. Important to remember without the goods there can be no services. Merchants are derived as a way of distributing goods, without the goods there can be no merchants.

Knowledge economics therefore has its roots in the material, it has its roots in knowledge of the material. Knowledge of the material is understanding the material, it is "acquaintance with facts, truths, or principles, as from study or investigation" of "the substance or substances of which a thing is made or composed." That is all that knowledge of the material is, just combining the definition of knowledge and material.

Human beings gain knowledge of the material by studying and investigating the material. By undertaking this activity human society builds up its knowledge base. So simple is this concept yet it baffles the mind that less economically developed societies have refused to embrace this concept, this chapter seeks to help these less economically developed societies embrace knowledge as the basis of economics, as the originator of all goods, therefore of all services. This chapter will present the case for knowledge in both a most scientific manner as possible as well as easy understanding as possible why knowledge must be respected. Returning to knowledge of the material, not all materials are commodities it can be argued, not all materials are useful to mankind, therefore what materials are the uppermost in knowledge economics, for this question we must look at the question of a commodity.

1.3. What is a Commodity?

A commodity is derived from the material. The internet dictionary defines commodity as:

1. an article of trade or commerce, esp. a product as distinguished from a service.
2. something of use, advantage, or value.

Therefore a material that is useful to mankind or to a society is a commodity. This means that not all materials are commodities. This is not difficult to fathom, 200 years ago

petroleum was not a commodity, but the material still existed underneath the Arabian Desert and the Arctic ice, today it is such a valuable commodity mankind at the present can not do away with it. Petroleum was still a material when it was not a commodity. A commodity is derived from the material, a material is something that is constant and governed by the same laws for ever. Oxygen will always be oxygen, gold will always be gold, if the atomic structure changes of an element, it is no longer that element. Laws of the material are not the same as the laws of mankind, laws of the material are consistent, never change, and consistency is a key component of the investigation process in the material.

1.4. Knowledge as a Commodity

Having defined what a commodity is, or rather having taken a definition of a commodity from the dictionary it is now possible to explain what knowledge as a commodity is.

The problem of Hayek's definition of knowledge and the way Hayek took knowledge is that the sense was to broad, though he was definitely talking about knowledge. But he did not take knowledge as a resource, he took it for granted that knowledge of a commodity is known, or he could not comprehend Hayek underestimated the importance of productive knowledge.

Machlup though on the right course also underestimated knowledge as a productive force, when he famously declared in 1962 that 29% of the American labor force is involved in knowledge production. The truth as the matter is that throughout history all economies have been involved in using knowledge, goods have always been created by knowledge. From the hunter gatherers, to the farmers, all people using knowledge right up to the creation of an ipod. Goods are always 100% created by knowledge, the industrial revolution was just a burst of growth in the knowledge base.

Economies, societies in production have always been using knowledge, from weavers in medieval Europe, builders in ancient Egypt all had the basic commodity as knowledge. When Machlup declared that 29% of the American economy is involved in knowledge he showed a clear misunderstanding of knowledge the commodity, what about the farmer who grew wheat or corn, is he not using knowledge of farming. To get a great crop did the farmer not need knowledge of the crop, knowledge of how much nutrients to put into the soil to maximize his crop yield, that is all knowledge. Just as the computer programmer needs knowledge to create a computer program.

To understand knowledge as a commodity we must return to the difference between a material and a commodity. The material is what existence is made off, the physical world that is, this chapter refuses to look into or get into the debate of the spiritual, that will help nobody develop, goods are created by materials not by spiritual - ness. All existence that humans can comprehend with their five senses at best is the material. The material world can be best summed as matter. A commodity is a material that has use to mankind, it brings economic benefits to mankind, a commodity is a material that is a good.

It is what we know of the material that makes it into a commodity. A good example is petroleum, this commodity had no value until recently in human existence, but as a material, petroleum behaved the same 500 years ago, as it does today. By behaving the same it is meant had the same properties, was governed by the same laws of existence 1 000 years ago as it does today, we as humanity however did not know the properties of petroleum, we had to

investigate and increase our knowledge base. When we want to talk of knowledge economics, knowledge is that having economic benefits to mankind, knowledge that will create a good.

1.5. Knowledge Economics

Knowledge as a commodity is that part of knowledge that will create a good. For example, knowledge that crops must be planted and how to plant them is knowledge as a commodity, just as metals that can be useful to mankind are commodities and the knowledge about them is what makes them commodities, that in essence is what knowledge economics will deal about at its most basic. That part of knowledge that is involved in creating goods, know how some would like to call it.

A commodity as has been described is material that has use for mankind, therefore in reality every material has the potential of being a commodity. Therefore knowledge economics can not only deal with the creation of goods and properties of the material, knowledge economics must also deal with the properties of what is potentially a commodity, of material that is potentially useful to mankind. In essence knowledge economics must deal with all scientific research, with all known laws of the material because they all have potential benefits for mankind.

Knowledge economics like all economics deals with the production, distribution and the for whom question of knowledge, and desires to understand that process. These questions where satisfactory answered in the essay “The Fundamental theory of Knowledge” written by Bhekuzulu Khumalo in 2006, and as this chapter is dealing with the need for understanding of knowledge for less developed countries this question will not be delved into in great detail.

What is important to understand is that knowledge economics is the study and understanding of the prime resource knowledge as a commodity, it takes no care of spiritual knowledge, knowledge of emotions, knowledge of history, merely knowledge of matter and how that matter becomes a good and its properties, this is the only type of knowledge that can be measured, and this was given its unit, knowl in the book Fundamental theory of knowledge in 2004.

2. Being Less Developed

When economists talk of economically less developed countries, they essentially are talking of countries, of societies that are behind in economic development, societies that are behind in terms of time. This brings the question what is being behind in time, we must understand the concept of time as applied to economics, and knowledge economics gives the best explanation of time in an economic sense, because truly speaking the relativity of time can be seen so clearly when looking through the glass of knowledge economics.

Take figure 1, it demonstrates two societies, society 1 and society 2. Given a simple scenario and a reasonable assumption that we expect a societies knowledge base to increase over time. This is a reasonable assumption but not always true, societies disappear, fall into disrepair, take the pump for example, a tool common in the Roman era of Europe. However with the crumble of the Roman empire it would take more than a thousand years before the pump was rediscovered in Europe, the knowledge had disappeared. This means the

assumption about increasing knowledge base is not always true, but it is a reasonable assumption.

In figure 1 society 1 is demonstrated as the society that gathers knowledge faster than society 2, this is evidently clear from the illustration. The illustration given by figure 1 has time as the independent variable and knowledge dependent on time. At time t_1, society 1 has knowledge worth k_1 knowls, a knowl being the unit of measure for knowledge as a kilogram is a unit of measurement for weight and meters and centimeters are a measure of length. By the time t_2, society 1 has amassed k_2 amount of knowledge whilst society 2 has gained knowledge up to k_1, a position that society 1 was at time t_1.

At time t2 as illustrated in figure 1, the difference in knowledge between society 1 and society 2 is equivalent to $k_2 - k_1 = k_d$. This difference in knowledge at the first instance merely represents the difference in knowledge between the two, but in reality k_d represents not only this difference but also the difference in time. The difference between society 1 and 2 could very well be like comparing a developed society to a less economically developed society.

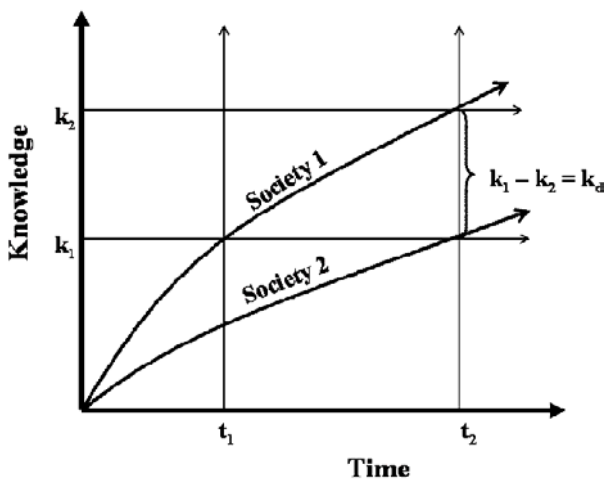

Figure 1.

The illustration of figure 1 gives us a clear comprehension that at time t1 and t2, society 2 has less knowledge, but to some this would not suggest that society 2 is behind, after all the illustration shows that both societies exist at time t1 and t2. To comprehend that society 2 is behind we need another illustration this time not with time as the independent variable and knowledge the dependent variable, we merely switch the two around. We make time the dependent variable and knowledge the independent variable.

At first this might seem a very difficult phenomenon to perceive after all to most minds time ticks away and we have no control over it. That depends, in the book "The Fundamental theory of Knowledge", a thorough discussion was into the concept of time and distance. Distance suggests motion, time is therefore associated with motion, motion suggests a force behind it, after all motion can not just occur. When looking at knowledge, time in the context of knowledge is made to move by acquiring more knowledge otherwise time would stand still in terms of knowledge economics even if we continue to get older, even if this world

continues to go around the sun and age, time would stand still in terms of knowledge economics. This concept is illustrated in figure 2.

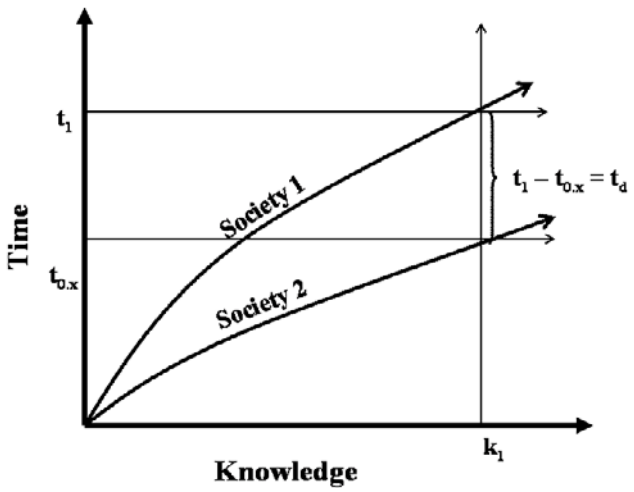

Figure 2.

Figure two depicts a situation whereby time is the dependent variable and knowledge is the dependent variable. Understanding the illustration of figure 2 is far more important than understanding figure 1 the reason being that figure 1 assumes that there is growth with time whilst figure 2 takes out that assumption. Figure 2 assumes rightly that with the growth of knowledge a dependent variable time moves on, and therefore the opposite situation must also be accepted that with the decrease of knowledge, time moves backwards. To understand figure 2 is not difficult, except one must take further considerations.

Time is the dependent variable and knowledge is the independent variable as is clearly illustrated in figure 2. As we have made time the independent variable it is not immediately clear from the diagram who is ahead. As it is unusual to make time the dependent variable we see an anomaly, at k1, society 1 as at time t1 and society 2 is at time t0.x. At k1 society 1 is ahead in terms of time. At k1 society 2 only has arrived at time t0.x, where $1 < X < 0$, though it seems that both have arrive at k1, clearly society 1 is ahead. Society 2 though has not arrived at k1, it is at 0.X of the way to K1.

Less developed societies are so because they are behind, they are society 2 in figures 1 and 2. They indeed need to close the gap, the gap in time, that gap is closed by acquiring more knowledge. The next segment of this chapter will show how far behind less developed countries really are, though they have covered most of the needed theoretical gap.

3. Point X and Point U

This section of the chapter will deal with the concepts of point X and point U as developed by the author in the paper "Point X and the Economics of Knowledge". Point X was described at its most simplest as a point of knowledge that contained one law of existence and at its largest contained all laws of existence. All laws of existence have the same value in terms of knowl, no law is greater than any other. Point U was described as use derived from that point X.

Point U essentially are the goods that we have. For example, the copper electric cables that carry power all over the world are a result of the inherent properties of copper, the point X that defines copper. Note however that copper has many uses, therefore the point X representing copper has many point U's. This is illustrated in figure 3.

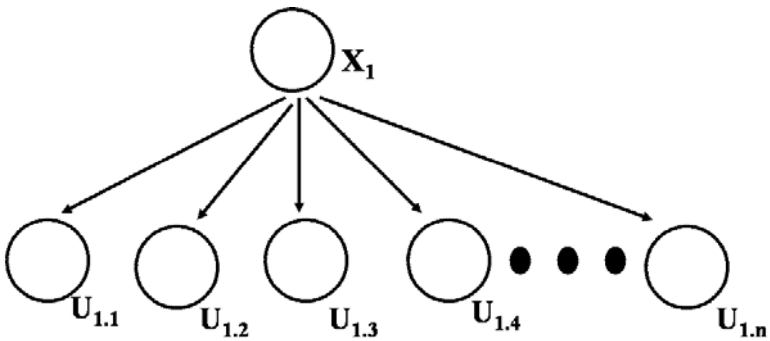

Figure 3.

Figure 3 illustrates the concept of use for a point X, in this case X1, it has n uses, each use is derived by investigation or eureka effect. Each single law has equal value in terms of knowl, note though not in terms of the market, 500 pounds of gold is worth more than 500 pounds of iron though both weigh the same, 500 pounds. Therefore in terms of knowl, each single law is the same, the figure given in the paper "Measuring a Societies Knowledge base", as 250 knowl. The reason for this is that the choice was arbitrary but as scientists we needed to leave the possibility that one day not only goods will be able to be measured in terms of knowledge, maybe one day Machlup's past time knowledge will be measurable, that possibility had to be left open, as well as Hayek's specialized knowledge which by its nature is fleeting.

To continue just as 500 pounds of gold weighs as much as 500 pounds of iron so each single law of existence equals the next law of existence at 250 knowl. However to mankind the market gives different values to each law and what is derived from that law, the latest technology going into a computer is certainly worth more than technology that makes a spoon, but they are worth the same in terms of knowl, but not in terms of the market. Think about it, without mankind, why is iron worth less than gold, there is no reason. The universe, existence itself would be fundamentally different without iron as it would be with out gold, but that is itself another discussion.

Each point U itself is equal to a point X, because each point U itself owes its creation to laws of existence and hence becomes a law unto itself. True, alloys do not exist in nature, stainless steel for example does not exist in nature, but when iron and chrome are mixed in certain proportions we get stainless steel. Though not occurring in nature, the laws of nature, the laws of existence say that when iron and chrome are mixed in such proportions because of the nature of the two metals we will arrive at stainless steel. The laws of existence say that if we take copper mix it in such proportions, take a magnet, take all the other things we will get a communications devise, a cell phone a telephone, a radio, goods are derived from our understanding of the laws of existence and each good is equal to a law, because each good is a law.

The above paragraph demonstrates something crucial and demonstrates how critically behind less developed countries are, first in terms of knowledge which is then magnified in the economy. Each good represents a law, each good is created by knowledge. Every patent demonstrates how further behind societies get. However this obvious fact seems to be lost in the world, maybe it is because of poor leadership in less developed countries, or maybe just a lack of vision.

Figure 3 gives to us an obvious policy mismanagement in less developed countries. From each point X we derive n uses. In most of the less developed countries there is good, or at the least acceptable theoretical foundation, after all most of the text books are bought and donated from the more economically developed countries. However this theoretical knowledge that is represented by point X has failed to be turned into use knowledge.

This failure to turn X into U has had and will continue to have catastrophic results on the economies of less developed countries. They have laterally concentrated on the wrong premises, or at worst have not really cared about their societies. The next section of the chapter will deal with systems potential.

3.1. Systems Potential

System potential deals with how a system that is in place in a society allows that society to exploit or not to exploit knowledge. All knowledge comes through the act of investigation or instruction. One can not know the properties of atoms unless they actively investigate atoms, the same as one can not know the property of wood without investigating it or being instructed in it qualities.

In the paper "Point X and the Economics of Knowledge", a satisfactory function was derived for knowledge. The function was:

$$Y = f(Y_{t-1}, X_1, X_2, X_3, X_4, X_5, X_6) + ka \quad (1)$$

Where:

X_1 = Economic Freedom
X_2 = Conversion rate
X_3 = Academic Freedom
X_4 = Research Private and Government
X_5 = Literacy Rate
$X_6 = f(\sum Y_{it-1} - Y_{t-1})\, C_i$
C_i = Conversion rate of $\sum Y_{it-1} - Y_{t-1}$
Ka = basic amount of knowledge needed for first human society to survive
Y_{t-1} = knowledge base of last time period
Y = Knowledge Base

The systems potential is determined by these above variables, these variables must not be confused with point X. The systems potential is what the system employed by a society will be able to achieve given time. It is worthwhile discussing each of the variables of the systems potential. Understanding knowledge now allows us to make corrections and adjustments to

the theory, but for the present it is important to discuss the variables and allow societies to understand how to maximize their knowledge.

3.1.1. $f(\sum Y_{it-1} - Y_{t-1})C_i = X_6$

X6 is the equation for what has become the discipline known as knowledge transfer. X_6 is literally knowledge transfer. Y_{it-1} is the knowledge that belongs to the entire world, therefore the expression $Y_{it-1} - Y_{t-1}$ is knowledge that belongs to all the other societies of the world except the society been analyzed, it is knowledge of the world not found in the society been evaluated. This knowledge Y_{it-1} of course is for the last time period. C_i is the conversion rate of knowledge of this knowledge that is not associated with the society being evaluated. The astute observer will basically see that X_6 applies to both humans and society as a whole. After all, it is individuals that must do the research.

Knowledge transfer can best be described as transferring knowledge to create useful goods. The Institute of Knowledge Transfer based in the UK for example has as its main aims to "The Institute has been created for those who are professionally engaged in making the transfer or exchange of knowledge more effective." however the question remains what is knowledge transfer?

Knowledge transfer in the case of variable X_6 can be simply defined as transferring knowledge that belongs outside of the society to knowledge that the society has. This is an important type of knowledge transfer for less developed countries, there can be no doubt that in less developed countries there is less knowledge in developed countries, that can not be denied, even if basic theoretical knowledge is available in universities there are far less product types manufactured and therefore creation of use knowledge is miniscule compared to developed countries. This how ever is for another topic that will be discussed in this chapter.

Knowledge transfer from outside the society comes in three main ways. We must return to the concept of point X and turning it into point U. Point X is strictly laws of existence and point U is the derived use, a good, that good can be a pencil, medicine, a television or simply a wheel. The transfer of knowledge can be strictly transferring laws of existence from outside to inside. This is the simplest transfer and probably the most common, university text books are largely the same all over the world, the text books to a large degree are originally written in more economically developed countries and transferred to less economically developed countries. This can be written in notation form as:

$\sum X_{i-1} \rightarrow X$ where

$\sum X_{i-1} = \sum X_i - X_1$ where $\sum X_i$ is summation of all laws of the existence known by every society and X1 are the laws that the society in question has available to them.

The second type of knowledge transfer is more complicated than the first because it is not as straightforward. The second form of knowledge transfer can be written in notation form as:

$$\sum X_{i-1} \rightarrow U$$

This is the use of theoretical knowledge from outside the society and turning it into a good. This is the most difficult type of transfer, to take theoretical knowledge and accept it and readily turn it into a good.

The third type of knowledge transfer is the most common and has been used by societies throughout the centuries, it is the easiest route to creating economic growth. In notation the third form of knowledge transfer can be written as:

$\sum U_{i-1} \rightarrow U$ where:

$\sum U_{i-1} = \sum U_i - U_1$ where $\sum U_i$ is the summation of all goods being created/ manufactured around the world and U1 are the goods created/ manufactured by the society in question.

The third type of knowledge transfer is the most simple, in most cases it requires what is typically known as reverse engineering. A practice made famous by the Japanese in it rapid industrialization process after the Second World War. This might be the easiest and the route most traveled but it is not as easy as it looks. To reverse engineer one must be able to do it, one needs the theoretical background, they need still to some extent have access to a point X corresponding to the good. Somebody without knowledge of a motor vehicle can never reverse engineer a motor vehicle. The process of reverse engineering itself needs people with technical capability, therefore though the easiest way to transfer knowledge, it itself needs technical know how and understanding of the product.

Knowledge transfer is done for a reason, because eventually goods, some useful product must be created from our understanding of the laws of existence. Eventually however a society or human being hopes the knowledge transfer business becomes self sustaining, By self sustaining, by sustainable knowledge growth, a task not impossible as is clearly demonstrated by countries like China, Japan, and South Korea. Many countries have tried reverse engineering but could not carry it out through and industrialize to the level of Japan and South Korea, other South Eastern Asian countries like Malaysia, Thailand, Indonesia have not industrialized as much or advanced as much economically that whilst Japan and South Korea are considered advanced, or economically developed, the same can not be said for example for Malaysia, Indonesia, or Thailand. Sustaining knowledge production is not easy, but the idea is described in notation form as example:

$$\sum U_{i-1} \rightarrow U \rightarrow X \rightarrow \uparrow U$$

The above demonstrates sustained knowledge growth. The first part of the above notation, the notation written at the and of the preceding paragraph, the first part is clearly the third type of knowledge transfer. However the use knowledge derived from the foreign use knowledge is not enough to sustain the economy, times change, competition soon makes that knowledge that created that U obsolete, the idea is to build supporting research to investigate that point U and derive new point X that will be useful to create a new improved good as represented by $\uparrow U$.

Having arrived at $\uparrow U$ this means the society is on a sustained knowledge creation policy, because knowledge must eventually pay for itself in economic terms and this is done by creating goods. It follows that $\uparrow U > U$. Continued sustainability will result in:

$\uparrow U \rightarrow X \rightarrow \uparrow U^*$ and so on where the next U is greater in terms of knowledge that goes into it than the last U. But all U's are equal in value though what goes into them is different. More knowledge goes into a modern cell phone than what went into the first phone however in terms of knowledge value they weigh the same, a difficult concept to get around, but with

thought it will be seen to be true, the parts are greater than the whole because the whole are all equal.

The lesson from discussing the variable X_6 for developing countries is that they must acquire the knowledge, but the process can not stop there, for sustainable knowledge policies after the initial good is created improvements must be made or that initial good will become obsolete in the market place. The initial aim of course is to acquire knowledge from outside, and then create sustainable knowledge policies.

Creating sustainable knowledge policies depends to a great degree on understanding the importance of the other variables in knowledge policy, in economic policy because without knowledge there is no production, even the most menial of tasks requires one to know how to do it. Therefore between the variables there will be correlation and most will have a high correlation with X_6.

For developing countries this is the most important variable, however because of the nature of X_6 it is highly correlated with the other variables no variable is not important, one after all wants to maximize knowledge production, knowledge production is not only understanding the laws, but for it to be a true commodity the laws of existence must be converted into goods.

The next variable is similar to X_6 because both deal with conversion of knowledge, that of course is variable X_2.

3.1.2. X_2, the Conversion Rate

X_2 is the conversion rate of energy created in the society, these mostly occurs in society with a sustainable knowledge policy. The first type of conversion and probably the most difficult is getting a new law of existence, this is given in notation form as:

$X \rightarrow \acute{X}$ where it would be expected that:

$\acute{X} \geq X$. Less or equal to because remember all laws of existence have equal value but a point X may contain more than one law of existence. It would be better just to say from $X \rightarrow \acute{X}$ and say where:

$\acute{X}$ was not known because in truth $\acute{X} \geq X$ or $\acute{X} \leq X$ can both be satisfactory. This however is not important, what is important is the act $X \rightarrow \acute{X}$. This type of conversion is converting known laws and using them to discover new laws. Discovering laws of existence is always important, pure theoretical research will always be important because everything eventually comes from that. The world will one day get quantum computers, but if humans had never endeavored to research pure quantum mechanics the quantum computer would never result. Again DNA research promises much in terms of medical advances and agricultural production, however without the pure genetic research in genes, into the code of life it would be very difficult to envision using genes for research. An important lesson in this for developing countries is that patients is a virtue, without patience little can be achieved, without patience pure research would be seen as a waste of time, show me the money philosophy does not work with pure research, you might find nothing there but at least the next researchers will know what not to do. Show me the money comes in once the discovery has been made, pure research is the riskiest undertaking but eventually hundreds of goods can be produced from discovering a few laws of existence because the laws will not stand alone, there are already many other laws of existence that are known.

The other conversion can be notified as:

$$X \rightarrow U$$

This is the changing of laws of existence to products, humanity now has a more clear grasp of for example of DNA, the promises in terms of medicine, agriculture are immense indeed. This type of conversion has traditionally been done by large corporations, however with the advance in competition, university research is being exploited by venture capitalists to convert their research into goods.

This trend that is occurring in the more economically developed societies should where possible be copied. The trend being that of commercializing university research. Where venture capitalists are not readily available, as would most likely be the case with most less developed societies, the government should kick in. This research need not be space age, it need not be nanotechnology, it could be just getting a better seed, a new method of extracting sewage, something that the local market will readily accept, from there the created business units could start competing internationally. Obviously the dream would be to create space age technology, but one must first walk before they run, patience, nothing comes over night except perhaps winning the lottery. Here what the universities of Scotland had to say about this, easy to understand, "The main business of higher education is to teach students and to create new knowledge through research. However, if this knowledge and learning is to be useful it has to be applied to the areas of life where it can make a difference. This is knowledge transfer.

Knowledge transfer has been at the core of university activity since their establishment – from disseminating new research findings around the world to getting graduates with skills into occupations where they can use them. There is increasing recognition that this aspect of higher education is enormously important and universities are being encouraged to do even more of this kind of activity. However, higher education has traditionally been funded for its two main 'missions' of teaching and research, and until recently there was no 'third stream' funding for knowledge transfer." Universities have to get into the game, venture capital funding must be made available even if it comes from the government.

The third type of conversion in notation form is as follows:

$U \rightarrow Ú$ where

$Ú \geq U$, because Ú will be an improvement of U. By saying $U \rightarrow Ú$ it is meant more knowledge has gone into it, naturally as it is an improvement. However it is important to note that strictly in terms of knowl, in terms of the unit of measurement of knowledge $Ú = U$. This obviously is the easiest type of conversion, the product already exists, it must just be improved upon. Once again the question of sustainable knowledge policy arises. In notation this would be as so, it actually is an improvement on the basic notation above:

$U \rightarrow X \rightarrow Ú \rightarrow X́ \rightarrow Ű$ and so on, a continuous process as the research does not stop, the desire is to constantly improve the product. Again it does not have to be something fantastic, skin products, hair products, that is still useful knowledge, still has a market.

For both conversion rates, that is to say, for both the variables X_2 and X_6, time is of the essence. Time must be kept moving, once time stands still the process is no longer sustainable. Time as discussed in section 2.0 and illustrated by figures 1 and 2. All societies

be they less developed or the most developed society can never allow time to stand still in a good scenario and in the worst scenario for time to go backwards. Believe it or not, when a society destroys its centers of knowledge transfer, the factories, the business units it truly is going back in time, a country like Zimbabwe in the early 21st century did go back in time, Cambodia under the Pol Pot where people with knowledge where shot did go back in time, and it still has not recovered. Though understanding Mao reasoning China was saved by Deng Xiaoping who understood progress, but Mao felt he had no choice but to purge the elements of the empire that had so readily sold China without seeking knowledge, obviously Mao never wanted that to happen again.

When saying time is of the essence that means focusing, knowledge is just about discipline, if one respects knowledge they will have discipline and they will research, they will seek that knowledge diligently. Knowledge is about doing, if one does not do, they will not get it. If a society ignores knowledge they can not get it, as simple as that. Less developed countries have in most part not found it to be a great endeavor to seek knowledge, it seems they had other priorities.

3.1.3. X_1, Economic Freedom

Economic freedom is a concept developed to determine how free and how not so free an economy is. There are essentially two indexes that have been developed over the years in a good and reasonable attempt to measure economic freedom. Economic freedom is far more than just the right for corporations to compete, the individual must be considered. Take Canada for example it has very restrictive economic laws against individuals, but because it has a sustainable knowledge policy, it will seem as if there is more economic freedom when in reality that can not be true. One can read the sad story of the people not allowed to compete within the media such as star ray television, therefore economic freedom is important but far from mandatory, because if it was mandatory star ray television would have been allowed to compete rather than been constantly blocked like in a dictatorship, Zimbabwe does the same as Canada within the media context though not to the same degree of severity. See, http://www.srtv.on.ca/.

However one must accept what the Fraser Institute and the Heritage Foundation have done in developing measures of economic freedom, though not perfect, but better than what was before and that was nothing. Therefore as an economist, for knowledge to truly be created easier and transferred easier economic freedom can be counted as an important variable. By 2007 the index developed by the Fraser Institute, had by far become the most accepted index and was developed along 71 other institutions from 71 different countries. The index is very comprehensive, a lot of viable variables go into the index, a testimony to the character of Milton Friedman and Michael Walker.

The index takes into consideration legal structure of a society. A country can not have a hope in hell of reaching its peak in developing sustained knowledge growth if the legal structure is in shambles, if laws change at the whims of those entrusted in ruling the countries. Many less developed societies are struggling with this basic concept. Knowledge is developed by individuals, if there is no proper legal structure to make sure that credit is given where its due, even in simple things like agriculture, (agricultural production is a result of knowledge), property rights must be guaranteed for anybody to be willing risking their time, the opportunity costs become too high without legal guarantees, maybe it would be better to seek developing that knowledge elsewhere, hence the so called brain drain in many less developed

countries. In reality there is no such thing as a brain drain, as an article I read in the 1990's in the economist said, if really there was a skills shortage in less developed countries, people will flock to those countries, because a shortage means people would be paid higher. For the systems they follow, there are probably too many educated people in less developed societies. If they really intended to stop the 'brain drain' they would follow policies that would ensure that people do not leave those societies.

Another variable going into the economic freedom index is access to sound money. Therefore sound monetary policy is a must, but then sound monetary policy must not take hold such that it itself reduces investment. It must be balanced with the need to create investment, with the need to transfer knowledge and create goods. Monetary policy should never be the overriding factor when unemployment levels are above 20% of the working population. The main aim must always be to boost economic growth, a little leeway to allow for growth in physical production should also counter the need for tight economic policy, as long as goods are available that should counter inflationary pressure, with 20% unemployment, raising interest rates is a sure way to undermine investment. Remember that inflation is as Milton Friedman said, always a money problem, too much money chasing too few goods, allowing for increased production should counter inflation because there would be more goods.

The index also takes into account regulation of credit, labor and business. This is very important, you can not regulate what you do not produce. Why have tariffs on what is not produced unless of course a society wants to protect future industry. Again having unemployment rates of over 20% and having the number of people leaving on less than US$1 a day, where is the harm in having new investment not falling under labor regulations in terms of wages, safety of course must be considered. New companies are very vulnerable. Imagine if a university has made a break through and they have the potential of commercializing some of their research. The uncertainty plus the desire for a regulated labor market will be very much a disincentive.

Less economically developed societies seem not to understand this concept, the reason it can be suspected is mostly on reliance on natural resources, well if they forever want to stay in the pit of relying on natural resources than regulation of labor markets is great, but nobody will invest except if they come for natural resources. If price of natural resources rise, no matter how bad a government is, they will always be those who will invest, and they will go when the price of natural resources fall. Possibly, it is this reliance on natural resources that have made these societies fail to see the need for economic freedom. Less regulation on government less regulation of labor.

The debate hear is open but let us look briefly at the German miracle after the Second World war. In 1948, encouraged by the philosophy of Hayek, what was then West Germany immediately got rid of most regulations, that was the beginning of the German post war miracle. Germany showed tremendous growth, but as the country grew more prosperous it kept adding new regulation for business and labor. By 1989, some Germans Unions had become so very powerful, if a company faced financial trouble it was very difficult to lay off labor, and with Unions the non connected not the laziest workers are laid of first, this was all good during the Heydays, then the Berlin wall fell and East Germany was absorbed to create the Germany we have today. People wondered how come the east part of Germany is not growing as first as the West did after the Second World War. The reason is not far away to fathom, since 1948 and with great prosperity West Germany had increasingly regulated its

economy, the West Germany of 1989 was a very different West Germany from that of the 1950's and 60's it had far more regulation so much that West German capitalists found it difficult to move factories to East Germany increasing their costs to absorb workers who were less skilled and because of the United Germany would be paid equally to people with far more skill than them, and today, there is the whiff of neo NAZI.

Less developed countries must understand, knowledge needs as little regulation as possible, but workers of course must be protected, they do need things like pensions, right to work safely, but wage guarantees must not stifle new investment. But a pension for example is not expensive, even if one earns US$1 an hour then surely 5 cents an hour towards a pension is not too much too ask, mandatory and any government that taxes somebody earning US$1 is not one with the interest of the people. The sad aspect of the behavior of most less developed countries is that the governments have failed to look at reality, they demand standards that are found in the more developed countries but the more developed countries labor has more bargaining power due to the simple fact of less unemployment and more economic activity, a good worker has room to leave a company and go to another one. This is due to economic factors, when labor is legislated bargaining power it would not have had through market forces, the best way to give labor bargaining power is to allow economic growth. To achieve sustainable knowledge process, goods must start to be manufactured, knowledge eventually needs to pay for itself, or at the least not drain the economy. The sustainable knowledge economy is that described in section 3.1.2 and 3.1.1. Sustainability is the goal, it would be easier achieved in a more free economy.

Another crucial variable that is included in the economic freedom index is the "freedom to trade internationally". Take a local industry that is protected from international competition, the owners of the business units in this industry would not have the incentive to improve their products as the government would have protected them from competition. Therefore protection not only has the traditional accepted effect of taking choice away from consumers, it also has the effect of reducing the desire to seek knowledge that will improve a product because the consumers will have no choice but to accept the shoddy goods that are kept shoddy by lack of competition. Competition will be the incentive for local industry to seek knowledge that will improve the local products.

Less developed countries need to understand why reducing barriers will in the long run increase the knowledge base of the society. If they believe they are truly equal then they would not fear competition because they know that knowledge is just a matter of investigation, competition is the incentive to look for knowledge in order to make the best possible product.

3.1.4. X_3, Academic Freedom

Academic freedom is the right to study whatever one wants. The importance of academic freedom is that if there is presence of academic freedom it also means that students are free to explore knowledge. Many people say that they believe in academic freedom yet at the same time canonize knowledge, knowledge can not be canonized, it is not the scriptures, religious people are afraid that is why they need to canonize their knowledge and say this is the word of God and God,? Spirit, some manifestation will never speak again, because of fear. Any society delving in knowledge can not fear if something is proven to be wrong then it is wrong. It is wrong for a country with over 20% unemployment to worry more about monetary policy than getting people employed, that is nonsense even if a Noble awarded economist

says so, that is academic freedom searching for the truth. Without academic freedom the search for the truth becomes more difficult, when some subjects become taboo.

In philosophical terms academic freedom demonstrates a nations respect for freedom. A nation that is bogged down by the non material will have less academic freedom, and that again is demonstrated in how they treat knowledge that is non threatening, all knowledge becomes feared. A people who have great need to control exist in fear, the result of this fear is that it stifles society, it stifles society because it takes choice away from people, like the story of the owner of star ray television in Canada, fear of competition by those who where always protected has stifled the Canadian entertainment industry stifled choice for the consumer. In extreme Muslim societies, religious dogma means that people are afraid to research because the culture of research is stifled, what if research seemingly disproves of Allah, surely if God is great he would want the advancement of knowledge, so that humans better themselves.

Academic freedom is a must in any institution of higher learning, that freedom will transpire to all forms of research, it is the culture that academic freedom represents. Take the example of the Soviet Union, a society that created tremendous amounts of knowledge, but because of the lack of basic freedoms that knowledge in most instances was never turned into goods. Believe it or not, that academic who challenges society philosophically, the one whose ideas will never create goods, that is the cornerstone of creating goods, his freedom, a philosophy department is very important, challenging the norms of society, that is what the Soviet Union misunderstood, though in scientific knowledge the Soviet Union was equal and in some aspects superior and in other aspects inferior to its opponents.

3.1.5. X_4, Research Private and Government

X_4 is the cornerstone of a sustainable knowledge society. Producing goods is important, but given the global aspect of the competitiveness of the market, a good that is not improved upon will soon be obsolete. Continuous research leads to product improvement, the only way to solve this would be ban outside good, a definite method of decreasing economic freedom and reducing the desire to search for new knowledge. Why search for new knowledge when the old ways are protected by government, this was explained above in the discussion of economic freedom.

Private research is mostly carried out by those who believe they will use the positive results of their research. Private research is carried out to a large extent by business units as they have the incentive that they will use the results to improve their existing product line. Research should be considered a cost, a full cost. It is as simple as that, though a large proportion of research will most likely not become a good, that part that becomes a good is worth the tax deductibility it is keeping society productive, without the research the goods will become obsolete and society would eventually be the loser.

As the research has been counted as a cost, the production that occurs because of that research must take place within the society, otherwise society will be bankrolling corporations, the only winner will be the corporation if it takes production elsewhere after it had included research as a cost. For a certain period of time any research that is included as a cost must be produced within the country, if business says this is unfair then they must do the research where they will produce the goods and have tax breaks there, this applies especially to less economically developed countries as they need the jobs more as they do not have the sustainable knowledge process that the more economically developed countries have. If a factory leaves USA and transfers production to China, true enough there is loss, but those

workers have more of a chance of finding work than if a factory for example closes down in Angola, Nepal or Bolivia.

The more research that is carried out the better. A key area where research takes place is universities, this research needs to be more speedily processed and turned into goods. Taking out university research into production has a great advantage in that it brings that research out of the university and into the market. Once in the market several units will be involved in its research not just the university where it originated from. In clearer terms, research will be taking place say at University of A. Maybe 15 scientists are involved in the research. Once this university patents its findings and has a venture capitalist commercialize this research it is now out in the market. Once in the market it is 'free game', if it is accepted by the market suddenly many business units will start researching that same product to try and improve upon it. The main emphasis however is that once the research has been commercialized, more people have access to research that product as is the nature of competition.

Governments around the world particularly in more economically developed countries carry out research. The agricultural department of the US government for example is expected to commit US$2.2bln in research in 2008, the department of energy has over US$7bln research budget, though preaching non government involvement the US government is one of the biggest researchers on earth. There really is nothing wrong with that, less economically developed countries should take that matter to hand.

There is a special consideration that must be taken into account when considering government research, who is it for, after all it was created by tax payers' money. Take the Agricultural Research Services of the United States Agricultural Department, it has itself made important discoveries that might never at the time been made by commercial interests, take for example the technique of freezing food, the frozen peas in the deep freeze, in 1936 this government department discovered, "Discovered that selenium is absorbed from roots and carried to the foliage where it kills aphids; the first systemic insecticide." in 1977 "Developed practice of spraying calcium chloride or calcium nitrate on unsprayed fruit to reduce blemishes." and in 1998 "First genetically engineered vaccine for shipping fever in cattle developed.". These are just some of the pioneering research of the Agricultural Research Services and they can be found on their website, http://www.ars.usda.gov/main/main.htm.

The question is the research undertaken by the government, who does it belong to. It should belong to who ever can develop it best. It would be most unfair to the citizenry if government research is only for a select few private corporations. Less developed countries need their governments to be involved in research but they need that research to be available to the citizenry in general. They need to foster more competition they are after all behind, they can not afford to choose select corporations to be the sole beneficiary of the research. Those who think they can use it should, it should be a free for all, the right of the individual, fostering more competition is really the only way they will catch up. However sensitive research that will compromise national security of course can not be made available to all, but research such as agriculture, health, energy, this has to be made available to the general product, maybe somebody who has no government connections can make better use of the research than somebody who does.

3.1.6. X_5, Literacy Rate

Knowledge is spread mostly by writing, though with computer technology advancing at the rate it is, it is possible that one will not need to be able to write and read, one will just need to talk into a computer and a computer will store it as 1's and 0's. But as of now, people need to be able to decipher the information, they need to be able to read and write.

3.2. The Systems Potential

The systems potential takes into consideration all the above variables. The systems potential can be defined as the limit of knowledge a society can achieve given the above variables. Take figure 4, this illustration shows a frictionless society that adheres totally to the laws of knowledge. Economic freedom is at its highest, academic freedom is at its peak and research is finely balanced between the economy and continued growth. Given the known laws that are known of existence figure 4 demonstrates that the knowledge gathered will have such a limit. In this case knowledge we include knowledge used for good creation and a static known laws of existence situation.

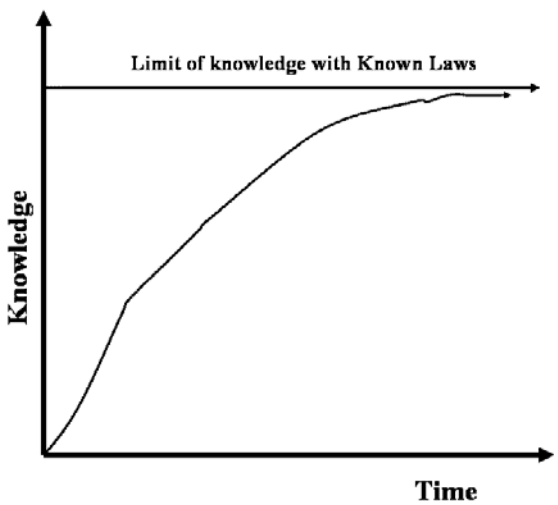

Figure 4.

Figure 4 is what a society will achieve if there is no friction to gather knowledge. However all societies have hindrances to gathering knowledge from the less economically developed to the most economically developed. The level of friction of course is highest in less developed societies. Figure 5 demonstrates what occurs because of friction.

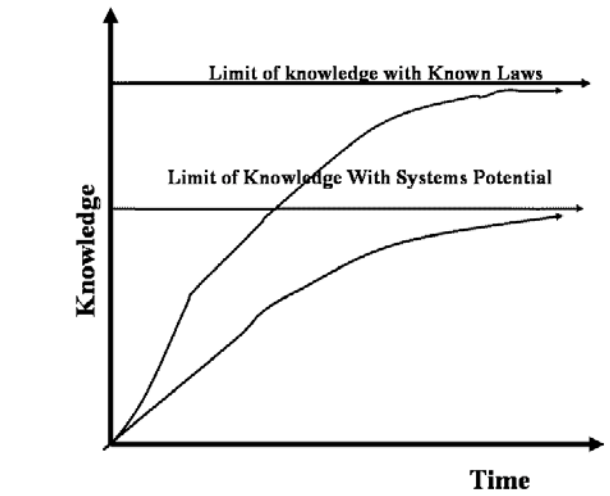

Figure 5. Continued.

As there is friction, usually caused by somebody protecting themselves from competition or from a cultural norms, or from forbidding some section of the population from pursuing knowledge, all these factors come together to create this friction and the society therefore can not achieve its full potential. The idea of course is to manipulate the variables defined in section 3.1 so as to have maximum knowledge coverage. All the variables have an effect on the systems potential and the idea is to have the systems potential as high as possible for the benefit of the citizenry. The lower the systems potential, the faster time will 'stand still'.

4. Knowledge management Tips

4.1. Crucial Past Mistakes

In many instances societies are themselves not acknowledging the importance of knowledge. Therefore 'experts' from IMF, World Bank, and all these other 'development' agencies because they have missed the importance of knowledge advocate 'good' policies that eventually miss the mark. Absolutely a society needs free markets, but in most instances less developed countries because their leaders where interested in the now, did not understand nothing is an over night fix, having a free market is a pre requisite to good economic progress but in itself a free market is nothing if there is no knowledge created.

The failure of the IMF, World Bank and other such organizations is that because they ignored the power of knowledge, or failed to comprehend it, they felt that in most instances less developed countries needed to create a situation whereby these societies would be ready to privatize state owned assets as well as foster an environment conducive for foreign investment. These are sound intentions but fraught with flaws, and by the end of the day both policies failed. These policies where the victory chant of the West over communism, but their failure was as a result of looking for a solution that would work immediately, that would produce immediate 'Asian Tiger' growth. It took China a long time before it started achieving the impressive growth rates demonstrates in the early part of the twenty first century. For

example Deng Xiaoping began his market reforms in 1982, impressive economic growth only came to the publics notice around 1997, there is no quick solution, the Chinese society first had to acquire the knowledge required for such impressive growth.

Privatization was one of the immediate post Cold war calls by the West on less developed countries. The miracle of privatization policy as touted by Margaret Thatcher was hailed as an example for developing societies, free the state of managing and let people who have the self interest to manage the economy. True enough, but the privatization policy that occurred in the less developed countries was hardly the giving to the people that Margaret Thatcher advocated, this part was neatly avoided by the global international financial community. Instead the less developed countries where neatly advised to sell their assets to foreign investors, note Margaret Thatcher privatized first to British people, it would never have succeeded in the early 1980's if she decided to sell say to American corporations. Privatization should have targeted local peoples, after all it is their tax dollars that built these state industries, they should have had first choice. As a result of what the international financial institutions like the Breton woods institutions where demanding, the whole sale selling of local public assets to foreign corporations backfired, the people said how comes we have nothing. Privatization should have been undertaken on the same premises that Margaret Thatcher undertook her great ideological shift. It should have been about giving back to the people what is theirs. Having given back to the people the people could do whatever they wanted with their assets even if it mean selling to the assets to foreign corporations, an individual has the right to sell their property to whomever.

Another bizarre twist to the World Bank privatization plans was that though the World Bank and like minded institutions came in with the discussion of free market competition, in many if not most instances they would require privatization of state assets and demand that these former state entities remain as legal monopolies, bizarre because they hid behind the talk that privatization would lead to competition but in most instances they demanded that the sold of assets face no competition. The worst of these instances is the incident in Bolivia. The IMF and the World Bank demanded that Bolivia in one of the cities should privatize its water supply; their chosen candidate was Betchel, an American corporation. In the clauses it was stipulated that people could not collect their own water even rainfall, they had to purchase the water from Betchel, such behavior is not about competition, has nothing to do with the free market, and eventually led to Bolivia falling into socialist hands, very sad indeed.

The second important victory cry of post cold war was seek Foreign direct Investment, and the Asian Tigers where touted as an example. Do not misunderstand, Foreign Direct investment should never be closed, logically speaking 100% ownership by foreign investors would be a recommended policy to follow, however, it should never be the prime goal that is recipe for a disaster. It is knowledge that should be promoted, foreign investors will follow in their own good time. The IMF and World Bank promoted this policy in order that countries free themselves up for investment from the more economically developed countries. However the problem hear is that FDI goes to the country with the lowest costs of production, what if a countries costs of production are not low enough, that is the end of FDI, selling assets and counting it as FDI is nonsense, no new jobs are created, proper FDI is when new plants are built. Having concentrated on creating local entrepreneurs, local scientist, competent engineers, and allowing these people to be, there is no point been a competent engineer if you can not practice engineering except for few government designated posts, after these forty odd years since the end of colonialism these countries should at the least be having viable

basis for knowledge creation industries. Deng Xiaoping's reforms started when Zimbabwe achieved independence, where is Zimbabwe, brought down by people who believe rock can be turned into diesel, such people need the ignorance of others for power, never can they build anything if they believe such magical powers are for their bidding.

4.2. Managing Knowledge

Managing knowledge is a simple theoretical matter but obviously in practice it is a very difficult affair otherwise less developed countries would be standing much higher in terms of economic affairs. When managing something one has the aim of getting the process to a self sustaining level whereby the government will pull out.

Managing in the context of a free market and achieving as much economic growth from knowledge is the primary target. However, first the basics must be taken care off, a firm foundation established, first and foremost the variables described above that determine the potential of the economy must be addressed, this is mostly addressed by giving the individual the right to participate in the economy. This of course does not mean an individual must be a traitor, becoming a parasite. Individuals are given rights because that is the best way for the economy to thrive.

Once economic freedom, is sorted out all other variables can be looked into, economic freedom is not and can not be managed, it is legislated into the constitution, all rights in reality are legal and cultural. Human rights and the such are philosophical arguments, one can say there are no such things as human rights, a right is guaranteed, throughout history there has been slavery, feudalism, in fact most societies operate in a system that is tantamount to Serfdom, Hayek understood well what he was saying when he warned that this slow controls will return the West to serfdom, though a more pleasant form of serfdom than that operating before 'democracy'.

Having given economic freedom, that freedom will be undermined politically if knowledge is not infused into the economy. One would be right to suspect that the failures of reforms in the economically less developed countries were a result of the failure to generate knowledge. One is therefore right to sympathize with the tactics of the Chinese communist party with their slow steady reforms, otherwise the society would suffer immeasurably, these slow but steady reforms have created a very vibrant manufacturing zone, from there they can move on to more new knowledge, remember that once upon a time manufacturing a spear, a sword, a rifle was considered amazing knowledge, genetic engineering is certainly not more knowledge than television, but it certainly is newer knowledge.

If industry is to strive, a government to support any industry must look at various factors. Targeting industry has proved to be a successful growth strategy as exemplified by South Korea and Japan. Given the current state of the world order it might be the only option left, what Japan did after World War Two was essentially to manage the knowledge process, but times change competition is now at a much higher level globally than when Japan began its miracle. Targeting now is a priority, if done properly can be very beneficial. In fact every successful country manages the knowledge production process with implicit aid from the government. Take the energy bill signed by President George Bush on August 8 2005, US$1.7 billion was put aside by the US government to develop hydrogen fuel cells. This money would go to universities and research institutions, a very worthwhile endeavor,

ensuring that American industry will be able to compete in such industries if the technology proves viable, obviously environmentalists are hoping the technology will prove viable.

In less developed countries, the need to start supporting a policy whereby knowledge becomes a good needs to start now, the truth the matter should have been promoted by organizations like the IMF, World Bank, and the United Nations, all goods are created by knowledge. Instead the United Nations ran of on a tangent and promoted bizarre nonsense on subjects like indigenous knowledge, there is no such thing, knowledge is knowledge. This idea by the UN one can suspect was to try and give back dignity to people who felt had been robbed, but that was the biggest waste of money, fuel cells, the goods in the market are not found by soothing broken spirits and telling them they had knowledge, that is not a big debate, knowledge of creating goods and services is what the UN should have undertaken, a proper scientific approach. What the UN calls indigenous knowledge, for example local herbal medicine is of benefit however it is not as beneficial if local scientists researched these traditional medicines and found why they cure, one does not need a big conference for that. It would be wise for societies to understand, knowledge is just knowledge, there is no fight about who is superior, that is another waste of resources. Man is man and that is just that. The UN program of focusing on so called indigenous knowledge at best held countries back.

When targeting an industry, first what is needed are people, are there people who can actually undertake this task. Say a government of a less developed country wants to make television screen, the first question to be asked can these screens be built. If not people must be taught to build these screens. Manpower is important, but once the process gets underway, those highly skilled minds need to improve upon the product, because once known, once the factory is set up, the factory workers need only the skills of doing a task, this for anybody who has worked in a factory can take in most instances less than a day, no matter how complicated the end product is.

Always when deciding to support industry A over industry B the opportunity costs must be analyzed. The opportunity costs are over and above financial rewards, the total opportunity costs include knowledge, how much knowledge was will be gained by supporting industry A over the opportunity costs of how much knowledge would have been gained at industry B.

By supporting industry A, those managing the economy must ask themselves what is the likely reaction of competing industries in different countries. Say a government in an economically less developed society decides it wants to have a car industry or an electronics industry manufacturing say cell phones. The reaction of the global cell phone industry must be taken into account, the major global players like Nokia, Erickson, Motorola, Samsung, Sony, how will they react to this new competitor. Not analyzing this factor could end up with wrong strategies being taken, wrong strategies could lead to wasted effort, wasted effort could use to wasting knowledge that was at hand. Plunging in can only work if a product is unique as Sony did with the walkman in the 1980's. Competitors of course do not like the addition of new entrants, that is an increase in competition, the newest entrant will face obvious obstacles, it is already fighting established brand names, for one who will try and squash the competition.

Competitors reaction includes price cuts or introduction of new products that are of superior quality immediately diffusing the competition. Will the new product be able to withstand price war, will the new product be competent enough technologically to compete with these established players especially if they starting adding updated products.

Does the society have people who can, have the knowledge to create a sustainable policy to support this new industry. By sustainability it is meant creating improvements, are the scientists and engineers capable of competing, they most likely are competent but they just need to do, one can only become competent and sustainable if they do.

There is a whole lot of new industries where there are not yet globally dominant manufacturers, solar panel manufacturing, wind generation turbine manufacturing, DNA has not yet been fully exploited, there are plenty of industries where competition is not yet too stiff and there is plenty of room for new entrants. There is no point in seeking to dominate industries that might soon be out of date, the pharmaceutical industry is another example, there is still so much we do not know about products that would use natural ingredients, we have no clue about so many plants, possibly time to take serious that 'indigenous' knowledge and create worthwhile medicines for local and international consumption, nobody is stopping the less developed countries, and nobody is going to give them the go ahead, it is up to them. Nobody will support increased competition, each country has its own self interest, supporting a knowledge policy means increased competition, it can be understood why the World Bank, UN could not support knowledge.

5. Conclusion

Knowledge economics basically desires that sustainable knowledge creation policies are achieved. Knowledge economics acknowledges that all goods come from knowledge of the material, without knowledge there is no economics, without knowledge mankind could not exist let alone have a complex array of goods available to them.

True enough all sections of economics are important, but the ultimate desire of studying economics is to see a more prosperous and a materially satisfied world, this can be achieved by understanding the importance of knowledge and allowing people to use their knowledge to survive. People who fear competition accept that their knowledge is not superior therefore they need protection. The general citizenry is never protected when others are not allowed to use their knowledge, the only people being protected are the ones getting higher incomes because of protection.

It is interesting to note that the Middle East is making great strides to participate in a future knowledge economy, Saudi Arabia building a knowledge city, Iran has an array of manufacturing industries involved in space age industries, industries that will become highly competitive once they start patenting their own inventions and are sold of into the hands of the Iranian population who will run the affairs to maximize profit, Dubai has taken great strides to transfer knowledge from more developed societies to Dubai to aide Dubai in its efforts to become a viable knowledge center. It is possible, for hose who desire so.

Less developed countries in reality have shot themselves in the foot most of the time. The evidence of the power of knowledge is around, it is everywhere, yet people with skills leave those societies because they are not allowed to use their skills, then organizations like the UN talk about a 'brain drain', there never was a brain drain, there was too much 'brain' for the systems that are being employed. China is witnessing massive number of Chinese returning from such countries as Canada, because with economic growth, they do not have to remain in Canada where it is difficult for them to be accepted always seen as a threat. Yet these same

people if treated without suspicion would have made Canada even more prosperous but human nature forces them to go to China.

Africa, South America, and the Asian States like Burma, can all follow the undertaking of knowledge and make it a priority. In reality no matter what economic system is followed as long as the variables laid out in section 3.1 are treated with the respect they deserve and that the laws of knowledge are clearly understood, an economy can do well. As South Korea has proved it is not genetics, it is the system that one follows, if it was just a matter of genetics as some like to claim, then North Korea would be doing as well as South Korea, but we see starvation in North Korea and prosperity in South Korea, it is a matter of adhering to the principles of sound economics, adhering to the principles of knowledge economics.

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Chapter 7

ECONOMIC DEVELOPMENT EXPERIENCES AND DEVELOPING COUNTRIES

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Abstract

The purpose of this study is to examine development experiences and to revise the growth paradigm from the beginning of the nineteenth century. The characteristics of the economic development vary with respect to time and factors which determine the growth process from one country to another. There is not one growth and/or development recipe. Phsical and human capital, technological innovations and the structure of the population were common pillars for growth. Although, the importance of these factors, they are not enough to reveal the development process. Specialization, income distribution, the role of the goverment, foreign capital, borrowing ability, external trade and dependency, regional characteristics, political stability and/or instability, education and genetical factors are also have serious effects on the development process. In this study, we propose that all these factors must be investigated altogether.

Studies in the framework of Beta-convergence, conditionally beta-convergence and sigma convergence shows the differences in income levels among the developed countries decreased, but between the developed countries and developing countries increased. There was an absolute poverty trap, for example Zambia, Mozambic, Chad and Afghanistan became relatively poor in the twentieth century than before.

In this study, beside these points OECD countries, European Union, transition economies, Asian countries, Afrique countries and Middle-east countries will be analysed. We hope to find answers of some questions, such as why Turkey, Brazil, Mexico and Argentina left behind in the development proccess, why former SSCB countries failed in transition countries.Why as an owner of petroleum Iran and Irak were lag behind in the Middle-east countries. Why there was a poverty trap among Afrique countries. the ownership of natural resources can explain the highness of Per Capita Income in Saudi Arabie, Quatar, Kuveyt, United Arab Emirates, but can not explain the lowness of Per Capita Income of Iran, Iraq, Azerbajcan and North African Countries. The USA and Mexico are the examples of contradictions. Having human capital is important for development, but it is not adequate to

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reveal the whole process. A % 100 education level of SSCB is not enough to increase growth performance. While transition countries in Europe has faster growth rates than Russia. Why the growth rates differ regionally, and it was unequal. Could growth theories explain these differences. For examining these questions, Panel unit and panel cointegration methods will be used.

Introduction

According to Classical theory, the role of population growth and the relationship between population and land is important in the economy. Malthusian population theory and Ricardoian rent are effective in the long run stagnation argument. In Marxist theory capital, in Veblen and institualist school traditions, institutions, structure of production and consumption get importance (For similar views see, Pasinetti, 1994:353-355: Bulutay: 2004: 1-40). It must be specified that development is a result of accumulation of human and capital, technological advancements. For achieving this some of the conditions must come together. Since the conditions are changeable, there is no any recipe for development. The experience of one country is not like the other one. The success of one country's experience can not be recipe for the others. An economic, political, demografic, ethnic, cultural, geofigureical, sociological and genetical and etc. many factors influence the achievement of development policies. In historical and development literature, foreign capital, technology, human capital, industrialisation, natural resources, political stability have been examined in the framework of economic growth.

In the nineteenth century there was a considerable effect of industrial revolution on the economic growth. The effects of industrial revolution was not only confine with technological advancements but it also had influence on demografic changes and living standarts. The countries which adapted their social and economic structures in line with these changes diverged rapidly from the other countries. After the World War II, second enormous break off was observed. Regionally, in per capita real income and growth rates of per capita real income showed two facts. First, in developed countries per capita real income converged while in developing countries it was hard to talk about this. Among the devoloping countries we may talk about on some of the far east counries that came closer to the developed counries. The characteristics of this convergence depends on the performance differences in Asian countries. For example, East Asian countries such as Japan caught the developed countries, but Russia stayed behind. India and China are rapid growing economies lately. In this framework developing countries grew fast, but between the periods there is a divergence among them. Between 1970 and 1990, even 1970 and 2000 Korea was the fastest growing economy. While Korea and East Asian countries were the fastest growing countries in this period, China and India now. Regionally, Asia has the fastest growth rates but, sub-sahara Africa had the least.

These examples can be counted in the process of economic development, but it is seen that fort he conditions and characteristics of every country there must be a unique recipe.

A. The Stages of Economic Growth

There are regional inequilities in economic growth. Figure 1 shows the unequal growth regionally from the first century to the twenty first century. In the first century, all regions had

418 $ average per capita income (Maddison scale). In Africa, it was 430 $, in Asia 449$ and in 29 Western European countries 450$. In the year 1000, average per capita income was 411$ and Asia with 449$, Africa with 429$ was above the avarege. In 1500, Total Western Offshoots with 400$ Per Capita income is lower than Africa with 414$. After the First Industrial Revolution, the disparity between Total Western Offshoots and Total Western Europe became larger, the growth rates of the rest of the world were lower than the Western European countries.

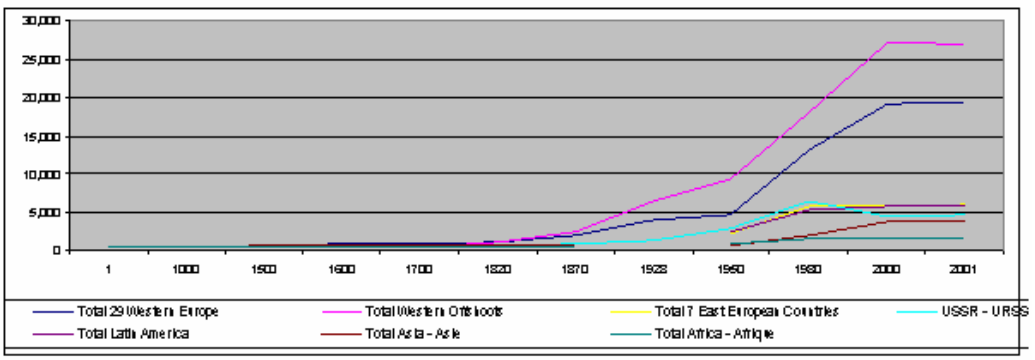


Figure 1. The Performance of Regional Growth.

In the year 2001, Total 29 Western Europe countries and Total Western Offshoots had 0,71469 of the world income, Total 7 East European Countries had 0,22, USSR 0,17. Total Latin America 0,22, Total Asia 0,14 but, Total Africa has 0,05526. Total Western Offshoots was the fastest growing part of the world, Africa was the failing region. What are the reasons behind the divergencies among the regions? Why did Western Europe grow rapidly and Africa fail? The answer of this question will be investigated along the study.

Industrial revolution had a considerable impact on economic growth process. An Industrial revolution was not only limited with technological advancements, it also affected the demoFigureic structures and living conditions of the countries. An adaptation of countries to the new conditions rapidly, brought about divergence of these economies from the others. In 1870, with the effects of industrial revolution Per Capita income in England increased.

In Figure 2, the convergence of the per capita income will be investigated. Some interesting examples shows the convergence of the countries. Austria's per capita income was 58% of England's per capita income in 1870, it was higher than than England's income in 1980. Norwegian per capita income was 44% of England's income in 1870, it went up to 116% of it, in 1980. While the OECD countries balanced their per capita income levels to the England, the rest of the world had problems in this. In Asian countries Japan, Hong-Kong, Singapure had quarter of the per capita income in 1870, but they have a higher income level than the England now. Argentina, Brazil, Chili, Colombia, Mexico, Peru, Uruguay, Venezuela(T8LAC) had a quarter of the income level of England rise to 3 to one income level. Turkey has the similar conditions. Seven East European countries(Albania, Bulgaria, Republic of Checzk, Hungary, Poland, Romania, Yugoslavia) had 28% Englands Income level, keeps the same percentage in 2001. Some of the countries became worse. In 1870, England had 6.3 times more income than Burma, the difference went up to 14.28 times in 2001. Nepal's income was worsening from 8.03 to 19.58 times. Africa had the worst

backwardness between 1940-1945, but Africa became worse in time. The biggest decline is seen in Zaire with 99 to Togo with 35, Tanzanya with 37.

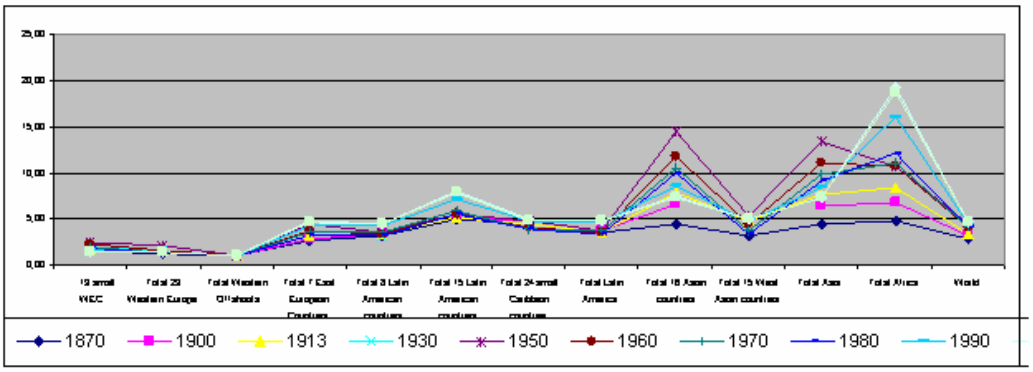


Figure 2. A Comparision of Per Capita Income levels of the Regions to USA (USA Per Capita/ Per Capita Income levels of the Regions)

In Figure 2, it was showed a comparision of per capita income levels of the regions to USA. It was calculated to USA Per Capita/ Per Capita Income levels of the Regions.

Table 1. Population Percentages Below Poverty Level and Poverty Deficit in Some Countries

Country	Research Year	Below 1 $ Daily Income Level % of Population	Poverty Deficit (taken 1$)	Below 2 $ Daily Income Level % of Population	Poverty Deficit (taken 2$)
Albanic Algeria Angola Argentina Armenia	1995	<2	<0.5	15.1	3.6
Bangladesh	1996	29.1	5.9	77.8	31.8
Belarus	1998	<2	<2	<2	0.1
Brazil	1997	5.1	1.3	17.4	6.3
Indonesia	1999	15.2	2.5	66.1	22.6
Chile	1994	4.2	0.7	20.3	5.9
Jordan	1998	18.5	4.2	53.7	21
Chine	1997	<2	<0.5	7.4	1.4
Ekvador	1995	20.2	5.8	52.3	21.2
Egypt		3.1	0.3	52.7	11.4
Ethiopia		31.3	8.0	76.4	32.9
Niger	1997	70.2	34.9	90.8	59.0
Russian Fed.	1998	7.1	1.4	25.1	8.7
Turkey	1994	2.4	0.5	18.0	5.0

Source: World Bank:2000/2001; 280-282

a. Convergence Theories

Table 1 shows that second globalisation period increased poverty for Africa. According to World Bank, there are 267.1 million people in East Asia and Pasific countries, 17.6 million people in East Europe and Central Asian counries, 60.7 million people in Latin America and Karaip iselands, 6 million people in the Middle East and North Africa, 521.8 million people in South Asia, 301.6 million people in Africa below sahara living with less than 1 $ a day.

According to convergence theory, the late 19th century had an impressive convergence in living standards, at least within most of the OECD club. Poor countries around the European periphery tended to grow faster than the rich industrial leaders at the European core, and often even faster than the richer countries overseas in the New World. This club excluded most of Third World and eastern Europe, and even around this limited periphery there were some who failed to catch up. (J. G. Williamson; 1998, p.1) As Pritchett (1997) point out that the proportional gap in per-capita GDP between the richest and poorest countries grew more than five-fold from 1870 to 1990, and according to the data in Maddison (2001) the proportional gap between the richest group of countries and the poorest grew from 3 in 1820 to 19 in 1998. The "great divergence" between rich and poor countries continued through the end of the twentieth century. The proportional gap in per-capita GDP between Mayer-Foulkes's (2002) richest and poorest convergence groups grew by a factor of 2.6 between 1960 and 1995, and the proportional gap between Maddison's richest and poorest groups grew by a factor of 1.75 between 1950 and 1998. (Aghion P., Howitt P. and Foulkes D.M:2004;1)

The convergence would appear to have been driven by a significant reduction. The σ convergence seemed to have received little further impetus in the late 19th and early 20th centuries. Epstein, Howlett and Schulze, (2003) argue that the timing and incidence of convergence processes over the last 120 or so years is not straightforward. In Broadberry (1996), this evidence is consistent with local rather than global convergence and that the convergence process has not been smooth and continuous.

We will approach the convergence theories from different point of view, beta-convergence, conditional beta-convergence and sigma convergence, OECD club. We named it, developed club.

i. Developed Club

In this paper, we propose the concept of 'Developed Club' instead of OECD club. In Table 2, with respect to the USA's income level, convergence of the countries is calculated. Countries are classified in three groups. The countries who had the income level of USA's between 1 and 0.7 (really 0.7 -0.87), second between 0.69 and 0.5, third, below 0.5. First group is between 1 and 0.7 called developed club, there is a convergence in this group. Between 1830 and 2003 there is a convergence among 16 countries. Hong Kong and Singapore joined in this club in the final period, Japan has been in developed club last two periods. With declining performances New Zeland, Germany and Italy came to a part of a second group, while South Korea and Taiwan with their economic success. There is also a convergence in the second group countries. Shortly, in 1870s developed club in 2002 had new members Hong Kong, Singapore Australia and Japan while Germany, Italy, Portugal ve Spain have been excluded. For the countries below 0.25 income level of the USA's, suddenly are impossible to move upward to developed club, they have to climb step by step.

Table 2. Developed Club

	X	Y	Z	Q	W
Austria	0,97	0,70	0,39	0,74	0,71
Belgium	1,05	0,91	0,57	0,78	0,74
Denmark	1,01	0,74	0,73	0,82	0,82
Finland	0,62	0,41	0,44	0,70	0,72
France	0,90	0,70	0,55	0,81	0,74
Australia	0,41	0,98	0,78	0,78	0,77
Japan	0,53	0,29	0,20	0,72	0,75
Netherlands	1,46	0,84	0,63	0,79	0,77
Norway	0,88	0,47	0,57	0,81	0,87
Sweden	0,95	0,63	0,70	0,80	0,72
Switzerland	0,87	0,94	0,95	1,01	0,78
UKingdom	1,36	1,10	0,73	0,70	0,70
Ireland	0,70		0,36	0,46	0,78
Hong Kong	0,49		0,23	0,57	0,76
Singapore	0,49		0,23	0,49	0,79
Canada	0,72	0,71	0,76	0,87	0,79
Between 0.69 and 0,5 income level countries					
Germany	0,86	0,73	0,41	0,76	0,66
Italy	0,89	0,44	0,37	0,71	0,67
New Zealand	0,32	1,05	0,88	0,66	0,57
South Korea	0,48		0,08	0,22	0,51
Taiwan	0,40		0,10	0,32	0,59
Portugal	0,73	0,32	0,22	0,43	0,50
Spain	0,80	0,44	0,23	0,50	0,54
Below 0.50 income leve l countries					
Greece	0,51	0,33	0,20	0,48	0,43
Hungary		0,41	0,26	0,34	0,25
Poland		0,38	0,26	0,31	0,26
Malaysia	0,48		0,16	0,20	0,28
Thailand	0,51		0,09	0,14	0,23
Brazil	0,51	0,17	0,17	0,28	0,20
Syria	0,52		0,25	0,35	0,27
Turkey	0,51		0,17	0,22	0,25

Table 2. Continued

	X	Y	Z	Q	W
Below 0.25 income level countries					
South Africa	0,33		0,27	0,24	0,15
Tunisia	0,34		0,12	0,16	0,16
Romania		0,35	0,12	0,22	0,11
China	0,48	0,13	0,05	0,06	0,12
Indonesia	0,49	0,18	0,09	0,10	0,11
Sri Lanka	0,39	0,32	0,13	0,10	0,13
Iran	0,47		0,18	0,21	0,17
Jordan	0,47		0,17	0,24	0,14
Lebanon	0,52		0,25	0,19	0,12
USSR	0,55	0,30	0,30	0,35	0,15
Algeria	0,34		0,14	0,17	0,10
Egypt	0,38		0,10	0,11	0,10
India	0,42	0,15	0,06	0,05	0,07
Burma	0,40		0,04	0,04	0,05
Philippines	0,56		0,11	0,13	0,08
Nepal	0,32		0,05	0,03	0,04
Vietnam	0,42		0,07	0,04	0,06
Iraq	0,47		0,14	0,34	0,04
Morocco	0,34		0,15	0,12	0,09

Regionally, following the 1950, the performance of the countries with per capita real income and growth of the per capita real income put forward two basic phonemenon. In developed club, there is a convergence in per capita real income, but it is hard to say this for the developing countries. Some of the Far East countries converged to the developed countries. After the World War II, the performance of the countries differs. Japan caught the developed Club level, Russia left behind. Lately, India and China is growing rapidly. In this context the developing world grows fast, but there are differences among the countries. For example, Korea is the fastest growing country between 1970 and 1990 and even between 1970 and 2000. From 1990 to 2000 sub-period, the fastest growing country is Ireland.

In the framework of beta-convergence, conditonally beta-convergence and sigma convergence and with respect to developed club approach after the World War II, divergence is expanding between developed and undeveloped countries. Some of the countries are in poverty trap, such as Zambia, Mozambic, Cad, Afghanistan, Morocco, Nepal, Iraq, India, North Korea. These are the most poorest countries.

The size of the Developed Club is varying, but the rest of the world is worsening. What are the reasons of this divergency? There are several important answers of the theories relating growth and convergence. The literature on poverty traps and convergence or divergence of economies with credit market imperfections, in particularly, Banerjee and Newman (1993), Galor and Zeira (1993), Aghion and Bolton (1997) and Piketty (1997) relate with that all agents that face the same production technology and poverty traps are either non-

convexities in production or monitoring, or pecuniary externalities working through factor prices. However, there is no technical progress and therefore no positive long-run growth in these models. A second strand analyzes the effects of financial constraints and/or financial intermediation on long-term growth. Greenwood and Jovanovic (1990), Levine (1991), Bencivenga and Smith (1991, 1993), Saint-Paul (1992), Sussman (1993), Harrison, Sussman and Zeira (1999) and Kahn (2001) analyze the effects of financial intermediation on growth in an AK-style model with no distinction being made between investing in technology and investing in physical or human capital accumulation. King and Levine (1993), de la Fuente and Marin (1996), Galetovic (1996), Blackburn and Hung (1998) and Morales (2003) consider the relationship between finance and growth in the context of innovation-based growth models. (Aghion, Howitt and Foulkes; 2004: p.2-5)

b. Volatility

The second criteria of explaining divergencies is volatility. The growth rates of the economies fluctuate in time. The interesting point comes out of the investigation of the growth data of last 58 years. The charestic phonemennon is that there is a negatively relation with average growth and variance. Time series and cross section analysis show that if volatility increases, average growth will decline. Argentina, Brazil, Mexico and Turkey are good examples for this.

The asimetric growth rates and high volatility brought about divergence of these countries. Developed and developing countries are seen below in Table 3. Table 3 and 4 shows the volatility of countries between 1970 and 2002.

Table 3. The Volatility Between 1950 and 1969

Mongolia	0,04
West Bank and Gaza	0,05
Laos	0,09
Bahrain	0,26
Japan	0,28
France	0,32
Italy	0,33
World Average	0,34
Puerto Rico	0,34
Congo	0,36
Taiwan	0,40
Albania	0,41
Saudi Arabia	0,43
Total Asia	0,45
Germany	0,47
South Africa	0,48
Sweden	0,48
Portugal	0,49
Greece	0,50
Norway	0,50
Romania	0,51

Cameroon	0,53
Austria	0,53
Belgium	0,60
Spain	0,68
Finland	0,69
Jamaica	0,69
United Kingdom	0,69
Gabon	0,71
Poland	0,72
Switzerland	0,74
Netherlands	0,74
Hong Kong	0,74
Panama	0,74
Mexico	0,74
Total Africa	0,75
Ireland	0,76
Australia	0,77
Philippines	0,78
Colombia	0,78

Table 3. Continued

Czechoslovakia	0,79
Guinea Bissau	0,80
Reunion	0,82
Brazil	0,83
Denmark	0,84
Burkina Faso	0,88
Sierra Leone	0,88
Libya	0,89
Thailand	0,90
Hungary	0,91
Botswana	0,91
Bulgaria	0,92
Israel	0,93
Canada	0,94
Trinidad and Tobago	0,95
Total Western Offshoots	1,04
Total Former USSR	1,05
Equatorial Guinea	1,06
Iran	1,06
Total 3 Small African countries	1,11
United States	1,11
Togo	1,11
Turkey	1,16
Guatemala	1,17
Costa Rica	1,18
Yugoslavia	1,19
Guinea	1,21
Eritrea and Ethiopia	1,22
Ecuador	1,22
Peru	1,23
El Salvador	1,31
Swaziland	1,31
Mali	1,33
Madagascar	1,36
United Arab Emirates	1,36
Cape Verde	1,38
Lesotho	1,39
South Korea	1,39
Singapore	1,42
Mozambique	1,43
Nepal	1,43
Comoro Islands	1,46
Egypt	1,47

Nicaragua	1,52
Côte d'Ivoire	1,54
Zimbabwe	1,54
Pakistan	1,55
Angola	1,57
Mauritania	1,66
India	1,71
São Tomé and Principe	1,78
Iraq	1,84
Oman	1,87
Venezuela	1,94
Namibia	1,96
Niger	2,00
Liberia	2,02
Chile	2,05
Burma	2,09
China	2,17
Tunisia	2,18
Argentina	2,21
Malaysia	2,24
Malawi	2,27
Indonesia	2,31
Seychelles	2,33
Yemen	2,43
Djibouti	2,44
Sri Lanka	2,44
Zambia	2,47
Tanzania	2,49
Paraguay	2,57
Dominican Republic	2,68
Gambia	2,74
Central African Republic	2,81
Uganda	2,90
New Zealand	3,02
Cambodia	3,02
Burundi	3,02
Algeria	3,11
Afghanistan	3,20
Honduras	3,25
Kenya	3,28
Nigeria	3,40
Morocco	3,41
Zaire	3,61

Table 3. Continued

Rwanda	3,78
Ghana	3,86
Senegal	4,06
Jordan	4,23
Syria	4,24
Bangladesh	4,78
Bolivia	5,96
Mauritius	5,99
Lebanon	6,05
Uruguay	6,06

Chad	6,19
Vietnam	6,81
Sudan	8,84
Haïti	-8,44
Benin	-10,2
Qatar	10,41
Somalia	10,64
Kuwait	13,75
Cuba	-52,7

Note*:* Standart deviation / the mean equals to volatility.

Volatility is low in developed countries. Between 1950 and 1969, Japan had the lowest volatility with 0.28, and Canada had the highest with 0.94. In the rest of the countries the lowest volatility was 1.05 in USSR and highest was 13.75 in Kuveyt.

Table 4. The Volatility Between 1970 and 2002

Uruguay	-0,46
Benin	0,48
Egypt	0,48
Pakistan	0,51
Ghana	-0,51
Canada	-0,52
Total 15 Latin American countries	-0,53
United Arab Emirates	-0,54
Sri Lanka	0,55
Morocco	0,59
China	0,60
Denmark	0,61
Reunion	0,63
Total Asia	0,63
South Korea	0,69
Iran	0,69
France	0,71
United States	-0,72
Sudan	0,74
Gambia	0,75
Mongolia	0,75
Vietnam	0,77
Uganda	0,88
Japan	0,91

Australia	-0,91
Austria	0,93
Afghanistan	0,96
Switzerland	-0,99
Hungary	0,98
Cameroon	1,02
Mauritius	1,05
Oman	1,08
Swaziland	1,11
Finland	1,11
Kenya	1,14
United Kingdom	1,18
Mexico	-1,18
Malaysia	1,19
Thailand	1,20
Taiwan	1,24
Nigeria	-1,23
Lebanon	-1,36
Tunisia	-1,43
Congo	1,28
Panama	1,33
Belgium	1,33
Algeria	1,42
Mozambique	-1,43
Zaire	-1,46

Table 4. Continued

Tanzania	-1,48
Angola	-1,49
Bulgaria	1,49
Burma	1,50
Turkey	1,59
Portugal	1,70
Singapore	1,71
Spain	1,74
Bahrain	1,76
Cambodia	1,81
Czechoslovakia	1,84
Laos	1,85
Botswana	1,85
Sweden	1,90
Jordan	2,08
New Zealand	2,16
Guinea Bissau	2,19
West Bank and Gaza	2,20
Brazil	-2,14
Gabon	-2,29
Poland	-2,29
Germany	-2,40
Ireland	2,46
Total 24 small Caribbean countries	2,57
Somalia	2,65
Bangladesh	-2,63
Malawi	-2,69
Peru	-2,91
Ecuador	-2,97

Rwanda	2,89
Philippines	2,95
Namibia	-3,00
Yemen	-3,28
India	3,39
Hong Kong	3,60
Cuba	3,70
Iraq	-3,86
Eritrea and Ethiopia	-3,95
Syria	*-4,87*
Central African Republic	*-4,87*
Italy	*4,57*
Comoro Islands	*4,58*
Lesotho	*6,86*
Guinea	*-6,77*
Dominican Republic	*-7,44*
Jamaica	*-8,07*
Israel	*9,71*
Cape Verde	*13,01*
Albania	*13,31*
Norway	*-10,51*
Romania	*-13,08*
Greece	*-14,57*
Burkina Faso	*-14,59*
Equatorial Guinea	*-18,21*
Sierra Leone	*-22,44*
Chad	*21,38*
Djibouti	*26,80*
Zimbabwe	*-27,60*
Yugoslavia	*79,28*

Between 1970 and 2002, developed countries had lower volatility than developing countries. In developed countries volatility range was between 0.95 and 1.18 while in developing countries highest margin was going up to 79.28.

Table 5 shows the regional volatility values between 1950-69 and between 1970-2002.

Between 1950 and 1969 volatility fluctuated between 0.10 and 0.84 in convergence regions but in total 29 East Asian countries it was 1.38 and higher than the others. Between 1970 and 2002 volatility is high. Volatility was between 0.68 and 11.06. The results suggest that globalisation increase volatility.

As it is seen in the Tables 3, 4, 5, volatility is low in developed countries but in emerging and undeveloped countries have high volatility. When volatility increases, development decreases.

Table 5. Regional Volatility

1950-1969		1970-2002	
Total 24 small Caribbean countries	0,10	Total Latin America	-0,68
Total 29 Western Europe	0,24	Total Western Offshoots	-0,68
Total 12 Western Europe	0,27	Total 8 Latin American countries	-0,71
Total 15 West Asian countries	0,42	Total 16 East Asian countries	0,71
Total 7 East European Countries	0,45	Total 29 Western Europe	2,06
Total 16 East Asian countries	0,50	Total 12 Western Europe	2,20
Total 23 Small East Asian countries	0,59	Total 15 West Asian countries	3,76
Total Latin America	0,59	Total Africa	7,95
Total 13 small WEC	0,63	Total 13 small WEC	0,77
Total 8 Latin American countries	0,65	Total 29 East Asian countries	0,85
Total 15 Latin American countries	0,84	Total 7 East European Countries	11,06
Total 29 East Asian countries	1,38	Total 23 Small East Asian countries	-4,03
		Total Former USSR	3,38

B. Review of the Growth and Development Literature

Development process is a complex result of a number of variables. In this study, beginning conditions and natural resources, globalization, structural transformatio and technology, Real wage effects and productivity, investment in human capital, population, democracy, political stability and instability will be examined. Especially, the role of political instabilities questioned with special reference to the islamic countries.

I. Beginning Conditions and Natural Resources

GeoFigureical elements, climate, natural resources of the countries have a basic role in the historical development process. History is important. According to Bockstette, Chando, Putterman, (2002:347), antiquity, political determination, quality of the instutitions, per capita income were related to level of growth rates between 1960 and 1995.

Negative impact is connected to colonization. European colonialism created deep distortions in these countries. Many factors involves in the failure of African countries, but one -colonization and slavery- is very important. Bairoch (1993) pointed out that there are many negative structures in underdevelopment process and its roots reached to European colonization. Manning (1990) stress on slavery trade; slavery is precolonial origin of the modern dissolution. Bertocchi and Canova (2002), Englebert (2000a, 2000b) and Grier (1999) pointed out that the relationship between colonial inheritance and postindependence influence the economic development. Acemoglu et al. (2001, 2002) emphasized that colonial development related to the impact of colonial institutions (Nunn: 2005;1).

Table 6 shows the allocation of African slavery exports between 1400-1913.

Table 6. Total Slave Exports From Africa, 1400-1913

Total Slave Exports from Africa, 1400–1913

Slave Trade	1400–1599	1600–1699	1700–1799	1800–1913	1400–1913
trans-Atlantic	188,108	597,444	8,253,885	3,709,081	12,748,518
trans-Saharan	700,000	435,000	865,000	1,066,143	3,066,143
Red Sea	400,000	200,000	200,000	505,400	1,305,400
Indian Ocean	200,000	100,000	428,000	395,300	1,123,300
Total	1,488,108	1,332,444	9,746,885	5,675,924	18,243,361
Total/year	7,441	13,324	97,469	50,230	35,562

Source: Nunn:2005;8

During the trans-Atlantic slave trade, slaves were taken in greatest numbers from the Bight of Biafra (Benin and Nigeria), West Central Africa (Zaire, Congo and Angola), and the Gold Coast (Ghana). All of these countries, as well, Ethiopia and Sudan are among the top 10 countries in slavery export. (Nunn, 2005:8). These countries failed in development process in the 20th century.

Table 7. Total Slave Exports, 1400-1913:Top 10 countries

Country	Number Exported	Percent of total
Nigeria	2,326,526	13%
Zaire	2,184,318	12%
Angola	2,095,149	12%
Ghana	1,459,691	8%
Ethiopia	1,217,724	7%
Sudan	1,174,049	7%
Benin	928,963	5%
Mozambique	710,657	4%
Congo	706,931	4%

Source: Nunn:2005; 9

These countries were colonized by European countries and they were relatively rich in 1500, but now, they are in poverty. We could stress on institutialist school, which emphasized the importance of the institutions. Colonialism created negative impact on the institutions of these countries. Institutialist view suggest that environment has effect on economic development by long-term institutions. In inconvenient conditions colonialists established institutions to exploit natural resources in Africa, South and Middle America, such as Kongo experience of Belgium. Bu the same powers prefer to settle in North America and Austrialia and establish permanent institutions (Bulutay, 2004, p.50). Ottoman Empire made many reforms and set up institutions in order to serve the international economy better. In Brazil, Slavery is abolished in 1888, Malesia had its indepency in 1957. The history of Malesia is a history of invasions, colonisations since the beginning of the sixteenth century. First, it was a colony of Dutch people, at the and of the eighteenth century it became a colony of England. The development level of the countries is connected with the promulgation of independencies.

There is a interesting relationship between the establishment of the states and Economic development levels. African countries are set up after 1960, some asian countries are set up

after 1950. Africa had been a colonies of the West, but in Asia situation was different.: Algeria 1962, Angola 1975, Central Africa Republic 1960 , Cote D'Ivoire 1960, Egypt 1831, Kenya 1963, Mauritius * 1968, Morocco 1956, Nigeria 1960, South Africa 1910, Tunisia 1591/1957, Zambia 1964, Zimbabwe 1965, Asia: China 1368, India 1947, Indonesia 1949, Japan 1590 , Korea * 1945, Malaysia * 1957, Myanmar 1948, Philippines 1947, Singapore * 1965, Taiwan * 1949, Thailand * 1769 Europe: Austria 1282, Belgium * 1830, Denmark * 980, Finland * 1917, France 943, Germany 1618, Greece 1829 Hungary 1918, Italy 1569, Netherlands * 1581, Norway * 1905, Poland 1918, Portugal 1139, Romania 1878 Russia 1457, Spain 1476, Sweden 1523, Turkey 1299, United Kingdom 1066 , Latin America: Argentina 1816, Bolivia 1825, Brazil 1822, Chile 1818, Colombia 1819, Costa Rica 1821, Dominican Republic 1845, Ecuador 1830, El Salvador 1821, Guatemala 1821, Honduras 1821, Mexico 1821, Nicaragua 1821, Panama 1903, Paraguay 1811, Peru 1821, Uruguay 1811, Venezuela 1830. North America: Canada * 1867, United States * 1783, Oceania: Australia * 1901, New Zealand * 1907

Developed countries has oldest establishment dates. While the oldest countries are developed, the newest ones are mostly in a failure. African countries were set up in 1960s and colonies of the west are in a poverty trap, now. The basic cause of failure of the older countries such as Turkey, Russia and China and emerging countries which were established during the 19th century; Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Uruguay, Venezuela, Philippines, is a high political and social instability.

On the other hand, some of the old but, somehow failure countries are transition countries. The inception and end of socialistic regimes in these countries; Russia, 1917-December 1991; Mongolia, 1924-1991; Yugoslavia, 1945-1991; Albany, 1946-1991(1992); East Europe, set up 1945-48 Polond 1989, Hungary 1990, Czechoslovakia 1989, Romania 1989, Bulgaria 1991; East Germany, 1949- October 1989 (unification with W.Germany, October 1990); Chine, 1949; Vietnam, North 1945, total 1976; Kambocia, 1975 (1976) - 1991(1993); Laos,1975; North Korea,1948, Cuba,1959 (Lavigne:1995;26).

a. Natural Resources

The existence of natural resources is not enough for succedding development. After the discovery of the American continent, rich natural resources of South and Central America had a primary importance. The labor and capital movements started latter. The settlements of these places set up powerfull economies, especially the USA began with primary superiorities of rich natural resources. This superiority transformed into educational and technological oppurtunities in the development of the country. Without realising this transformation, to be an owner of rich natural resources is not enough to accomplish economic development. In Ricardo, the relationship between ownership of the natural resources and economic development can be seen in the USA and in Finland but, it cannot explain the situation of the rich petroleum countries.

The ownership of natural resources is not enough for development. It cannot be put forward that these countries grow fast because of the rich natural resources. According to J.D.Sachs, A.M.Warner (1997) the owners of rich natural resources have low growth rates. The countries (Africa, former SSCB countries, Iran and Iraq are excluded) with abundant natural resources grow rapidly, but cannot complete the development process. Saudian Arabia, Kuveyt, Umman, United Arap Emirates had rapid increases in per capita incomes, but

could not complete development process. According to Hirschman natural resources did not go to invesments but in consumption in these kind of countries. The contact of natural resources to the backward and the forward is weak, and influence on the other sectors is inadequate. The study on 'Dutch Disease' examined the subject from the different point of view. This study shows that the existence of rich resources cause to remove the resources from sectors which have positive externalities, decrease the human and physical capital accumulation. For example, these type of countries meet their foreign currency needs by exporting raw materials, such as mines, this would affect commodity exports negatively. This influences industrialisation efforts negatively. Countries with weak natural resources can only obtain the foreign currency by exporting commodities. The best sample is East Asian countries for exporting produced goods. The countries with rich resources have had a long-run stagnation period in economic growth since the beginning of the 1970s (Bildirici and Sunal, 2007) .

If natural resources is evaluated in geoFigureical integrity, it will be more comprehensive. J.Sachs points out that it is enough to look up to the map in order to understand why the development is a geoFigureical event. It is very seldom that rich areas would be a poor countries. But, there will be a few rich countries in poor geoFigureical areas. The success of transition countries in Europe proves that. GeoFigureical conditions and structures have an impact on economic growth. If we approach the subject in context of the transition countries, Baltic countries have faster growth than the other former SSCB countries, due to the location of these countries, they are closer to Europe. On the other hand, China, Singapure, Taiwan are closer to Japan which made growth rates speed up. Afghanistan, Iran, Iraq are negative samples. Civil wars and clashes increase socio-political instabilities and defence expenditures caused to decline in growth rates.

Every event has a path-dependence. Development and growth process is a dependent to the past, it have ups and downs, and not stable process. So, growth rate of the country is dependent to the neighbours performance. Closer to the large market affect the growth process positively (Moreno and Trehan: 1997;399).

II. Globalisation

The impact of globalisation on economy or the impact of economy on globalisation is important. The effects of globalisation on the economic development is not clear. In the first phase of globalisation the role of industrial revolution is crucial in the globalisation process. During the 15th and 16th centuries, agriculture was the basic type of earning, commerce was partially important. First turning point caused to increase the gap between agricultural and non-agricultural earnings. With industrial revolution international trade grew faster and commercial earnings increased. Acceleration in trade was based on two factors, the need of raw materials and food, with the increasing production necessity for sell. In this context, international trade must be liberalized (Berksoy: 2004, 2005).

Improvement in transport technologies and vehicles had a serious role in the inception of the globalisation period in 1870s. Voyages in the oceans, enlarging capacity of vessels, steam-boats, railroads made crucial changes in transport technologies and carried millions of people. Between 1850 and 1910 the transport costs fell 80%. Between 1870-1914, capital and labor flowed across national frontiers in unprecedented quantities and commodity trade boomed because of falling transport costs. The late 19th century had an impressive

convergence in living standards. Poor countries around the European periphery tended to grow faster than the rich industrial leaders at the European core, and even faster than the richer countries overseas in the New World.

The World War I was the end of first globalisation period. War destroyed the industrial and cultural centers of Europe. After the War, important developments took place, semitism, nationalism expanded all over the world, from Mexico to China, from Turkey to Russia. The independence movements covered from North to South, from East to West. With social and political developments, 1929 depression caused to collapse of the economies (Hobsbawm,1996:106). As a result of depression, world trade fall 60% between 1929-1932. Goverments implemented restrictive policies, raised the customs, in order to protect the national economies from uncertainities and negative effects of the international waves (Flora, 1983:461). Autocratic goverments and protective policies brought about closed economies. These developments increased the intensity of the Crises, and gave rise to shrinkage of the international trade (Conklin, 1995:401). Between 1931 and 1936, monetary systems collapsed and Gold Standard were abolished (Foreman-Peck, 1983:216). In 1931 England left free trade policies which was the pillar of the English economic and American political identification (Stewart, 1980:60-64). Economic problems had priority in goverment policies. After the Second World War, in dualistic world, the United States became the main actor in reconstruction of the capitalistic system. The reconstruction period following the Second World War was marked by a much more constructive attempt to foster international economic co-operation and establish conditions under which European recovery could thrive and remain sustained than had been the case after 1918. From negotiations at Bretton Woods in 1944, two important institution emerged, the International Monetary Fund(IMF), and the International Bank for Reconstruction and Development(IBRD), while in 1947, after a meeting of 23 nations at Geneva, the General Agreement on Tariffs and Trade(GATT) was signed. The general philosophy of both the IMF and GATT was freedom for trade and payments, reducement of the discrimination among nations and the restoration of currency convertibility.

Welfare economies ended at the beginning of the 1970s, stagflation became the main problem of the developed economies.

In 1980s, trade deficits of the USA enlarged. In order to decrease trade deficits, the value of the dolar devaluated. Japan open up its domestic market to the foreign goods and deregulate its financal markets, but In 1990s trade deficits of the USA continued. When it reached to 2000's, an important problem had emerged: Domestic and foreign balances of the USA and attracting these surpluses towards USA by financial operations. In this context, balance of payments of European countries, petroleum exporting countries and Japan were pushed to making surpluses. These surpluses play the role of closing USA's foreign deficits. Another point which must be considered in this context, is the decreases in USA's reserves in strong currencies and gold since 1950's. Consequently, USA had 60% of the overall world reserves and 70% of the developed economies' reserves in 1960 while these ratios fell all the way down to 4% and 10 % consequently. This monetary expansion becomes into a political asset for the USA while other core and peripheral economies are forced to adhere to this dominance (See, Bulutay; 2005; p.26, 29, Bildirci and Sunal: 2006)

As a result of the reflections of the deregulation policies and increases in international trade, second globalisation period started.

i. Globalisation and Production System

The influence of production system was crucial for both globalisation periods. (Eichengreen, 1991; 4: Ashworth,1987,p.194). Profit squeezing which was a result of excess production and excess consumption of fordist production system, financial deregulation and increasing intensity of capitalistic competition switched the preferences of the financial capital and speculations in front of industrial investments.

The purpose of fordist production system was to increase productivity by standardisation of the product. This system expanded the following the World War II. In this model, variety of products must be restricted by Model-T in order to not raise the costs. Fordist system is not only a production system, it is also a consumption system. System must find new consumers to buy all the produced products. In other words, mass production necessiates mass consumption. Keynesian policies served on this purpose.

During the crises of the fordist system, high cost of labor and expanding goverment spendings were charged. In the course of the Fordist crises in capitalism, countries out of this production system did not have problems, some of them raised the growth rates. For example, the exports of Japan increased twenty times in twenty years. When Fordist system was extended to Europe, Latin America, superiority in competition disappeared. In 1970s, the success of Japanese companies in competition stimulated many analysts to reevaluate the Fordist system in Europe.

At the end of 1970s, post-Fordist era started. M. Thatcher in England, R. Reagen in the USA transformed the economies in this way. This transformation covered four basic spheres: In production post-fordist specialisation and in political economy neo-liberal policies replaced. Goverment intervention in the economy restricted by privatization and deregulation. In social life, society met new merits. Personal preferences switched from Protestan ethic to hedonistic and consumption base. Social solidarity replaced by personal preferences.

The compression of profit rates made capital move to financial investments and internalize it. This was a distinctive essence of the history of the twentieth century. National currencies were not supported by real values such as gold, etc, just had nominal values. This uncertainity in the exchange rates of the national currencies carried enourmeous risk. This attracted speculative activities and increased the speed of financial capital flows.

In the second globalisation period, financial sector became a primary sector, abundance of funds and likidity became the basic determinants. Capital movements are the basic determinants of the second globalisation period. In this period there is no room for labor movements which was important during the first globalisation period. In international relations assets flows are more effective. In foreign trade vertical specialization and subcontractors were prevalent. Between 1995 and 2005, private capital flows towards developing countries speeded up. Direct foreign investments had the largest share in capital flows. Portfolio had the smaller, but it was increasing in line with total foreign investments (World Bank, World Development Indicators, 2007:343).

ii. Globalisation and Free Foreign Trade

During the first globalisation period, international trade was among the industries. Free trade is basic characteristic of this period. To expanding free trade area was not easy. Sometimes by political pressure to contract, such as 1838 commercial Treaty of the Otoman Empire,

sometimes by imposing physially, for example, China and Japan open up their markets under the phsical pressures. According to many economists, free trade and globalisation had serious effects on growth. Open economies grow faster than less open economies (Bulutay, 2004, p.28; Rodrik, 1999,p.1; Fischer,2003, p.11-13). There is a free trade fort he sucess of some Asian countries (Helliwell, 2004). According to Frankel and Romer(1996, p.380-1) 1 % increase in the share of the trade in GDP, will raise per capita income 1.5-2%. To Dolar ve Kraay in 1980s, especially in 1990s globalised countries had faster growth than unglobalised (Bulutay, 2004, p.29)

But these effects are not clear. From 1870 s to nowadays there is no evidence that there is a relationship between free trade and growth (Vamvakidis,2002, p.73). Does foreign trade ensure growth in emerging countries. From the first globalization periods there are many studies on this. Prebisch examined the subject in core-periphery context, and calculated short run economic damage since the periphery committed to primary product exports. Between 1890-1909, Latin America devoted 97 percent of its exports to primary products, Asia and the Middle East 90 percent, but the European industrial core devoted only 30 percent of their total exports to primary products. The trade for primary product exporting regions rose until the 1860s or 1870s. The decline in the trade of primary products between 1870 and 1930 for Asia was 29 %; for Latin America, the fall from its 1885-1895 peak to its 1930s trough was 40 percent.

Integration of core and periphery may take various combinations. The imperialist who wanted to get benefits of Argentina's comparative advantage, increased railroad construction, and domestic tribes of Pampas kicked out of their land. Railroad debts of the Ottoman Empire created more political pressures on Ottoman goverments. The relationship with industrial countries resulted in increasing rate of debtness was not a coincidence. Rising debtness brought about defaults, moratoriums and repayment processes. In Brazil occupation by French was direct phsical intervention to the economy. Along the 19th century, export to the undeveloped countries without exporting industrial development destroyed traditional production types. Capital exportation to these countries could only set up production of some secondary kind of products and they could continue to import many items, and dependency. Capitalistic type of production was not established for providing the needs of the economic and industrial development but serving the core's needs.

After the World War II, USA and the other industrial countries supported autoritative regimes in order to protect their investors, if, anything be a harmful to their interest they occupy and give support to the Coups.

During the second globalisation, following the petroleum shocks of the 1970s developed countries aimed at liberalising foreign trade in order to secure long-run growth. The exchange rate systems became flexible. At the end of the 1980s, with the dissolution of central planning economies, tendency to free trade increased. In order to diminish the burden of foreign debts service and transfer of new resources, international institutions set up to support the programs which was accelerated deregulations. Liberal approaches would speed up growth and increase exports (Celasun; 2001;163) The dillema of emerging countries was increases in exports depended on the paralel development in real exchange rate index. In other words, country's currency is devaluated, domestic prices fell in terms of dolar and the domestic goods can be exported. Dani Rodrik(1995) examined export growths in Turkey, Chile, Korea, Taiwan and had similar results. In Turkey and Chile increases in exports realised as a result of devaluations(100%). In Korea and Taiwan realised as a result of investment growths.

Table 8. The Impact on Per Capita GDP of the Globalization Periods I and II (1990 International Geary-Khamis dollars)

	1870-1913%	1914-1970%	1971-2003%	1990-2003%		1870-1913%	1914-1970%	1971-2003%	1990-2003%
Austria	86,06	238,97	108,16	25,67	Argentina	189,73	121,12	1,81	19,12
Belgium	56,77	170,45	93,31	23,31	Brazil	13,75	291,92	69,66	13,01
Denmark	95,30	208,62	78,86	25,36	Chile	131,61	109,52	95,64	71,06
Finland	85,20	378,70	110,05	21,61	Mexico	156,89	147,64	63,51	17,29
France	85,79	260,41	80,52	20,83	Uruguay	51,79	95,32	32,65	5,12
Germany	98,36	254,30	72,83	20,18	Venezuela	93,90	1015,79	-33,11	-15,94
Italy	70,98	282,23	94,63	17,39	India	26,14	22,50	152,25	65,02
Netherlands	46,86	209,36	74,35	24,43	Indonesia	38,16	33,87	187,83	40,73
Norway	79,91	305,59	148,59	40,98	Japan	88,06	632,30	111,33	12,93
Sweden	86,34	317,26	69,08	22,41	Philippines	58,36	85,37	40,29	14,04
Switzerland	102,93	299,32	27,96	3,51	South Korea	43,93	140,28	574,49	80,73
United Kingdom	54,23	118,56	94,76	29,70	Taiwan	35,77	299,20	419,96	74,83
Ireland	54,14	144,78	289,37	109,34	Burma	35,97	-22,02	191,65	143,83
Greece	80,88	223,79	106,48	36,56	Malaysia	35,87	125,95	288,34	65,01
Portugal	28,23	335,21	135,18	27,53	Nepal	35,76	23,27	59,13	24,70
Spain	70,30	213,81	157,17	41,20	Singapore	87,44	249,54	339,02	51,41
Australia	57,54	139,19	89,49	36,14	Sri Lanka	44,97	24,74	161,54	56,81

Table 8. Continued

	1870-1913%	1914-1970%	1971-2003%	1990-2003%		1870-1913%	1914-1970%	1971-2003%	1990-2003%
New Zealand	66,23	115,63	51,72	26,28	North Korea	43,86	127,21	-55,33	-60,35
Canada	162,42	199,37	84,97	23,12	Vietnam	43,87	2,09	184,66	109,44
United States	116,83	213,17	89,73	25,16	World Average	74,71	145,82	71,01	26,23
Albania	81,73	150,44	52,27	26,94	Jamaica	13,65	541,45	-3,23	-2,80
Bulgaria	82,63	218,21	28,08	12,17	Tunisia	39,55	107,60	150,62	48,87
Czechoslovakia	80,04	234,49	46,10	14,28	Egypt	38,99	39,34	136,45	20,28
Hungary	92,18	194,22	51,71	23,04	Ghana	77,89	82,56	-8,74	27,96
Poland	83,83	157,43	63,03	50,08	Morocco	26,14	130,89	75,15	12,31
Romania	87,00	63,96	8,98	-0,01	Iran	39,09		21,38	58,11
Yugoslavia	76,45	264,08	22,89	-10,82	Iraq	39,08		-71,31	-58,38
South Africa	86,74	152,82	4,25	12,19	Jordan	39,27		78,37	11,26
Syria	59,98		104,79	35,03	Lebanon	59,82		16,86	80,96
Turkey	47,03		105,11	23,61	Hong Kong	87,32		303,76	37,39
Algeria	62,70		56,68	6,34	China	4,21		504,16	156,71
Thailand	38,26		317,15	55,28	Colombia		166,05	63,65	8,00
					Peru		280,44	2,33	32,66

Source: Calculated by Maddison: 2003

Table 9. The Impact on Per Capita GDP of the Globalization Periods II in The National Established after 1960

	1971-2003	1990-2003		1971-2003	1990-2003		1971-2003	1990-2003		1971-2003	1990-2003
Mongolia	28,23	-21,97	Bangladesh	60,31	46,76	Mauritius	288,49	66,08	Congo	12,32	-15,75
Bahrain	40,33	36,17	Bolivia	18,73	19,10	Mozambique	-7,67	50,44	Côte d'Ivoire	-32,80	-9,75
Israel	87,80	26,16	Costa Rica	67,54	37,27	Namibia	13,96	20,30	Djibouti	-47,50	-22,33
Kuwait	-67,20	65,75	Cuba	26,14	-12,86	Niger	-40,25	-4,03	Equatorial Guinea	1043,34	767,33
Oman	85,57	6,44	Dominican Republic	120,29	49,61	Nigeria	3,96	11,13	Eritrea and Ethiopia	-1,93	2,93
Qatar	-76,65	31,02	Ecuador	17,02	-12,39	Reunion	41,79	9,19	Gabon	-41,00	-22,17
Saudi Arabia	-10,86	-15,99	El Salvador	22,41	28,39	Rwanda	27,77	1,75	Gambia	-6,17	1,43
United Arab Emirates	-28,17	36,33	Guatemala	26,35	11,82	São Tomé and Principe	-13,34	-7,54	Guinea	28,43	14,12
Yemen	85,23	15,26	Haïti	-22,52	-28,29	Senegal	2,00	10,88	Guinea Bissau	-26,63	-23,31
Angola	-49,60	0,29	Honduras	23,78	4,16	Seychelles	99,87	16,70	Kenya	6,06	-10,68
Benin	36,40	19,95	Pakistan	102,07	18,41	Sierra Leone	-47,40	-43,60	Lesotho	215,07	42,85
Botswana	560,74	49,32	Nicaragua	-47,00	5,26	Somalia	-23,16	-19,04	Liberia	-29,77	0,60
Burkina Faso	29,89	22,76	Panama	44,25	29,42	Sudan	17,82	46,32	Libya	-70,58	-21,37
Burundi	-16,33	-32,25	Paraguay	55,28	-10,16	Swaziland	36,58	13,01	Madagascar	-47,42	-18,05
Cameroon	19,90	-2,86	Puerto Rico	118,06	37,43	Tanzania	6,25	10,74	Malawi	23,87	11,97
Cape Verde	258,16	64,76	Trinidad and Tobago	105,33	83,18	Togo	-44,83	-22,41	Mali	76,20	39,14
Central African Republic	-39,50	-20,55	Afghanistan	1,48	10,66	Uganda	-2,48	42,19	Mauritania	2,63	17,34
Chad	3,08	25,02	Cambodia	106,04	44,05	Zimbabwe	-20,93	-21,08	Zaire	-73,39	-58,51
Comoro Islands	-50,86	-17,24	Laos	75,10	42,32	Total 3 Small African countries	28,57	3,28	Zambia	-33,93	-14,98

Source: Calculated by Maddison: 2003

The increases in incomes examined at regional level.

Table 10. Regional Changes in Per Capita GDP

	1870-1913	1914-1970	1971-2003	1990-2003		1870-1913	1914-1970	1971-2003	1990-2003
T 12 W Eu	76,65	218,63	83,62	22,09	T 8 L A Co	118,15	187,72	41,04	14,86
T 13 sl WEC	76,61	180,39	173,83	48,64	T 15 L A Co	113,67	152,48	35,85	10,75
T 29 W Eu	76,40	225,83	90,27	24,72	T 24 sCar co	113,97	229,88	40,15	16,07
T W Off	116,31	206,03	88,74	25,48	T Latin A	121,07	167,76	40,36	14,08
Total Africa	27,48	115,08	12,21	6,92	T 23SE A co	40,58	139,58	56,76	31,62
T 7 E Eu Co	80,96	155,34	40,92	19,04	T3 S Af co			28,57	3,28
CAf Rep			-39,50	-20,55	T29 E A co	40,57		56,29	27,24
T16 E As co	23,70		208,47	64,73	T 15 W A co	40,44		37,06	21,30
W B Gaza	66,54		25,22	-32,68	World Ave	74,71	145,82	71,01	26,23

Total 12 Western Europe , Total 13 small WEC, Total 29 Western Europe, Total Western Offshoots, Total Africa, Total 7 East European Countries, Central African Republic, Total 16 East Asian countries, West Bank and Gaza, Total 8 Latin American countries, Total 24 small Caribbean countries, Total Latin America, Total 23 Small East Asian countries, World Average, Total 3 Small African countries, Total 29 East Asian countries, Total 15 West Asian countries

In line with economic development and the transformation in the structure of exports, Hong Kong, Singapure, Korea, Taiwan, Maleyzia, Tayland, China had important structural transformation. In all counries, the share of goods produced with inferior technologies fell down, the share of high-tech goods increased. This increase came from the export of multi-national companies. In Argentina, Brazil, India and in Turkey, the share of high-tech is low and there is not structural transformation in the economies.

In 1990s volume of international operations grow rapidly. The emerging countries liberalized foreign trade. Capital movements were freed, convertibility was accepted and financial sector opened up to the world markets. These countries became highly sensitive to the capital flows when inflation rates fluctuated, with dolarisation destructive effects of financial shocks increased. At this point, risk perceptions of the foreign financial investors and the existence of stable, trustable politicians became very important. Global changing processes, adaptation of the countries to the new conditions caused crises in many places all over the world. When foreign capital enters in one country, there is a low possibility of creating development, but high possibility of crises. Besides, the liberalized and integrated capital markets, uncertainities on the direction and amount of capital movements, failure of setting up adequate control mechanisms are the reasons of these crises. Crises caused socio-economic effecs in Mexico, East Asian countries, Russia, Argentina and Turkey. Integration of the international markets spreaded up crises in many countries, to cope with the crises IMF programs were imposed to the emerging economies. These programs decreased social expenditures which resulted in utilization of unregistered sectors in order to come up with poverty.

During the globalization the income of developed countries increased, but emerging countries had to face crises.Between 1914 and 1971, Burma was the only country with declining income (-22.02). Between 1971 and 2003, during the second globalisation period these countries had falling incomes: Venezuela(-33,11), North Korea (-55,33), Jamaica(-3,23), Ghana(-8,74), Iraq(-71,31), Kuwait(-67,20), Qatar(-76,65), Saudi Arabia(-10,86), United Arab Emirates(-28,17), Angola(-49,60), Haïti(-22,52), Mozambique(-7,67), Niger(-40,25), São Tomé and Principe(-13,34), Sierra Leone(47,40), Côte d'Ivoire(-32,80), Djibouti(-47,50), Eritrea and Ethiopia(-1,93), Gabon(-41,00), Gambia(-6,17), Guinea Bissau (-26,63), Burundi(-16,33), Central African Republic (-39,50), Comoro Islands(-50,86), Nicaragua(-47,00), Somalia(-23,16), Togo(-44,83), Uganda(-2,48), Zimbabwe(-20,93), Liberia(-29,77), Libya(-70,58), Madagascar(-47,42), Zaire(-73,39), Zambia(-33,93).

During the first globalisation period, Total Western Offshoots, Total 8 Latin American countries, Total 24 small Caribbean countries, Total Latin America had over 100% increase in incomes. Between 1914-1970, countries were relatively closed economies, Total 12 Western Europe , Total 13 small WEC, Total 29 Western Europe, Total Western Offshoots, Total Africa, Total 7 East European Countries, Total 8 Latin American countries, Total 24 small Caribbean countries, Total Latin America, Total 23 Small East Asian countries had over 100% increases in their incomes. Average World increases in incomes was 145%. During the second globalisation period, Total 13 small WEC and Total 16 East Asian countries had 100% income increases. In last two periods, Central African Republic had the negative income increases, between 1914-1970 incomes decreased a-39.5%, during the second globalisation period -20.55%.

The average increases in incomes among the periods, between 1870-1913 it was 74.71%, 1914-1970 145.8%, 1971-2003 71.01%. During the closed periods, the incomes of the countries increase much more than the other periods.

iii. Globalisation and Capital Movements

There are many studies approaching differently on the effects of foreign capital on economies. The question whether Foreign Direct Investment(FDI) promotes economic growth is a very important question. Many economists claim that FDI negatively affects the distribution of income, quality of environment and working conditions. Saltz (1992) argues that FDI raises the price of capital and depresses domestic investment. Dependency theorists also view FDI as crowding out domestic investment and creating distortions in economic development (see Sylwester, 2005;291). As Borensztein et al. (1998) the relationship between FDI and economic growth is positive for 69 developing countries. They explain that FDI creates technological spillovers from more technologically advanced countries. Balasubramanyam et al. (1999) and Olofsdotter (1998) also found a positive relation between FDI and growth although the country had stronger property rights regimes. According to Olofsdotter this result interprets that nations with better institutions can capture the benefits provided by FDI. Hermes & Lensink (2003) report that advanced financial sector is necessary for FDI to promote economic growth. Williamson (1996) and O_Rourke and Williamson (1999) focus on the relationship between economic growth, globalization, and factor price convergence. Moving from these assertions, we will compare foreign trade, financial capital and foreign trade in two globalisation periods.

The free circulation of capital is the common characteristic of the both globalisation periods. Between 1875 and 1914, labor and capital movements and international trade rapidly increased (Eichengreen, 1991; 4: Ashworth,1987,p.194). Capital flew from West to East, Europe and various places all over the world. Between 1880 and 1914, capital flows speeded up. The important point was the bonds between capital and commodity markets. Countries who borrowed from England, exported English goods. English credits directed to countries which had low political risk and stable economies, such as Canada, New Zealend, and the USA 90% of the capital movements of this period was portfolio investments.

Table 11. Investments in Foreign Countries

	UK	France	Germany	USA	Holland	Belçika	İsviçre	Japan
1862	3.6							
1870	20	10						
1885	30	15	6.5					
1902	62	30	12.5	3				
1914	87	40	30	15	10	7	7	1
1930	90	20	5.6	75	18	4	9	4.5
1938	85	15	-	48	22	7	6	9
1948	40	3	-	69	10	4	8	-
1957	46	6	2	120	11	6	12.5	-
1960 60	60	?	4	150	12	8	14	1

(in 1913 gold milyar frank): 1£=5$=20 RM=25 Frs.

In nineteenth century, private invesments augmented in the USA, Argentina, Brazil, Mexico, Canada, and India. Globalisation of capital began with England, France, Germany, Hollands, Belgium, Switzerland, Sweeden, Portugal and the USA followed. Table 11 shows general development of capital exportation in foreign countries.

The share of trade in GDP was 44.7% in England in 1913, this rate fell drasticly between two wars, in 1973 it rise to 39.3, in 1993 40.5%. France did not have the same level of 1913(34.5%). This rate was 29% in 1973, 32.4% in 1993. The advancements in communications interlinked continents each other in 1860s. And they are effectively used to determine the prices and daily trade. One of the reasons in the increase of the overseas investments was the difference between domestic and overseas returns. Lehfeldt calculated the return of the constant interest rate bonds in 1888-1913 period. In 1888 domestic return rate was 4.35, colony return rate 3.43, overseas return rate 5.61. Between 1903-1907, domestic return rate of stocks was 3.37, colony rate was 6.25, overseas rate 6.14 (Iversen, 1967,p.104). The conditions of the countries, formal measurements and international conjuncture determine the international capital movements. Historical developments justify these phonemenon.

In England, capital exportation was high in the periods 1886-1890, 1896-1900, 1904-1907 and 1909-1913; while between 1891-95, 1901-03 ve 1908, depressions caused declines in capital exports. Take the advantage of cheap labor and raw materials, women and child labor. For example, in 1947-1948 hourly wages in textile industry was 9.4-12 cent, while in the USA it was 104-106 cent. This also may explain the rapid increase of foreign investments of the USA. Figure 3 shows the profit rates of USA companies in the USA and in developing countries.

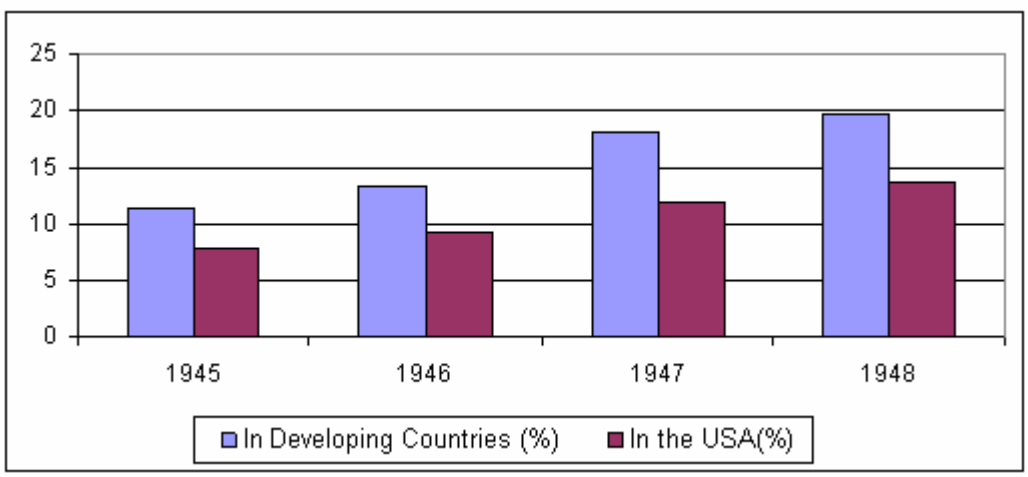


Figure 3. The Profit Rates of the USA Companies.

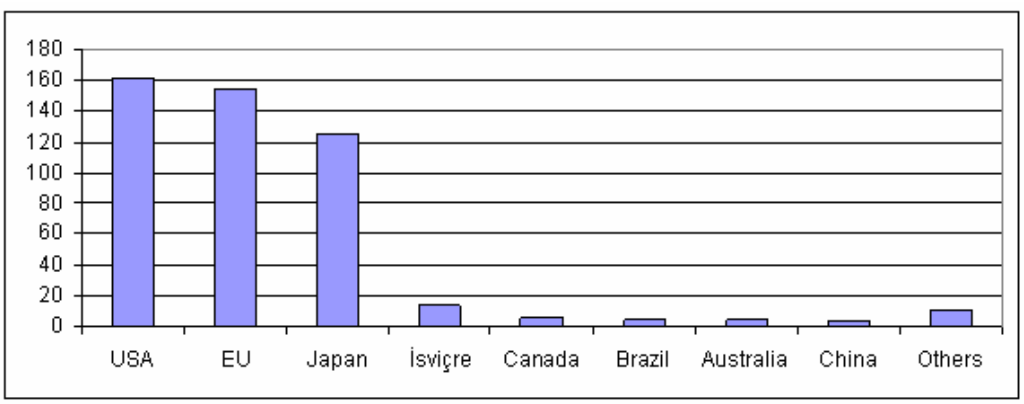
The most important difference between the globalisation periods was the duration of capital flows. In the first globalisation period, capital flows was long-termed, in the second it was shorter. This short-term capital movements were the reasons of initiations and deepining of the crises. Private capital flows speeded up after 1991 and focused East Asia and Latin America. In the American continent, capital flows came from USA, in Asia from Asian countries. Asian countries had direct foreign capital investments while portfolio investments

directed to the western hemipshere. Middle income countries attracted more equity capital while low income countries had formal capital flows (Chen and Khan: 1997;.5-11).

The influence and size of capital flows are disputable. It was not the primary factor in development of the Asian Tigers. The rate of foreign capital stocks to Gross Domestic National Income and the rate of capital inflows to fixed capital for Far East Asia Hong Kong and Maleysia, for new European Unity countries(EU) Hungary, from Latin America, Chile and Brazil showed positive performance. Recent years, even though foreign investments rapidly increased, the rates were low compare to other countries. This indicates that the factor behind the growth is domestic investment in China. For example, indicators of foreign capital shows that South Korea also grow fast on domestic dynamics rather than foreign capital.

The various tendencies had been seen between 1990-2003, on the allocation of foreign capital in sectors. In foreign capital stock the share of developed countries decreased 3.3 point to77.6, the share of developing counries rise to 22.4. In developed countries the share of basic sectors and manufacturing industry declined appearantly, but the share of services rose 15.8 point to 61. On developing countries the tendency was different. The share of basic sectors rose from 7.7 to 10.1, share of manufaturing sector from 47.2 to 48.3. The share of services fell from 45.1 to 41.7 (World Bank). This tendency shows that with cheap labor and raw materials these countries became assembly center of world production. So, developed countries transformed cheap labor countries to the assembly bases (this growth is disputable). The role of production system is important on this transformation in some countries.

The purpose of multi-national companies is to maximize their profits which stimulates globalisation. The commercial relations following the 1990 supports the evidence. For example, the largest 500 companies were from the USA, EU and Japan in 1997. Figure 4 shows the distribution of the largest 500 multi-national companies among the countries.



Source: Fortune,The Fortune Global 500, August 4,1997 'den

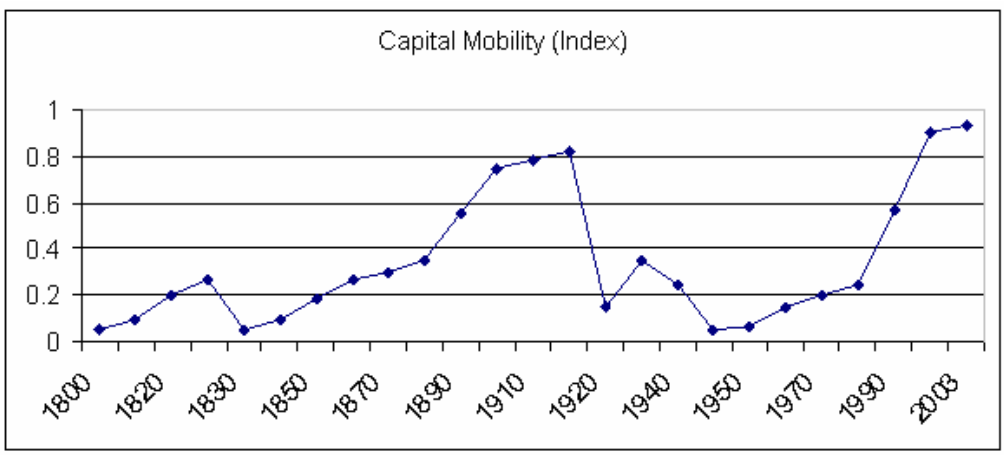
Figure 4. The Largest 500 Multi-national Companies of the World.

Table 12 shows the comparision of multi-national companies' profits and some countries GDP's. As Table 12 shows that these companies' profits were equal to some countries GDP's.

Table 12. Globalisation and Expanded Power of the Multi-national Companies (1994, Billion $)

Country and Company Name	GDP	Total Company Sales
Indonesia	174.6	
General Motors		168.8
Turkey	149.8	
Denmark	146.1	
Ford		137.1
South Africa	123.3	
Toyota		111.1
Exxon		110.0
Shell		109.8
Norway	109.6	
Poland	92.8	
IBM		72
Maleyzia	68.5	
Venezuella	59	
Pakistan	57.1	
Unilever		49.7
Nestle		47.8
Sony		47.6
Under Development Countries	76.5	
South Asia	451.3	
Africa	246.8	
The Larges Five Multi-national Company		871.4

Source: Aktan :2002; 22



Source: Reinhart and Rogoff: 2008;8

Figure 5. Capital Mobility.

The countries who want globalisation and who benefit from it are the same in North America, Western Europe and East Asia Pasific. The triple has the total exports of inner continents was 21.4% of global exports in 1970 (Petrella, 1996: 79). It rose to 47.2 % in 2002. (World Trade Organisation, 2003: 33–35). If the intercontinent export figures are added to this numbers, total share of three regions in world exports increased to 60.8% in 1970, 71.1% in 2002 (World Trade Organization, 2003: 33–35). If we add every country in Europe and the most important exporter countries(China, India and the others), the share of triple goes up to 87.1% (WTO, 2004:19). This trade triple realised 79.2% of direct capital inflows 89.3% of direct capital outflows in 2004 (UNCTAD, 2004b: 369 – 375). Figure 5 shows the development of capital movements from 1800 to the nowadays.

Today's emerging and underdevelopment countries can hardly claim credit for inventing serial default but this point was very old subject. Table 13 shows the number of defaults, including default years, between 1300 and 2007 for a number of now rich European countries. The combination of the development of international capital markets together with the emergence of a number of new nation states, led to an increase in international defaults. Table 13 shows nineteenth-century default and rescheduling episodes in Africa, Europe and Latin America. In this period, most of Africa and Asia was colonized during this period, allowing Latin America and Europe a substantial head start. The only African countries to default during this period were Egypt (1876) and Algeria (1867). A number of countries in Europe defaulted during or just after the Napoleonic wars, while many countries in both Latin America defaulted during the 1820s. Most of these defaults are associated with Latin America's wars of independence. There are notable global default episodes during the late 1860s up to the mid-1870s, and again starting in the mid-1880s through the early 1890s.

In the twentieth century, there was defaults in Africa and Asia, including among the many newly colonized countries. Nigeria, despite its oil riches, has defaulted a stunning five times since achieving independence in 1960. Indonesia has also defaulted four times. Morocco, counting its first default in 1903 during an earlier era of independence. India ın 1997 Asian crisis, it was forced to reschedule its external debt three times since independence. While China did not default during its communist era, it did default on external debt in both 1921 and 1939. The countries outside Latin American and low-income Europe were the only ones to default during the twentieth century. Latin America and Europe, with only a few exceptions, countries were independent throughout the entire twentieth century. Again, as in the earlier tables, we see that country defaults tend to come in clusters, including especially the period of the Great Depression, when much of the world went into default, the 1980s debt crisis, and also the 1990s debt crisis. There were Turkey's five defaults, Ecuador and Peru's six defaults, and Brazil's seven.(Reinhart and Rogoff: 2008)

As seen, today's emerging market countries and underdevelopment countries did not invent serial default and they was live seriously default in globalisation periods.

The another serious effect of globalisation in emerging coutries was the tax decline on the capital. In 30 countries the average corporate tax was 37.6 in 1966, 30.8 in 2003 (Bulutay, 2005a;30). An also, almost all counries decreased marginal tax rates on high incomes. In Turkey, the share of capital on taxes decreased, tax system concencrated on wages and indirect taxes. Political instabilities affected this seperation more (Study on this subject for Turkey, see. Bildiri and Coşar; 2005).

Table 13. The Year's of Countries' Default

Africa : Algeria, 1991, Angola, 1985, Central African Republic, 1981, 1983, Cote D'Ivoire, 1983, 2000, Egypt 1831 1984 Kenya, 1994, 2000, Morocco, 1903 1983, 1986, Nigeria, 1982, 1986, 1992,2001, 2004, Tunisia 1867, SouthAfrica, 1985, 1989, 1993, Zambia, 1983, Zimbabwe, 1965 2000,	Europe: Austria–Hungary 1802, 1805, 1811, 1816, 1868 France 1812, Germany, Hesse 1814, Prussia 1807, 1813, Schleswig–Holstein, 1850, Westphalia 1812, Greece, 1829 1826, 1843 1860 1893, Netherlands 1814, Portugal 1828, 1837, 1841, 1845, 1852, 1890, Russia 1839 1885 Spain 1809, 1820 1831, 1834 1851, 1867, 1872 1882, Sweden 1812, Turkey 1875
Latin America: Argentina, 1827 1890, Bolivia, 1875, Brazil, 1898, Chile, 1826 1880, Colombia, 1826 1850, 1873 1880, Costa Rica, 1828 1874, 1895, Dominican Republic, 1872 1892, 1897, 1899, Ecuador, 1826 1868 1894, El Salvador, 1828 1898 Guatemala, 1828 1876, 1894, 1899, Honduras, 1828 1873, Mexico, 1827, 1833, 1844 1866 1898, Nicaragua, 1828 1894, Paraguay, 1874 1892, Peru, 1826 1876, Uruguay, 1876, 1891, Venezuela, 1826, 1848 1860, 1865 1892, 1898 1900–1824 1925–1949 1950–1974 1975–2006,	Asia: China 1921 1939 Japan 1942, India, 1947 1958, 1969, 1972, Indonesia, 1949 1966 1998, 2000, 2002, Myanmar, 1948 2002, Philippines, 1947 1983, Sri Lanka, 1948 1980, 1982

Sources: Sources: Standard and Poor's, Purcell and Kaufman (1993), Reinhart, Rogoff and Savastano (2003)

III. Structural Transformation, Industrialisation and Technology

Industrial revolution initiated structural transformation in the countries. So, the economic superiority of Europe began after the industrial revolution. In the 18th century China and India were not behind the Europe, European industry did not compete with Asia. Following the industrial revolution de-industrialisation started in Asian countries. India had greater de-industrialization process than China between 1750 and 1810. China, India, Japan and some parts of Latin America started significant re-industrialization process in the late 19th century, while Egypt, the Ottoman Empire, and others parts of Latin America did not?

The Industrial Revolution was basic element in this industrialisation process. After the industrial revolution the source of power and growth changed. The source of growth was land, and agriculture before the industrial revolution. In Pre-capitalist societies conquests, invasions, wars and booty were important. Production had second place in society. With industrial revolution, production became important, to produce to sell was the purpose of this

era. Technological advances accelerated this process. Starting with advances in textile industries in 1730's, railroads in 1820s, steam-engine overseas vessel transportation in 1840s, in 1870s electric motors increased mobility of goods and population. Mechanisation in spin yarns raised productivity 300-400 times between 1750 and 1830. According to Krugman (2001) between1801-1851 per capita domestic income increase 1.3% a year. The other European countries and USA realised their revolutions. France lost time with Napoleonic wars and domestic political problems and completed its industrial revolution in 1830s. Germany retarded, had problems with the unification of market, politics and culture. In 1870s, Germany completed its industrial revolution. Germany was good at new industries, such as steel and electrical equipments. East European countries could not start industrialisation process. The USA accomplished its industrialialisation after the civil war.

With industrialisation, total and per capita industrial production increased in Europe and in the USA. Between 1870 and 1913, per capita GDP rised 2.2 % a year (Krugman: 2001). The composition of labor force changed, in England the percentage of laborforce working in industry was 30% at the beginning of the 1800s, it went up to 47% in 1840, 49% in 1870 (Baldwin ve Martin: 1999). Rapidly changing conditions in industrialisation and commercialisation brought about de-industrialisation process for the other countries. India, China and third world countries lived this process as de-industrialisation and colonisation. No country could escape from these processes, commercialisation and monetisation enhanced all over the world. Domestic manufacturing was devasteted by the products of industrial countries, economies colonised by commercial treaties, by debts and by direct and indirect foreign investments. Cheaper and qualitier goods invaded markets of third world countries. This affected national manufacturing negatively. In 1750 the share of India was 24.5 %, 32.8%, China and rest of the periphery was 15.7% and developed core was 27 %. A decline in the shares of India and China started with industrial revolution and reached to successively in 1830, 2.8, 12.5, 5.6, 79.1. In 20th century a decline in the shares of China and India continued but developed core increased to 92,8 (Simmons: 1985;600, Bairoch: 1982;296 and 304). China and India is important in this context. In 1750s there was no divergence between Europe and periphery. In 1900, the share of periphery was left behind the Europe a lot.

Table 14. 1750-1900 Shares in World Production

	1750	**1800**	**1830**	**1860**	**1880**	**1900**
Total Europe	23,2	28,1	34,2	53,2	61,3	62,0
England	1,9	4,3	9,5	19,9	22,9	18,5
Habsburg Empire	2,9	3,2	3,2	4,2	4,4	4,7
France	4,0	4,2	5,2	7,9	7,8	5,8
German States	2,9	3,5	3,5	4,9	8,5	13,2
İtalian States	2,4	2,5	2,3	2,5	2,5	2,5
Russia	5,0	5,6	5,6	7,0	7,6	8,8
USA	0,1	0,8	2,4	7,2	14,7	23,6
Japan	3,8	3,5	2,8	2,6	2,4	2,4
Third World	73,0	67,7	60,5	36,6	20,9	11,0
China	32,8	33,3	29,8	19,7	12,5	6,2
India/Pakistan	24,5	19,7	17,6	8,6	2,8	1,7

http://www.foreigntrade.gov.tr/ead/DTDERGI/tem98/uzakdogu.htm

The population growth rate alleviates the per capita income levels for China, India and other countries. In this framework, per capita industrialisation rate is important. In India , since 1813 when customs were abolished, 1 million yard cotton was imported, 51 million yard in 1839 995 million yard in 1870. This brought about the end of family businesses. The effects of customs and its effects on domestic industries had similarities with China and the Ottoman Empire. Table 15 shows per capita industrialisation rates fort the countries.

Table 15. Per Capita industrialisation rate

	1750	**1800**	**1830**	**1860**	**1880**	**1900**
Total Europe	8	8	11	16	24	35
England	10	16	25	64	87	100
Habsburg Empire	7	7	8	11	15	23
France	9	9	12	20	28	39
German States	8	8	9	15	25	52
Italian States	8	8	8	10	12	17
Russia	6	6	7	8	10	15
USA	4	9	14	21	38	69
Japan	7	7	7	7	9	12
Third World	7	6	6	4	3	2
China	8	6	6	4	4	3
India/Pakistan	7	6	6	3	2	1

Source: **********

Following the World War I and II, per capita industrialisation rates had varied. Many studies emphasizes technology in order to explain disparities. Technology is central factor created divergence among countries. As Easterly and Levine (2001), 60% of the cross-country variations in growth rates of per-capita GDP can be explained with the differences in productivity growth rates. As Klenow and Rodríguez-Clare (1997) pointed out that about 90% of the variation can be estimated differences in productivity growth. Feyrer (2001) found that the distribution of the productivity residual had become increasingly twin-peaked. The level of productivity can be affected by many factors other than technology. The divergency reflects long-lasting cross-country differences in technological progress rates. These facts are very important when they are taken into account the possibility of international technology transfer and the "advantage of backwardness" (Gerschenkron 1952) being related with technological laggards. That is, the further a country falls behind the world's technology leaders the easier it is for that country to progress technologically by implementing new technologies and this advantage should be enough to stabilize the proportional gap that separates it from the leaders. This is situation that happens in neoclassical models, technology transfer is instantaneous (Mankiw, Romer and Weil, 1992), and in models where technologies developed on the frontier are not "appropriate" for poorer countries (Basu and Weil, 1998; Acemoglu and Zilibotti, 2001), in models where technology transfer can be blocked by special interests (Parente and Prescott, 1994, 1999) and in models of country with institutions that impedes technology transfer (Acemoglu, Aghion and Zilibotti, 2002, (Aghion, Howitt and Foulkes;2004: 1-2) Aghion, Howitt and Foulkes (2004), explore that financial constraints

prevent poor countries from taking advantage of technology transfer and this situation causes some of them to diverge from the growth rate of the world frontier. They introduce credit constraints into a multi-country version of Schumpeterian growth theory with technology transfer.

As Cohen and Levinthal (1989) and Grifth, Redding and Van Reenen (2001), each act of technology transfer requires an innovation on the part of the receiving country, and in technology investment is a necessary input to the process of technology transfer.

In the nineteenth century England Economy grew in line with innovations in competitive market. USA and Germany learned from England by developing new products and processes. The Otoman Empire and India could not learn or created technology and stained backward. In the 20th century, late industrialised countries learned technologies instead of created it. These countries accomplished economic development by learning and copying technology. The first country was Japan in learning and copying the technology. By using this technology Japanese production became exportable. The production of these goods are similar to Cummings reverse (V). But, certain a while Japan gave up technology copying and began to create technology and lost its fast growth ability. Technology copying switched to the other countries in the region. Technology copying is important in Hong-Kong, Taiwan, Singapure and South Korea. Lately, Maleysia, China and India follow these counries. Since the major factor in Japanese miracle is imitating technology, it is to be asserted that some of the emerging countries including Turkey have wasted this chance by copyright laws and consumer protection laws. Copyright, intellectual property and consumer protection laws are obstacles in this context. In these perspectives, an important point is the Washington Consensus. The Washington Consensus advocates the removal of development in international trade, the liberalization of capital flows and the creation of a strong patent regime regulating technology transfers and intellectual property. In 1990's a large number of countries were adopted this reform, but not all courtiers, for example, the policy followed in India, the "Delhi Consensus" avoided liberalizing the capital account, down played the speed of reforms, and relied little on external resources. From this point, it reveals that some emerging countries lost this oppurtunity by signing copyrights, consumer protection rights. These measurements hinder economic development

In order to see the influence of technology copying, transformation in the structure of the manufacturing industry must be examined. In Japan, Germany and the USA, the share of high-tech industries in the industrial added value was 27-30% in 1960s. Constantly increased to 27-39 in mid-1990s. In Korea, this rate was 5%, in 1963, in 1970s rose rapidly to 27%. In Turkey and Mexico this rate was 5% in 1990s it was ended up with 9-10%. Turkey and Mexico have similar conditions (Lal: 2000). As it is seen in the Table 15, below, the share of high-tech products in exports decreased or retained constant between 1985 and 1996 such as Turkey, Argentina, Brazil, India, Argentina. Hong Kong, Singapure, South Korea, Taiwan, Indonesia, Maleyzia, Tayland, China doubled their shares or more.

It must be noted that it is very difficult to copy nowadays technology. Increasing complexity of the technologies, biotechnology, nanotechnology and space technology made copying harder. Industrialisation based on science, new technologies, restrictions and/or support in front of them are very important in the context of economic development such as legal limitations, bribery, violance, sabotages, and bureaucracy. The common point in all these limitations is, increasing adoptation cost of the new technology. Japan, France, West Germany and Asian Tigers succedded to come up with these restraints after the World War II.

Table 16. The Structure of Commodity Exports in Developing Countries

	1985 (%)				1996(%)			
	Resource Intensive	Inferior Technology	Medium Technology	High Technology	Resource Intensive	Inferior Technology	Medium Technology	High Technology
Turkey	22	62.3	13.4	2.3	17.5	63.9	12.8	5.7
HongKong	2.1	64.3	14.2	19.3	4.4	52.7	14	28.9
Singapure	42.3	10.8	14.6	32.3	12.7	7.9	14	65.4
Korea	7.8	59.9	12.2	20.1	9.4	28.4	26.6	35.7
Taiwan	8.7	57.3	13.3	20.7	5.1	33.9	20.2	40.9
Indonesia	72.2	19.2	5.9	2.8	34.9	41.9	8.5	14.7
Maleyzia	53.7	9.7	5.5	31.0	17.8	13.1	8.7	60.4
Tayland	42.1	38.2	6.6	13.1	14.5	35.6	13.5	36.3
China	11.7	57.1	21.8	9.4	9.8	56.3	13.4	20.6
India	40.3	46.1	10.6	3.0	31.1	52.3	13.1	4.4
Argentina	67.5	15.6	11.8	5.1	49.1	18.8	28.8	3.3
Brazil	32.6	33.3	27.1	7.1	25.6	31.8	34.0	8.6
Mexico	20.2	15.0	29.2	35.6	7.1	20.9	35.2	36.9

For China 1990 figures used for 1985
Source: Lall 2000

IV. Real Wage Effect and Labor Productivity

In growth process, factor productivity, primarily labor productivity is important. Wage rates directly/indirectly determine productivity and international competition. Effective wage theorists reveal that high wages increase productivity, but during the first years of industrial revolution it was not. (the studies emphasize the relation between productivity and wages; Akerlof and Yellen: 1986, Yellen 1984, Leibistein:1957, Salop 1979; Shapiro and Stiglitz 1984). Hall (1986), Alexander (1993), Hondroyiannis (1997), Dibooğlu and Enders (2001), Marcellino and Mizon (2001), Welfe and Majsterek (2002), Brüggemann (2004), Wakeford (2004), Christopoulos and Tsionas (2005)). During the industrial revolution, working hours were too long, wages were too low, working conditions were bad. There were no labor unions, or any protective measurements for labor (See, Table 17). These conditions cause to decline in production costs. England also used slavery trade to decline production costs. France and Germany could not had the same conditions as England had. They had troubles in creating labor class in Germany and France which was the important factor for retardation in industrial revolutions.

In 19 century, transport costs had a sharp decline. Real freight rates fell by an enormous 1.5 percent per annum between 1840 and 1910 (Rourke and Williamson: 1998, ch. 3). These situations triggered a divergence in real wages and living standards until the mid of the century (Williamson 1996). According to standard trade theory, factor prices converge (or diverge) far faster than does GDP per capita or GDP per worker. (Williamson: 1998;1-3) By the end of the late 19th century, there were huge gaps in real wages and living standards between the Mediterranean Basin and the industrial core in Northwestern Europe. Even, there were huge gaps around the Mediterranean itself. Real wages earned by Spanish workers were almost twice those earned at the eastern end of the Mediterranean and the difference between northern Italy and in the rest of the Mediterranean was even bigger, ranging from four times in Egypt, 2.5 times in Turkey, 2.7 times in the Italian South and 1.4 times in Spain. Real

wages in northern Italy were higher from a third to a half of those in Britain, the fifteen or twenty years in between allowing for some impressive catching up in the Italian North and for Edwardian crisis in Britain. Spain and central Italy were tied for second, both not much more than a third of British real wages. Portugal was next, at about one quarter of Britain, with Serbia and Turkey not too far behind.

Table 17. Real Wage Performances in the Meddittereanean Basin

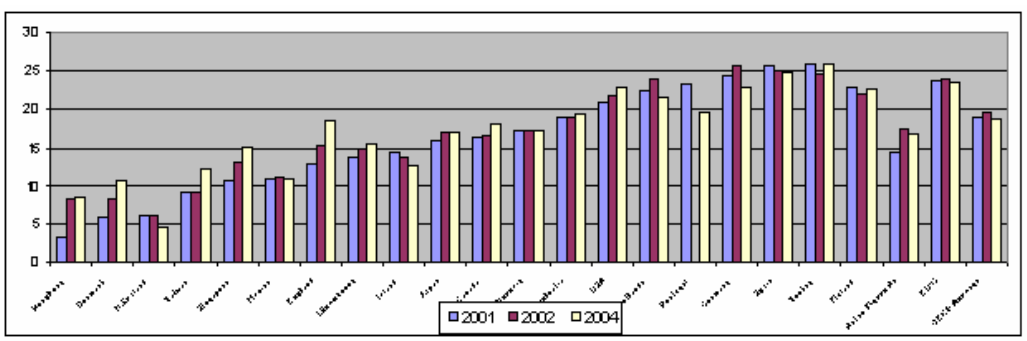
Real Wage Performances in the Mediterranean Basin
By Decades 1870s - 1930s

Decade	Spain	Italy	Portugal	Turkey	Serbia	Egypt
A. Relative to Great Britain						
1870s	39.7	37.3	28.7	30.4	33.6	11.9
1890s	37.0	37.7	33.6	31.9	30.4	13.5
1909-1913	38.7	34.7	34.6	31.6	31.3	13.8
1930s	61.5	49.1	33.9	18.3	18.3	9.6
B. Relative to the United States						
1870s	23.3	22.2	17.0	12.3	15.1	7.1
1890s	18.2	23.4	15.6	14.7	13.6	9.3
1909-1913	21.9	20.9	13.9	12.2	12.0	7.6
1930s	32.0	23.6	13.4	8.4	8.3	5.1
C. Relative to Average of Britain, France and Germany						
1870s	43.1	41.0	32.7	33.3	39.2	13.0
1890s	33.3	46.3	28.9	28.9	33.1	16.9
1909-1913	43.9	61.0	37.9	34.4	34.0	13.7
1930s	73.7	37.8	30.3	18.0	18.3	11.3
D. Relative to Average of Britain, France, Germany and USA						
1870s	36.5	34.6	26.5	19.0	23.6	11.1
1890s	27.5	36.4	24.0	22.3	20.8	14.0
1909-1913	35.1	49.5	32.3	19.5	19.2	12.3
1930s	54.9	43.7	23.0	14.4	14.4	8.6

Source: Williamson, 1998

To Willamson (1998), the variety in growth performance is considerable. Between the 1870s and the 1890s, two countries were catching up, and both of them were in the east. Turkey and Egypt both recorded real wage growth almost double that of France, Germany and the United States, and a quarter more than Britain. And Italy caught up, but not as fast as Egypt and Turkey.

With the second globalisation, wage rates ensured serious advantages, again. Multi-national companies switched their production to the countries with lower wages, and had important advantage in costs. The most of the fast growing companies following the 1980, had great cost advantages from low wages. The other payments out of wages raise the cost of worker.

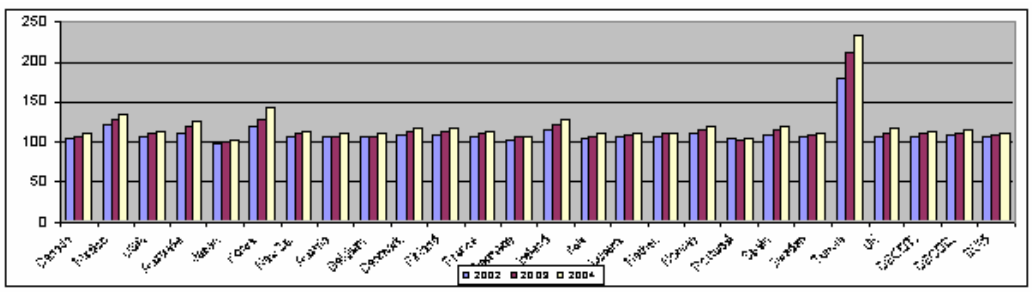


Source: USA Bureau of Labor Statistics, www.bls.gov, For Turkey TİSK.

Figure 6. The share of the Burden of employment in Total laborforce cost, 2004 (%) (Payments for taxes and premiums on behalf of labor are excluded),

Figure 6 shows the share of the burden of employment in total laborforce cost in 2001, 2002, and 2004.

To see the cost of the worker for the firm, hourly earnings can be compared. In Turkey hourly earnings are high. Figure 7 shows hourly earnings for several countries. Hourly Earnings data refer to gross earnings per production worker. Total earnings comprise: direct wages and salaries for normal time worked or work done and remuneration for time not worked, other payments such as bonuses, premiums and indemnities and social contributions. In the figure, it is emphasized that OECD and EU countries has the lower ratio than Turkey.



Source: OECD Main Economic Indicators, 2005b.

Figure 7. Hourly Earnings.

The productivity of workers is another important indicator for development level. Japan, Germany, South Korea has the most increase in labor productivity. In 1960s, labor productivity in Japan was lower than Germany. At the end of the 1970s, Japan passed Germany, at the beginning of the 1990s caught Germany. In 1963, labor productivity in Korea was high in medium and inferior technology industries,1300, 1140 and 930 $(as a percentage of 12, 7, 8%). The same year in Turkey 2440$, 2370$,and 3720 $. The relative labor productivity fluctuates in Turkey, but had permanent increases in Korea. The Figure 8 shows labor productivity in several countries in 2005.

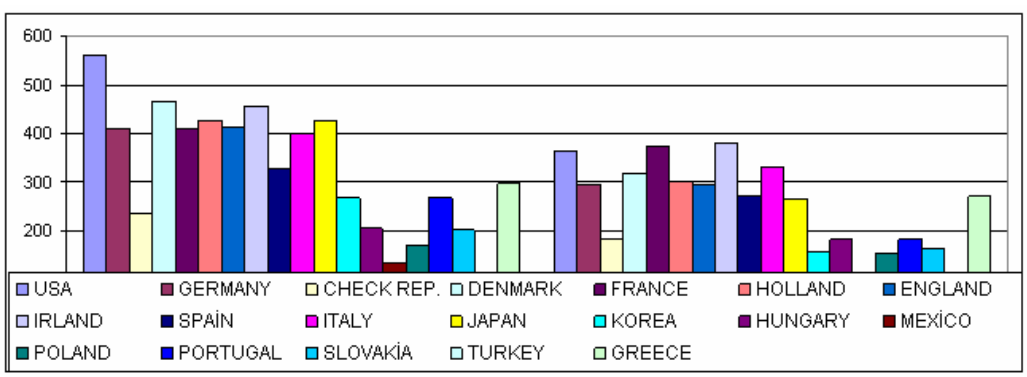


Figure 8. Labor Productivity in OECD Countries in 2005.

In Ireland, labor productivity is 3.8 times(283%) higher than Turkey. The difference was 67% between two countries.

V. Investment in Human Capital

The influence of human capital on the first globalisation period is limited. There was no noteworthy development in human capital, literary rate was 50% for adults. But there was a serious development in the working conditions. The importance of human capital has been discussed after the World War II. The role of human capital in economic development is emphasized in endogeneous growth theories. The human capital is a strategic source of countries. The biggest addition in welfare is a well-educated, talented, scientific and managerial people. According to Harbison(1978), human is a basic richness of the country. Human is a production factor that shapes capital, social economic and political organisations and accomplishes economic development.

According to expanded neo-classical model, human capital was added as an explanatory variable besides labor force and physical capital. It is accepted that this model could depicts disparities in growth performances among countries (Mankiw et.all; 1992). Nelson and Phelps (1966), Romer, (1990), Aghion and Howitt, (1992) have assumed that human capital is necessary for the discovery of new technologies and thus its stock is permanently related to the growth rate of output. Micro-economic studies of human capital based on Mincerian human capital earnings, functions suggest significant returns to education. Jorgenson et al., (1987); Young, (1994, 1995) provide some additional support to a significant growth impact of human capital accumulation, In particular, while the initial stock of human capital matters, the evolution of human capital over time is not statistically related to output growth as Benhabib and Spiegel, (1994); Pritchett, (1996), and Topel, (1999).

Education level and literacy rate is important for human capital and economic development. Turkey and Spain are good exampels. Turkey and Spain had closer populations but educational rates are different. Turkey had 4950 $ per capita income with 1995 prices in 1970. Similar to Portugal for the age 25 and above, education period is 2.4 year. Ireland and Spain have closer income levels, but education period is longer in Ireland.

Even, increasing literacy rates in Turkey, it dropped back of these countries. Literacy rates are 97.6% in Spain, 97.3% in Greece, 92.9% in Portugal, and 86.5% in Turkey in 2000. Turkey has the lowest female literacy rates with 78%. Literacy rates of women have a serious role in the determination of the economic growth.

Recently, researches on the relations between economic growth and genetics mostly concentrated on the relationship between IQ levels and economic development. If IQ is low, economic development level is low. According to Lynn ve Vanhanen (2002), the differences between economic development levels depend on disparities among the IQ levels of the countries. Genetical differences determine economic development levels. The basic reason of disparities in Per Capita incomes is genetical differences. The IQ level of society and economic success interrelated. Jones ve Schneider (2004) propose that %1 increase in IQ level raise national income 16%. While IQ levels rise, convergence among the countries realised. For example Kenya's IQ level increases three times (Bildirici and Kökdener:2007)

Table 18 shows the IQ results of the countries. Hong-Kong, Korea, Japan, Taiwan, Singapure and China have IQ level above 100.

Table 18. The IQ Levels of the Countries

Above 100 IQ
Hong-Kong 107, Korea 106, Japan 105, Taiwan 104, Singapure 103, Austria 102, Germany 102, Italy 102, Holland 102, Sweden 101, Switzerland101, Belgium 100, China 100, New Zeland 100, England 100
Between 100-90 IQ
Hungary 99, Poland 99, Australia 98, Denmark 98, France 98, Norveg 98, USA 98, Canada 97, Check Republic 97, Finland 97, Spain 97, Argentina 96, Slovakia 96, Uruguay 96, Portugal 95, Slovenia 95, Israel 94, Romania 94, Bulgaria 93, Irland 93, Greece 92, Maleyzia 92, Albania 90, Turkey 90
Below 90 IQ
Brazil 87, Iraq 87, Mexico 87, Somalia 87, Lebonan 86, Filipins 86, Cuba 85, Morocco 85, Fiiji 84, Iran 84, Marshall Islands 84, Porto Rico 84, Egypt 83, India 81, Ekvatore 80, Guetemala 79, Barbodos 78, Nepal 78, Quatar 78, Zambia 77, Congo 73, Uganda 73, Jamaika 72, Kenya 72, South Africa 72, Sudan 72, Tanzania 72, Gana 71, Niger 67, Gine 66, Zaire 65

According to Lynn ve Vanhanen (2002) the most critized point of World IQ calculations is a decline in IQ levels. The IQ level of the World is 91.64 in 1950, went down to 90.80 in 1975, 89.2 in 2000. It is calculated 87.81 for 2025. Even though there is a decline in IQ levels, growth rates do not drop.

IQ levels and a performance of the country introduced as an explanatory variable for revealing disparities in economic development levels. In order to have more convenient explanation, this variable must be taken with the other criterions.Why the countries between 100-90 level did not have the same development level? India is one of the rapidly growing countris has 81 IQ level.

VI. Population

The ampiric studies which question the relationship between demoFigureic change and economic growth, focused on the relationship between age composition and growth performance. New studies show that there is a positive relationship between economic growth and aging. Another important result was there is a negative relationship between increases in birth rates and economic growth. This result justifies neoclassical postulate that increases in birth rates cause to switch investment to ensure capital for new workers, instead of increasing per capita amounts for per worker.

The difference between real per capita GDP and hypothetical per capita GDP is calculated from Madison (2002; 2001). Hypothetical per capita GDP is calculated according to the population of countries under the scenario that they had a population growth rate equal to that of England's in the period 1950–2002. Their current GDP's (GDP's in 2002) are divided into these calculated populations.

Table 19 shows the differences between calculated and real per capita GDP's.

Table 19. Differences Between Calculated and Real Per Capita GDP for Selected Countries (1950–2002)

Australia	20,851	Costa Rica	16,109	Kenya	3,245
Canada	19,639	Bahrain	19,087	Lesotho	1,923
United States	15,683	Iran	11,814	Liberia	1,899
USSR	1,612	Turkey	9,808	Libya	8,101
Armenia	4,997	Yemen	5,593	Madagascar	1,378
Azerbaijan	3,437	Algeria	5,561	Malawi	1,547
Kazakhstan	6,191	Benin	3,105	Mali	1,231
Kyrgyzstan	2,989	Botswana	9,392	Mauritania	1,320
Lithuania	1,228	Burkina Faso	1,221	Mozambique	2,074
Moldova	1,314	Cameroon	1,814	Namibia	8,963
Russian Federation	1,034	Cape Verde	2,370	Niger	1,324
Tajikistan	2,824	C. African Republic	872	Nigeria	2,700
Turkmenistan	5,878	Chad	792	Reunion	6,948
Uzbekistan	8,180	Comoro Islands	1,353	Rwanda	1,371
Argentina	6,866	Congo	4,715	S. Tomé and Principe	1,612
Brazil	9,881	Côte d'Ivoire	4,844	Senegal	3,180
Chile	10,990	Djibouti	5,618	Somalia	1,329
Colombia	9,682	Egypt	5,472	Sudan	2,778
Mexico	14,057	Equatorial Guinea	10,385	Swaziland	6,308
Peru	7,272	Eritrea and Ethiopia	1,079	Togo	1,539
Uruguay	2,094	Gabon	5,886	Tunisia	6,130
Venezuela	25,370	Gambia	3,053	Uganda	2,145
Bolivia	3,846	Ghana	2,784	Zambia	1,552
		Guinea	1,064	Zimbabwe	3,016

Source: Maddison; 2007. For further information see. Bildirici and Sunal: 2007.

VII. Democracy, Political Stability and Instability

Is there a relationship between democracy and economic growth. Democracy caused rapid economic growth in Europe. Dictatorship and military powers have often seen in developing countries. Revolutions and political resistances are experiences of these countries, such as Latin America, Tailand, Pakistan, Sudan, Nigeria.

Since 1932, there were 13 constitution modifications, 17 coups and uprisings in Tayland. In Italy, 57 goverments were set up since World War II. In Africa, and Latin America, long-lived goverments could not succed economic development. For example, even though the same person have been in power between 1967 and 1997, the economic growth rate was negative. Even, there were frequent military interventions in Tailand, there was not any change in private property rights and economic growth indicators were positive. So, the confidence to the stability of economic policy is more important than political regime. If political instabilities do not cause uncertainity in property rights, capital outflow and in invesments , the influence on the economy will not be too much.(Ali: 2001 ; 86 96,97, 105)

a. Political Stability and Instability

There are several factors determine growth performances of the countries. Socio-political stability and/or instability must be serious one. Socio-political stability is low in the unsuccessful countries while it is relatively high in Taiwan, Hong-Kong, South Korea, Japan and Singapure which is called growth miracles.

Population structure, ethnicity, minorities, religious oppositions, terror, civil war, the structure of the parliament, polarization in the parliament, strikes, lock-out, political massacres are the parts of the socio-political structure.

Homogeneity in population structure results in fewer social clashes than heterogeneity in populations. Etnicity and religious clashes affect economic development efforts. Homogeneity in population affects development performance positively.

The importance of ethnic structure was seen in transition countries. Homogeneous societies came up with transition problems better than the other countries. Bulgarian minority is moslem Turkish minority. In Baltics, There are vast religious disparities. For example Kazakhstan has 8 million population, 50.4% is Kazakh, 2.18% Russian, 4.43% Ukrainan, 2.26% Uzbekh, 1.91% German, 1.75% Tatar, 0.92 white Russian. The similar composition is effective for the other countries (Balbay:1999; 149, 211-212).

An Asian Tiger Maleysia is a sample for heterogenous structure. During the colonial years under the British administration, for operating the rich natural resources, a lot of workers were brought from China and India which transformed the society's ethnic structure. These groups did not go back to their countries and had 42% of Maleysian population. 23 million of Maleysian population divided into Muslim Malays(58%) , Budist and christian Chinese(28%), Hinduist Indians(10%).

India, Afghanistan, Pakistan, Iran, Iraq have heterogeneous social-political structure and high political instability which goes in line with minority problems, but the existence of minorities does not always a factor restrainting economic development. In the USA, Germany, France, Holland, Canada, Australia, minorities have not affected economic growth negatively, but with low wages positively. The important point is if an existence of minorities causes clashes and discontent, this will affect political stability negatively.

b. Political Instability and Terror

Terror, domestic conflicts and civil wars cause different results according to wars. Following the World War I and II, economic growth speeded up. But, Iran-Iraq, Afghanistan-Pakistan wars did not cause similar results because of the ethnic and religious clashes in the administrations. Wars had two effects on economies. First, economy was renewed. Second, defence industry had two effect on economic growth, one exclusion of private investments, second increasing aggregate demand. The relationship between defence expenditures and economic growth is called "Benoit Hypothesis." Benoit (1973, 1978). Macnair and others. (1995), Blomberg (1996), Brumm (1997), Murdoch and others (1997), Landau (1996) and Dakurah and others (2001) found supporting results for Benoit Hypothesis. Biswas and Ram (1986), Alexander (1990) and Huand and Mintz (1990, 1991) did not found any statistical significant relationship between defence expenditures and economic growth. Smith (1980), Deger and Smith (1983), Cappelen and the others (1984), Faini and the others (1984) and Deger (1986) found negative relationship between defence expenditures and economic growth.

Terror, domestic conflicts, civil wars, and wars raise defence expenditures and the resources spend on defence. If countries could succed economic growth leading by defence industry, such as Israel, could increase economic growth rates. If country meets its defence needs by imported equipments, it export its resources outside the country, such as Turkey. Turkey, Iran, Iran, Brazil, Chili, Argentina, Azerbeycan import defence technology from outside which affects economic growth negatively.

Terror, domestic conflicts, civil wars cause socio-political instability. As a result of this, low or instabile growth rates, high inflation, budget deficits, high interest rates, increasing goverment borrowings, decline in investments, increasing unemployment, high population growth rates bring many problems. The research on development, concentrated on instable political regimes showed that it brought a slower economic growth. Eren and Bildirici (2000) found that political instabilities by increasing budget deficits and domestic borrowings influence economic growth negatively. In Berthélemy, et.all, (2002) paper's for 22 African countries over the ADB 5 sub-regions of Africa, political instability has resulted in a reaction from the authorities in the case of Côte d'Ivoire during 1996, for Zimbabwe in 1998 and for Egypt and Chad throughout the period. Nigeria and Zimbabwe displays a situation in which the hardening of the regime clearly explains the occurrence of political troubles. Political instability has a direct negative impact on the accumulation of private investment that is highly sensitive to the institutional environment and the performance of the economy.(Berthélemy, et.all: 2002; 15,18)

c. Political Instability, Property Rights, Goverment Expenditures, Debts, and Tax Structure

Some of the studies on negative relationship between political instabilities and economic growth focused on property rights. Barro and Sala-i Martin (1995) discussed the uncertainity of general condition of sustaining output ownership. Svensson (1998) examined the relationship among individual incentives for investment, protection of property rights and political instability. Stevens(2000) developed formal model for investments under the uncertainity. Aron (2000) proposed intuitive formulation for the relationship between quality of the institutions and political instability for developing countries. Berthelemy et.all (2002) concentrated on accumulation and deteriation of production factors in efficiency.

Some studies focused on goverment expenditures, political instability and development. The effects of political instabilities and uncertainities on the allocation of the goverment expenditures were examined. Political instabilities create distortions in tax justice and efficiency. The structure and elasticity of taxes also examined in this context. The studies on Argentina, Brazil, Uruguay, Chile found that there was a close relation between political events and inflation.(Agénor and Montiel: 1996;536) Polarized political parties, strong labor movements, intrust in working conditions, demands for redistribution increase instabilities in macro economy. Increasing political instabilities brings about high goverment expenditures. The share of goverment expenditures in total income is 50% in developed countries, 25% in developing countries. In 1960s, in OECD countries it was 27%, while in 1996 48%. The share of goverments in the economy expanded beyond traditional functions (Gwartney, Holcombe and Lawson, 1998: 164). In developed countries, the largest part of the goverment expenditures is transfer expenditures, while in developing countries goverment enterprising has primary place. In these countries, goverments tries to move resources and accelerate growth (Soubbotine and Sheram, 2000:61).

In this respect, another important point is the quality of goverment expenditures. In the last decade, growing literature has begun to focus on the growth implications of unproductive government spendings, and whether such expenditures can induce structural breaks in growth (see Levine and Renelt, 1991; Easterly and Rebelo, 1993; Turnovsky and Fisher, 1995; Tanzi and Zee, 1997; Ghate and Zak, 2002; Romer, 2003). In the context of welfare state economies, fiscal choices induce structural breaks in the growth rate of an economy in two ways. First, unproductive government expenditures hinder growth because such expenditures are less-than-perfect substitute for private consumption in the aggregate and cause to decline of private savings and economic growth . A related channel adds a political economy an explanation to declining investment and growth because of a rising welfare state. Since, politicians determine government expenditures, fiscal flows reflect political objectives . Second, in the long run, growth is affected adversely because higher welfare state spending is financed by higher taxation which generates an economic inefficiency (Fic and Ghate 2005; 571).

The increase in income tax causes a decline in the return of investments, and affects private sector investments and capital accumulation (phsical and human) negatively and decreases growth rates. But, as Mexico, Brazil, Turkey, and Argentina, political instabilities create distortions in tax systems, increases in tax rates cause to fall in tax revenues, but expand unregistered economy. High political instabilities bring about high tax rates but low tax ratios, such as inTurkey. While tax rates increase, tax revenues fall. There are various reasons behind this but, indirect taxes are preferred instead of direct taxes in segmented and polarized parliament. Under the increasing political instabilies, people do not want to pay taxes. The unequal structure of the tax structure increase budget deficits in these countries. Public borrowings and seigniorage revenues are influenced from this. The share of public debts goes up not just in developing countries, in developed counries also. FTPL theory made connections between inflation and public debts (FTPL approach developed by Leeper (1991), Woodford (1994, 1995, 1998, and 2000) and Sims (1994) exhibit a relation between domestic borrowing and inflation. (For analysis on the issue for Turkey see Bildirici ve Ersin; 2005; 2007, and for Brazil see Loyo; 1999).

In emerging countries, the problem is not a high debt ratios, but interest rates. Repeating economic crises raise interest rates and inflation. Interaction between them influence real interest rates. In OECD countries, Belgium, Italy and Greece debt rate is 100%, in 2000; net interest rates to GNP ratio is 8%. In Turkey it is 23.2%. the total internal and external debt stock to GNP is 51.2 in Turkey 55.7 in India, 90 in Pakistan, 114.4 in Belgium, 64.5 in Denmak, 20 in Germany, 112.7 in Greece, 34.8 in USA. The share of interest in public revenues 58.7 in Turkey, 55.7 in India, 90 in Pakistan, 16.7 in Belgium, 10.8 in Denmak, 7.3 in Germany, 38.4 in Greece, 11.2 in the USA. These data shows that debt stock is not a problem, but interest rate. Borrowing with short-term high interest rates increases inflation. The countries had disparities in debt interest rates under the crises. For example, the USA was the biggest lender in the 1980, but the borrower of nowaday. But it did not have the negative effects of the borrowings, such as Argentina, Mexico, and Turkey. The USA has strong economy, low interest rates, has high returns from overseas investments. But in emerging economies, interest rates are high, foreign exchance market is highly flexible, and capital markets is shallow. New borrowings are made for repayment of debts and interests. In this perspective debt-export ratio must be examined.

For emerging countries, debt-export ratio shows fragility of these economies. Between 1970 and 1980, debt-export ratio was 214.6 in Argentina, 281 in Brazil, 25.5 in Chile, 271.1 in Mexico, 80.7 in Venezuela. Between 1991-95 they are 393.2, 295.9, 153,215.9, 194.3. Between 1970-80 4.1 in China, 185.8 in Endonesia, 135 in South Korea, 42.6 in Malesia, 168.8 in Filipins and 77.2 in Tayland. Between 1991-95 döneminde sırası ile 83.3, 214.1, 4.4, 43.5, 174.5 ve 88 (Baer, Miles and Moran, 1999:1738). The high rates in less developed countries is interesting.

Bildirici and Ersin (2007) pointed out that the increase in domestic borrowing interest rates raise inflation and that cause foreign borrowings and vicious circles. IMF did not take into account these conditions in its policy propositions. In 1970's and 1980's, IMF suggested stabilization packages generated shrinkage. These packages, which further deteriorated the income distribution, caused application problems, for example exchange rate based stabilization programs are considered as an alternative to decrease inflation. Such policies were implemented primarily in Chile, Argentina and Uruguay in 1970's and after 1985; heterodox policies are implemented in Argentina and Brazil. The success of the policy depended on capital inflows and liberalisation of capital movements. In this framework, liberalisation of foreign trade increased capital inflows and with appreciating currencies, inflation was decreased without bringing excessive burdens on the budget 1990's, pegged FX policies and Washington Consensus were popular.

Countries which are like Turkey, Chile, Brazil, Peru, and Romania are advised to implement inflation targeting in decreasing inflation. But the result of inflation targeting is based on the appreciation of currency and widening current account deficits. (For results of application in countries, see Marfan; 2006, Mnyande, 2006; Fachada, 2006; Roman, 2006; Leiderman, 2006; Özatay; 2006). The important point is that the part of inflation is caused by the rise in the cost of domestic borrowing is overlooked. In countries with similar structures, inflation will decrease with the decrease in the cost of domestic borrowing. The most important problem in inflation targeting is the appreciation of local currency by transition to flexible exchange rate system. These countries finance USA in some sense like in countries where Washington Consensus was accepted. In countries where the cost of domestic borrowing is high, the result is overvalued exchange rate and financing of USA.

d. Political Instability and Unregistered Economy

In emerging economies with democratic system, political instabilities increase unregistered economy. The rising interest rates of goverment bonds, malfunctioning tax system, tax escape, tax evasion feed unregistered economy. Unregistered economy also increase political instabilities and hinder economic growth. Growing unregistered economy brough about low economic performance in development process.

In 1999, unregistered economy was % 47.9 of GDP in Kyrgyz Republic. In 2000, it was 26.8% in Kazakhstan. Georgia's shadow economy was the largest, at 64 percent of GDP; Russia's was 44 percent of GDP (OECD, 2004). 1998–99 in Africa, Nigeria and Egypt had the largest shadow economies, equivalent to 77 percent and 69 percent of GDP, but South Africa, had a shadow economy of only 11 percent of GDP. In Asia in the same period, Thailand ranked number one with a shadow economy of 70 percent of GDP; Hong Kong SAR and Singapore had the smallest shadow economies, both at 14 percent of GDP. In Latin

America in 1998-99, the biggest shadow economy was in Bolivia, at 67 percent of GDP, and the smallest was in Chile, at 19 percent.

Among the transition countries of central and eastern Europe in the same period, Bulgaria's was at 11.1 percent of GDP in 2000, and Slovakia's and Czech Rebuplic's the smallest, at 7.3 percent and 5.6 percent. There are a small unregistered economy in transition economies which had transition process completed without problems.

In the 21 OECD countries in 1998–2002, Turkey and Italy had the largest shadow economies, at 37 percent and 16 percent of GDP. In the middle group, the Scandinavian countries, and at the lower end were the United Kingdom and Australia, at 1.5 percent and 3 percent of GDP, Belgium at 3.5 percent and Canada, at 3 percent.

In emerging countries, socio-political instabilities are high. The population structure, ethnic and religious roots, war, civil war, terror, corruption were the basic factors of failureness of the countries. High and/or hyper inflation, high rate unemployment, increase in unhappiness index, budget deficits, unequal income distribution, high public spending, inefficient tax structure develop in line with political instability and cause vicious circle and make harder to transform economy.

e. Globalisation, Nation State and Political Instabilities

Globalisation processes questions the state notion which brought about and increase political instabilities. Political instabilites augmented discussions on the concept of state.

On the one hand, globalisation influences human rights and democracy positively, on the other hand sharpens inequalities and cultural differences and set up identity is less and weakens the power of nation state. The reference of all these in the political and cultural areas is global economy. Globalisition manages to weaken national identity by influencing the goverments and some groups to think over the frontiers, in this case, even, defence of the country is defined by reference to the global economy (Falk: 2001;210-211).

In this process, goverments give up stressing on national identity, but emphasizing on ethnic and religious identities and weakning national identities in developing countries. The demands of minorities increased but most of the EU countries don't regocnize some minority rights, try to strenghten its nation states.

Micro-nationalism developed in line with globalisation process, which brought about break down of nation-states. The number of new nation-states increased from 150 to 200 at the beginning of the 1980s. Multi-cultural policies rejected by EU countries which were imposed to developing countries. Multi cultural policies were began to discuss following the 1970. Canada and Australia implemented multicultural policies instead of assimilation (Will:1998; 43). Multi cultural policies began to discuss in 1990s. In England, even though the share of multi cultural groups are over the 6 % of the society, conservatives do not think that English society is multi cultural. The people from Karaips and South Africa are accepted as minorities, but gall and skotch people are not. France has a lot of , but do not accept multicultural policy. (Şan:2005; 14) In Holland, multicultural policies banktrupted in 2004, and it is gave up. Germany also rejected multicultural policies.

As conclusion, globalisation without colonization of nation-states includes colonization paradox. This creates political instabilities, and ethnic-religious conflicts, terror, nationalism which resulted in establishment of small states, wars and political alienation.

f) The Role of Religious Terror Organisations in Underdevelopment and High Political Instabilities in Islamic Countries

Social, ethnic and religious divisions are much more in islamic countries than the others. There is a low economic growth in these countries. Religious rules, seriat, inequalities between women and men, intolerance to women rights, corruption are the top problems of these countries. There is a need for democracy, but authoritative administrations restrict this. The main factor of restriction in democratization is not a islamic rules but, fear factor that dictatorian regimes use. In anti-democratic conditions radical conservatives and religious terror organizations can survive. In this context, religion, ethnic conflicts, political violance, war and riots will be examined closely.

g. Religion

Religious structures of countries is important in explaining instability and especially political instabilities. The most effective religion among the developing countries is Islam, which is the religion of a very large majority of the peoples of countries, the role of Islam in these cultures is not uniform and but to be important in the perspectives of militant religion opposition.

In these countries, militant religion opposition is very important. In Tajikistan, religious fundamentalism has caused important problems in transition period. When considered within this framework, religious and ethnic wars between Cechnia-Russia, Abhazia-Georgia, Armenia-Azerbaijan are of great importance. (Eren and Bildirici :2000; 3-10)

Militant religion opposition to the governments is seen as a factor constraining the governments' reform and development strategies. An important militant religion opposition movement to be analysed in this context is Taliban in Afghanistan that is seen as an important movement in Central Asia. As Boroumand (2002), the other one is the Jamaat-e-Islami-e-Pakistan that is founded by Sayyid Abu'l-A'la Mawdudi in 1941 and remains an important political force in Pakistan.

The Taliban Movement is the rising situation not only within Afghanistan, but also within Pakistan, Turkey, Saudi Arabia and Central Asia. It is clear that the rise in religious conservatism in Pakistan provided the basis for the rise of the movement. Today, some religious conservatives within Pakistan see the Taliban as important and support for their own cause in Pakistan. The basic division regarding the relationship between religion and the state pits those who see the existence of Pakistan as necessary to protect the social, political and economic rights of Muslims, and those who see it as an Islamic religious state (Islamic in Asia;2003).

In transition countries, Militant religion opposition to the governments as a factor constraining the governments' reform and development strategies. This new level of inter-state cooperation cause mitigation of the most antidemocratic tendencies in the region. (Gleason:2001;118-131; Gleason:2002;193-206.). An important movement to be analysed in this context is Taliban. The Taliban movement is seen as an important movement in Central Asia. The Islamic Movement of Uzbekistan (IMU) in Kunduz in northern Afghanistan is important. The fall of 1999 by an IMU contingent to fight its way from Tajikistan to Uzbekistan and an ensuing hostage-taking in Kyrgyzstan raised fears in the region that separatist movements in the region may take a more religion colour. Moreover, the Taliban actively supports the Chechen insurgents and is the only country to have recognized Chechnya's independence.

Pakistan with effects of domestic and international developments was pushed in the direction of a more religious state. The other important point is that the Iranian revolution has impact on Pakistan. At first, much of Pakistan society and some mainstream Islamic parties accepted the Iranian revolution as a true Islamic revolution. But, it lost support amongst Pakistani's majority but found some support among the conservative Shiite groups in Pakistan. Conservative Sunni regimes supported Pakistan's Sunni groups who began to oppose the Iranian revolution. This situation exacerbated tensions between Sunnis and Shiites.

The most serious religious division at present is the increasingly intractable strife between Sunni and Shi'a militants. An estimated two hundred people were killed in Sunni-Shi'a clashes in 1996. Both external and internal factors influenced the majority Sunni and minority Shi'a communities' descent into violence. Among the foreign influences are important Saudi Arabian and Iranian support for rival groups, the impact of the Iranian revolution, and the role of Afghanistan, a base for international Islamist militancy and as a source of the proliferation of illegal arms. This growth in Islamic militancy is linked to increasing incidents of harassment of members of minority groups such as Christians and Ahmadis. (Evans:1997; 3) In addition to, the war in Afghanistan exacerbated internal religion tension. Not only did the war lead to an increase in the flow of arms but it also caused a major shift in the attitude of religions conservatives in Pakistan.

Hindu-Muslim violence that is other important point within Pakistan has been on the rise since the late 1970s. There was a relatively low and stable rate of violence between the India-Pakistan. Hindu-Muslim violence does not appear to be an internal security concern threatening to the entire country (Islamic in Asia;2003) India-Pakistan dispute has expanded between Muslims and Hindus. There are many Muslims in India and Pakistan.

Rather than Islam, the main causes of the India-Pakistan disputes are competing nationalisms and the asymmetries of power between the two countries. Similarly, the Kashmir dispute is outgrowth of these competing nationalisms.

h. Ethnic Heterogeneity

The problem of minorities has caused great problems. Analysed countries are to varying degrees multi-ethnic with the varying share of the majority population. Regional and ethnic differences have a great effect on instability. India is an extraordinarly diverse country. There are schisms of every kind, religion, ethnicity and language. Iran, one of analysed in this paper has very different relations with a wide range of peoples; Arab, Turkic, Russian, Afghan, Central Asian, South Asian. Iranian society, with its mixture of Persian, Islamic and Western is in transition along a number of different axes: traditional-modern; religious-secular; ideological-rational; and tribal-individual. (Middle...; 2003)

Ethnic heterogeneity in Iraqi has very diverse with wide range people, Arab, Turkmen, Kurdish. And Afghanistan, Afghanistan's population is composed of Tajiks, Uzbeks and Turkmen's and Afghanistan is a country riven by ethnic divisions made even deeper by linguistic, sectarian, geoFigureic, and other cleavages because since Afghanistan has long been a crossroads connecting central, south, and southwest Asia, its ethnic groups spill over its borders. (Godson: 2003; 83-84) These ethnic links have very important impact on the security of the countries. Especially in an age of increased global ethnic awareness, the ethnic

milieu of Afghanistan is affected by the cross-border ethnic linkages. (Cornell and Sultan;2000). And these ethnic divisions have hardened in recent years, especially since 1998, when the Pushtuns who ran the Taliban began deploying their Pakistani and Arab allies to carry out ethnic cleansing against the northern minorities. In Iran and other regional actors championed their ethnic clients within Afghanistan. (Goodson:2003;90)

The population of Pakistan is 75% Sunnis and 12% Shiites In Pakistan, ethnic tensions remain a significant problem, the problem is not so much "old-style" provincial separatism. For example, tensions in Baluchistan focus on the Baluchi-Pushtun divide. The most serious ethnic conflict is the long-running strife in Sindh between muhajirs descendants of Muslim refugees from India and rural ethnic Sindhis. (Evans:1997; 3) Other ethnic tensions in Pakistan are latent. But actual and potential conflicts distract the government in Islamabad and absorb resources needed for social and economic development.

In the context, other important point is the state's identity and can be quite distinct from national identities of the local population. The identity approaches are interested with understanding concept of Arab identity. The contemporary possibilities are limited by history and relate to statism, Islam, and Arabism. In perspectives of Arabism, the most important factor is the common Arab language and state-centered nationalism. A wide range for political identity groups, trans-Jordanian nationalists, Palestinian nationalists, liberals, and Islamists compete with each other. Iran provides to consider the implications of identity in the aftermath of revolutionary change. Arabism has competed with an Iraqi national identity. The Shiite and Kurdish response rejected any plan for unification in the Arab world.

Ethnic heterogeneity is very important factor that is cause to political instability. The problem of minorities has raised great problems that even amont to massive destructions in transition periods through religious, ethnic or sometimes both factors. These issues have deepened transition problems in countries because a major characteristic of republics in paper is their ethnic heterogeneity. All republics are to varying degrees multi-ethnic, with the share of the majority population. Republics have ethnic linkages to each other: Kazakhstan, Kyrgyzstan, Uzbekistan and Turkmenistan are all Turkish-speaking nations; but Tajikistan differs by its Persian ethnic and cultural roots. The people of Tajikistan are predominantly Persian rather than Turkish origin. Ethnicity in Kyrgyzstan and ethnic minorities in the region. Kyrgyz 52.4 % Russian 18.0 % Uzbek 12.9 % Others 16.8 % In Azerbaijan, it is Azerbaijan 82 %, Russian 6% and other %12. The figures in Uzbekistan are: Uzbek 71% and Russian 11% of population. Turkmens constitute 72% of Turkmenistan population. (Eren and Bildirici :2000; 4-9)

Regional and ethnic differences have a great effect on the turmoil in republics. Especially, through the early 1990s, the concerns of non-Central Asian minorities were also politically significant in Tajikistan. Russians, who comprised under eight percent of the total population, and smaller groups of others (including Ukrainians, Germans, Armenians, and Jews), labeled collectively "Russian-speakers," had been increasingly dissatisfied with life in Tajikistan even before the escalation of political tensions. In Kazakhstan, Kyrgyzstan, there are Russian-speaking populations; especially Kazakhstan's continued existence in its present shape could be put into question should it decide to embark on a more nationalistic, anti-Russian path. Kyrgyzstan is a small country that shares this problem; moreover it is vulnerable to it's neighbours, China and Uzbekistan. Most members of these nationalities either supported the anti-reformists or emigrated. The emigration turned into a mass exodus by 1992 with the outbreak of civil war.

Another point in Tajikistan and Uzbekistan is definition problem. Bukhara and Samarkand, which Tajiks consider their most important cities historically, were assigned to Uzbekistan. Leaders of the new Uzbekistan tried to Uzbekify the Tajik minority. These issues have remained sore points between Tajiks and Uzbeks to the present. During the height of the civil war, most Uzbeks in Tajikistan sided with the anti-reformist coalition and some took an active part in the fighting. (Atkin:1999;175-203)

In addition to these problems, there is Afghanistan's problem. As Cornell and Sultan (2000), a quarter of Afghanistan's population is composed of Tajiks, Uzbeks and Turkmens. Moreover, Kazakh, Kyrgyz and Uzbek communities also exist in Xinjiang. These ethnic links have a considerable impact on the security of the concerned states. Especially in an age of increased global ethnic awareness, the ethnic milieu of Afghanistan is effected increasingly by the cross-border ethnic linkages. These linkages are at times further strengthened by geopolitical and economic interests of stakeholders and actors in the region.

Other minority problems rose in Azerbaijan. In 1989 the soviet of the Nagorno-Karabakh autonomous region raised its autonomy, with the support of nationalists in Armenia. After transation, tensions between the Armenians and Azerbaijanis developed into open warfare between the two states. By October 1993 approximately one-fifth of Azerbaijani territory was under Armenian control. This is particularly the case between Armenia and Azerbaijan, where discord has led to the virtually complete displacement of ethnic Armenians from Azerbaijan and vice versa (Nichol and Kim:2001;.3-16). The war in Chechnia and hightened tension between Armenia and Azerbaijan over the Nagorno- Karabakh enclave has added volatility to the Caucasus region during 2003.

i. Security, Civil War and War

There are terrorist attacks, civil war and war and it is surrounded with instability in these countries Iraq, India, Afghanistan, Iran and Pakistan. The causes of instabilities in countries were the existence of nuclear weapons in Israel, India and Pakistan, Israeli-Palestinian conflict, movement of the Taliban, Iraq-USA war, civil war in Afghanistan and Pakistan, violence in India and India-Pakistan and Pakistan-Afghanistan dispute. In regional security perspectives, there has been tacit cooperation between Iran and the USA. Another important point, in this perspective, Iran that has suffered from terrorist acts, particularly from the Taliban, is say that a state-sponsor of international terrorism is reject. In Iran perspective, three of the top security threats to Iran in recent decades have been Iraq, Afghanistan, and Israel (Middle...;2003)

Afghanistan has experienced civil war and political instability since Soviet-invasion, the traditional ethnic balance of power came to an end. The institutional sources of power, including the army and the state ministries, as well as the social foundations of power, all became casualties of the long war. In recent years, power has devolved to the level of local identity groups and subtribes. New sources of power have emerged, including armed Tanzimat (militias) made up of ex-mujahideen who control portions of the illicit economy. (Goodson:2003; 84)

The Afghan was harder to defeat the Taliban. Most important causes are produced in Afghanistan's long war, an armed Islamist movement composed largely of young men from the Pushtun ethnic group, the notional border between Afghanistan and Pakistan. The Taliban

took Kabul in 1996, and by the fall of 1998 controlled but the northeastern of the country, where a dogged Northern Alliance of minority forces (primarily Tajiks, with some Hazaras, Uzbeks, and Pushtuns) hung on under the leadership of Ahmed Shah Massoud. (Goodson: 2003; 86-87) During most of 2001, the Taliban controlled approximately 90 percent of the country. On October 7, 2001, OEF, a U.S.-led coalition, began military action aimed at toppling the Taliban regime and eliminating the al-Qa'ida network in the country. There was no functioning central government from 1996 to 2001, when the Afghan Interim Administration (AIA) took office. There was a peaceful transfer of power from the AIA to the Transitional Islamic State of Afghanistan (TISA). (Afghanistan Country, 2003) Pakistan initially developed close ties to the Taliban regime and offer strategic depth in any future conflict with India, and extended recognition in 1997. This policy was not without controversy in Pakistan. Pakistan altered its policy by closing its border and downgrading its ties.

And other problem is Afghanistan's relations with Iran. The relations have fluctuated, with periodic disputes over the water rights. Relations deteriorated. Iran supported the Afghan resistance and provided limited financial and military assistance.

For security, it is very important India-Pakistan relations and the dispute for Kashmir. While the history of Hindu-Muslim relations had a major impact on the creation of two independent countries after the British withdrew, the India-Pakistan dispute has expanded far beyond animosity between Muslims and Hindus. (Islamic in Asia;2003).

The exacerbate of tension in this regional has important effect of Afganistan and Israel, especially with its policies towards the Palestinians.

And India, in 1991 first cautioned against the Gulf War and temporarily maintained relative neutrality. This was itself a shift away from its support for Saddam Hussein even after he invaded Kuwait, but the US prevailed upon India to signal its support for the war by refueling US warplanes on Indian soil. In America's war against Iraq, it supports a USA.

All problems analysed in the paper must created political instability and will investigated effect of political instability on growth. While hot wars that characterized the region, Georgia-Abkhazia, Armenia- Azerbaijan and the civil war in Tajikistan have all cooled. In Central Asia there is an extension of the conflicts of the Afghanistan civil war. Over the past few years the cultural confrontations that emerged from the war have become intertwined with Russia's imbroglio in Chechnya and, more recently, with the separatist movement in Xinjiang-Uigur Autonomous Republic of China.

Security of region states is relationship with situation of the other one. Uzbekistan's security is conditioned upon the situation in Afghanistan and Tajikistan, both being some of the most unstable and volatile states in Eurasia. Uzbekistan is a 'front-line state'. Moreover, substantial numbers of Uzbeks reside in certain regions of both states, whereas numerous Tajiks live in Uzbekistan. Ethnic Uzbeks hold important positions in the economies of Central Asian states and given the rise in ethnic awareness in the post-Soviet era.(Cornell S.,2000,p.125) Uzbekistan holds a number of assets: beyond those mentioned, it lies at the geoFigureic center of Central Asia, bordering on all regional states but not, significantly, on Russia. (Starr:1996;83-94)

The anti-government uprising in Hujand, Tajikistan, in November 1998 showed that the conflicts of the Tajikistan war had not been resolved by the Tajikistan peace accord. Uzbekistan was bombed by terrorist in Tashkent in February 1999. In this situation, in Kyrgyzstan, Security issues, reemerged with the onset of the Tajikistan war reemerged in

summer 1999 with a hostage crisis. In August 2000 a new hostage crisis in Kyrgyzstan refocused attention on the country's vulnerability. In September, an military force had penetrated into Uzbekistan within 100 kilometers from the capital.

Uzbekistan is the target of terrorist organizations, especially the IMU and has announced that its goal is to overthrow the Uzbekistan government. In Uzbekistan, legitimate political disagreement and political extremism, that is, political instability was increasing.

Other important point, In 1996 China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan commenced a diplomatic dialogue concerning their common west Asian borders. On April 26, 1996, the Presidents of the five border countries met in Shanghai to sign a package of fourteen agreements on border issues. The agreements included both economic and security measures relating to common borders. The "Shanghai Accord," as it soon came to be known, constituted a breakthrough in establishing a framework for border normalization in the west Asian region. The Shanghai Five (China, Kazakhstan, Kyrgyzstan, Russia and Tajikistan) now present a Tajik military units have policed the Tajikistan border with Afghanistan. It was seen Afghanistan-Tajikistan border as a porlous through which terrorism, weapons and drugs penetrate on route to destinations in Eurasia and Azerbaijan was entangled in a war with Armenia over Nagorno-Karabakh. The period from 1993 to 1996 can roughly be termed Azerbaijan's hard road to stability. After the Azerbaijani armed forces, suffered severe military setbacks in the fall of 1993, Armenian forces occupied the whole area between Karabakh and the Iranian border. In May 1994, as a military stalemate developed between Azerbaijan and Armenia, a cease-fire was signed. In 1995, coup attempt, this time organized by a leader of the interior ministry forces, was averted; since 1996 has Aliev had control over the country. (Cornell:2001;120)

And in this countries, There are physical mistreatment of defenders by police, and law enforcement agencies' use of psychological harassment, including prolonged solitary confinement, public denunciation, intimidating, and intrusive police surveillance, and threats of arrest. All these problems have severely affected the region's political and economic development.

j. Political Violence, Predation of Opposition

The politically motivated violence, coups or attempted coups, and ordinary crime heightened the sense of insecurity in republics. Parliaments and constitutional courts have been disbanded, elections are rigged and civil rights are systematically suppressed. (Eren and Bildirici:2000;3-13; Eren and Bildirici:2001) This is very important for instability. For example in Uzbekistan during the first decade of independence, politics has been far from pluralistic or competitive. The political process is carefully monitored and controlled. Restrictions on the electoral registration process make it possible for the government to exercise a determining influence on the pre-selection of candidates. In theory, the judiciary is independent, but in practice, the capacity of the judiciary, being an independent branch of government is limited. The Constitution describes the legislature as the highest organ of power, in the country has a unitary. In reality, the branches are not coequal or balanced; the executive branch is dominant in virtually all matters. (Gleason:2001;12)

Especially Azerbaijan is very vulnerable and it has suffered several coups or attempted coups. A constitutional referendum in 1995 granted Azerbaijani President Heydar Aliyev

sweeping powers. He has arrested many of his opponents. The 1995 legislative and 1998 presidential elections were married by irregularities, according to international observers. The 1998 presidential election was very important. At first, the regime issued an electoral law that was rejected by both the OSCE and the opposition, which decided to boycott the elections. In response to the OSCE's criticism and after a dialogue with the opposition, the Aliev regime reformed the electoral law and abolished press censorship. These changes won the OSCE's approval.(Cornell.S, ,2001,p.118-131) In late June 2000, the Parliamentary Assembly of the Council of Europe (PACE) approved Azerbaijan's membership, conditioned on its compliance with commitments, including holding a free and fair legislative election. Although international observers also judged January 2001 legislative run-off elections as seriously flawed (Nichol and Kim: 2001;3) In elections in Republics presented a crucial opportunity to change this state of affairs. But they produced another rubber-stamp parliament, through electoral fraud and opposition boycott.

Conclusion

Development process is a complex result of various variables. In this study, beginning conditions and natural resources, globalization, structural transformation and technology, real wage effects and productivity, investment in human capital, population, democracy, political stability and instability is examined. Especially, the role of political instabilities questioned with special reference to the islamic countries.

Twentieth century had two World Wars, a lot of regional wars, revolutions, independence movements, economic crisess, technological revolutions. For the economists, twentieth century has rapid economic growth and second industrial revolution. Between 1950 and 2001 per capita growth rates fort the Western hemisphere 2.8%, fort he rest of the world 2.2%. In this period, some of the Asian countries could catch the Western countries. Between 1950 and 1973 the fastest growing country was Japan with 5.94 times more than previous period. Western Europe 2.51, Eastern Europe 2.35, Africa 1.6. Japan caught Europe, Western Europe caught the USA in this period. Following 1973, growth rates declined all over the world. Asia except Japan had the fastest economic growth performance in this period. 2.61 times over world growth rates(1.47). the lowest growth rates with 0.76 former USSR(Maddison, (2002:p.52).

Since 1973, fixed exchance rates, planning, social security programs were dumped flexible exchance rates, stocks markets, international capital and commercial activities had got importance, internal and external debts increased. The USA and Europe had the advantage of globalisation processes mostly but, the USA grew more rapidly than Europe between 1995 and 2001.

The negative implications of globalisation are burdened by the people of developing countries. Globalisation policies sometimes distorted social structure of the societies. In this process, world financial system gain enourmeous rent, and a serious amount of income transfers was realised from developing countries to the developed ones. Some corporations profits exceeded the GDP's of some developing countries.

In the first and second globalisation periods, income of all countries did not increase but some of them. The rest of the world had the costs of globalisation, social violance,

nationalism, minority rights and etc. accelerated differences and increased the social discontent.

As conclusion, in the globalisation process not every country can gain. The growth performance of the countries are relatively different. There is no common recipe for development. Depending on the political structures, traditions, institutions, economic resources, development performance of the countries differ. The political stability is very important to set up rational processes in a society. It seems that generating rational processes in every step of the social, political and economic order is crucial point.

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Chapter 8

BALANCE SHEET EFFECT OF CURRENCY CRISIS: EVIDENCE FROM INDONESIA

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Abstract

The 1997 financial crisis in Indonesia changed dramatically the destiny of the country. Before crisis, Indonesia was a prosperous country with a very promising future. But crisis changed this good direction. Unfortunately, until nowadays there is no consensus about the main sources of the crisis. After ten years of Asian crisis, it is still unclear what are really the roots of crisis; whether internal fundamental economic system rather than global financial system has to be responsible to this turbulence; whether the macro factors rather than micro factors propagate the mechanism; whether it is liquidity problem rather than solvability problem of the economy; whether corruption and political governmental system is responsible, and so on. It is in the above context that this paper seeks to the explanation of the evolution of Indonesia economic system.

The aim of the paper is to contribute to the lively debate by two steps of analysis. Firstly, it shows the sequence of events of the Indonesia's economy starting from financial liberalization in the 1980s until recently, in order to understand the relationship between financial globalisation, national deregulation and institutional development in Indonesia. It emphasises the evidence that following a financial liberalisation, huge foreign capital was circulating in such a situation in which supervision and regulation were not well-established. As a consequence, risk taking behaviour and self-fulfilling responses emerged when shocks originating from external source were entering in the country. It is probably the "main story" (mechanism) of the 1997 financial crisis in Indonesia. Secondly, the paper argues that financing policies of the firms are central in propagating financial crisis. The perspective of "Balance Sheet Effect" is preferably considered for better understanding of the corporate borrowing behavior in the relation with macro economic fluctuation. The accounting data covers the period 1994-2004 and includes all non-financial sectors but excludes the financial sector, since the debt structure of banks and investment institutions is not comparable to that

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in other sectors. Macro indicators are taken from International Finance Statistic (IFS) provided by International Monetary Fund (IMF). By this data, we investigate the relationship between the financing choice of the firms and their vulnerability in the mid of macro economic fluctuation. In other sense, this paper takes into account the impact of macroeconomic fluctuation on firm performance where capital structure choices might play a pivotal role in the mechanism.

Key words: capital structure, financial crisis, firm vulnerability, performance, Indonesia

The truth is that nobody really imagined that something like the Asian financial crisis was possible, and even after the fact there is no consensus about why and how it happened
….irrelevant events caused a self-fulfilling loss of confidence, and conventional macroeconomic remedies were not available

(Paul Krugman, 1999a)[1]

1. Introduction

For most scholars, financial crisis in Asian regions is neither predictable nor understandable even until nowadays. The citation from Krugman above represents the immediate responses from most scholars due to Asian fluctuation. In several countries, like Indonesia -where crisis hit severely- responses to the crisis seem to be "trial and error", since the causes and than the remedies are far for clear. The consequence is that government's policies were very often unfit with the actual problem.

Basically, there are two principal explanations concerning with the causes of the Asian crisis. First approach named a fundamental view (Corsetti, Pesenti and Roubini 1998) accentuates on the structural imbalances rooted deeply in the countries experiencing crisis far before the crisis hit. Second approach referred to as a self-fulfilling or panic view (Redelet and Sachs 1998) which more concentrates on the behavior of economic agents facing the great movement of exchange rate in this region. According to this view, the panic of liquidity holders should be an explanation why severe crisis happened in such a performing economy.

These two perspectives seem to be conflicting, but they actually describe both sides from the same coin. Meanwhile structural imbalances in economy happened in most Asian countries, the reaction of economic agents (self fulfilling prophecy) in the herd behavior pushed countries to the depth and width of crisis. Krugman (1999b) reveals the opposing approach to the crisis as a dispute of argument between "fundamentalist" and "self-fulfilling" crisis stories. However, both mechanisms were really present in such a severe crisis.

Besides on the divergence perspective, some regions around the world, such as Mexico and Latin American region with Tequila effect, Russia and the Central European region and Asian countries (Thailand, Indonesia, Malaysia, Philippine and South Korea) were experiencing the financial crisis in 1990s. There is a serial of crisis in the world in the post financial liberalization era.

For Asian countries, especially, there is a listing causes of crisis, such as imprudent banking system, lack of transparency, misguided investment subsidies and loan guarantees,

[1] See http://web.mit.edu/krugman/www/MINICRIS.htm

external deficits, fixed exchange rate, poor financial regulation, excessive borrowing abroad, and so on.

Krugman (1998), for example, focuses on the links between moral hazard and over-investment in the presence of asymmetric information of the financial sector. He argues that government's implicit guarantees drives investors' moral hazard by ignoring the prudential decision making in lending policies, both in banking and corporate sector. Stiglitz (1998) notes that premature financial sector liberalization within a weak institution becomes a main source of crisis in many Asian countries. Liberalization in financial sector is perceived as one of the most important factor to explain the financial crisis in Asian region.

In monetary perspective, the Tequila crisis and the East Asian crisis in 1997 raised questions on the role of exchange rate and monetary policies in the context of crisis management in emerging market economies (Goldstein & Turner, 2004). In previous period, with the conventional open economy models *à la* Mundell-Fleming, exchange rate depreciations are assumed to have an expansionary effect on domestic output. But Asian crisis shows the opposite effect.

In conventional wisdom, when countries face a contraction of foreign demand or a reduction of international liquidity, monetary authorities should reduce domestic interest rates and let the exchange rate depreciate in order to stabilize output and inflation. However, this conventional result may be reversed when domestic firms carry substantial amounts of un-hedged foreign currency (dollar) debt in their balance sheets and the cost of external funds decreases with net worth (Cowan, Hansen & Herrera, 2005). According to them, a depreciation of the local currency inflates the value of debt, deteriorates net worth and increases the cost of external finance. Holding all else constant, the weakening of balance-sheet positions prevents firms from investing and expanding their production.

In the context of the economy where firms are highly leveraged in dollars, the expansionary effect of depreciation of the local currency may be reversed. The main channels for the real exchange rate to affect country risk are external and domestic balance sheet effects, stemming from the sudden increase in the stock of external or domestic dollar-denominated debt, respectively (Berganza, and Herrero, 2004).

This paper aims at to describe two pivotal points of Asian crisis within the liberalized financial system taking on the context of Indonesia's economy. First, since 1980s Indonesia's economy experiences progressive deregulation and liberalization, especially in financial sector that pushed corporate sector access foreign loans easily. Liberalized financial system gives an important positive impact in growth since the lack of capital can be covered. But unfortunately, liberalized financial system in Indonesia leads to the fragility. Financial crisis in 1997 destroyed either good performing economic growth.

Secondly, this paper proposes to understand the linkage of macro and micro variables of crisis, especially by exploring the balance sheet effects perspective. Balance sheet effects allow understanding how bad debt denominated in foreign currencies in corporate sector can amplify the exchange rate crisis. Meanwhile in the same time, great depreciation of local currency make worse the leverage of corporate sector and than banking sector.

2. Financial Liberalization and Crisis

2.1. Experience of Indonesia

Indeed, recent financial crisis is like a jet plane crash; it is spectacular and dreadful. The following parabolic statement of Lawrence Summers – former US Treasury Deputy Secretary--, as cited by Roubini and Setser (2004)[2], describes well the impact of the financial crisis on the whole modern economy.

> *"The technology of modern finance, like a jet plane, lets you get to your destination faster than older transportation technology. But the rare crashes that occur along the way are also more spectacular"*

For Asian countries, including Indonesia, the 1997 financial crisis changed dramatically the destiny of the region and countries. Before the crisis, this region was praised as one of the most important economy in the world. Jackson (1999) reminded that from 1945 – 1997 the Asian economic miracle fuelled the greatest expansion of wealth, for the largest number of people, in the history of mankind. At that time, an "Asian Century" or "Asian Decade" was prognosticated in which by 2020 Asians were expected to produce 40 percent of the world's GDP, while U.S. and European shares would recede to 18 percent and 14 percent, respectively (Jackson, 1999)[3]. But the dream did not come true. Asian miracle has changed abruptly in just a couple of months to Asian sick, which subsequently devastated the Asian dream.

The East Asian currency crisis began in Thailand in late June of 1997 and spread contagiously with high rapidity around neighbouring countries, such as Malaysia, Philippines, South Korea and Indonesia. In the last quarter of 1998, all of East Asian currencies lost significant value comparing to the U.S. Dollar.

Meanwhile, until 1997, just before financial crisis, Indonesia underwent a high economic growth accompanied by fairly good macro economic indicators, such as balance of payment, capital account, reserves and inflation. It is therefore questionable why such a huge crisis happened in such a fairly impressive macro economic performance in Indonesia and in other countries in South East Asian region.

This chapter starts the research by introducing the historical background of Indonesia's economy by accentuating on the financial liberalization, institutional development and the mechanism of crisis.

Financial crisis in Indonesia could not be separated from the financial liberalization has taken place progressively in the 1980s. Financial system history in Indonesia, however, just started in the year 1966 when the commercial banks were born. It can be said that before 1966 a financial system in Indonesia hardly existed, a fact commonly attributed to economic

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2 See Nouriel Roubini and Brad Setser. 2004. *Bailouts or Bail-ins? Responding to Financial Crises in Emerging Economies*, Institute for International Economics, Massachusetts, Washington DC. US.

3 See Karl D. Jackson (ed). 1999. Asian Contagion: The Causes and Consequences of a Financial Crisis, ISEAS, Singapore.

disruptions like the consecutive runs of fiscal deficit and hyperinflation under the Soekarno Administration (Hamada, 2003)[4].

According to Hamada, the Indonesian financial system developed in five phases from 1966 until recently. The first period (1966-72) was its formative period, the second (1973-82) its policy based finance period under soaring oil prices, the third (1983-91) its financial-reform period, the fourth (1992-97) its period of expansion, and the fifth (1998-2002) its period of financial restructuring.

In the first wave of financial system development, Parliament of the Republic of Indonesia engaged with the legalization of banking system in Indonesia. Law 14/1967 on the Principles of Banking is legalized by Parliament to redefine the roles of banks and improve access to credit. The law characterized the banking system as an instrument of national development to improve economic growth, equitable distribution of wealth, and national stability (Hofman, Rodrick-Jones and Thee, 2004). One year later, the Parliament issued Law no.13/1968 to authorize Bank Indonesia as a national Central Bank.

Liberalization policies in Indonesia have been excessively implemented in the 1980s, due to the sharp declines of oil revenues in the late of 1982, and again in 1986[5]. In the financial-reform period, some policies were taken to liberalize the financial market through several deregulation and liberalization policies. On June 1, 1983 the first banking deregulation package was issued including (a) the lifting of credit ceiling for all banks that had been imposed in 1974, (b) the elimination of deposit interest rate controls on state banks, and (c) the phasing out of Bank Indonesia liquidity credit. The main impact of the banking reform is the increased freedom for banks to mobilize deposits in support of new lending.

On October 27, 1988 government of Indonesia launched the second major policies package for bank deregulation. These reforms had the main goal to enhance financial sector efficiency by encouraging competition and increasing the availability of long-term finance by promoting the development of a capital market.

Hofman, Rodrick-Jones and Thee (2004) describe that the policy package of the October 1988 policies[6] entailed (a) an easing of restrictions on the opening of new private banks, bank offices, and non-bank financial institutions. This included permitting joint ventures with foreign banks, allowing domestic banks to open offices throughout Indonesia and foreign banks to open offices in major cities, and permitting rural banks to establish themselves on districts outside the provincial capital; (b) another significant banking policy enabled state-owned enterprises to place up to 50 percent of their total deposits with private banks. Removing barriers to entry resulted in the opening of a large number of new private banks, both domestic and joint venture that would compete with public financial institutions[7]; and (c)

4 Soekarno is the first president of the Republic of Indonesia after its independence in August 17th, 1945, after having colonized by Dutch during 3.5 century. He was running his presidency until the succession of Soeharto as the second president in 1966.

5 Harris, Schiantarelli and Siregar (1992) identify two principal policies as the response of the end of the oil booms in Indonesia. First, non-oil exports had to be increased in order to maintain the flow of imports essential for continued development. Second, with the decline in oil revenues, fewer resources were available to the public sector and therefore it became necessary to stimulate private savings mobilization.

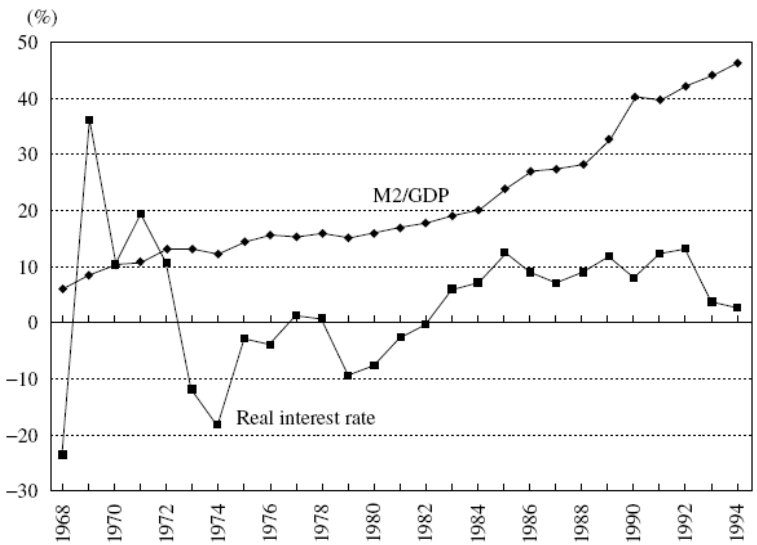
6 In Indonesian language, this policy is acknowledged as *"Paket Oktober 1988"* or *"Pakto 88"*.

7 Just 4 months later licenses had been approved for 7 new national commercial banks, 3 joint ventures with foreign banks and 47 secondary banks (World Bank 1989)

The package included a reduction in the required reserve ratios from multiple set rates that averaged 11 percent to a uniform level of 2 percent of all third-party liabilities[8].

Deregulation in October 1988 was followed by several aggressive policies taken in December 1988 and March 1989 with the main objective to accelerate the capital market development[9]. The reforms contributed to a burst of financial system in Indonesia. Domestic credit jumped from 3.9 trillion Rupiah in 1988 to 6.2 trillion in 1989 and 9.3 trillion in 1990 (up from just 1 billion Rupiah in 1984). Meanwhile, the number of banks increased significantly from 111 in 1988 to 171 in 1990 and 240 in 1994 (Sitorus and Srinivas, 2004).

Since financial liberalization, state bank raised both deposit and lending rates, leading to a sharp rise in the average real interest rate from -5.0 to 8.2 percent. Meanwhile, as shown in the following Figure (1), in 1983-87, the balance of deposits at all commercial bank rose sharply, by an annual average of 25 percent, and the balance of outstanding loans also increased by an annual average of 26 percent, with the ratio of M2 to GDP growing to an average of 23 percent from 15 percent in the preceding period (Sato, 2005).



	Period (Average)			
	1968–73	1974–82	1983–87	1988–94
Real interest rate (%)	6.7	−5.0	8.2	8.5
M2/GDP (%)	10.3	15.3	23.4	39.0

Source: Compiled by Sato (2005) based on Cole and Slade (1996, pp.10, 18)

Note: Real interest rate is the average of one-year deposit interest rate at state banks, deflated by inflation rate.

Figure 1. Real Interest Rate and Financial Deepening, 1968 – 94.

[8] This very low capital requirement reduced the intermediation costs for banks and increased the potential monetary expansion from any given increase in reserve money (Cole and Slade, 1996:23).

[9] Government basically relaxed the requirement for listing in Indonesian Capital Market. And therefore the number of listed companies rose from just 24 companies in 1988 to 306 in 1997.

Policy Package on October 1988 basically eased the capital requirement for bank establishment, which required only 10 billion Rupiah. Since the requirement of bank's establishment was relatively easy, the number of bank in Indonesia exploded tremendously[10]. This drastic increase is also due to the easy policy where a bank is free to open its branches in rural areas, so that they can absorb more money from the people.

This fast banking sector development has caused Indonesia belongs to one of the countries having the most banks all over Asia[11]. Meanwhile, this drastic increase of the number of banks was accompanied by unhealthy business competition and low respect to the prudential banking system. It was very common that the new emerging banks were owned by businessmen with poor knowledge on banking system and its operational risks. They even tended to use their banks as the 'business cashiers' for their business group (conglomerate). Given this fact, they had no real banker's way of thinking, which should be independent in nature -thinking and behaving independently is the main requirement for a banker. The banking sector in Indonesia was therefore growing with imprudent policies, which was very dangerous for the economic stability[12].

The fast development of banking sector was also accompanied by insufficient prudential regulations and supervision capacity of Bank Indonesia (BI) to deal with the rapid increase in the number of banks and branches. Therefore even after prudential regulations were subsequently introduced, problems such as the lack of enforcement of these regulations as well as weakness in the legal and regulatory framework remained.

It seems that although banking sector had grown at a fast pace, regulations and law enforcement remained poor or even was under-developed. For example, regulation on maximum legal lending limit had been violated by people and there was no enough punishment on this imprudent policy.

As a matter of fact, there had been some symptoms for unhealthy banks in Indonesia before the crisis came up. This following case can illustrate the real condition on banking supervision in Indonesia. In 1990, Summa Bank had a serious financial problem. At that time, its liabilities were US$ 750 million, having outstanding bad debt mostly on property, real estate sector and other related business. There was so much outstanding credit because the bank had violated the regulation on legal lending limit. For two years, Bank Indonesia as the central bank had only treated the bank persuasively by calling for the bank to settle or solve its problem, while at the same time the central bank kept giving or injecting the bank with the Bank Indonesia liquidity support. In 1992, when Bank Indonesia stopped injecting the financial aid, Summa Bank immediately collapsed. This typical case is repeated as a massive case when crisis hit and banks had a liquidity problem.

There was no sufficient legal punishment given proportionally to the bad banking practices. For the case of Summa Bank, none of the management and commissioners has been

[10] Total amount of private national banks prior to *Pacto 88* that was only 64 banks with total office of 512, at the end of 1996 increased to 240 banks with total operational offices of around 5,919.

[11] IBRA annual report, 2002

[12] "The drastic increase of asset percentage to 398 percent or average 57 percent annually within 7 years was regarded extraordinary and unbelievable. In normal banking system, an increase of by average 12 percent per year has been regarded aggressive," said by Robby Djohan, former CEO of some SOEs and banking practitioner, as written in his speech for Inauguration Day at a private university in Jakarta.

legally processed and brought to court[13]. It is therefore important to note that the fast development of financial system was not be accompanied by sufficient regulation and supervision from the monetary authority.

Since deregulation and liberalization, financial system has gone through substantial structural change during the last decades. One of important change is due to the emergence of private commercial banks. Until the 1980s banking sector in Indonesia was basically state-owned banks[14]. Furthermore, until the time of crisis, financial system in Indonesia was dominated by banking system (indirect finance) since capital market was not yet well developed.

In this following Table (1), it is shown the evolution of policies in both monetary and banking sector dealing with financial liberalization and supervision. We can see that the spirit of liberalization was taken place since 1983 and progressively in 1988, but the notion of banking supervision just emerged in 1991.

Table 1. Pre-Crisis Monetary and Banking Policy

Date of Issuance	***Main features***
1983 (June 1)	Abolishment of credit ceiling for banks Reduction of central bank liquidity credits Liberalization of banks' lending rates Reduction of reserve requirement from 30 per cent of total deposits to 15 per cent.
1988 (October 27)	Liberalization of bank licensing Liberalization of bank branching and freer activities for banks and non-banking institutions Simplified foreign exchange licensing procedures Liberalization of licensing for money changers Further reduction of reserve requirement for banks and non-banking financial institution, from 15 per cent of total deposits to 2 per cent Banks had to invest 80 per cent of their excess liquidity in Bank Indonesia certificates (SBI).
1990 (January 29)	Limitation of central bank liquidity credits for government programs; self-sufficiency in rice program, development of cooperative movement at the village level and farmers' enterprises Stipulating for banks to allocate 20 per cent of their credits for small-scale enterprises The development of banks and non-banking financial institutions as means for supporting national payment system and the central bank as the guardian of monetary policy and banking supervision

[13] The above case demonstrates that Bank Indonesia has no capability and decisive attitude to build strong institutional framework of banking system. At that time, the personal and "family approach" was more favourable rather than legal and law-based approach.

[14] At that time, Indonesia is characterized as the bureaucratic capitalism. See for example, Hofman, Rodrick-Jones and Thee (2004).

Table 1. Continued

Date of Issuance	*Main features*
1991 (February 28)	Improvement of banking supervision, including more stringent requirements for bank owners, management and commissioners of banks, with a new to professionalism and moral integrity Adoption of BIS standard on prudential measures, with a view to using band yardstick on measuring bank soundness by monitoring the capital adequacy ratio, assets quality, management, efficiency and liquidity (CAMEL).
1992 (March)	The enactment of the new banking law, law of the Republic of Indonesia no.7 of 1992 concerning Banking: improvement of banking regulation over Law number 14/1967
1993 (May 29)	Incentive to raise bank lending to fight economic sluggishness Improvement of various prudential measures, like CAR calculation, provisions for bad debts, rules on credits to SMS, and on legal lending limit
1994 (March)	Special audit for banks with problem loans Banks having large percentage of problem loans were required to set up their own team dealing with problem loans Bank Indonesia set up a forum dealing with problem loans and bad debts, comprising of the Chairman of the Supreme Court, the Attorney General, the Minister of Finance, the Minister for National Land, and the Governor of Bank Indonesia. One of the important decisions was to limit the court settlement of bad debts to 6 months. BI issued rules on minimum standards that had to be followed by banks in their lending. BI also issued rules on internal audit for banks. Bank Indonesia issued instruction for banks having sizeable problem loans to exercise bank restructuring, including the possibility for merger and sale to interested investors Rules for banks to submits their annual credit plan, including credit for property to the central bank Advancing concept of self-regulatory banking and the use of moral suasion Combining on-site and off-site supervision BI enforced its authority to determine the allowable amount for each bank to borrow internationally. The total amount of allowable foreign borrowing is determined with a view to the balance of payments position.
1994 (September)	Widening of intervention band, from Rp 20 to 30 per US$1 BI announcement of conversion rate was moved from morning daily to afternoon Raising the percentage of Net open position (NOP) from 20 per cent of bank capital to 25 per cent
1995 (January)	BI intervened in the foreign exchange market to defend the rupiah that was under pressure from the “tequila effect” by selling US$580 million.

Table 1. Continued

Date of Issuance	*Main features*
1995 (June)	Widening of intervention band from Rp 30 to Rp 44 per US$1
1995 (December)	BI raised the reserve requirement from 2 per cent to 3 per cent of third party funds in the bank, with an obligation for banks to put the funds in their Bank Indonesia accounts. The calculation of bank's reserve requirement was changed from once a week to one a day. Signing bilateral agreements of repurchases on securities, with the central banks of Malaysia, Singapore, Thailand, Hong Kong, Australia and the Philippines, respectively. The objective of the arrangements was to build deterrents against speculation on foreign exchange trading BI assisted the Ministry of Finance in supervising non-bank financial institutions Widening intervention band from Rp 44 to Rp 66 per US$1 BI issued instruction for banks to exclusively use their foreign loans for providing export credit
1996 (April)	Improving the national payment system toward an integrated system that would be safe and credible Widening of intervention band from Rp 66 to Rp 118 per US$1
1996 (July)	The sale of US$400 million Yankee bonds in the US markets. The bonds bore coupons of 7.75 per cent, which was equivalent to 100 basis point above T-notes. The sale was aimed at providing a benchmark for sales of Indonesian corporate bonds. Widening of intervention band from Rp 118 to Rp 192 per US$1. A spread between buying and selling rate that was widened from 5 per cent to 8 per cent
1996 (December)	BI introduced a rediscount facility for banks with export documents of priority commodity exports Introduction of rediscount facility for local L/Cs The issuance of Government Decree number 68, 1996 that provided rules on Bank Liquidation. There were two important rules that would better facilitate bank closure. First, in the process of liquidation, the liquidated bank could make a stipulation to prioritize payments to deposit holders. This was not possible under the general rule of corporate liquidation. Second, the bank owners is not allowed to initiate a liquidation process of his/her own bank
1997 (April)	The implementation of the requirement for banks to raise their reserve requirement from 3 per cent of third party funds to 5 per cent.

Source: Bank Indonesia, Report for the Financial Year, 1993/4-1996/7, and Binhadi, Financial Deregulation, Banking Development and Monetary Policy: The Indonesian Experience, (Jakarta: IBI, 1993); taken from J. Soedradjad Djiwandono, *Bank Indonesia and The Crisis An Insider's View*, (Singapore: 2005)

2.2. Transmission Problem

The major question regarding the Asian crisis is what the source of the economic fluctuation. Before answering this question, we have to remind that in the 1980/90s financial sector was evolving radically. One of the most momentous developments of the last ten years has been the liberalization of international financial markets (Eichengreen & Hausmann, 2003). And according to them, in practice, capital flow reversals have been associated with disruptive crises in Mexico, Thailand, Indonesia, Korea, Russia, Brazil, Ecuador, Turkey, Argentina and Uruguay, prompting the development of a literature on how capital flows and their composition can be an engine of instability.

Kaminski and Reinhart (1999), Sachs, Tornell, and Valesco (1996) Tornell and Westermann (2002a, 2002b, 2004) investigate intensively the links between financial liberalization and financial crisis. Financial liberalization in emerging market economies occurs with rapid integration process on the global financial market prevail enormous risk-taking behavior that will be followed by the increasing financial fragility and then macroeconomic volatility and leads to more frequent crisis.

In 1980s five Asian countries (Thailand, Indonesia, Philippines, Malaysia and South Korea), where economic crisis hit severely in the mid of 1997, implemented progressively deregulation and liberalization policies in several sectors. The partial reforms had led to increasingly fragile financial systems, characterized by growing short-term foreign debt, rapidly expanding bank credit, and inadequate regulation and supervision of financial institutions (Radelet, *et al*. 1998). It causes economy of five countries become more vulnerable and prone to crisis.

Theoretically, international financial liberalization softens financial constraints and improves risk-sharing, thereby fostering investment. This argument suggests that we should expect a positive correlation between international financial liberalization and economic growth (Bonfiglioli & Mendicino, 2004). But in other side, a country with bad fundamentals will definitely suffer a crisis and a country with good fundamental will not (Furman *et al*., 1998).

Calvo, Leiderman and Reinhart (1996) describe the positive and negative effect of capital flow from rich countries to poor countries. In essence this flow of capital will enhance the economic growth, standard of living, level of consumption, and also provide better opportunity of investment by diversifying the portfolio and support for pension funds as well. But negatively this flow could be dangerous in term of monetary condition because of a high capital mobility effect.

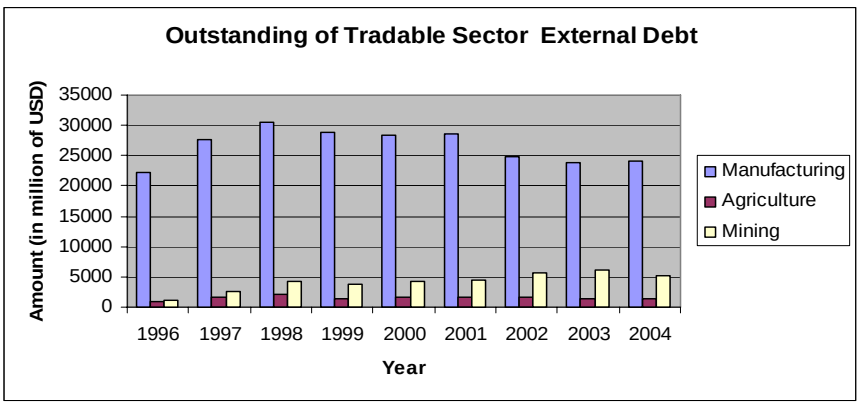
Furman *et al* (1998) indicate that net-private long-term capital flow to Indonesia, Malaysia, Philippines, and Thailand increased from 3.3 percent of GNP in 1990 to 8.3 percent of GNP in 1996. These were part of a wave of capital flows to developing countries, which increased more than six-fold, between 1990-1997: from 1.0 percent of developing country GNP to 4.1 percent. The swing of capital flow to Asian countries is based on the global context of capital market. In the early of 1990s the economic downturn happened in US, Japan and European countries. The declining of the US interest rate that reached the lowest level (since 1960s) in 1992 caused the capital flow to developing countries more attractive.

Basically, there are two principal transmissions of foreign capital inflow, debt and investment. Debt could be ordered by government (official foreign debt) and private sector (private foreign debt). Meanwhile investment taken place directly on market, either in the

form of Foreign Direct Investment (FDI) or investment in domestic capital market. Liberalization, in principle, is to open broadly the access of foreign capital to the domestic market, especially by private sectors. In the previous period, capital inflow mainly was conducted by government's official foreign debt. But in the liberalized financial system, corporate sector could access directly to global financial market.

Since 1980s, Indonesia opened rapidly domestic market to the global financial market, firstly by developing capital market. One year after banking liberalization, government relaxed the requirement for listing in Indonesian Capital Market. The number of listed companies rose from just 24 companies in 1988 to 306 in 1997. During more than one decade, Indonesia's economy has an impressive performance indicated by high growth rate, moderate inflation and relatively low interest rate.

In this chart bellow, between tradable sector (manufacturing, agriculture and mining), manufacturing have a majority proportion. It lead an explanation that agriculture is less developed than other sector in which manufacturing is most integrated to the global financial market.

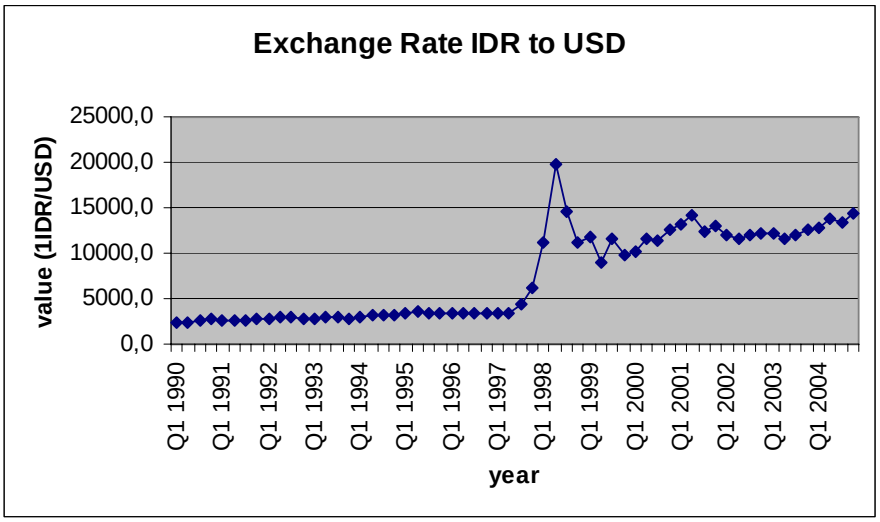


Source: Bank Indonesia, Indonesian Central Bank

Graph 1.

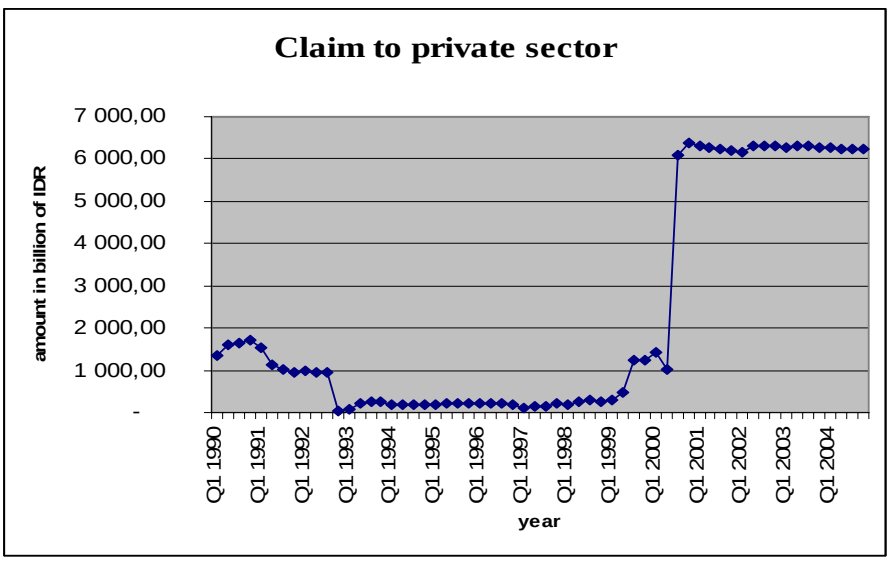
The history of crisis in Indonesia started on August 14th 1997 when the monetary authority (Indonesia Central Bank) decided to adopt a free-floating exchange rate policy. After that, Indonesian Rupiah (IDR) depreciated sharply to United States Dollar (USD); from 4,950 IDR/1 USD in December 1997 to 15,000 IDR/1 USD in June 1998. At that exchange rate, approximately a half of Indonesian corporations became technically insolvent. As the consequence, and to make matter worse, macro economic indicators in 1998 went worse in which Gross Domestic Product (GDP) contracted by 13 percent, meanwhile the inflation rate reached 58,5 percent.

The exchange rate crisis has direct and indirect impact to corporate sector. One most important transmission of macro crisis and micro crisis resides on the debt structure of firms. Since large of firms borrow directly to the foreign creditors, the great depreciation of the local currency have been collapsed debt structure. In following chart, we can see how currency crisis have been augmented private debts.



Source: International Financial Statistic, IMF

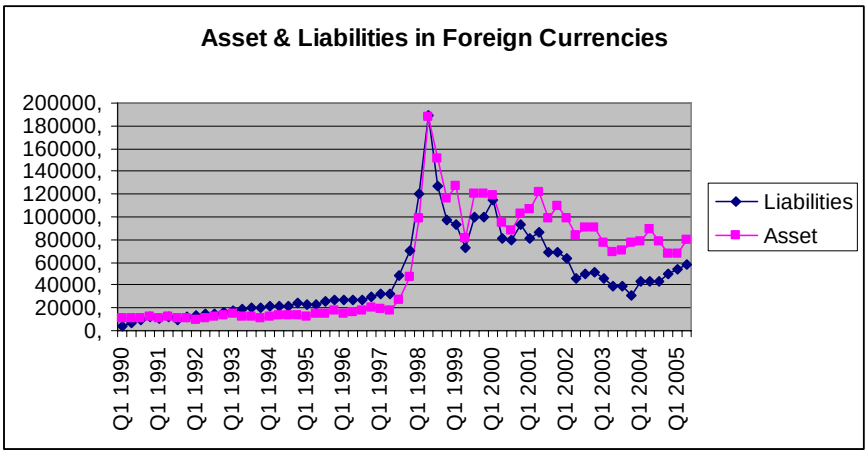
Graph 2.



Source: International Financial Statistic, IMF

Graph 3.

Since the currency floated in market mechanism, the values of the national asset and liabilities in foreign currency hiked too, reached the peak in the mid of 1998.



Source : International Financial Statistic - IMF

Graph 4.

3. Balance Sheet Approach

3.1. Macro Fluctuation

The currency crisis of the 1990s in East Asia and other regions in the world need new explanations, since the traditional ones based on macro imbalances could not sufficiently explain. In the perspective of financial economics, such as Mishkin (1996), crisis could be mainly caused by the holding of excessive foreign currency liabilities by firms and banks.

This explanation inspires the studies of third generation of crisis, mainly happened in Latin America and East Asia. Bleakley & Cowan (2002) note that none of the governments in these countries was turning to the printing money to cover budget deficits, such as a mechanism behind "first generation" model of crisis. They add that there were no large output gaps that might have signaled a future need to devalue, as in "second generation" models.

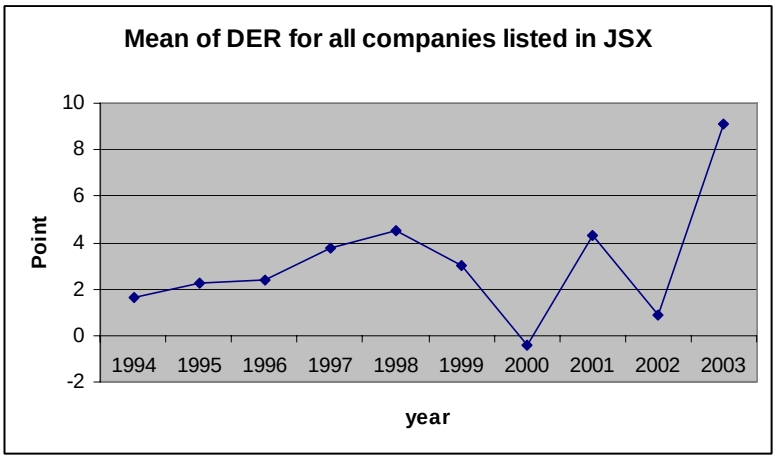
In recent literature of crisis, many scholars have emphasized the currency mismatch between inflows and expenditures at the micro level as a mechanism for the propagation of currency crisis. Krugman (1999) and Aghion, Baccetta, and Banerjee (2001) identify debt denominated in foreign currency as the key protagonist behind crisis of the 1990s.

In explaining this generation of crisis, Barnanke and Gertler (1989), Aghion *et al*. (2003) become important foundation of studies. Krugman (1999) mentioned about the "Bernanke-Gertler Effect" for explaining the amplification of negative shocks due to the combination of capital market imperfections and weak balance sheets. According to Krugman, devaluation gives the competitive effect by improving the financial situation of exporting firms, but he also argues that this effect is offset by the mismatch between foreign currency liabilities and assets denominated in local currency, increasing indebtedness of firms with dollar denominated debt – net worth effect (Lobato *et al*., 2003).

The interactions between depreciation and a currency mismatch between liabilities and income will induce the firm level in two ways, net worth effect and competitiveness affect. If a country's debt is denominated in foreign currency, a real depreciation will reduce the

country's net worth through a balance sheet effect and, in the presence of financial imperfections, may increase the cost of capital.

In the Indonesia, and in other countries, currency crisis have a direct impact to firms' debt structure. The following chart describes the impact of currency crisis in 1997 to the debt/equity ratio of all companies listed in the Jakarta Stock Exchange (JSX).



Source : The Jakarta Stock Exchange

Graph 5.

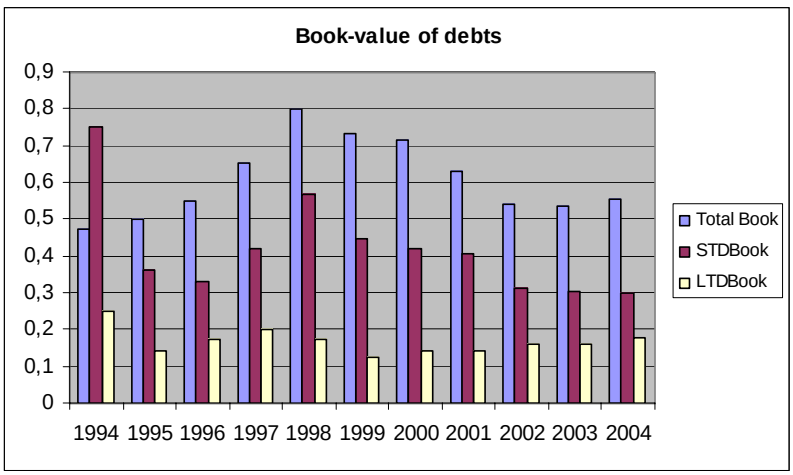
Depreciation accompanied by Sudden Stops (sharp contraction of international capital flows), are basically an emerging market phenomenon (Calvo, Izquierdo & Mejía, 2004). Sudden stop could be happening since the corporate sector, especially in tradable sector access directly to the global financial market to finance their operation. In such great depreciation, borrower could not demand further lending because of unwillingness of lenders to give money in corporate sector within this situation. Since the size of dollar liabilities in the domestic corporate and banking system is large, the probability of sudden stops is naturally high. Sudden stops are associated with large depreciations and major financial disruptions, leading to significantly lower rates of return, investment and growth.

Eichengreen, Hausmann, and Panizza (2003) named countries with domestic liabilities dollarization as an original sin phenomenon. They explain than if a country is unable to borrow abroad in its own currency, then when it accumulates a net debt, as developing countries are expected to do, it will have an aggregate currency mismatch on its balance sheet. The definition of Original Sin focuses on the inability to borrow long-term in domestic currency (even within the domestic market) and the inability to borrow internationally (even short-term) in domestic currency.

3.2. Micro Foundation

Related to the issue of the relationship between corporate balance sheet and macro economic condition, Gray and Stones (1999) explain three operational tools to gauge such a relation, namely simple financial indicators, corporate profit simulations and economic value estimate (EVE). Simple financial indicators, such as the ratio of corporate debt to equity and the ratio

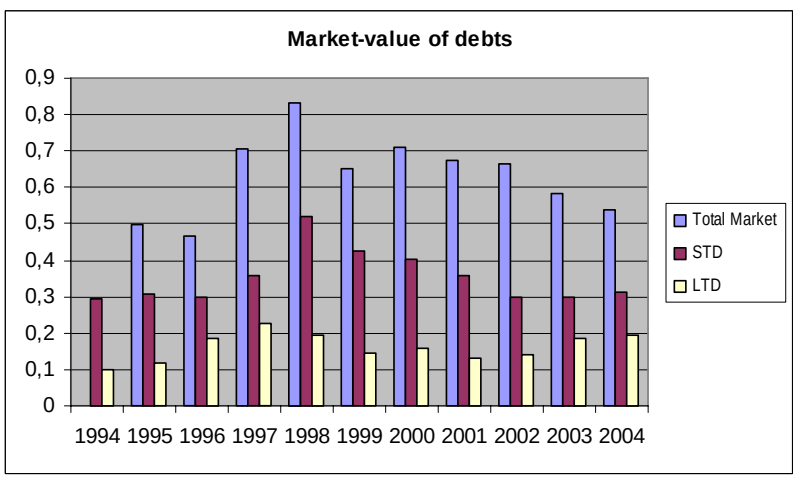
of debt to assets, can serve as rough-and-ready gauges of the vulnerability of corporations to macroeconomic shocks. In this initial research, this paper provides descriptive financial indicators on debt ratio and profitability. It could be leading indicators for analyzing the corporate vulnerability.



Note: Total Book is sum of book value of leverage as the ratio of total debt to total debt plus book value of equity. LTDBook is long-term book value of leverage (long-term debt deflated by total debt plus book value of equity). STDBook is short-term book value of leverage (short-term debt deflated by total debt plus book value of equity)

Source: author's calculation based on data from JSX's database and Indonesian Capital Market Directory (ICMD) - Ecfin

Graph 6. Median (%).



Note: Total Market is sum of market value of leverage as the ratio of total debt to total debt plus market value of equity. LTD is long-term market value of leverage (long-term debt deflated by total debt plus market value of equity). STD is short-term market value of leverage (short-term debt deflated by total debt plus market value of equity)

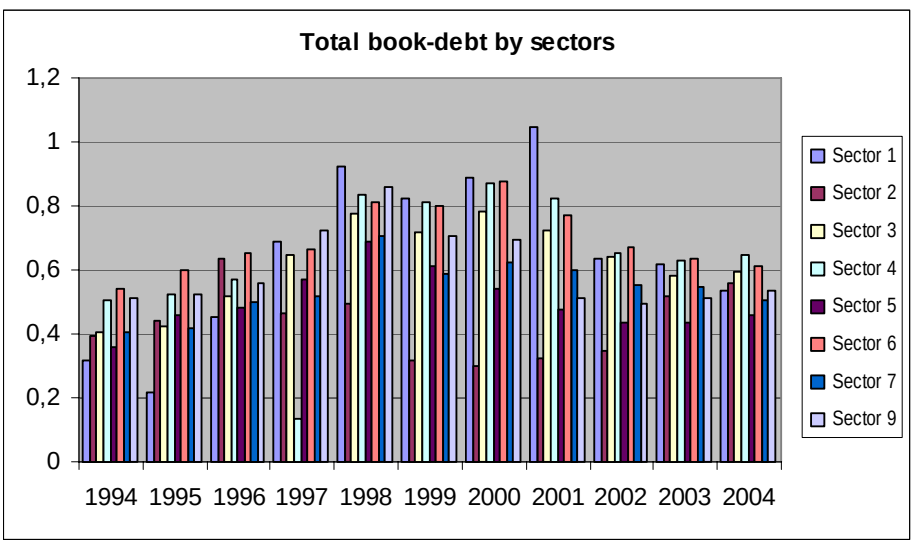
Source: author's calculation from various sources

Graph 7. Median (%).

In these following graphs, it is shown several key ratios that fluctuate over times (1994 – 2004). Graph 6 and graph 7 describe how debt ratios fluctuate during times. Before crisis hit in 1997, the debt ratios tend to increase in both book and market value measurements. Debt in market value has a higher fluctuation than those of book value since market value is valuated based upon stock prices. For comparing to the neighboring countries, Fan *et al*. (2004) give an explanation that Indonesia is one of the five highest leverage ratios together with South Korea, Thailand, India and Brazil.

Claessens *et al*. (2000) describe that long-term debt was low in East Asia during pre-crisis period. We can see in graph 6 and 7 that short-term debt dominates capital structure among Indonesian firms in all periods of study. It is likely true that firms in Asia become even more fragile after the crises. By descriptive data of this paper, we can see that in post-crisis period short-term debt was still dominating.

Like other neighboring countries in East Asia, Indonesia has been exposed to external capital rather than internal capital for financing the firms. This high rates of investment meant that companies in East Asian countries had to turn to external financing to make up for the lack of capital from retained earnings (Claessens *et al*. 2000). It is common phenomenon in developing countries where ratios of book value of debt tend to increase during recessions and fall during expansionary periods due to business cycle effects (Booth *et al*. 2001).

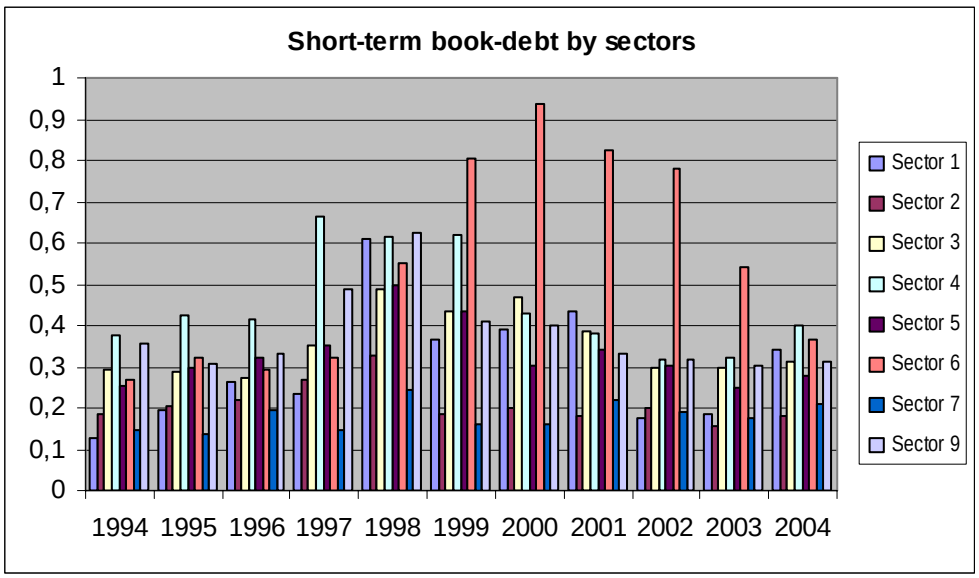


Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

Graph 8. Median (%).

Following graph (8, 9 and 10) show the composition of total debt, long-term and short-term debts (all in book values) by industrial sector. We can see that following a financial crisis in 1997, most of industrial sector undermined higher debt-ratio in which the mechanism of balance-sheet effects was present. It is important to note that agriculture sector (sector 1) have a highest increase of debt ratio which could indicate that this sector had a high burden of foreign debt.

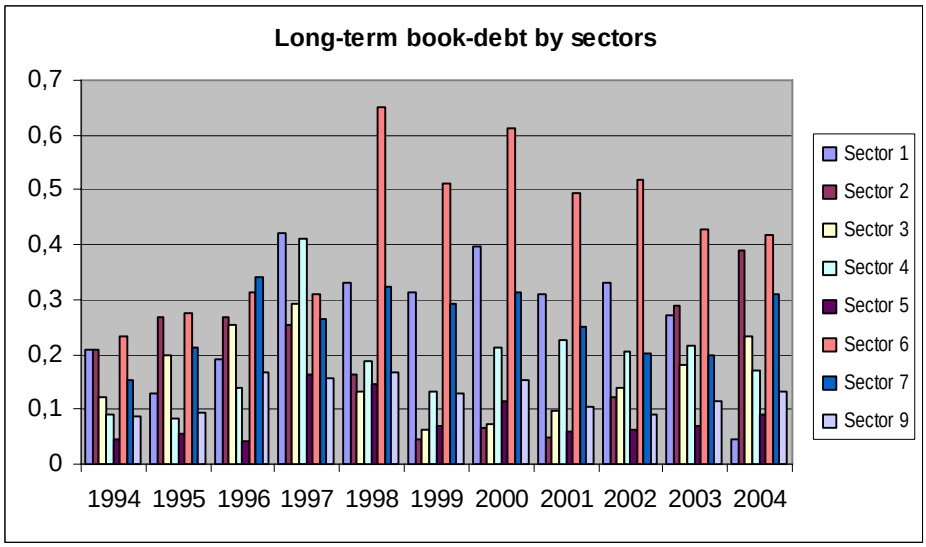
In term of short-term debt, sector 4 (miscellaneous industrial sector) containing machinery and heavy equipment, automotive and components, textile and garment, cable and electronics industries had a highest ratio when crisis hit. It can be explained that this sector have a high import component, so that they have to fulfill their operation by acquiring high short-term debt in foreign currencies.



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

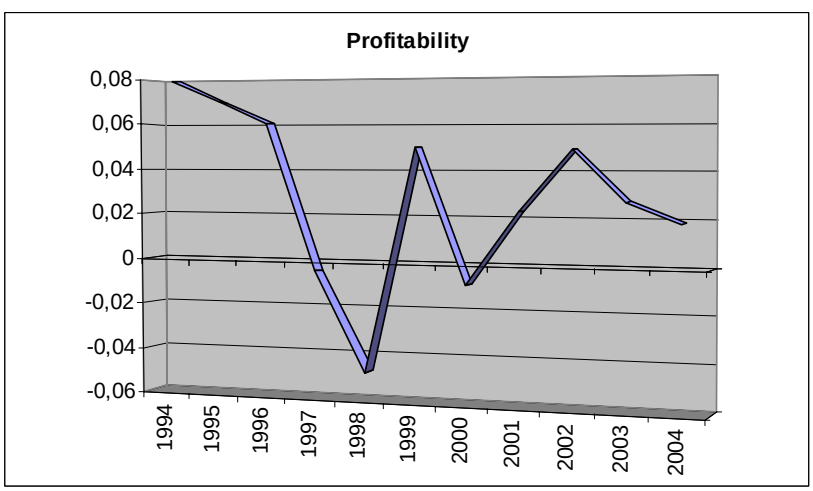
Graph 9. Median (%).

Generally, following a financial crisis sector property (sector 6) has a highest debt ratio showed by high median debt ratio in both, long-term and short-term ratio.



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

Graph 10. Median (%).



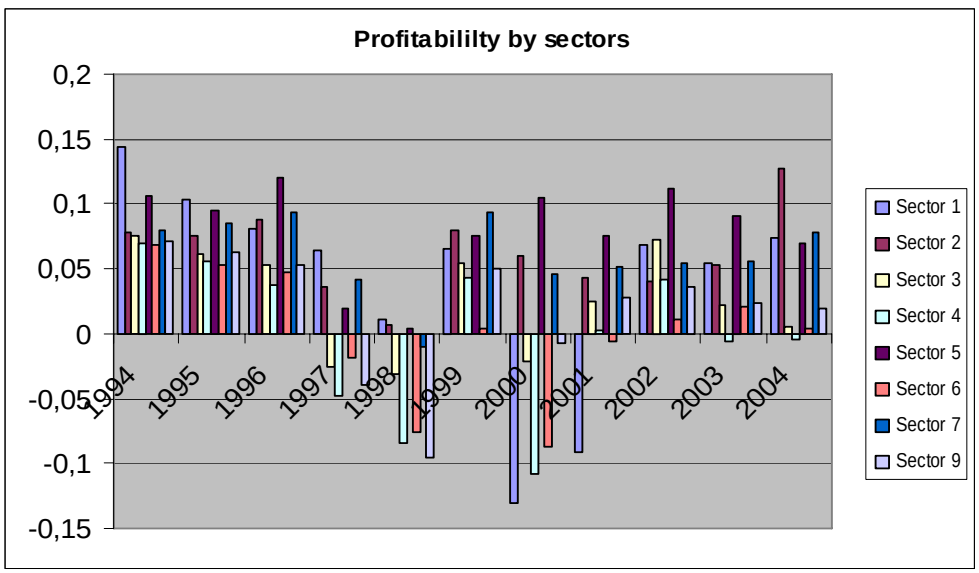
Note: Profitability is measured by ROA (Return on Assets)
Source: author's calculation from various sources

Graph 11. Median (%).

These following two graphs describe two important determinants of capital structure, namely profitability and growth opportunity. These variables are shown for giving insight idea how firm performance before crisis hit in 1997.

In graph 11, we can see that during 1994 – 1996 (before crisis period), Indonesian firms have diminished their profitability. It is confirmed that high investment with low profitability have resulted the high debt ratios. In graph 10, in term of growth opportunities Indonesian firms have a high fluctuation, whereas in the onset of crisis growth opportunities of Indonesian firms tend to diminish. It can be said that on the onset of crisis, Indonesian firms have been in danger since several "early warning system" in micro level have had emerged indications of financial distress. At least firm level data provide evidence that before crisis, firms have experienced unhealthy conditions.

This following graph (graph 12) show how is profitability in industrial sector. Sector 3, 4, 6 and 9 are sectors in which crisis impacted much in their performance indicated by high loss in their profitability.

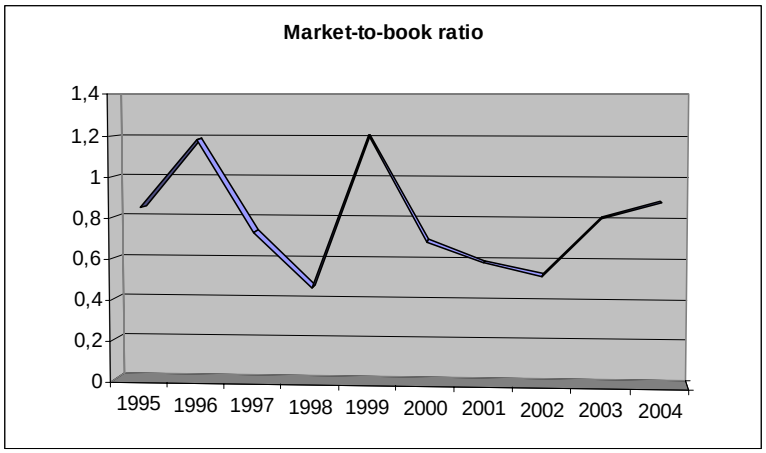


Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

Graph 12. Median (%).

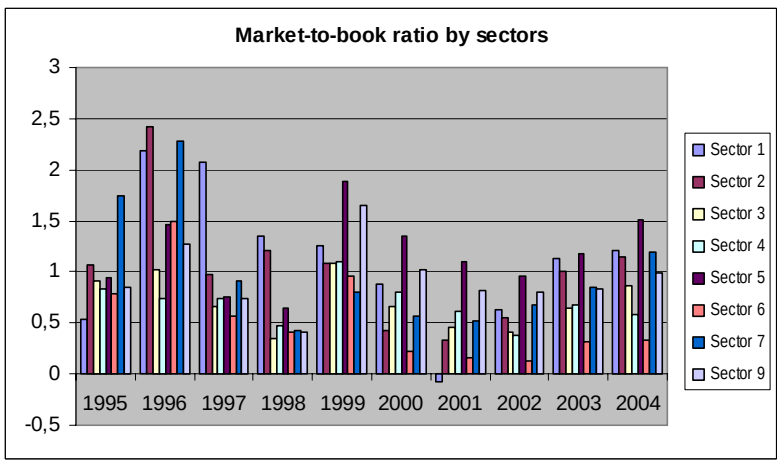
Market-to-book ratio measures the growth opportunities by considering the market expectation of the firms. In many literatures, market-to-book ratio is used to mention Tobin Q which is measurement of the market expectation (opportunities) in the future of the firms.

This trend is influenced by fluctuation in capital market. We can see that in general, the trend of Q value of firms in Indonesia was decreasing following a financial crisis.



Note: Market-to-book ratio is market value of equity deflated by book value of equity for measuring growth opportunities of firms.
Source: author's calculation from various sources

Graph 13. Median (%).



Source: author's calculation based on JSX's database and Indonesian Capital Market Directory provided by ECFIN
Sector 1 = agriculture
Sector 2 = mining
Sector 3 = basic industry & chemical
Sector 4 = miscellaneous industry
Sector 5 = consumer good industry
Sector 6 = property, real estate & building construction
Sector 7 = infrastructure, utilities & transportation
Sector 9 = trade, service & investment

Graph 14. Median (%).

Several studies (Claessens et al. 2000; Pomerleano 1998) confirm that in Asian countries debt ratios have increased and firm performance has decreased in the onset of crisis. They also shed light on how these conditions have been leaded by some institutional or countries specific factors.

4. Conclusion

Effort to describe recent crisis is still doing by a list of research conducted by scholars. In the case of Indonesia, the study of linkage between macro in micro is absolutely absent with one important cause of the lack of data. Most publication of data by either official institution of profit making/consultant bodies does not describe the currencies composition of debt. These difficulties to access this variable of data become major constraint for researchers to conducting studies concerning to debt composition and debt behavior.

Research agenda which should be pursued is firstly providing and completing data more detail, mainly about debt composition to explain the currencies mismatch in the firms level. By this data, we could linkage the exchange rate fluctuation with the capital structure of firms in Indonesia by paying attention on the question of how macro variable determine micro level and otherwise, how micro evidence could describe the long and wide of currency crisis in Indonesia.

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Chapter 9

JUMP DOWN, TURN AROUND, PICK A BALE OF...POVERTY? U.S. COTTON POLICY AND HOUSEHOLD INCOME IN CÔTE D'IVOIRE

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Abstract

This paper serves as an *ex ante* measure of the impact on Ivoirian household income that would result from any of four possible long-run cotton policy outcomes. Central among these are the discontinuation of U.S. cotton subsidies, as well as the liberalization of the heavily regulated Ivoirian cotton market. Because cotton-growing households are most prevalent in the 40th-90th percentiles of the income distribution and because every policy change considered here results in a higher Ivoirian farm gate price of cotton, the first round effect in each of the simulations is a slightly more unequal distribution of household income. The impact on aggregate household income is more significant---over 5 percent under the most generous assumptions---but still insufficient to have much influence on measures of poverty.

Keywords: Agriculture, Africa, Côte d'Ivoire, cotton, household income
JEL Codes: F14, O12, O13, O15

1. Introduction

The dependence of many African economies on commodity exports as a source of national income, government revenue, and foreign exchange is well documented.[1] With few exceptions, African economies rely heavily on exports of primary commodities and perform few of the production stages that provide high value added. Beginning in North Africa nearly

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[1]See, for example, Deaton and Miller (1995) and Deaton (1999).

200 years ago, cotton production has been responsible for booms and busts in Egypt, and indeed, throughout many parts of Africa. In recent years, especially in West Africa, African cotton production has increased to historical record levels. In Benin, Burkina Faso, Côte d'Ivoire, and Mali combined, cotton production in the 2004 growing season was more than triple its level of twenty years ago. This rapid growth owes both to increases in yields as well as to increases in the acreage devoted to cotton.

These four West African countries now account for over 3 percent of world production and 11 percent of world exports. Raw cotton is a heavily traded good, with over 30 percent of production (with a market value of approximately $11 billion) crossing a border before further processing. Tables 1 and 2 show the world's principal producers, consumers, exporters, and importers of cotton. An important feature to note is the U.S. dominance of world export markets. Though the U.S. lags China significantly in production, China is a net importer of cotton due to its massive textile industry. Today, the U.S. accounts for 39 percent of world exports, a share nearly four times larger than the next largest exporter of cotton. Moreover, this share has grown over the last two decades from 22.8 percent in the 1984 marketing year to 33.1 percent in the 1994 marketing year to 39 percent in the 2004 marketing year.

Since the early 1930s, with very few exceptions, the U.S. government has provided annual support to domestic cotton growers. The level of support and its structure have changed over the years to reflect changes in cotton markets as well as changes in administrations' attitudes toward farm subsidies. The cotton lobby in America has considerable political clout, as evidenced by the most recent farm bill. The Farm Security and Rural Investment Act of 2002 (2002 Farm Act), which sets levels of subsidy from 2002-2007, offered one of the most generous support programs in history to U.S. cotton farmers.

The current system provides a three-tiered payment structure for cotton growers, with the intent of providing a price floor of 72.4 cents per pound to farmers. Each tier of support has a different relationship with current levels of production. In addition, there are provisions for cotton users, which provide incentive to purchase domestically grown cotton. While these payments are nominally made to cotton buyers, they also provide an additional measure of price support for domestic farmers. Finally, farmers have access to subsidized crop insurance through USDA. While higher quality extra-long staple cotton constitutes an important part of U.S. production, its production in Côte d'Ivoire is virtually nonexistent. Thus, this paper focuses on results for the more common upland cotton only.

The first tier of payments provided to U.S. cotton farmers consists of direct decoupled payments. These payments are decoupled in the sense that they are completely independent of current production and provide a payment rate of 6.67 cents per pound of historical production. The level of historical cotton production for a farm is calculated based on that farm's base cotton acreage taken from a survey conducted in 1981. These base acres are multiplied by a factor of 0.85 and a yield rate common to all farmers to find the total amount of the direct payment. Thus, any farmer owning land on which cotton was planted in 1981 can receive payments of this sort regardless of what, if any, crop is planted on the land in the current production year as long as he or she enrolls in the program and meets minimum conservation guidelines.

The second tier of support offered takes the form of ``counter-cyclical'' payments. These payments are available to farmers whenever the effective farm gate price of cotton falls below the target price minus the direct payment rate. That is, when the cotton price received by

farmers falls below 65.73 cents per pound, these payments make up the difference up to a maximum of 13.73 cents per pound. When the difference exceeds 13.73 cents per pound (i.e., when farm gate price falls below 52 cents per pound) a third tier of support becomes available.

The final level of support goes into effect when prices fall below the ``loan rate,'' set at 52 cents per pound for the 2002-2007 period. When prices are this low, farmers have the option of repaying commodity loans at a rate less than the original terms of the loan. The loan terms are adjusted such that the benefit received by the farmer is equal to the difference between world price and the loan rate. Alternatively, farmers can forego placing the commodity under loan to USDA and take this benefit directly as a ``loan deficiency payment.''

The 2002 Farm Act also sets limits on the total amount of benefits any single farmer can receive. Direct payments are capped at $40,000 per person, counter-cyclical payments are capped at $65,000, and marketing loan benefits are capped at $75,000. Producers with an adjusted gross income in excess of $2.5 million (averaged over the three previous years) are not eligible for payments unless more than 75 percent of this income was derived from farming. Farmers could, in theory at least, receive double the maximum subsidy amount by maintaining three separate farming operations. The law allows a full payment on the first farming operation and half payments on each of the second and third farming operations ERS02.

In addition to the above payments available to farmers, a three-pronged program exists to encourage export of U.S. cotton and to encourage domestic producers to purchase domestically grown cotton. These programs are commonly referred to as step one, step two, and step three. Step one payments are active when the world price of cotton is less than 115 percent of the U.S. loan rate and the average price of U.S. grown cotton sold in Northern Europe exceeds the c.i.f. price of cotton from other sources sold in Northern Europe. Step one allows further reductions in farmers' loan repayment rates when the above conditions are met. Step two payments are active when the world price of cotton is less than 134 percent of the U.S. loan rate and there has been a consecutive four-week period during which the price of U.S. cotton sold in Northern Europe has exceeded the c.i.f. price of cotton from other sources sold in Northern Europe. When these conditions are met, payments equal to the difference in price are available to exporters and domestic mill users of U.S. cotton. Finally, step three of the program authorizes temporary import quotas if for any consecutive four-week period the weekly average price of U.S. cotton sold in Northern Europe exceeds the c.i.f. price of cotton from other sources sold in Northern Europe.

Export support does not end there, however. Mechanisms are in place to encourage further foreign importation of U.S. grown cotton, especially by developing countries. The GSM-102 and GSM-103 programs allow for export credit guarantees through the Export-Import Bank of the U.S. designed to help foreign importers who may face foreign exchange constraints and wish to purchase cotton on credit. By guaranteeing payment, the programs allow foreign importers to get credit from U.S. financial institutions at extremely competitive rates. Other programs, like the Market Access Program, the Foreign Market Development Program, and the Emerging Markets Program, are intended to promote U.S. cotton abroad and to maintain a healthy market for U.S. exports ERS02.

All told, this maze of programs cost the U.S. government in excess of $3 billion in fiscal 2003. This level of spending has drawn the ire of the press, NGOs, and other cotton

producing countries.[2] Most times, the story is cast as a David versus Goliath struggle. American farmers are portrayed as large, high cost producers utterly dependent on government handouts while the foreign farmers are touted as small, family farmers with low production costs. While each role has an element of truth to it, reality is much more nuanced. A point ignored by almost every discussion of U.S. cotton policy is that there must be winners as well as losers. For every Burkina Faso, which loses export revenue due to depressed cotton prices, there is a China, or an Indonesia, or a Bangladesh whose cotton processing industry benefits from access to a cheap and plentiful global supply.

Cotton and other agricultural exports have also been at the center of a protracted debate in the Doha Round of WTO negotiations. The central goals of the Doha Round with respect to agriculture are improving market access for developing countries, eliminating export subsidies, and minimizing trade distorting domestic support. Poor cotton exporting countries as well as the Cairns group of countries have been exerting increasing pressure on the United States and European Union to reform their agricultural support systems. WTO cases against the U.S. cotton subsidy system as well as the E.U.'s sugar importation regime underscore the importance of these commodities to several developing countries.

In September of 2002, Brazil formally requested consultations with the U.S. government through the WTO with a view to eliminating subsidies that favor U.S. cotton growers. WTO The government of Brazil alleged that during the years 1999-2002 support of the cotton industry by the U.S. government had caused ``significant price depression and price suppression in the markets for upland cotton in Brazil and elsewhere.'' They further alleged that these subsidies were in violation of U.S. obligations under various WTO provisions. By January 2003, these consultations had broken down, with little progress toward reaching an agreement. At that time, Brazil, joined by several third party signatories, requested a WTO panel to decide the dispute.[3]

In May of 2004, that panel decided that many of the U.S. cotton programs were in violation of obligations pursuant to the WTO. Specifically, the U.S. classification of direct payments to cotton growers as ``green box,'' or minimally distorting, was rejected. Similarly, payments classified as ``amber box,'' or subject to reduction commitments, were re-classified by the panel as export subsidies. Siding with Brazil, the panel recommended elimination of more than 80 percent of the subsidies currently paid to U.S. growers and processors of cotton. This decision and its subsequent confirmation after the U.S.'s appeal have wide implications for the future of U.S. crop support programs. While the ultimate outcome remains in doubt as the new farm bill is negotiated, if the decision is respected, it will mean sweeping changes in the U.S. agricultural sector.

The purpose of this paper is not to investigate the balance between the gains of some countries and the losses of others as the consequences of WTO decision-making are put in place (though this might be an interesting direction for future research). More simply, this paper seeks to investigate the strength of the link between world cotton prices and the average

[2]For example, in late 2002, Oxfam International published a policy paper in which it claims that U.S. agricultural subsidies are one of the driving forces behind the poverty experienced by Central and West African cotton farmers. By the middle of 2003, the New York Times had latched onto the issue, publishing frequent editorials in a series called ``Harvesting Poverty.'' Each one spelled out the plight of particular farmers in developing countries who received lower prices for their cotton, or corn, or catfish, because of protectionist U.S. policy.

[3]Brazil was joined by Argentina, Australia, Benin, Canada, Chad, China, the European Union, India, New Zealand, Pakistan, Paraguay, Taiwan and Venezuela.

household income of a West African cotton farmer, specifically an Ivoirian cotton farmer. There are many reasons why the story may not be as simple as it is portrayed in the common analyses. Perhaps farmers can easily transition to other exportable goods during times of low cotton prices. Perhaps the government provides an implicit insurance policy to farmers by standing ready to buy cotton at a set price. Perhaps Ivoirian cotton growers tend to be a small minority at the top of the income distribution, and thus we should be less concerned about the implications of depressed cotton prices for the average West African.

Previous work related to this topic has concentrated on two main areas. The first seeks to explain and evaluate the consequences of Sub-Saharan Africa's dependence on the world price of commodity exports. One common viewpoint holds that commodity price booms are actually detrimental to African economies. Studies by Krueger (1987) and Sachs (1988) blame commodity price booms of the 1970s for the debt crises experienced in the 1980s. They argue that temporary windfalls due to commodity price booms lead to increases in borrowing that cannot be serviced once the price returns to its previous level. Bevan, Collier, and Gunning (1991) examine 23 episodes of commodity price shock in Africa, Asia, and Latin America. The authors argue that governments undertake partially irreversible investments during price booms and that these investments are often of very low quality. They also find that governments tend to invest in excess of the present windfall, perhaps based on faulty expectations of continued high prices.

Other authors paint a less dreary picture. For example, Deaton and Miller (1995) examine the relationship between commodity price and macroeconomic performance in 32 Sub-Saharan countries and find that while there is a high degree of variability across countries there is little evidence that commodity price booms are harmful in the long run. Specifically, they find no long-term deterioration in the real balance of trade and little evidence of a link between price booms and increases in debt. Like Deaton and Miller, Deaton (1999) reaffirms the common sense result that high commodity prices, though sometimes mishandled, are beneficial to African economies.

A second strain of research seeks to identify the amount of price distortion caused by support of cotton growers in the U.S. and abroad. In 2002, the International Cotton Advisory Committee (ICAC) published a report detailing results of a simulation based on their World Textile Demand Model. This exercise, highly dependent on measurements of worldwide supply and demand elasticities, predicted that removal of the system of U.S. subsidies would have resulted in a world price increase of 3 cents per pound in the 1999/2000 marketing year, 6 cents per pound in the 2000/2001 marketing year, and 11 cents per pound in the 2001/2002 marketing year. Removal of all countries' subsidies would have resulted in an increase of 17 cents in 2000/2001 and 31 cents in 2001/2002. Work by Daniel Sumner in support of Brazil's WTO case found that U.S. support led to 40 percent higher exports that would otherwise have been the case. This glut of exports, he found, drove down world prices by an average of 12.6 percent.

This paper begins in section 2 by examining the differences between cotton farming as it is practiced in the U.S. and Côte d'Ivoire. Section 3 presents a simple theoretical framework for thinking about the household problem facing an Ivoirian farmer. Section 4 provides a brief overview of the data and describes analyses to determine the importance of cotton to the welfare of farmers and non-farmers in Côte d'Ivoire. Section 5 examines the implications of these analyses for U.S. and West African policymakers, offers preliminary conclusions, and presents directions for future research.

2. Cotton Farming in the U.S. and Côte d'Ivoire

Cotton farming in Côte d'Ivoire is a far different enterprise from the version practiced in the U.S. While American cotton farms rely on highly mechanized processes, irrigation systems, and economies of scale, most Ivoirian cotton farming is small scale---done by hand or with the use of draft animals and reliant on natural rainfall. In 1995, reports from the USDA attaché in Côte d'Ivoire stated that 52 percent of the arable land planted to cotton was cultivated manually, 47 percent was cultivated using draft animals, and just 1 percent of land was cultivated using mechanized equipment. The lack of agricultural capital in Côte d'Ivoire severely limits the average size of a cotton farm. The average Ivoirian cotton farm measures just 3.9 acres as compared to more than 400 acres in the U.S. Ivoirian cotton growers also are much more diversified; nearly every cotton farming household in the survey considered here reported planting other crops in the same year.[4] By contrast, U.S. farmers tend to specialize, growing cotton almost exclusively. Furthermore, the percentage of households that depend on cotton farming as a source of income is vastly different. In Côte d'Ivoire, nearly 10 percent of households sell cotton to generate a portion of their household income. In the U.S., cotton-farming households account for below one tenth of one percent of all households.

U.S. cotton farmers are also very well compensated. American cotton growing households earn more per year than farm households specializing in any other crop. Cotton farming households in the U.S. had an average income in 2003 of $131,447, placing them on average in the top decile of all U.S. households and at a level of income nearly twice the average for all types of farming households.[5] Moreover, cotton-farming households in the U.S. derive a greater percentage of their income from farming than any other segment of the farm population. Cotton farmers earn 67 percent of household income from farming on average. For American farmers as a whole, the average is only around 5 percent (USDA Farm Household Income 2004).

Whereas cotton farming households in the U.S. tend to be well compensated in comparison to almost every other subset of the population, cotton farmers in Côte d'Ivoire earn a modest living compared to their compatriots. Table 3 compares sources of income for the average cotton farming household, average crop farming household (including cotton), and average Ivoirian household.[6] Each column represents mean values for a subset of the Ivoirian population, and moving rightward through the columns, each successive column is a proper subset of the one to its left.

Looking down the second column of Table 3, we find that Ivoirian crop farming households derive approximately 40 percent of household income from agro-pastoral activities. Interestingly, Ivoirian cotton farming households seem to be more reliant on off-farm sources of income than other farm households. Cotton farming households receive only approximately 17 percent of their income from farming activities. As one might expect, farmers in general derive less of their income from wages and benefits and more of their income from the value of home-produced food than the average Ivoirian. Furthermore, the

[4]Peanuts, cassava, yams, maize, and rice were all commonly grown alongside cotton.

[5]The average farming household in the U.S. had income of $67,453 in 2003.

[6]Here, crop farming household is defined as any household that planted land and sold any crop during the sample year. Households growing crops only for home consumption are not counted as crop farming households. In practice, the distinction matters little, as nearly every household that grew crops sold at least part of their harvest.

mean income for cotton farming households is very close to the overall average household income. Note that in the unweighted sample more than half of the households fall within my definition of a crop farming household. As with most household surveys, rural households are underrepresented in the Côte d'Ivoire LSMS survey. On a weighted basis, 957 (or roughly 60 percent) of the 1600 households surveyed would fall under the definition of crop farming households and 152 (or roughly 10 percent) would fall under the definition of cotton farming households.

Examining only mean incomes, while informative, masks interesting characteristics of the underlying income distributions. Figure 1 presents a kernel density estimation of the distribution of household income for cotton farmers in Côte d'Ivoire as compared to all farmers and to the population at large. While the income distribution for cotton farmers peaks slightly rightward of the distribution for the other two groups, cotton farmers are considerably less likely to have an income in the upper reaches of the income distribution. In the portion of the income distribution between 4 million and 7 million CFA per year, cotton-farming households are not very prevalent. This accounts for the relatively low mean among cotton farmers. Thus, when compared to other Ivoirian households, we find that cotton farming households are likely to earn a respectable but not astronomical income.

The costs of cotton production also differ widely between the two countries. Table 4 presents the per-acre average costs and revenues of cotton production in the U.S. Over the past four years (and, indeed, going back much further) U.S. cotton farmers have been unable to cover their average total cost and only sometimes able to cover their operating expenses. Without the exceptional level of government support, the industry would rapidly wither. West Africa, on the other hand, is the most efficient cotton-producing region in the world. While statistics are scarce and should probably be interpreted with a measure of caution, the ICAC puts the cost of West African production at around 20 cents per pound---roughly 23 percent of U.S. production costs.

Another important distinction comes when examining the markets for cotton in the two countries. In the U.S., despite heavy price support, farmers are free to sell their cotton to any enterprise they wish, including to USDA's crop programs. In West Africa, the development of the cotton industry can be traced to the *Compagnie Francaise pour le Developpement des Fibres Textiles* (CFDT), a French company which brought cotton farming to the region. As the countries of West Africa gained independence, they generally established their own national cotton companies, with CFDT generally retaining a minority stake (Akiyama, et al. 2001). In the case of Côte d'Ivoire, CFDT retained 30 percent ownership of the *Compagnie Ivoirienne pour le Developpement des Textiles* (CIDT). Until the 1998/1999 marketing year, CIDT enjoyed a legal monopsony in seed cotton as well as a monopoly in the ginning, marketing, and provision of cotton inputs. At the beginning of the growing season, the company set guaranteed prices for two grades of cotton and provided free seed and transportation and subsidized fertilizer, herbicide, and insecticide. Each farmer would deliver his or her crop to the village warehouse, where it was then sold by village-level cooperatives to the CIDT.

This system frequently led to inefficient outcomes. When the CIDT-set prices for seed cotton were significantly lower than the producer price in neighboring countries, informal exports flourished. Furthermore, the company operated 10 gins located throughout the cotton producing areas of the country, but gin capacity was sometimes outstripped by production, forcing delays and costly transportation of cotton to other regions for processing. By setting

prices on a pan-territorial and pan-seasonal basis and absorbing the cost of transport, the government subsidized production far from collection and distribution centers at the expense of more advantageously located producers. Government provision of cotton inputs may also have discouraged farmers from experimenting with new hybrid types or growing the more valuable extra-long staple varieties. Furthermore, government subsidization of inputs may have changed their relative prices such that farmers were incented to use more intensively some types of inputs whose true social cost was greater than other, substitute inputs.

In 1998, the government undertook privatization of CIDT as a provision of a $100 million IMF/World Bank Agricultural Structural Adjustment Program. Ultimately, the company was broken into three parts, each controlling a group of 3 or 4 gins. The former CIDT, now CIDT Nouvelle, retained control of one group of gins (the ``central'' group), while majority foreign owned companies took control of the other two groups (the ``northwest'' and ``northeast'' groups). Since then, there has been a gradual liberalization of cotton markets. The first producer-owned gin was constructed in 2003, potentially signaling further reductions to government involvement in the cotton market.

Often times, even today, prices remain at the same nominal CFA franc level for more than one year, insulating farmers from risk, but preventing them from profiting by storing the cotton to sell during price booms.[7] Infrequent nominal adjustments also mean that the real price of cotton fluctuates (generally, downward) as inflation erodes the value. Figure 2 plots time series of the real CFA franc price received by Ivoirian farmers as well as the real CFA franc price received by their American counterparts. Clearly, the U.S. series is more volatile. The Ivoirian series exhibits the classic pattern of a real series subject to periodic nominal revision; it rises sharply, followed by a slow decline as the discretely changing nominal series is subject to continuous inflation.

Increases in the overall price level have significantly outstripped the rate of adjustment of the price of cotton sold in Côte d'Ivoire. The real price received for cotton sold in the 2003-2004 marketing year was only approximately 60 percent as high as the level during the 1984-1985 marketing year. The practice of setting nominal prices persists today, and these prices seem to be at best weakly correlated with world prices. Moreover, these prices are often far below the real world price of cotton of similar quality. The spike in the U.S. farm gate price in 1994 comes from the devaluation of the CFA franc and the incomplete pass through of this devaluation to the price level. Over the 1985-2004 period, the average real price received by Ivoirian cotton farmers was only 29 percent of the price received by U.S. farmers.[8] While the value of services provided by the Ivoirian government to the Ivoirian cotton farmers remains to be determined, this graph seems to suggest the presence of an implicit tax on cotton production. Whether this is indeed the case, and the desirability of such a taxation regime are two questions to be addressed later in this paper.

[7]In fact, over all four years of the LSMS survey, the government kept a fixed farm gate price of 115 CFA per kilogram.

[8]This graph would look virtually identical if a proxy for the world price of cotton were used in place of the U.S. farm gate price. The U.S. farm gate price is used simply to make the most accurate comparison and to avoid capturing any costs of transport.

3. A Simple Theoretical Framework

The theoretical model in the background of this paper is one in which Ivoirian households solve a simple, static income maximization problem. Competitive, risk-averse farming households choose an allocation of their available land across crops in order to maximize household surplus. The expected value of planting a crop i, is given by

$$v_i = A_i e^{(ln(P_i^e - C_i^e)+\eta_i)} e^{(ln(Y_i^e)+\varepsilon_i)}, \textit{where} \quad \eta_i \sim N(0,\sigma_{\eta_i}^2),\ \varepsilon_i \sim N(0,\sigma_{\varepsilon_i}^2),\ \textit{and}\ i \in I. \quad (1)$$

Variable definitions are as follows:

A_i	=	acreage devoted to crop *i*
P_i^e	=	expected price of crop *i*,
C_i^e	=	expected cost of cultivation per unit of crop *i*
Y_i^e	=	expected yield per acre of crop *i*,
I	=	set of crops suitable for cultivation at the household's location,
η_i	=	price shock for crop *i*
ϵ_i	=	yield shock for crop *i*,

Because the farm-gate price of cotton is set by the government at P_cotton and inputs are provided at zero cost, when i=cotton the first exponential function collapses to simply P_cotton . Thus,

$$v_{cotton} = A_{cotton} \overline{P}_{cotton} e^{(ln(Y_{cotton}^e)+\varepsilon_{cotton})}. \quad (2)$$

Overall household surplus is given by

$$Y = \sum_i v_i. \quad (3)$$

Household utility is given by

$$U(Y), \textit{where}\ U' > 0\ \textit{and}\ U'' < 0. \quad (4)$$

Households then solve

$$\max_{A_i} E(U)\ \textit{subject to}\ \sum_i A_i = \overline{A}\ \textit{and}\ i \in I. \quad (5)$$

This maximization problem abstracts from several of the real world problems facing an Ivoirian farmer. First, it is static. It ignores any time-dependent decisions, central among which are the decision to fallow land in order to achieve higher future yields and the decision to engage in growing crops that take more than one season to mature. Second, it assumes that off-farm decisions will never be enticing enough to induce an Ivoirian household not to use available land. Third, it assumes that households supply whatever labor is necessary to achieve the expected yield.

In a number of ways, however, this simple maximization problem captures the decision facing Ivoirian farm households. They must allocate several plots of land of fixed size across several different crops. In any given year, yields can differ from their expected value due to weather shocks, pest shocks, soil quality shocks, etc. In any given year, the difference between the market price of a crop and the cost of its inputs can also vary due to market conditions, the introduction of substitutes or complements, etc. Because of this uncertainty and because households are risk-averse, farmers diversify as seen in the data. Note that as long as

$$\sigma^2_{\eta_i} + \sigma^2_{\varepsilon_i} > \sigma^2_{\varepsilon_{cotton}} \quad \forall \; i \neq cotton \tag{6}$$

the variance of expected surplus from planting an acre of cotton is lower than that of any other crop. Further, because the uncertainty of cotton income is less than the income uncertainty from planting any other crop, farmers in areas suitable for cotton cultivation should tend to allocate an especially high share of available land to cotton. That is, they should be willing to accept lower revenue per acre planted to cotton in exchange for eliminating some of the income uncertainty they would suffer by planting any other crop. This result is borne out in the data. Ivoirian farmers located in areas suitable for cotton cultivation derive a lower surplus per acre from cotton production than from the production of competing crops.

4. Data and Results

Household level data for this project come from the World Bank's Living Standards Measurement Survey for Côte d'Ivoire. As with most household surveys, respondents are nonrandom and based around regions separated into clusters. To compensate for the nonrandom nature of selection for the survey, each household is assigned a weight that corresponds to the statistical likelihood of such a household appearing among the entire population of households.[9] The survey was undertaken in two sessions per year over the years 1985-1988. Since they are the most recent and most completely standardized data, only the 1988 data are considered here.[10] Data on aggregate cotton acreage and pricing in Côte d'Ivoire come from USDA's Foreign Agricultural Service. Macroeconomic data for Côte d'Ivoire are from the IMF's International Financial Statistics.

Since it is clear that both U.S. agricultural policy and the price setting regime in Côte d'Ivoire have some effect on the price received by Ivoirian cotton farmers, I consider each effect in turn. For the purposes of this study, I abstract from the question of the magnitude of U.S. support effect and examine instead the consequences of effects on the order of those found by Sumner and ICAC. Specifically, in any simulation in which the U.S. is assumed to remove its cotton subsidies, I take Sumner's projection to be correct and assume that the

[9] As one might expect, due to ease of access, households near urban centers are oversampled relative to more distant households. In general, cotton farming households tend to be in the more remote areas of Côte d'Ivoire, meaning that they frequently receive weights greater than one.

[10] For example, in earlier years of the survey farmers were allowed to report sales of cotton in various nonstandard measures such as sheets, sacks, etc. By 1988, reporting was universally done in kilograms, making comparisons more valid.

world price of cotton rises by 12.6 percent. The primary considerations are the implications of these changes in the world price and changes to the Ivoirian government's pricing regime on the welfare of Ivoirian households. At the aggregate level, we can consider what degree of impact the world price of cotton has on Ivoirian GDP.

At a micro level, we want to consider not only how the world price might affect cotton producing households, but also the implications of that effect for the overall distribution of income in Côte d'Ivoire. A few caveats should be kept in mind when considering the household effects, however. Since most of the cotton production in Côte d'Ivoire takes place in the rural northern savanna, a significant percentage of household income is spent on locally produced goods. Thus, there could be an important base-multiplier effect that the analysis ignores.[11] In all of the analysis that follows, cotton yields are assumed to be uncorrelated with price. If, however, higher prices lead to greater investment in cotton-producing capital, it could be true that prices and yields would be positively correlated. Finally, Côte d'Ivoire cultivates cotton less intensively than some of its West African neighbors (for example, Mali and Burkina Faso). Thus is it dangerous to extrapolate the results for Côte d'Ivoire to the entire region. For these and other reasons to be elaborated below, many of the impacts found here are probably best regarded as lower bounds on the actual effects on West African cotton growers.

Taking as given the magnitude of price depression attributable to U.S. agricultural policy, we can estimate the macroeconomic impact of lower world prices in several ways. First, and most simply, we can ignore all quantity effects and focus solely on the effects of the change in world price. From Table 6 we see that 5-year average Ivoirian cotton production has been about 580,000 bales. If, as Sumner found, in the absence of U.S. subsidies the world price of cotton would have been about 12.6 percent higher over that period (7.014 cents per pound), those 580,000 bales would have created an increase in GDP of approximately $19.5 million (about 0.16 percent), and, assuming about 80 percent of production is exported, an increase in exports of 0.32 percent.[12]

As mentioned above, this ignores any potential supply response. If, as found by Berte and Eppelin, Ivoirian farmers are responsive to changes in their selling price and if the government passed positive changes in world price through to farmers, the magnitude of the results could be significantly higher. Berte and Eppelin find that the long run elasticity of supply for Ivoirian cotton farmers is 0.67. It is also useful to note that a 12.6 percent increase in world price, if completely passed through to farmers, would represent an increase in farm gate price of more than 52 percent. Using Berte and Eppelin's result of supply elasticity equal to 0.67, this suggests that average production would be 34.8 percent higher. Under these circumstances, the macroeconomic impact of discontinuation of U.S. cotton subsidy would be $26.3 million (.22 percent of GDP). This may approximate the upper bound on the true effect, as it is dependent on complete pass through of the change in world price as well as a constant elasticity of supply.[13]

A more interesting question to consider is the impact of a change in the U.S. subsidy policy at the household level. In considering this question, we should keep in mind effects on

[11]See, for example, Fujita, Krugman, and Venables (2000).

[12]Average Ivoirian GDP was approximately 7861 billion CFA over the period and the average exchange rate was 662.5 CFA per dollar.

[13]It should be noted, however, that sporadic military conflicts in Côte d'Ivoire have diminished cotton acreage and yields in recent years. If production returned to its 2001 and 2002 highs, the effect could be more pronounced.

both the level of Ivoirian household income as well as its distribution. In order to consider this question, I examine four possible scenarios. In three of the four, the removal of U.S. cotton subsidy and its resultant effect on world price is taken as given. In these simulations, what will be allowed to vary is the Ivoirian government's decision on how much of this increase in world price to pass along to farmers through a higher mandated producer price. I also examine the results of dropping the Ivoirian government's pricing regime and allowing Ivoirian farmers to receive a fraction of the world price of cotton comparable to that received in African countries with liberalized cotton markets. Since government rents from cotton production are eliminated in these scenarios, I assume that the government ceases to provide any inputs to cotton production. This analysis inherently involves greater uncertainty as it requires assigning values to the goods and services typically provided by the Ivoirian government to Ivoirian cotton farmers at below market price.

Tables 7 and 8 report the cumulative distribution of Ivoirian household income by decile under various assumptions. The idea is very similar to the graphical tool of a Lorenz curve. However, since the data here are so close together, Lorenz curves are virtually indistinguishable. The technique employed is to sum over weighted deciles of households to see what proportion of national household income accrues to those households. For example, to evaluate the 30% decile, I find household n^*_.30 which satisfies

$$.30 \approx \frac{\sum_{n=1}^{n^*_{.30}} \omega_n}{1600}, \tag{7}$$

where the _n represent the households' weights among the 1600 households in the survey and n indexes the households. I then find the proportion of total household income that accrues to households in the 0-30th percentile by evaluating

$$Y_{.30}^{cum} = \frac{\sum_{n=1}^{n^*_{.30}} \omega_n y_n}{\sum_{n=1} \omega_n y_n}. \tag{8}$$

In parentheses, the tables report the proportion of income that accrues only to that particular decile. So, for example, the figure in parentheses for the 30% decile is calculated as

$$Y_{.30}^{frac} = \frac{\sum_{n=n^*_{.20}+1}^{n^*_{.30}} \omega_n y_n}{\sum_{n=1} \omega_n y_n}. \tag{9}$$

Actual household income in Côte d'Ivoire is reported in the first row of Tables 7 (distributionally) and 8 (in levels). Before any modification, it is clear that income distribution across Ivoirian households is highly uneven. It is not until nearly 90 percent of households are accounted for that cumulative income exceeds 50 percent. Rows 2 through 5 of the tables report household income by cumulative deciles under various alternative assumptions about world price and Ivoirian pricing regime. In each case, no supply response is simulated, so farmers keep exactly the planting acreage and yield that they reported in the household survey.

The only change is to world price and/or the Ivoirian government purchase price. Furthermore, the incomes of households not engaged in cotton farming are left unchanged, and no attempt is made to simulate the effect on these households. In the cases in which the Ivoirian government is assumed to allow cotton prices to approach the world price of cotton, the only effect on public provision of goods and services is to curtail subsidization of inputs to cotton production. While this is clearly an imperfect measure of the effect of any policy change, it is probably a good indicator of the winners and losers from the first-round effects. Because of the assumption of no supply response, the reader should regard these figures as lower bounds on the true effect. Tables 9 and 10 report the results under the assumption that Ivoirian farmers increase their supply of cotton in response to higher perceived prices.

Simulation A of Tables 7 and 8 reports the results of a 12.6 percent increase in the world price of cotton assuming that 50 percent of the increase is passed along to farmers through a higher government purchase price. Under this assumption, the cumulative income distribution reacts about as one might expect based on the density estimation presented earlier. The higher price of cotton creates small relative gains for the segments of the population in the upper middle portion of the distribution. The extreme right tail of the distribution, as well as those households just below the median, suffer small declines in their relative income, while households in the 40th to 90th percentiles generally reap a greater percentage of overall income. Because the only change at work here is an increase in the farm gate price of cotton, the cumulative income distribution reported in levels shows gains at each decile. While every household is weakly better off in terms of its level of income, individual deciles may gain or lose income due to marginal households being reclassified into a different decile. Though not shown in any table, the Ivoirian government must also be a winner in this scenario, since only half of the increase in world price is passed though to farmers. At 2004 levels of production, this benefit to the government would be on the order of $11 million.

Simulation B of the same tables reports the results of a 12.6 percent increase in world price coupled with complete pass through of the increase to Ivoirian cotton farmers. The outcomes are similar in pattern to those in simulation A. The households that gain relative to the others are those in the middle to upper incomes, while the relative losers are those households just below middle income and at the extreme right tail of the distribution. As in Simulation A, the magnitudes of the results are relatively modest. In terms of levels, overall household income in Côte d'Ivoire rises by 6.5 million CFA (0.2 percent), with the largest gains accruing to households in the 80th-90th percentiles. The modest size of the effect is likely a symptom of the relatively even distribution of cotton farmers throughout the income distribution as well as the diversification of cotton farming operations.

Simulation C considers a situation in which world prices remain unchanged (i.e., the assumption is that the level of the U.S. subsidy program remains unchanged), but the Ivoirian government shifts its policy to one in which farmers receive a price much closer to world

price. Akiyama, et al., find that in Zimbabwe, with liberalized cotton markets, farmers typically receive between 75 to 85 percent of the c.i.f. price of cotton. Since Zimbabwean cotton is of comparable quality to that produced in Côte d'Ivoire, I set the Ivoirian producer price equal to 80 percent of c.i.f. for this simulation. Since this essentially eliminates the implicit tax on Ivoirian cotton production, it is safe to assume that the government would be unwilling to provide subsidized inputs to cotton production under this scenario. Thus, I also adjust upward the amount cotton farmers spend on inputs. Time series data on Ivoirian input costs are virtually nonexistent, but Table 11 shows recent levels of the cost differential between the U.S. and Côte d'Ivoire for a few key inputs. Judging by the results of Table 11, it does not seem unreasonable to adjust upward the amount cotton farmers spend on insecticide and fertilizer by 35 percent.

Because transportation and seed costs were covered entirely by the government monopsony, judging the amount by which those costs should be raised is a more difficult matter still. In the end, I opt to assign a cost of transportation of 18 CFA per kilo of cotton, as this is the average transportation cost incurred by cocoa producers. In either case the crop is likely to require transportation to the provincial capital for processing and transportation costs based on mass should not vary across crops. Seed costs are raised so that the cost per acre for planting cotton is equal to the average reported cost per acre for peanuts, maize, and rice, three other annual crops often grown in the northern savannah. This is admittedly an imperfect solution; there is no reason to believe that, in the absence of government provision of transportation and seed, these prices would prevail. However, in the absence of better approximations, these seem reasonable.

With the above caveats, the results of simulation C are summarized in the fourth row of Tables 7 and 8. Again, the results are similar. The bottom of the income distribution is little affected, while those in the upper-middle class now account for a greater fraction of overall household income. In each successive simulation there is a reduction in the relative amount of national household income accounted for by the top 10 percent of households due to the relatively low prevalence of cotton farmers among these households. Interestingly, even after increasing farmers' input costs, the magnitude of the changes in income are greater than the previous simulations in which only world price was assumed to change. This provides further evidence that the Ivoirian policy, while offering some price stability to farmers, also provides significant remuneration to the government.

Simulation D replicates the scenario of simulation C with the exception that now U.S. policy as well as Ivoirian policy is assumed to have changed. That is, I examine the results with an increase of 12.6 percent in the world price as well as deregulation of the Ivoirian cotton market such that cotton farmers receive 80 percent of the world c.i.f. price of cotton. In this scenario we see the most substantial response in terms of income distribution. As before, the most substantial impact occurs in the 70th to 90th percentiles, where relative incomes rise, and the 90th to 100th percentiles, where relative incomes fall. Overall, we see that household income is improved by 62.2 million CFA, or 1.6 percent, for the survey population. As in each of the four previous simulations, Ivoirian cotton production is held constant and I ignore any potential multiplier effects. As such, these estimates of the impact on income level and distribution should be regarded as lower bounds. It is important to bear in mind that simulations C and D may have serious public finance implications. I return to this question in the following section.

In simulations A' through D', I assume that Ivoirian cotton producers respond to changes in their perceived price with an elasticity of supply of 0.67 BerteEppelin. In addition, I suppose that farming is a constant returns to scale endeavor, so that the cotton farmers' expenses for fertilizer, insecticide, labor, and storage can be raised by the same fraction as their output. Because we cannot be sure which, if any, other crops would be displaced by this increased cotton production, I leave production figures for all other crops unchanged. Thus, these simulations probably represent an upper bound on the true effect and should be interpreted with caution. Furthermore, the use of an elasticity to project a supply response is best done when the magnitude of the change is small. In many of these simulations the magnitude of the change in producer price is quite large, rendering less trustworthy any assumption reliant on constant elasticity.

The results of simulations A' through D' are contained in Tables 9 and 10. Despite the fact that the tables rely on several assumptions, the results appear plausible. As before, most of the benefit of higher world prices or a relaxation of government control over cotton markets accrue to Ivoirians in the upper-middle portion of the income distribution. At their most potent, these changes result in an increase of $204.3 million in household income for the 1600 survey households. More importantly, this amounts to 5.4 percent of total household income---an amount clearly insufficient to alleviate poverty in Côte d'Ivoire---but certainly significant, especially for cotton-farming households.

5. Conclusions and Policy Implications

The most important conclusion arising from this exercise is that changes to the farm gate price of cotton have little effect on the overall distribution of household income. To the extent that distribution is affected, the results seem to be toward a slightly more unequal distribution of income. The segments of the population that typically benefit most relative to the rest of the population are those in the upper-middle portion of the income distribution, but in no case did a simulation cause any decile to gain or lose more than about 0.8 percent of total household income. The Lorenz curves that correspond to simulations A through D typically begin outside of the actual Lorenz curve and then cut inside by about the 70th percentile. Results are broadly similar for simulations A' through D'. Most measures of inequality would suggest that these policy changes lead to increased inequality, but the effects are generally very small. Simply put, cotton prices do not exert much leverage over the distribution of income in Côte d'Ivoire.

In terms of aggregate income, the results are slightly more impressive. In simulation D, in which the Ivoirian government is assumed to completely liberalize cotton markets and the U.S. government drops its support of the domestic cotton industry, aggregate household income increases by approximately 1.6 percent. In simulation D', in which the same conditions exist but farmers respond to higher prices by increasing cotton production, the impact on aggregate household income exceeds 5 percent. Despite resulting in higher input costs for farmers, simulations in which the Ivoirian government drops its taxation regime (C, C', D, and D') seem to have the most significant effect on aggregate income. However, as mentioned before, to say that these policies are better than the current policy is to ignore the potential public finance ramifications of any policy change.

The desirability of such a taxation regime is another question entirely. The maintenance of a guaranteed price of cotton insulates farmers from risk but is less economically efficient since decisions to plant one crop in place of another (or even to plant at all) are not based on the true opportunity cost. Moreover, the system creates other inefficiencies mentioned above. However, since the collection of income taxes may be infeasible for a large proportion of the population, a tax on agricultural production may be the government's best option. Arguments that the government should simply set its purchase price at the level of the world price ignore the public finance ramifications of this approach. While it would almost certainly result in higher incomes for the cotton-farming segment of the population, the provision of some types of public goods may suffer. Furthermore, to the extent that cotton farmers tend to be located above the median of the income distribution, the tax may provide an important means of income redistribution.

Finally, it is worthwhile to note some of the limitations of the above analysis. First, and probably most importantly, there are important data constraints with regard to household data for West Africa, and cotton is not cultivated as intensively in Côte d'Ivoire as in some other West African nations (notably Mali). Thus, the effects measured here may be felt more acutely in other settings. Second, the analysis implicitly assumes that all factors of production are fully employed both before and after the change in the world price, and so there is no multiplier effect on the increased income of cotton farmers as they spend that income on various other goods and services. Finally, there is no dynamic element to the analysis and yields are assumed to remain unchanged after the increase in world price. To the extent that depression of world prices causes underinvestment in cotton producing capital and technology, rising world prices may be correlated with rising yields.

Appendix

Table 1. Major Cotton Producers and Exporters (2004 Marketing Year)

Country	Thousands of 480 lb. Bales	Share of World (%)
Production		
China	29.0	24.2
United States	23.3	19.4
India	18.1	15.1
Pakistan	11.3	9.4
Brazil	6.4	5.4
Uzbekistan	5.1	4.2
Turkey	4.2	3.5
Australia	2.8	2.3
Greece	1.8	1.5
Syria	1.6	1.3
Exports		
United States	13.0	39.0
Uzbekistan	3.3	9.9
Australia	2.1	6.3
Brazil	1.8	5.4
Greece	1.1	3.3
Burkina Faso	1.0	2.8
Mali	1.0	2.8
India	0.8	2.4
Syria	0.7	2.1
Egypt	0.7	1.9

Note: Data are from USDA's Foreign Agricultural Service

Table 2. Major Cotton Consumers and Importers (2004 Marketing Year)

Country	Thousands of 480 lb. Bales	Share of World (%)
Consumption		
China	38.0	35.2
India	15.0	13.9
Pakistan	10.4	9.6
Turkey	7.0	6.5
United States	6.3	5.8
Brazil	4.2	3.9
Indonesia	2.3	2.1
Mexico	2.1	1.9
Thailand	2.0	1.9
Bangladesh	1.7	1.6
Imports		
China	6.5	19.5
Turkey	3.5	10.5
Indonesia	2.4	7.2
Thailand	2.1	6.3
Mexico	1.9	5.7
Bangladesh	1.7	5.1
Russia	1.5	4.3
Taiwan	1.4	4.2
South Korea	1.3	3.8
Pakistan	1.0	3.0

Note: Data are from USDA's Foreign Agricultural Service

Table 3. Income Sources of Various Subsets of Ivoirian Households (000 CFA)

	Population	Crop Farmers	Cotton Farmers
Compensation	1016.1	501.9	690.7
Monetary Benefits	973.0	497.6	690.0
Nonmonetary Benefits	43.1	4.3	0.8
Net Farm Income	663.9	1191.9	405.0
Net Rental Payments	23.0	41.7	-0.1
Crop Income	640.8	1159.8	427.7
Less:			
Seed	-2.3	-4.0	-1.5
Fertilizer	-3.8	-6.7	-38.7
Crop Given as Payment	-9.9	-18.0	-6.1
Insecticide	-1.0	-1.8	-2.1
Transportation	-0.7	-1.2	-0.3
Containers	-0.3	-0.6	-0.1
Storage	-0.0	-0.0	-0.0
Labor	-11.1	-19.4	-15.9
Other	-0.2	-0.4	-1.2
Net Transformation Income	22.3	38.1	43.1
Livestock Income	11.0	5.5	2.3
Less:			
Livestock Expenses	-4.0	-1.3	-3.1
Net Income From Tools	0.1	0.1	0.9
Miscellaneous Income	699.5	1241.3	1239.3
Value of Home-Produced Food	691.2	1235.6	1235.4
Net Remittances	-10.7	1.3	2.4
Other Income	19.1	4.5	1.5
TOTAL INCOME	2379.5	2935.2	2334.9
Number of Households	1600	884	136

Note: Data are from the World Bank's Living Standards Measurement Survey for Côte d'Ivoire, 1988.

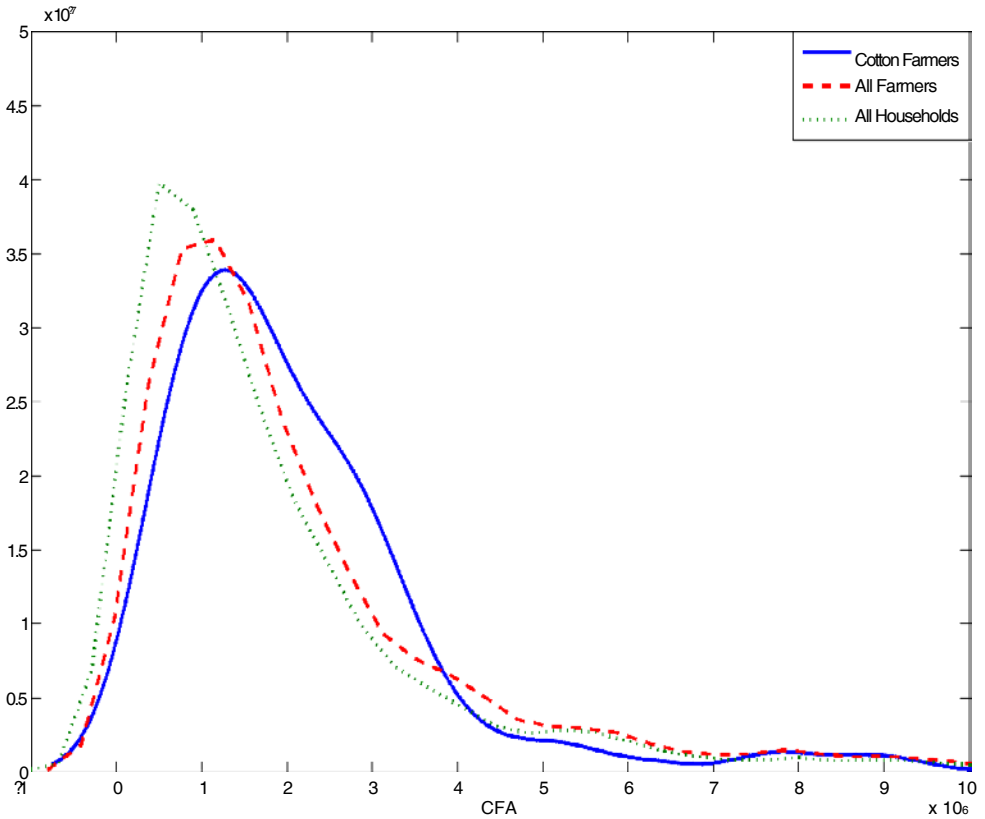

Figure 1: Income Distribution of Various Subgroups of the Ivoirian Population.

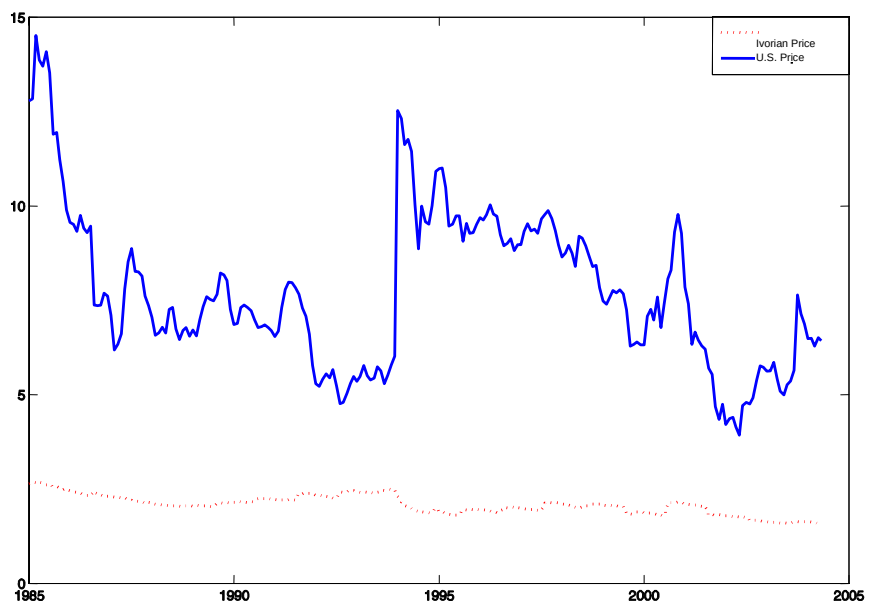

Figure 2: Real Farm-Gate Price of Cotton in the U.S. and Côte d'Ivoire.

Table 4. Per-Acre Costs of U.S. Cotton Production (Current Dollars)

Item	2001	2002	2003	2004
Gross Value of Production	271.40	307.83	377.35	416.93
Primary Product: Cotton	222.60	257.88	331.50	366.00
Secondary Product: Cottonseed	48.80	49.95	45.85	50.93
Operating Costs	284.24	278.00	292.72	292.28
Seed	37.82	47.99	51.40	51.12
Fertilizer	35.36	30.56	32.43	32.85
Chemicals	59.25	56.80	56.63	57.76
Custom Operations	19.99	19.25	19.38	19.50
Fuel, Lubricant, Electricity	36.49	31.37	36.29	36.07
Repairs	28.53	29.10	28.11	28.51
Interest on Operating Inputs	4.71	2.31	1.95	3.83
Irrigation and Ginning	62.19	60.62	66.53	62.64
Allocated Overhead	246.28	251.02	248.23	250.07
Hired Labor	37.89	38.16	38.32	38.69
Opportunity Cost of Unpaid Labor	30.28	32.73	32.87	33.18
Capital Recovery of Machinery and Equipment	101.49	100.39	96.91	98.28
Opportunity Cost of Land	43.83	46.76	46.67	46.11
Taxes and Insurance	16.68	17.01	17.29	17.53
General Farm Overhead	16.11	15.97	16.17	16.28
TOTAL COST	530.52	529.02	540.95	542.35
Value of Production Less Total Costs	-259.12	-221.19	-163.60	-125.42
Value of Production Less Operating Costs	-12.84	29.83	84.63	124.65
Supporting Information:				
Cotton Yield (Pounds/Acre)	636	614	650	600
Cotton Price ($/Pound)	0.35	0.42	0.51	0.61
Cottonseed Yield (Pounds/Acre)	1220	999	917	926
Cottonseed Price ($/Pound)	0.04	0.05	0.05	0.06

Note. — Data are from USDA's Economic Research Service, Commodity Costs and Returns (2003). Cost data for 2003 and 2004 are forecasts from USDA's economic research service. Supporting information for those years are the author's calculations based on available data.

Table 5. Average Land Usage of Various Subsets of Ivoirian Households (Acres)

	Population	Crop Farmers	Cotton Farmers
Cocoa	1.6	3.0	0.1
Coffee	1.6	2.6	0.4
Rubber	0.0	0.0	0.0
Coconut	0.0	0.0	0.0
Oil Palm	0.3	0.5	0.0
Banana	0.0	0.0	0.0
Fruit Trees	0.2	0.3	0.2
Wood	0.0	0.0	0.0
Cola Nut	0.2	0.4	0.0
Cotton	0.4	0.6	3.9
Peanut	0.3	0.5	1.6
Tobacco	0.0	0.0	0.1
Pineapple	0.0	0.0	0.0
Sugarcane	0.0	0.0	0.0
Cassava	0.6	1.0	1.0
Yam	0.8	1.3	1.9
Taro	0.2	0.3	0.0
Sweet Potatoes	0.0	0.0	0.1
Maize	0.8	1.4	2.9
Rice	0.9	1.6	1.9
Millet, Sorghum	0.1	0.2	1.1
Vegetables	0.2	0.4	0.2
Other Crops	0.0	0.0	0.0

Note. — Data are from World Bank's Living Standards Measurement Survey for Côte d'Ivoire, 1988. This table is based on household reports of acreage harvested in the 12-month period preceding the survey. It does not take into account land left fallow, land not yet in production, or acreage planted to a crop but not harvested.

Table 6. Recent Levels of Ivoirian Cotton Production and Usage (000 of 480 lb. Bales)

Marketing Year	Average World Price (cents/lb.)	Harvested Acres (000)	Average Yield (lbs./acre)	Beginning Stock	Production	Total Supply	Mill Use	Exports	Ending Stock
1984	87.65	360	541	20	406	426	84	200	142
1985	69.16	378	480	142	378	520	84	385	51
1986	48.97	394	520	51	427	478	94	294	90
1987	62.06	446	563	90	523	613	94	391	128
1988	72.30	527	536	128	589	717	95	462	160
1989	66.41	498	476	160	494	654	95	531	28
1990	82.39	491	520	28	532	560	88	372	100
1991	82.95	469	408	100	399	499	81	350	68
1992	62.96	554	420	68	485	553	61	316	176
1993	57.73	541	465	176	524	700	73	369	258
1994	70.76	598	342	258	426	692	82	575	35
1995	92.72	504	419	35	440	488	85	365	38
1996	85.59	519	485	38	524	571	96	371	104
1997	78.60	603	537	104	675	779	110	450	219
1998	72.13	670	515	219	719	938	110	550	278
1999	58.88	717	502	278	750	1028	90	735	203
2000	52.84	741	372	203	575	778	90	600	88
2001	57.21	704	477	88	700	788	80	400	308
2002	41.85	796	422	308	700	1008	70	400	488
2003	55.75	568	338	488	400	888	65	500	323
2004	69.23	642	393	323	525	848	65	500	283

Table 7. Cumulative Distribution of Income by Weighted Decile of Survey Respondents: Various Scenarios

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Memo: Producer Price (CFA/kg)
Actual	.0039	.0218	.0490	.0865	.1347	.1949	.2715	.3698	.5106	1.0000	115.0
	(.0039)	(.0179)	(.0272)	(.0375)	(.0482)	(.0602)	(.0766)	(.0983)	(.1408)	(.4894)	
Simulation A	.0039	.0218	.0490	.0864	.1349	.1947	.2715	.3701	.5112	1.0000	141.2
	(.0039)	(.0179)	(.0272)	(.0374)	(.0485)	(.0598)	(.0768)	(.0986)	(.1411)	(.4888)	
Simulation B	.0039	.0218	.0489	.0863	.1349	.1947	.2717	.3705	.5119	1.0000	167.5
	(.0039)	(.0179)	(.0271)	(.0374)	(.0486)	(.0598)	(.0770)	(.0988)	(.1414)	(.4881)	
Simulation C	.0039	.0218	.0488	.0863	.1348	.1948	.2728	.3719	.5147	1.0000	333.3
	(.0039)	(.0179)	(.0270)	(.0375)	(.0485)	(.0600)	(.0780)	(.0991)	(.1428)	(.4853)	
Simulation D	.0040	.0217	.0487	.0862	.1346	.1946	.2727	.3720	.5154	1.0000	375.3
	(.0039)	(.0177)	(.0270)	(.0375)	(.0484)	(.0600)	(.0781)	(.0993)	(.1434)	(.4846)	

Note. — Figures in parentheses denote the fraction of total household income that accrues to the decile up to the percentile listed as the column heading. Simulation A reflects the results of a 12.6 percent increase in world price with 50 percent pass through to Ivoirian farmers. Simulation B reflects the results of a 12.6 percent increase in world price with complete pass through to Ivoirian farmers. Simulation C reflects the results of no rise in world price, but a liberalization of Ivoirian cotton markets to a point where farmers receive the same proportion of world price as in other African countries with liberalized markets. Simulation D reflects the results of a liberalization of cotton markets along with a 12.6 percent rise in world price.

Table 8. Cumulative Level of Income by Weighted Decile of Survey Respondents: Various Scenarios (Millions of CFA)

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Memo: Producer Price (CFA/kg)
Actual	14.9	83.2	186.6	329.2	512.8	742.0	1033.5	1407.9	1943.9	3807.3	115.0
	(14.9)	(68.3)	(103.4)	(142.7)	(183.6)	(229.2)	(291.5)	(374.4)	(536.0)	(1863.4)	
Simulation A	14.9	83.2	186.8	329.4	514.5	742.7	1035.6	1411.5	1949.6	3813.8	141.2
	(14.9)	(68.3)	(103.5)	(142.6)	(185.1)	(228.2)	(292.9)	(375.9)	(538.1)	(1864.2)	
Simulation B	14.9	83.3	187.0	329.9	515.4	744.0	1038.1	1415.6	1955.9	3820.9	167.5
	(14.9)	(68.3)	(103.7)	(142.9)	(185.5)	(228.7)	(294.1)	(377.4)	(540.3)	(1865.0)	
Simulation C	15.0	84.0	188.4	332.9	519.9	751.6	1052.6	1434.8	1985.9	3858.0	333.3
	(15.0)	(69.0)	(104.3)	(144.5)	(187.0)	(231.7)	(301.1)	(382.2)	(551.0)	(1872.1)	
Simulation D	15.3	84.0	188.5	333.4	520.7	753.1	1055.3	1439.3	1994.2	3869.5	375.3
	(15.3)	(68.8)	(104.5)	(144.9)	(187.3)	(232.4)	(302.2)	(384.0)	(554.8)	(1875.3)	

Note. — Figures in parentheses denote the fraction of total household income that accrues to the decile up to the percentile listed as the column heading. Simulation A reflects the results of a 12.6 percent increase in world price with 50 percent pass through to Ivoirian farmers. Simulation B reflects the results of a 12.6 percent increase in world price with complete pass through to Ivoirian farmers. Simulation C reflects the results of no rise in world price, but a liberalization of Ivoirian cotton markets to a point where farmers receive the same proportion of world price as in other African countries with liberalized markets. Simulation D reflects the results of a liberalization of cotton markets along with a 12.6 percent rise in world price.

Table 9.. Cumulative Distribution of Income by Weighted Decile of Survey Respondents: Various Scenarios with Supply Response

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Memo: Producer Price (CFA/kg)
Actual	.0039	.0218	.0490	.0865	.1347	.1949	.2715	.3698	.5106	1.0000	115.0
	(.0039)	(.0179)	(.0272)	(.0375)	(.0482)	(.0602)	(.0766)	(.0983)	(.1408)	(.4894)	
Simulation A'	.0039	.0218	.0489	.0863	.1349	.1947	.2717	.3704	.5117	1.0000	141.2
	(.0039)	(.0179)	(.0271)	(.0374)	(.0485)	(.0598)	(.0769)	(.0987)	(.1413)	(.4883)	
Simulation B'	.0039	.0218	.0488	.0863	.1348	.1947	.2718	.3716	.5130	1.0000	167.5
	(.0039)	(.0180)	(.0270)	(.0374)	(.0485)	(.0599)	(.0771)	(.0998)	(.1414)	(.4870)	
Simulation C'	.0039	.0213	.0479	.0850	.1326	.1926	.2714	.3710	.5192	1.0000	333.3
	(.0039)	(.0174)	(.0267)	(.0371)	(.0476)	(.0599)	(.0789)	(.0996)	(.1482)	(.4808)	
Simulation D'	.0038	.0210	.0474	.0842	.1318	.1914	.2694	.3699	.5186	1.0000	375.3
	(15.3)	(68.8)	(104.5)	(144.9)	(187.3)	(232.4)	(302.2)	(384.0)	(554.8)	(1875.3)	

Note. — Figures in parentheses denote the fraction of total household income that accrues to the decile up to the percentile listed as the column heading. In each case, farmers are assumed to respond to changes in selling price with a supply elasticity of 0.67. Changes in price level and changes in Ivoirian government policy are the same as those in simulations A through D.

Table 10. Cumulative Level of Income by Weighted Decile of Survey Respondents: Various Scenarios With Supply Response

	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	Memo: Producer Price (CFA/kg)
Actual	14.9	83.2	186.6	329.2	512.8	742.0	1033.5	1407.9	1943.9	3807.3	115.0
	(14.9)	(68.3)	(103.4)	(142.7)	(183.6)	(229.2)	(291.5)	(374.4)	(536.0)	(1863.4)	
Simulation A'	14.9	83.3	186.9	329.7	515.1	743.6	1037.4	1414.4	1954.0	3818.9	141.2
	(14.9)	(68.3)	(103.6)	(142.8)	(185.4)	(228.5)	(293.8)	(377.0)	(539.6)	(1864.8)	
Simulation B'	15.0	83.9	187.2	330.7	516.6	746.2	1041.8	1424.5	1966.4	3833.3	167.5
	(15.0)	(68.9)	(103.3)	(143.4)	(185.9)	(229.6)	(295.6)	(382.7)	(541.9)	(1866.9)	
Simulation C'	15.3	84.3	190.0	336.9	525.6	763.1	1075.7	1470.3	2057.8	3963.1	333.3
	(15.3)	(69.0)	(105.7)	(146.9)	(188.7)	(237.5)	(312.6)	(394.6)	(587.5)	(1905.3)	
Simulation D'	15.3	84.4	190.1	337.6	528.6	767.8	1080.7	1483.9	2080.6	4011.6	375.3
	(15.3)	(69.1)	(105.8)	(147.5)	(191.0)	(239.2)	(313.0)	(403.1)	(596.7)	(1931.1)	

Note. — Figures in parentheses denote the fraction of total household income that accrues to the decile up to the percentile listed as the column heading. In each case, farmers are assumed to respond to changes in selling price with a supply elasticity of 0.67. Changes in price level and changes in Ivoirian government policy are the same as those in simulations A through D.

Table 11. Comparison of Recent Cotton Input Prices in the U.S. and Côte d' Ivoire

	Côte d'Ivoire		U.S.		2001 Implied
	2000	2001	2000	2001	Subsidy(%)
Potassium Nitrate—Fertilizer ($/50 kg.)	15.87	12.14	14.33	15.10	19.6
Urea—Fertilizer ($/50 kg.)	14.74	8.77	11.02	15.43	43.2
Endosulfan—Insecticide ($/liter)	7.46	6.11	9.48	9.48	35.5

Note: Data from USDA National Agricultural Statistics Service Agricultural Prices Annual Survey (2002) and USDA Côte d' Ivoire Cotton and Products Annual (2001).

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Chapter 10

THE ECONOMICS OF UPGRADING TO INNOVATIVE TREATMENT TECHNOLOGIES IN THE FIGHT AGAINST HIV/AIDS

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Abstract

We argue that current funding campaigns to fight AIDS in developing countries fail to recognize significant losses associated with the introduction of innovative treatment technologies. For instance, the future albeit uncertain appearance and widespread use of a therapeutic vaccine will trigger significant and unrecoverable losses in current drugs treatment investments. Our objective is then two-fold. We first document losses associated with the transition to better treatment technologies and we show that failure to hedge against such losses leads to sub-optimal policies. Our second objective is to provide policy recommendations to alleviate this problem. We show how to transform some cutting-hedge financial products to generate full insurance coverage against such losses, and in some cases how to achieve full risk-sharing with agencies developing innovative treatments. We recommend that every funding campaign in current AIDS treatments be accompanied with the provision of such insurance against the cost of switching to future albeit uncertain innovative treatments.

1. Introduction

The epidemic of HIV/AIDS has been one of the most significant medical crises worldwide in the last few decades. It turns out that the epidemic has mostly spread in developing countries, for instance in Sub-Saharan Africa where the share of HIV infected individuals represents 5% of the population in 2007 (see UNAIDS 2007). Given the magnitude of the epidemic, both governmental and international interventions are necessary to contain and eradicate the disease. The shocking consequence is that developing countries face not only a medical crisis, but also an economic crisis since a significant fraction of national GDP must be allocated to fighting the disease. For instance, Nigeria has allocated 1.2% of its GDP in 2005 to fight

HIV/AIDS only (see Hickey 2005), a colossal amount of national resources that no country can forfeit without severe consequences on its economic development. Moreover, the spread of the disease triggers an increase in AIDS-related spendings over time; for instance, the percentage of health expenditures devoted to HIV/AIDS has switched from 0.8% to 7.8% between 2001 and 2005 in South-Africa (see Hickey 2005).

International agencies such as the United Nations, the GAFTAM and the G7 have provided significant subsidies and expertise to developing countries to help them contain and eradicate the disease. A total of about US$ 8.3 billion have been spent in 2005, about US$ 8.9 billion and US$ 10 billion in 2006 and 2007 respectively (see Leoni and Luchini, 2006). Nevertheless, those subsidies are nowhere close to being sufficient to meet the medical needs, and a significant part of the economic burden still remains on the developing countries.

In the situation of insufficient resources that developing countries face, the need to prioritize medical interventions and to identify optimal economic policies to fund them becomes critical. So far, economic policies have focused on two distinct objectives. The first objective is to foster investments in current treatment technologies such as field delivery of already-available ARV treatments; the second one is to allocate funds, entirely coming from developed countries, to develop innovative treatment technologies such as therapeutic vaccines (see Klausner et al., 2003).

In this study, we argue that those two policies are antagonistic, and thus inefficient, because they fail to address the severe inefficiencies associated with the transition to future albeit uncertain innovative treatment technologies. In a first step, we show that the development of innovative treatment technologies is a deterrent to current investments in available technologies. The basic idea is that the optimal reaction of developing countries, when facing the risk of forfeiting a significant part of current investments during the transition, is to postpone those investments until more information becomes available about the time of their obsolescence. This finding is consistent with reports of reluctance to invest in current treatment technologies in some African countries (see UNAIDS, 2004, p.11). Second, we show that the availability of insurance contracts allowing developing countries to hedge against the severe losses resulting from the appearance of an innovative treatment (a therapeutic vaccine for instance) must be a full component of every optimal policy in the fight against HIV/AIDS. We also explain why standard insurance contracts cannot be used for this type of risk, and we describe two distinct ways of efficiently replicating the desired hedge using recent financial products such as exotic options.

The deterrence to invest in current treatment technologies is briefly explained as follows. As documented in Section 2, therapeutic vaccines currently developed are more effective both at medical and economic levels. It is commonly agreed that the therapeutic vaccine will eventually become available, although the time of availability is uncertain. Current treatment technologies such as ARV treatments would then become immediately obsolete after the appearance of such vaccines. Moreover, new financial efforts would be needed to implement the innovative technology. The abandonment of the obsolete technology nevertheless implies to forfeit unrecoverable previous investments; those losses are particularly severe and are documented in Section 3. The social cost of those losses triggers severe crowding-out effects on every other public expenditures; that is, those unrecoverable AIDS-related expenditures tend to decrease public investments in other essential activities of a country life such as schools, roads et.c. (see Harling et al., 2005). It turns out that an insurance contract available at the time decisions to invest in current treatments are made, and allowing to hedge against

the losses resulting from the upgrading, is the most efficient way to alleviate those crowding-out effects.

When the development of innovative technologies is accompanied by the issuance of hedging schemes as described in this study, we argue that optimal delays in current investments are shortened. The main benefit of shortening those optimal delays is an easier containment of the epidemic, with positive consequences on the morbidity as well as future economic development. Despite the availability of insurance schemes and its influences on current investments, it remains optimal to nevertheless delay because of crowding-out effects linked to the always present losses in unrecoverable investments. Another positive effect of the introduction of those insurance schemes is the increase in optimal provision of current treatments, as argued in the welfare analysis of Leoni and Luchini (2006).

In Section 5, we discuss in details why standard insurance contracts are of no help to generate the desired hedge. Basically, the nature of the risk does not allow the issuer to diversify away as it is typically done. This fact alone prevents the issuance of such contracts because of the large amount of money at stake. However, we show how to modify recently commercialised financial products to replicate the desired hedge. We give two distinct methods hinging on different approaches of diversification. The first approach is derived from so-called *Collaterized Debt Obligations*, initially used to hedge the risk of losses on corporate bonds (see Chacko et al. 2006). The second approach uses a set of appropriately designed securities to be purchased both by developing countries and agencies in charge of vaccines R&D. Leoni and Luchini (2006) shows that full risk-sharing between developing countries and R&D agencies can be achieved when those securities are traded.

The paper is organised as follows. In Section 2, we carry out a general economic analysis, presenting all the relevant data relevant and explaining the improvements a therapeutic vaccine brings upon the currently available technologies. In Section 3, we explain why it always remains optimal to postpone current investments. In Section 4, we carry out a standard risk management analysis to show the improvements an insurance contract against a vaccine appearance before a given date brings. In Section 5, we give two distinct ways to generate the desired hedge using exotic options. Finally, Section 6 concludes this work. We have kept our discussion at a conceptual level, always presenting the intuition of the results and purposely avoiding mathematical modelling. The interested reader is invited to check the mathematical soundness of our results by directly looking at the references therein. Moreover, our analysis is devoted to the important case of HIV/AIDS, although the same analysis extends to similar diseases such as tuberculosis and malaria.

2. General Economic Analysis

We now discuss two important economic ideas central to the problem of transition to innovative treatment technologies. Those two ideas are crowding-out effects triggered by AIDS-related expenditures, and economic externalities (or future consequences) associated with the spread of the disease. In a first step, we identify why optimal economic policies must prioritize those problems; in subsequent sections we will discuss why the issuance of appropriate insurance schemes must be part of every optimal policy tackling those problems. Even if our focus is on AIDS, our discussion extends to similar diseases such as malaria and tuberculosis.

The first and obvious economic issue in the fight against HIV/AIDS is the funding of current treatments; that is, once an infected population and appropriate treatments strategies are identified the most natural challenge is to optimally allocate funds to implement those strategies (see Jenkins and Robalino, 2003, for an exhaustive list of strategies). This problem is simple albeit already difficult to address, since funds are not available to fully tackle this problem. For instance, the total amount of funds to fight AIDS in 2004 amounted to U.S. $10.8 billion, which resulted only in 12% of the overall HIV-positive population worldwide receiving ARV treatments (see WHO, 2004, this figure includes international subsidies). Moreover, even if governments in developing countries were to allocate enough funds to treat the infected population in its entirety, the diversion of those funds from other necessary public expenditures (such as schools, public infrastructures and else, see Harling et al., 2003) would render this policy inefficient. The idea is that, when treating the whole infected population, the severe reduction in social welfare resulting from all the other forfeited expenditures would offset the benefits of eradicating the disease. The economic situation is thus far more complex than solely funding treatment strategies on a given infected population, and addressing this issue alone without alleviating crowding-out effects necessarily leads to sub-optimal policies.

Another important issue is the future economic consequences of the spread of the epidemic. The most natural consequence of an uncontrolled spread is an increase in future public expenditures that will aggravate crowding-out effects (see Hickey, 2005, for the already-described increase in public expenditures in South-Africa). We next argue that an uncontrolled spread of the epidemic also, and perhaps foremost, leads to a decrease in domestic investments and in turn to a slow-down in the economic growth of developing countries. When a significant fraction of the population is infected as in Sub-Saharan countries, it becomes difficult to maintain a productive labour force and in turn competitive businesses because of the morbidity associated with AIDS. The prospect that the epidemic spreads, and thus that a larger fraction of the labour force gets infected, makes current investment decisions in labor-intensive businesses riskier and thus less likely. Labour-intensive businesses that are typical in developing countries may indeed find themselves short of workers in the long-run, and thus they may have to slow-down their production plans with a long-term reduction in profitability.

When making investment decisions in labour-intensive businesses, or in other words when evaluating the profitability of such investments, it becomes essential to anticipate the spread of the epidemic and its effect on the labour force. Standard economic theory (Dixit and Pyndick, 1994, Chapters 5-11 for instance) teaches us that the optimal reaction is to postpone investments until better information about the reliability of the labour force becomes available. However, postponing the creation and/or expansion of such businesses is a significant impediment to the economic development of already poor countries. At a micro-economic level, delays in investments affect nearly every aspect of economic life, such as agriculture with possible future famines and private sectors (see Shisana et al., 2004, for an exhaustive list of economic sectors sensitive to AIDS). Young (2007) reaches similar conclusions using a different approach, although the author considers mortality as an economic factor. Therefore, optimal economic policies must address not only the treatment of the currently infected population, but also the containment of the epidemic to reduce future negative effects on the labor force.

It turns out that crowding-out effects and spread externalities are intimately linked to the problem of transition to innovative treatment technologies, for reasons made clear in the next section. In the remainder of this study, we develop in details this issue that has been completely ignored so far, and we also describe some other negative economic consequences associated with switching to innovative treatment technologies. We also provide policy recommendations optimally tackling the pitfalls of upgrading; in particular, we show that those recommended policies alleviate crowding-out effects and spread externalities.

3. Optimal Investment Delays

We now explain why it is always optimal to delay current investments when facing the risk of upgrading to an innovative treatment technology. The analysis developed here for the therapeutic vaccine extends to any other medical improvement.

The difficulty with current treatments against HIV/AIDS, such as ARV treatments, is that they are awkwardly expensive and difficult to deliver to patients. Moreover, much better ways to tackle the epidemic, both at medical and economic levels, are being developed and will eventually cause the abandonment of current treatments. The best innovative treatment technology being currently developed is a therapeutic vaccine, capable of both reducing the transmissibility of the virus and treating infected patients by reducing the viral load within a population (see Klausner et al., 2003). With such a vaccine available, one injection only would treat a patient instead of a live-long treatment with ARV; moreover, the cost of production and delivery of one injection is small. Even if such vaccines are typically cheap to produce and easy to deliver to patients, the development is technologically challenging and expensive (see Kremer and Glennester, 2004). We have witnessed many failures in the R&D process, for instance with the Institut Pasteur in 2004 and Merck & Co. in 2007; however, it is commonly agreed that it is just a matter of time before success arises.

The availability of this vaccine could thus appear as good news for developing countries, since cheaper and more effective ways to treat large infected populations would *de facto* become available. Developing countries and subsidizing organisations such as GAFTAM, the G7 and others will find it optimal to adopt this new vaccine technology, both for medical and economic reasons. International subsidies amounting to roughly 75% of the overall budget allocated to fighting AIDS will thus be diverted to vaccine implementation, forcing in turn developing countries to upgrade to this new technology. Nevertheless, irreversible investments in current treatments technologies will be lost.

Those irreversible investments or *sunk-costs* are particularly stringent in the case of ARV treatments for instance; using UNAIDS 2004 data Leoni and Luchini (2006) estimates that, at the very least, they amount to $6 billion for the period 2005-2008. This last figure includes program level costs or managerial costs and related issues, but it does not include the cost of reshuffling/shutting down drugs plants nor inefficiencies linked with the transition period. This amount would represent not only a severe direct loss in case of a switch for developing countries, but also and perhaps foremost the *opportunity cost*[1] of those funds is severe and renders public economic policies inefficient if those losses cannot be compensated.

[1] That is, the social value of what is forfeited with those funds.

The general framework is thus as follows. Consider the decision for a developing country of whether to invest now in available treatments. Some of those investments are irreversible; that is, once the money is spent it cannot be recovered if those treatments are to be abandoned in the future. The risk faced by developing countries is about the date of obsolescence of those investments, or in others words about when a therapeutic vaccine appears. We next see how the uncertainty about the time those losses occur distorts optimal decisions to invest now in available treatments technologies.

The following figure summarizes the timing of investment decision in current technology and obsolescence of such investments, where the obsolescence corresponds to the random appearance of the vaccine for the reasons previously explained.

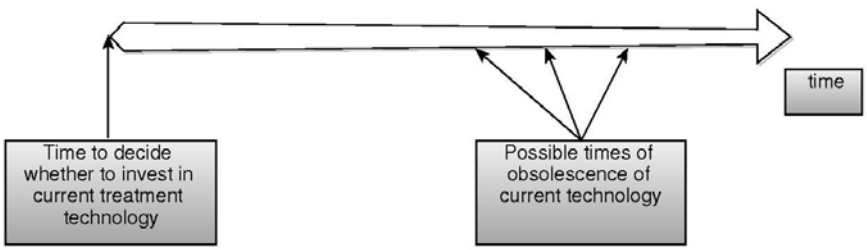

Figure 1. Timing of investment and obsolescence.

This abstract situation has been extensively analyzed in economic theory; it is a standard risk management problem with countless applications in Industrial Organisation and Finance for instance. Following an argument similar to that in Dixit and Pyndick (94) Ch. 7 for instance, it can be derived that the optimal investment decision in our setting is… to postpone the investment. The strategic motivation for delaying the investments is to wait until better information about the expected time of a vaccine appearance becomes public; this in turn will provide a better estimate about how long current investments will remain in place and thus about their profitability.

This idea is rather intuitive and easy to explain. The decision of investing now in current treatment technologies is based on the comparison between the return of the investments, not entirely measured in monetary terms in our setting, and the overall social cost of the investments. It is important to notice that the social cost of those investments ought to include the opportunity cost of money; that is, the cost of not using this money for other necessary social needs such as building schools and roads. The decision to invest now is optimal when the expected social benefits exceed the expected social costs, where the expectation encompasses the random time of obsolescence of current investments. This method is standard in Economics, and it is called a *cost-benefit analysis*. Since the time of appearance is random, it is rational to use the expected time of appearance when making the above comparison.

Standard results in Probability Theory show that, when better information become available over time, the estimator of the expected appearance time becomes more accurate leading in turn to more reliable cost-benefit analysis. The optimal delay to invest thus corresponds exactly to the date when this estimator on the time of vaccine appearance becomes accurate enough to make the cost-benefit analysis reliable. Information about the

likely time of a vaccine appearance will come naturally over time, for instance through public releases of success probability in the trial period of the vaccine or investment levels from bodies in charge of its pre-trial R&D. The situation is illustrated in the following figure.

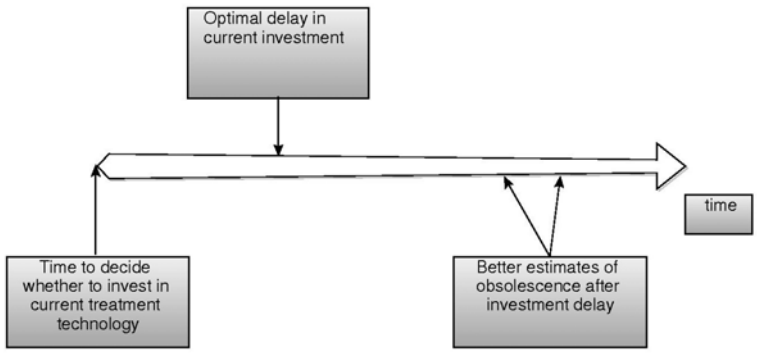

Figure 2. Optimal delay in current investments.

We still need to incorporate the externality of the epidemic spread in our analysis. The apparent difficulty is that any optimal decision to invest now must encompass this issue, and at the same time an investment delay (proven to be optimal in the previous case) worsens the spread. It turns out that it still remains optimal to delay current investments in the presence of an epidemic spread; however the presence of this negative externality shortens the optimal delay of the previous case. The intuition is similar to the previous cost-benefit analysis, the only difference is that the benefits of current investments are now increased because they slow down the spread. The soundness of this new cost-benefit analysis still and nevertheless depends on the accuracy of the estimator of the time of vaccine appearance, and as argued earlier delays to sharpen this estimator still remain optimal. Following this reasoning, it is also easy to see that the stronger the externality of the spread, the shorter the delay.

The optimal reaction of developing countries is rather problematic because it forces to delay current investments when we would ideally like immediate intervention. This is a typical situation of an uninsurable risk; in the next section, we show that the creation of financial products allowing to hedge against the risk of a vaccine appearance before a given date optimally tackles this problem.

4. Risk Management

We now analyze how to optimally manage the risk of vaccine appearance from the viewpoint of developing countries. In particular, we explain why optimal delays are shortened and the provision of AIDS-related expenditures is increased with the availability of insurance schemes. We also argue that standard insurance contracts cannot be used in this case. However, the design of such insurance schemes is postponed until the next section.

The most obvious motivation for purchasing an insurance against a vaccine appearance before a given date is to compensate for the loss of sunk costs. The financial compensation allows future insurance payments to be allocated to the implementation of the new technology. That is, sunk costs are not recovered *per se* but the compensation to developing

countries makes more funds available during the transition to the new technology. This lagging effect on investment compensations, and consequently crowding-out effects on current public expenditures, is unavoidable; however, future insurance payments have a direct and positive influence on current investment decisions at every macro-economic level.

Leoni and Luchini (2006) carries out a welfare analysis to identify the effects of the availability of this insurance opportunity not only on AIDS spendings but also on other macro-economic variables such as public goods (like roads, schools et.c.). The point is to see whether the introduction of this insurance fosters investments in current treatment technologies as well as reduces the crowding-out effect on public expenditure described earlier. The main finding is that the optimal reaction from developing countries, when having this insurance available, is to increase the level of investments in current treatment technologies. Moreover, it is shown that the optimal redistribution of insurance payments in case of a vaccine appearance also increases other current public expenditures. The study thus shows that crowding-out effects of AIDS spendings are significantly reduced when insurance schemes are available.

The intuition of the results in Leoni and Luchini (2006) is well beyond the scope of this study, but the idea can be roughly summarized as follows. The introduction of this hedging tool *completes the market*; that is, it allows to switch from a situation of fully uninsurable risk to another one where every hedging need can be met. Standard economic theory teaches us that social welfare, which encompasses provision of public goods as well as AIDS spendings, is maximised when markets are complete. This increase in social welfare directly stems in our case from an increase in both the provision of AIDS spendings and public goods; the proportion of the increases and thus the reduction of crowding-out effects depend on the substitution effects across those goods.

Another effect of the introduction of this insurance is the reduction of the optimal delay in current investments. Going back to our cost-benefit analysis from the previous section, we have seen that the optimal decision to invest in current treatment technologies occurs when the benefits of current investments are greater than their overall social costs. Those social costs must include the opportunity cost of unrecoverable funds in current investments. The necessity to consider those opportunity costs as social costs is that unrecoverable funds are invested in AIDS-related expenditures and not in other necessary public goods; this diversion of funds is economically detrimental because of the scarcity of resources (this issue is particularly stringent in developing countries). The value is what is currently forfeited, and permanently lost if no compensation is made, has a direct decreasing effect on overall social welfare encompassing every aspect of the social life of a country.

One of the consequences of the welfare analysis in Leoni and Luchini (2006), described above, is that the opportunity cost of sunk costs can be partially compensated by the benefits of future insurance payments in case of an upgrading. The introduction of our insurance schemes therefore reduces the overall social cost of current investments in available technologies, since provision of public goods is shown to increase in this case. The optimal delay to evaluate whether the benefits of current investments are profitable enough is necessarily shortened as a consequence, by argument similar to the cost-benefit analysis of the previous section. However, since the uncertainty about the time of the vaccine appearance can only be reduced by delaying the investment, delaying still remains optimal. The following figure illustrates this situation.

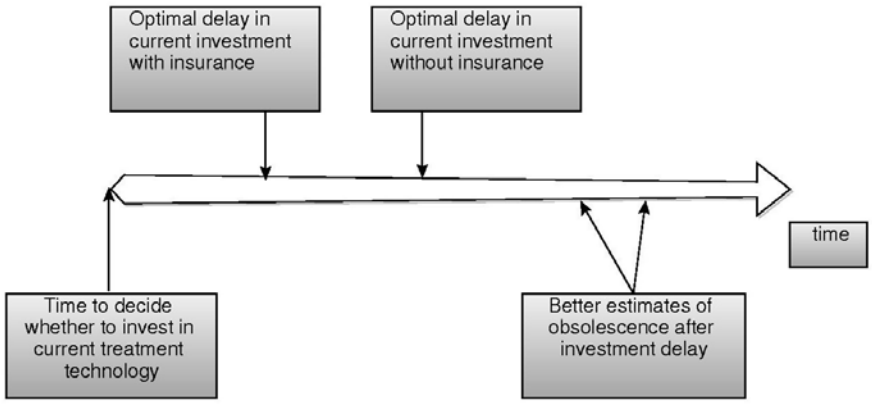

Figure 3. Optimal investment delay with insurance.

After having described the benefits of this hypothetical insurance scheme, we are now left with designing its implementation. It turns out that standard insurance contracts are not applicable in this setting, for reasons explained next, and we must rely on recent financial products such as *derivatives* and in particular *exotic options* to meet this hedging need (see Hull, 2006, for a complete introduction to those products).

There are many reasons why standard insurance contracts, like an individual car insurance contract, would be of no help in the fight against AIDS. Let us focus on car insurances to illustrate this idea, and let us take the standpoint of the insurer. Let us assume that this insurer knows somehow that her average customer has a car accident with a probability of, say, 10%, and that an accident triggers an average payment of $5,000 from the insurer. A naïve and inefficient way to manage this risk for the insurer would be to set an insurance premium so that she would break even ex-ante; here, the premium P to be charged should be such that P-5,000*0.1=0 corresponding to the *fair price* of the contract.

The way this risk is managed in practice is very different from that, and it relies on more sophisticated statistical ideas. The problem of issuing one contract only is that the insurer faces a huge volatility on her cash flow, and therefore the issued contract would simply come down to transferring the risk of a car accident from the driver to her. Standard risk management techniques rely on the fact that this volatility is significantly reduced by issuing a large number of similar contracts; the idea is that the realised uncertainty of a large group of comparable individuals is a lot more predictable that the realised uncertainty of a single individual. The Central Limit Theorem for instance, when applied in this setting, asserts that percentage of the insured population that will actually have a car accident converges to 10% (this corresponds to the probability of an accident) as the insured population increases. With this fact in mind, it becomes straightforward for the insurer to manage the cash flow and the risk of accident.

From the previous example, we can readily see why such contracts are of no use to hedge against a vaccine appearance. A potential insurer cannot issue many such contracts in the case of vaccine appearance, and all the customers are simultaneously affected by the same event (in contrast, it is fair to assume that the occurrence of an accident for a single driver cannot affect the odds of accident of a large population). As argued earlier, the insurance contract described in this section would thus represent a net risk transfer to the issuer, and this issuer

would find it nearly impossible to diversify away this risk. In the unlikely event that an insurer accepts to issue such a contract, any financial regulator following the Basel II agreement would prevent its issuance because of too high the risk taken by the insurer. It turns out that modern financial products such as derivatives and exotic options allow to replicate the desired hedge against a vaccine appearance while avoiding all the previous flaws. Those products are described in the next section.

5. Health Derivatives

We now describe some financial products capable of replicating the desired hedge against the risk of upgrading before a given date, while avoiding the pitfalls of standard insurance contracts. As we have seen in the previous section, the main problem with standard insurance contracts is that the risk of vaccine appearance is nearly impossible to diversify away. We next describe two 'exotic options' making this diversification natural, even if they rely on two very different approaches of risk management. We first give a brief overview of these products, and we describe them in details later in this section.

The first exotic option that we give is inspired from a class of *credit derivatives* (see Hull, 2006, Ch. 21 and Chacko, 2006) called *Collaterized Debt Obligation*, or CDO forthwith. Diversification is obtained by pooling parts of a broad insurance against vaccine appearance with many other risky assets in order to form a new financial asset. The point of adding parts only of the broad insurance against vaccine appearance, instead of the broad contract, is to allow an easier diversification through many CDOs. Once this large structured product is formed, the insurer or issuer of the CDO sells separate pieces or *tranches* of this body to investors, each tranche does not specify which assets are at risk but rather the overall risk of potential losses of the structured product. This construction is called a CDO, or also a *structured product*, even if they may take different shapes in practice. CDOs have largely grown in popularities to become one of the largest financial markets nowadays. To illustrate their importance, the aggregate global CDO issuance worldwide was U.S.$ 249 billion in 2005 and U.S.$ 489 billion in 2006.[2] Finance professionals have found ways to incorporate various forms of financial assets into those structured products. For instance, the risk of default on individual home loans has been hedged with CDOs, even if they have caused the famous credit crunch of 2007 in the U.S.

The second exotic option presented here is taken from Leoni and Luchini (2006). The way to diversify the risk of vaccine appearance in this case is based on the observation that developing countries and bodies in charge of the vaccine R&D face *negatively correlated risks*; that is, success in developing a vaccine negatively affects developing countries whereas failure maintains current investments in place longer and thus it positively affects those countries. In this situation, it should be possible to exchange the risk between those two parties by issuing well-designed securities, and it turns out that the securities described later achieve full risk-sharing between developing countries and agencies in charge of vaccine R&D.

The financial products introduced here are regarded as the latest generation of financial products due to the originality in their diversification techniques. Structured products have

[2] In contrast, the Gross Domestic Product of Benin in 2006 was U.S.$ 4,749 million.

been developed sometimes in the mid-90s to hedge against losses on corporate bonds in case of bankruptcy of the issuing sides. The securities described in Leoni and Luchini (2006) are more difficult to trace in practice because of some potential problems of moral hazard; in the case of a vaccine development it is possible to fully eliminate this problem as explained later. The origin of those securities is more theoretical and is due to K. Arrow and his early works on complete markets, thus the name of *Arrow securities* used throughout. Exotic options such as CAT bonds, introduced in the late 90s to provide compensations if a pre-determined catastrophic event occurs (or not), are somewhat similar to the Arrow securities designed here.

One can easily imagine other ways to generate the desired hedge while avoiding diversification problems; however the central problem of pricing those products is a significant challenge that is not yet fully understood, and it thus can prevent their implementation.

5.1. Structured Product

We now describe in details the first class of exotic options generating the desired hedge. The structured product presented next is derived from a standard CDO in which we can easily diversify any insurance contract against a vaccine appearance. Before showing how to diversify away our desired hedge with such a product, we first describe the basic organisation of an abstract CDO.

Consider an arbitrary number of tradable assets, every asset has a reselling price and carries the risk that its price may decrease in the future. The point is to hedge against the risk of loss in the reselling value. Those assets can be assembled into one single financial product, whose value (or price) is the sum of the prices of all pooled assets. This structured product is also risky, since a loss on any constituting asset will directly translate into a loss on the pool. However, standard results in Probability Theory show that the variance of the structured product is smaller than the sum of all individual variances, and thus the structured product is less risky than individual assets alone. It turns out that the smaller the correlation across constituting assets, the less risky the structured product.

The most standard way to diversify away the risk of the structured product is to cut it into pieces or tranches and to sell the tranches to outside investors, who would accept the risk of losses in return for a pre-agreed yield depending on the risk of the tranche. Tranches can be designed as follows, even if other combinations are possible and commonly seen. The first tranche amounts to, say, 15% of the overall initial value of the CDO and it absorbs the first 15% losses of this initial value. That is, if the CDO has lost more than 15% of its initial value during the lifetime of the tranche then the first tranche will become worthless. If now the overall loss on the CDO is less than 15% at the end of the lifetime, then the owner of the tranche will receive from the issuer of the CDO a pre-determined yield on the remaining value of the tranche on top of the remaining value. The second tranche amounts to 25% of the value of the CDO, and it absorbs losses within the range of 15-25% of the overall CDO during its lifetime. Payments to the owner of the second tranche work exactly as for the first tranche, with a different pre-determined yield though. The third tranche then absorbs losses within the range 25-35%, and works exactly as the previous ones. The process is repeated until every possible risk level is allocated to a tranche.

The next question is how to attract outside investors in buying such tranches. Clearly, the first tranche is much riskier than the second tranche; the second tranche is much riskier than the third and so on. Therefore, the issuer must provide a greater yield to the owner of the first tranche to compensate for the greater risk, then a lower yield for the owner of the second tranche and so on. Typically, high yields on the riskiest tranches have attracted aggressive investors such as hedge funds, whereas less risky tranches have attracted conservative investors seeking assets with low risk and yields greater than those of riskless Treasury bonds for instance. The structure of this CDO is described in the following figure.

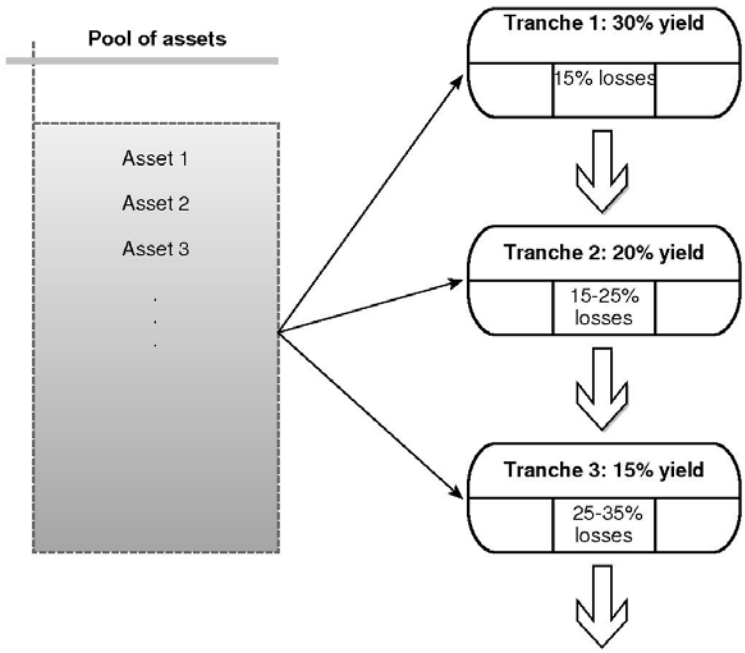

Figure 4. Basic structure of a Collaterized Debt Obligation.

We now describe how to add the hedge against vaccine appearance into an abstract CDO as above. Consider a contract stipulating a pre-determined payment if a therapeutic vaccine becomes available before a given date and nothing otherwise; such payment need not cover all the losses incurred by developing countries so as to break down in smaller pieces the broad hedging scheme. The risk of loss in issuing this contract occurs in case of a vaccine appearance during the life of the contract, and in this case the loss to the issuer is the value of payment to developing countries less the selling price of the insurance. The only potential problem in adding this contract to an already existing CDO is that it would make the tranches riskier. That is, the potential pitfall is that the probability that any tranche becomes less profitable or even worthless increases by adding insurance schemes against the risk of a vaccine appearance. It turns out that the overall risk of having any tranche riskier is unaffected by adding this insurance contract to the CDO. This can be shown by observing that the risk of vaccine appearance is uncorrelated with the risk of losses of any other already-pooled asset, since the event of a vaccine appearance (or not) is independent of the performances of most of the financial assets traded such as stocks and corporate bonds. Even

if the variance of the CDO will be affected, the overall risk of the structured product remains the same after adding this new insurance contract, and the attractiveness of the CDO also remains unchanged.

We have thus seen that breaking down the large insurance contract against vaccine appearance and adding the smaller contracts to many CDOs is a natural and effective way to diversify away the risk. The inherent difficulty with this method is to find the optimal yield assigned to every class; this problem is however common to every CDO. Theoretical methods to find those yields are still in their infancy (see Hull, 2006, Ch. 21), despite the large volume of trades of those products. However, there exists a market price, instead of a theoretical price, for similar tranches characterized by their risk level. In practice, every tranche is assigned a risk level or *credit rating* by specialized agencies such as Moody's. Once the credit rating of a given tranche is assigned, market indices such as iTraxx and CDX IG NA provide the current market price of the tranche. Since adding the insurance contract on AIDS to any CDO does not change the risk of the tranche, the pricing of the CDO is standard and thus this method of diversification can be regarded as feasible and efficient.

5.2. Arrow Securities

We now describe our second class of financial products generating the desired hedge against the vaccine appearance. The approach to diversify away the risk here is significantly different from CDOs and other structured products; the idea is now to design securities allowing to share the risk of vaccine appearance/failure before a given date between bodies in charge of the vaccine R&D and developing countries. What follows is derived from Leoni and Luchini (2006); interested readers are referred to this reference for more details, in particular for the pricing of those securities.

In our setting, we are dealing with two parties facing negatively correlated risk as explained earlier. On the one hand, developing countries face the risk of a loss of at least $6 billion in case of a vaccine appearance, and on the other hand vaccine development agencies have invested $500-600 million until 2006 in the R&D and they face the risk of loosing a significant part of this investment in case of failure (Leoni and Luchini, 2006, documents those losses). Many studies such as Arrow (71) show that it is never optimal for risk-averse agents to fully insure against all possible losses; however, it always remains optimal for risk-averse agents to insure against a significant part of those losses. The point is now to design a set of securities allowing both parties to share the risk, by exploiting the negative correlation of the events triggering losses.

Consider a financial asset available when decisions to invest in current treatment technologies are made, with a fixed maturity (or expiration) date and the following payoff structure: a pre-determined small payment is made to the owner of the asset if a successful vaccine is released before maturity and no payment is made otherwise. We call this asset an *Arrow security*. Developing countries can purchase this asset to hedge against the risk of vaccine appearance, and the small payment makes the diversification easier for the issuer.

The way to achieve risk-sharing is obtained by issuing another security, which will call a *complementary security*. Consider a security similar to an Arrow security, different only in the payoff structure: the same payment is made to the owner if the vaccine is not released before maturity and no payment is made otherwise. Agencies in charge of the vaccine R&D

are in demand for this complementary security, since they can compensate this way for losses resulting from failure in development. However, one must be very carefully when issuing complementary securities because the event triggering their payment is controllable by the party owning those securities. Indeed, a simple way to make profits for those agencies is to purchase those securities in large amount, and to collude for not making any R&D at all. No vaccine will ever appear before maturity, and payments will be received in return for no effort.

We must therefore refine our notion of complementary security to remove this moral hazard. The last problem can be simply tackled in the case of medical innovations as follows. The first observation is that every medical innovation must pass an official trial (for instance, the F.D.A. is in charge of organising those trials in the U.S.) before being approved and then released. A therapeutic vaccine against AIDS is no exception, and moreover there exist reliable tests capable of deciding whether a typically costly trial is worth undertaking (see Leoni and Luchini, 2006, and Klausner et al., 2003, for more details). We can therefore remove the moral hazard described above by making payment of the complementary security contingent on two events: 1- at least one therapeutic vaccine has passed the pre-trial test before maturity, and 2- no therapeutic vaccine is released before maturity. Condition 1 ensures that enough investments in R&D have been made by at least one development agency to have a reliable vaccine; the remaining uncertainty about the official approval depends on the F.D.A. for instance and it is beyond the agency control.

There is yet another moral hazard linked to the nature of the trial. Indeed, medical trials are carried out by national agencies but are paid for by submitting companies. The typical cost of a trial amounts to 1/3 of the overall R&D budget. A natural strategy for a vaccine agency is thus to buy a large amount of complementary securities, to make enough R&D investments to pass the pre-trial test and to immediately withdraw from the trial. A vaccine agency using this strategy can save 1/3 of its initial budget and receive the payment from the complementary securities, thus making a substantial profit. This moral hazard can simply be removed by adding a third clause to the contract stating that, in order to receive payment from complementary securities, no medical trial can be stopped without the approval of the official agency in charge of carrying it out.

With those two securities, it is relatively easy to see that the risk of vaccine appearance and development failure can entirely be removed. Consider the viewpoint of an insurer having issued an insurance contract against vaccine appearance to a developing country. This contract can be entirely replicated by issuing a given number N of Arrow securities (the number needed to be issued depends on the amount of money payable on each security). A natural way to diversify away the risk incurred after this issuance is to issue exactly N complementary securities, in which the insurer is taking no risk at all and can make some profits through commission fees. This situation is described in the following figure.

The last point to observe in the previous construction is that the risk of vaccine appearance has not fully been eliminated. Given the relative amounts of money needed to be insured by both parties, it appears that insurers following a N-for-N issuance scheme above cannot fully insure developing countries (recall that at least $6 billion are at risk in developing countries, whereas in contrast $500-600 million have been invested in vaccine R&D until 2006). The excess risk in developing can be optimally covered by international bodies, such as the GAFTAM, the G7 and else, subsidizing those countries in their fight against AIDS. Indeed, subsidies are entirely devoted to current treatments whereas throughout

this study we have shown that this policy is inefficient. Diverting part of those subsidies to hedging against the pitfalls of a vaccine appearance would render those policies more efficient, and this would allow for a complete risk-sharing between parties involved in the therapeutic vaccine. Moreover, a combination of securities issuance and structured products (as in Section 5.1) to diversify away the resulting excess risk on developing countries is feasible, efficient and easy to implement.

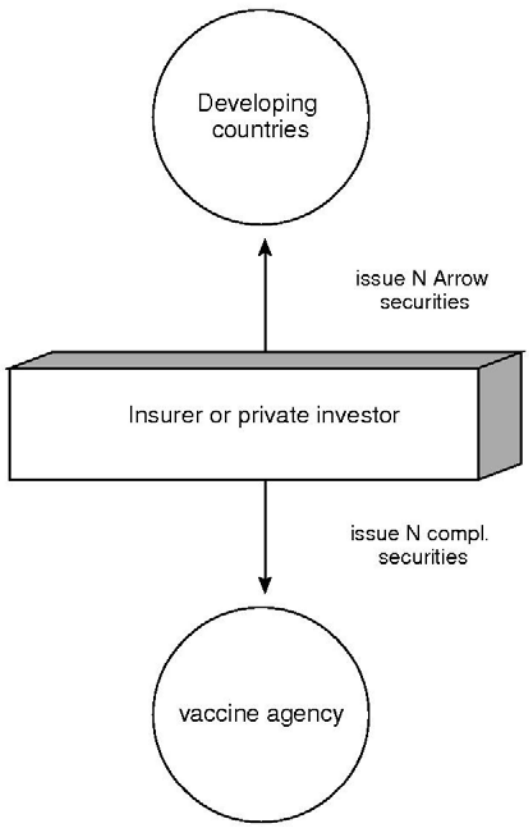

Figure 5. Risk-sharing between parties.

6. Conclusion

We have analysed, from the viewpoint of developing countries, the economic consequences of upgrading to innovative treatment technologies in the case of HIV/AIDS, with a particular focus on therapeutic vaccines. The basic risk for developing countries is that the future albeit uncertainty appearance of a therapeutic vaccine, or any other innovative treatment technology, would trigger significant losses in investments on current treatment technologies.

In a first step, we have seen that the optimal reaction of a developing country, when facing the uncertainty about the time of availability of a vaccine appearance, is to delay investments in current treatment technologies despite the negative externalities this brings. This finding is consistent with reports of reluctance to invest in current treatment technologies

in some African countries (see UNAIDS, 2004, p.11). We have also seen that the availability of an insurance allowing to hedge against this risk significantly shortens the optimal delay in current investments, and other studies such as Leoni and Luchini (2006) show that the optimal investment level is increased with the availability of such an insurance scheme. However, standard insurance contracts are useless in this situation and we must rely on modern financial products to effectively replicate the desired hedge.

In a second step, we have given two ways to replicate the desired hedge, one using structured products to diversify away the risk, the second one based on the issuance of Arrow securities allowing to achieve full risk-sharing with vaccine development agencies. We can imagine other financial products for this purpose; however their pricing always remains an important concern and a severe impediment to their practical implementation.

This work has thus addressed the important problem of upgrading to innovative treatment technologies, an issue systematically ignored in the design of economic policies to fight HIV/AIDS. We argue that every optimal policy to fight this epidemic must go beyond the optimal funding of treatments with current technologies and the R&D in innovative medical products; it must also encompass the transition to those future albeit uncertain innovative technologies.

In this respect, we recommend that funds allocation to current treatment technologies and/or R&D in innovative treatment technologies be accompanied with the issuance of financial products as described here. The point is that, when providing decision-makers with such hedging schemes, the present and future welfare gains largely offset the diversion of funds to immediate treatments and R&D. Those insurance products are thus a full component of every optimal economic policy in the fight against AIDS.

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Chapter 11

INNOVATIONS AND ECONOMIC GROWTH IN THE FAST CHANGING GLOBAL ECONOMY: COMPARATIVE EXPERIENCE OF THE ASIAN COUNTRIES

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Abstract

Transformation of East Asian countries from imitation to reaching the frontier areas of innovations in a short span of time is a question that has been explored in this paper. Asian continent has emerged as the hub of innovative activities in the fast pace of globalization. Within Asian continent, there are wide differentials in the stage of economic development and transformation as well as in the national innovation systems. Two distinct patterns of economic transformation and systems of innovations which have evolved over time are-one, based on building strong industrial sector as an engine of innovations and growth; two, the engine of growth is the service sector and innovation system is heavily dependent on foreign capital and technology. Public innovation policies played active role in the process of evolving distinct national innovation systems of Asian type. This paper, while drawing lessons from public innovation policy of the successful innovators of East Asian countries, brings out the need for public innovation policies to develop industrial sector rather than prematurely move towards service sector oriented economic growth.

Keywords: Technology policy, technological indicators, national innovation system, structural transformation, innovation institutions, economic growth, Asia.

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1. Introduction

Innovations spur growth and economic transformation is widely acclaimed in economic growth literature. Innovations entails organizational as well as changes in the rules of the game. Thus, transition in the national innovation system is the fundamental determinant of long-run economic growth and development. This is being reflected through the changes, which are occurring in the economic structure of an economy as well as in the structure of the innovation system. Since the national economies are growing in the interdependent world, therefore national innovation system is continuously being influenced by the changes occurring in other parts of the world. Asian continent has distinctly achieved high rates of economic growth and has emerged as the growth pole of the global economy. It has also emerged as the hub of innovative activities in the fast pace of globalization. Within Asian continent, there are wide differentials in the stage of economic development and transformation as well as in the national innovation systems. Two distinct patterns of economic transformation and systems of innovations which has evolved over time are-one, based on building strong industrial sector as an engine of innovations and growth; two, the engine of growth is the service sector and innovation system is heavily dependent on foreign capital. Recently, while recognizing the innovative capacity of some of the Asian countries, foreign R&D has devastated the boundaries of the Asian innovation system. Domestic agents of production have realized that there lies a dire need for the support of the state when innovations are being done on the frontiers of knowledge. Situational assessment surveys have also supported the view that Asian countries are fast approaching towards the frontiers of knowledge and innovations. Asian countries, themselves are competing to fast approach towards frontiers of knowledge and innovations so that newer areas of commercial activities can be explored and exploited in the global market. Transformation of East Asian countries from imitation to reaching the frontier areas of innovations in a short span of time is a question, which begs for an explanation. This paper attempts to provide some plausible answers and is divided into five sections. Apart from introductory section one, the transformation of the production structure and the factors that have determined it are analyzed in section two. Innovation systems across Asian countries and indicators of innovations based on input-output measures as well as situational assessment surveys have been presented in section three. Fourth section contains the discussion related to innovation policies and institutional arrangements, which caused the success in some cases and lack of it in others. Fifth section investigates the role of international agencies to enact rules of the game in an open innovation system and the national governments in terms of enacting innovative interventions in the fast globalizing world economy. Policy implications for other developing countries that emerge from the innovations and fast development experience of the successful East Asian countries are presented in the concluding section.

2. Structural Transformation in Asia

The evolutionary economics has recognized the role of technology and institutions in the process of long run economic growth. The interaction between economic and non-economic factors stressed by the theories of evolutionary economic growth generates dynamism in the economic system that brings in continuous economic transformation. The factors that drive

economic growth (technologies and institutions) and structural transformation in one era to the other itself go on changing. The process of economic growth thus brings in economic transformation and non steady state economic growth. Technology has emerged as a distinct and key factor that determines changes in the long run economic growth and structure of the economy. It needs to be noted here that the innovations are of two types that is radical and incremental. Radical innovations open up new opportunities and push the frontiers of knowledge, which dramatically alter the existing economic structure. Incremental innovations not only improve the practices of the existing technologies but are potent factor of diffusion of the radical innovation that engineer structural change in the economic system. However, imitation tends to erode differences in technological competencies across economic activities and over time that reduces differentials and gaps in economic activities. Therefore, radical and incremental innovations are a source of structural transformation and divergence in economic growth and imitation acts as an agent of reducing productivity gaps and initiates the process of convergence. Both the processes of innovations are continuously remains in action and the combination of the two that actually determine the economic transformation and convergence in the economic system (Fagerberg and Verspagen, 2001).

Fast rate of economic growth and closing the productivity gaps have been the major feature of economic transformation of the East Asian countries during four decades of the twentieth century. This process of fast economic growth has not only increased per capita income but has made the East Asian economies as a hub of economic activities and widely acknowledged as the growth pole of the fast changing global economy. It is worth noting here that the East Asia has followed a distinct path of economic transformation for generating dynamism in their respective economic systems. The global economy as a whole has become service oriented (Table 1.). The service sector contributed 68 per cent of the total GDP of the global economy in the year 2004. Industrial sector contributed 28 per cent of the GDP and rest of the 4 per cent GDP contributed by agriculture sector in the year 2004. This clearly brings out the fact that transformation process has reduced the role of agriculture in global economy and now the engine of economic growth is the service sector. It is important to note here that the less developed countries have also become heavily dominated by service sector. This seems to be premature economic transformation and defying the standard pattern of economic growth, which have dramatically improved the per capita income as well as working condition in the advanced economies. The developing countries, which prematurely become service oriented economies remain unable to grow at a fast rate and could not able to raise per capita income and living conditions of the majority of the workforce. However, the East Asian economies have followed the standard pattern of economic growth and transformation and successfully reduced the importance of agriculture sector both in terms of income and work force. China, Indonesia, and Malaysia are three countries, which have been generating income from the industrial sector higher than the service sector. South Korea and Thailand are the two other countries, which have been generating more than forty per cent of the GDP from the industrial sector (Table 1). If we compare East Asian countries with South Asian countries as well as with the global economy, it is the South East Asian countries where the engine of growth is industrial sector rather than agriculture and service sectors. The transformation process, which followed the standard pattern, is considered as a superior because of the fact that it along with raising the productivity and standard of living also brings in institutional, organizational and cultural changes. These changes make society more capable, productive, innovative and peaceful.

Table 1. Sectoral distribution of GDP across Asian Countries: 1960, 1980, 1990, 2000 and 2004

Sector/ Country	Agriculture				Industry				Services			
	1960	1980	1990	2004	1960	1980	1990	2004	1960	1980	1990	2004
Bangladesh	57	50	30	21	07	16	22	27	36	34	48	52
Nepal	-	62	52	40	-	12	16	23	-	26	32	37
India	50	38	31	21	20	26	28	27	30	36	41	52
China	47	30	27	13	33	49	42	46	20	21	31	41
Pakistan	46	30	26	22	16	25	25	25	38	46	49	53
Sri Lanka	32	28	26	18	20	30	26	27	48	43	48	55
Indonesia	54	24	19	15	14	42	39	44	32	34	42	41
Philippines	26	25	22	14	28	39	35	32	46	36	44	54
Thailand	40	23	13	10	19	29	37	44	41	48	50	46
Malaysia	36	22	15	10	18	38	42	50	46	40	43	40
South Korea	37	15	09	04	20	40	42	41	43	45	50	56
Hong Kong	04	01	-	-	39	32	25	11	57	67	74	89
Singapore	04	01	-	00	18	-	38	35	78	61	-	65
World	-	07	06	04	-	38	33	28	-	53	61	68

Source: World Bank (2006) World Development Indicators 2006, Washington, D.C.: The World Bank.

The engine of successful structural transformation of East Asian countries has been regarded as industrialization. The process of fast industrialization and continuous changes in the industrial structure requires huge amount of investment in fixed capital that was provided by the high savings rates recorded in the East Asian countries (Table 2). East Asian countries have saved more than 30 per cent of the GDP and recently China recorded 42 per cent savings of GDP. Rapid industrial growth and transformation requires continuous accumulation of the new capital assets and thus dependent heavily on increasing in investment in the capital assets. Capital formation as a share of GDP was remained very high during the fast pace of industrial development of the East Asian countries. In the recent period, some of the East Asian countries have shown a decline in the capital formation (Table 2). Saving and investment rates have remained quite low in the global economy as well as in the South Asian countries which can be regarded as an important factor of slow growth of the industrial sector in particular and the economy as a whole in general. The success of industrialization is highly constrained by the availability of right kind of skilled manpower. This was provided by the East Asian countries compared with the South Asian countries where the indicators of human capital lag behind. Adequate supply of skilled manpower has allowed East Asian countries to move up the industrial ladder from textile to simple assembly of machines and to high-tech industries. International trade has been regarded as a potent factor in the successful industrial transformation of the East Asian countries. Furthermore, it is the importance of capital goods and parts for assembly that has had stronger impact on productivity growth (Yusuf, 2003).

Industrial productivity and rate of economic growth has been widely acclaimed as fundamentally dependent on the science and technological development. East Asian countries achieved higher value added per worker in the manufacturing (Table 2) while investing heavily in science and technology compared with the South Asian countries (Singh, 2006). FDI as a factor of faster economic growth has been very important in the economies of

Malaysia, Thailand, Singapore, Indonesia and China. However, South Korea and Taiwan have been able to achieve high productivity growth based on domestic investment and more so in science and technology. Therefore, there are two distinct patterns of economic transformation in East Asia, one based heavily on FDI and other on domestic efforts. Productivity differentials show that productivity of industrial activities is very high in the later case (Table 2).

Table 2. Savings, capital formation and productivity across Asian Countries

Country	Gross savings as a per cent of GDP 2004	Capital formation as a per cent of GDP		Labour productivity in manufacturing 1995-99 $ per year
		1990	2004	
Bangladesh	31	17	24	1711
Nepal	27	18	26	-
India	23	24	24	3118
China	42	35	39	2885
Pakistan	23	19	17	-
Sri Lanka	19	23	25	3405
Indonesia	24	31	23	5139
Philippines	37	24	17	10781
Thailand	31	41	27	19946
Malaysia	35	32	23	12661
South Korea	34	38	30	40916
Hong Kong	32	28	22	32611
Singapore	45*	36	18	40674
World	20	23	21	-

Source: As in Table 1.

3. Capability Building for Innovations in Asia

Knowledge, science and technology have become a key component of contemporary economic and social systems. Recent spurt in economic literature on evolutionary and endogenous growth theory has empathetically argued how knowledge has become a decisive factor in economic systems of production. Knowledge accumulation not only explains existing across country and inter as well as intra economic activity productivity gaps, but also predicts increase in productivity gaps if knowledge accumulation differentials persist and perpetuate. Thus knowledge generation and accumulation process have severe implications for the future status of the national economic system in the fast changing global economy. It is important to note here that the knowledge generation process in the national economic system has undergone a fundamental non-reversible structural change in the developed countries. It is the transition from fundamental research to applied one. This phenomenon has been described as a dual “crowding out”. Firms are now increasingly engaged in applied research and do not finance fundamental research either in house or in the institutions of

higher learning is one form of crowding out. The other form of crowding out is the near absence of fundamental research from the public laboratories and the university research (Soete, 2006). This kind of change in the knowledge generation process has occurred towards the last quarter of the twentieth century. Another great transition in the knowledge production that has also occurred is the emergence of Asia as a hub of research and development activities leaving behind Europe. North America continues to dominate in R&D and accounted for 37 per cent of the world's R&D expenditure in 2002. Asia has emerged as the second largest investor in innovative activities with 32 per cent share of global R&D. Europe's share of global R&D expenditure is just 27 per cent (UNESCO, 2004). The share of R&D expenditure of North America and Europe has declined at a rate about one per cent during the period 1997 to 2002.The R&D expenditure has been increasing in Asia at a 4 per cent per annum during the same period. This clearly shows that Asian countries have been able to strengthen the national innovation systems. This has occurred because of the fact that the fast growth of industrialization exhaust soon the opportunities of adaptation and thus force the economic agents of production to investment more in innovative activities to maintain the lead in productivity growth and competitive advantage over the immediate rivals. It needs to be noted here that there exist substantial differentials in innovative activities across Asian countries (Table 3).

The most important input indicator of innovation is research and development expenditure intensity. South Korea has remarkably achieved high R&D intensity, that is, 2.64 mean value for the period 1996-2003. This high R&D intensity is comparable with the United States of America but lower in comparison with the highest spender countries like Israel, Sweden and Japan with R&D intensities 4.93, 3.98 and 3.15 respectively. Taiwan and Singapore are the other two high R&D intensity achievers with 2.20 and 2.15 R&D-GDP ratios respectively. China is fast catching up with high R&D intensity countries of East Asia. China's R&D intensity for the period 1996-2003 was 1.31 (Table 3). China has recorded dramatic growth of R&D expenditure with doubling its global share from 4 per cent to 9 per cent during the period 1997 to 2002(UNESCO, 2004). Rest of the East Asian countries has been increasing their respective R&D intensities, however, expending less than one per cent of GDP. Among the South Asian countries, India has well developed national innovation system but slowly forging ahead in innovations yet spending less than one per cent of GDP (0.88 average of 1996-2003).

Human capital engaged in national innovation system is another important input indicator of innovations. This is the only active factor that makes use of the innovation infrastructure arrangements and feeds on innovations as well as generates new knowledge and improves upon the existing one. Therefore, quantity and quality of researchers engaged in various innovation activities does matter for the outcomes of innovations. The highest number of researchers, 6517 per million people, was employed by Taiwan in innovation activities followed by Singapore (4745 per million people) and South Korea (3187 per million people) during the period 1996-2003 (Table 3). Other important countries, which have engaged significant number of scientists and engineers in innovative activities, are China and Hong Kong (663 and 1564 per million researchers respectively). When we compare East Asian countries with South Asian countries in terms of number of researchers employed in innovation activities, South Asian countries lag much behind the East Asian countries (Table 3). This clearly shows the edge of East Asian countries in innovation infrastructure and capability to generate innovations.

Table 3. Input indicators of innovations across Asian countries.

Country	Researchers in R&D per million people 1996-2002	Share of R&D expenditure in GDP (in per cent) 1996-2002	UNCTAD innovation capability index 2001	Technological Sophistication index	Company spending on R&D index	Firm level technology absorption index
Bangladesh	-	-	0.121 (106)	2.3 (77)	2.4 (75)	4.1 (71)
Nepal	59	0.66	-	-	-	-
India	119	0.85	0.285 (83)	3.8 (42)	3.6 (32)	5.5 (16)
China	663	1.31	0.358 (74)	3.9 (39)	3.6 (34)	4.7 (48)
Pakistan	86	0.22	0.137 (100)	-	-	-
Sri Lanka	181	0.18	0.317 (79)	3.2 (58)	3.4 (39)	4.6 (57)
Indonesia	-	-	0.261 (87)	3.0 (63)	3.3 (48)	4.7 (49)
Philippines	-	-	0.423 (64)	3.2 (56)	3.0 (55)	4.4 (63)
Thailand	286	0.24	0.488 (54)	3.8 (41)	3.3 (45)	5.2 (31)
Malaysia	299	0.69	0.467 (60)	4.6 (23)	4.1 (23)	5.3 (25)
South Korea	3187	2.64	0.839 (19)	5.2 (17)	4.8 (11)	5.8 (10)
Hong Kong	1564	0.60	0.563 (45)	4.5 (25)	3.4 (37)	5.2 (32)
Singapore	4745	2.15	0.748 (26)	5.6 (9)	4.6 (16)	5.9 (9)
Taiwan	6517	2.20	0.865 (15)	5.3 (13)	4.9 (10)	6.0 (6)

Source: World Bank (2006); UNCTAD (2005); and Cornelius, Porter and Schwab (2003).

Innovation capability index (ICI) has been developed by UNCTAD based on three kinds of broad measures such as innovation inputs, innovation outputs and human resource base for technology activity. This index is based on quantitative criteria to arrive at values for the countries and on the basis of values countries are reckoned in terms of global ranks among the 117 countries. Two Asian countries, that is, Taiwan and South Korea ranked, as high innovation capability with global ranking in 2001 was 15 and 19 respectively. China and other East Asian countries were recorded medium innovation capability ranks among the 117 countries (Table 3). It is important to note here that all the South Asian countries recorded values quite low and global ranking falls in the category of low innovation capability countries (UNCTAD, 2005). It needs to be noted here that China and India in terms of absolute level of R&D expenditure and researchers engaged in innovation activities are global powers but there reckoning is low because of their large population size. Situation assessment

survey based on qualitative information with regard to assess the innovation capability also shows a similar picture and confirms the transition of the Asian countries on the technological ladders. Survey based three indices-scores and ranks- technological sophistication index, company spending R&D index and firm level technology absorption index have shown wide differentials across Asian countries. Taiwan and South Korea, according to three indices, are high innovation capability countries among the 80 countries under consideration. However, other East Asian countries ranked either medium or low innovation capability countries on the basis of three qualitative innovation capability indices developed by World Economic Forum (Table 3).

Output measures of innovation presented in Table 4 shows dramatic differentials in innovations across Asian countries. South and South East Asian countries have emerged as significant contributors to global pool of knowledge. In absolute numbers, China, India and South Korea contributed to the global pool of knowledge through publishing research papers in scientific and engineering journals. Singapore and Hong Kong have also contributed significantly while publishing 2061 and 1817 research papers respectively in 2001 in scientific and engineering journals. Other South and East Asian countries lag far behind in terms of their contribution to global pool of knowledge. High-Tech exports as a share of manufacturing which is another output measure of innovation shows very high degree of science based manufactured commodities provided to the global economy by the South -East Asian countries. However, South Asian countries performed poorly on this count. Higher contribution of most of the East Asian countries in high tech exports seems to be based on the intra industry trade because of the presence of MNCs in these countries. On the contrary, high-tech exports originating from Taiwan and South Korea are based on the domestic

Table 4. Output indicators of Innovations across Asian countries

Country	Scientific and technical journal articles in numbers 2001	High-Tech exports and its share in manufacturing 2003		Royalty and license fees in million dollars 2002		Patent applications by residence of inventor	
		$millions	%	Receipts	Payments	1991-1993	2001-2003
Bangladesh	177	3	0.00	-	5	-	-
Nepal	39	1	0.00	-	-	-	-
India	11076	2840	5.00	25	421	56	909
China	20978	161603	30.00	236	4497	130	849
Pakistan	282	150	1.00	10	95		
Sri Lanka	76	60	1.00	-	-	10	64
Indonesia	207	5809	16.00	221	990	10	13
Philippines	158	13913	64.00	12	270	10	50
Thailand	727	18203	30.00	14	1584	-	-
Malaysia	494	52868	55.00	20	782	19	165
South Korea	11037	75742	33.00	1790	4450	1472	8356
Hong Kong	1817	80119	32.00	341	864	146	679
Singapore	2603	87742	59.00	224	5647	85	788
Taiwan	-	-	-	-	-	2598	12453

Source: World Bank (2006).

companies, which had been nurtured by the national innovation system of the respective countries. Somewhat similar trends can be found in terms of patent applications filed by the residents of innovator countries in the US patent office. The number of patent applications has dramatically increased during the period 1991-1993 to 2001-2003 in most of the Asian countries (Table 4). Royalty payments made by the Asian countries indicates that Asian countries are still highly dependent in terms of technology from the developed countries. However, majority of the countries do receive payments in lieu of technology exports and licensing of technology. South Korea has dramatically bridged the gap between payments made and payments received. This clearly indicates that countries, which have developed national innovation systems, are able to reduce foreign dependence on technology. East Asian countries such as Malaysia, Indonesia and Philippines that are FDI dependent still have to depend more on foreign services of technology and hence higher royalty payments compared with receipts.

Table 5. Indicators of foreign firm innovation investment destinations

Country	Current foreign R&D location of TNCs 2004 (per cent)	Prospective R&D location of TNCs 2005-2009
China	35.3 (3)	61.8 (1)
India	25.0 (6)	29.4 (3)
Singapore	17.6 (9)	4.4 (11)
Taiwan	5.9 (23)	4.4 (12)
Malaysia	-	2.9 (15)
South Korea	4.4 (26)	2.9 (16)
Thailand	4.4 (27)	2.9 (17)

Source: UNCTAD (2005).

Asian countries have been continuously interacted in the international economy to bring in technology and practices, which are superior and beneficial for enhancing its domestic requirements. Domestic efforts to absorb technologies developed somewhere else have allowed Asian economies to put in place institutional arrangements for supporting economic agents of production to become internationally competitive while reducing foreign dependence on technology. This process can be characterized as technology import substitution. Technology import substitution process has enabled the national innovation system to develop competitive advantage for the firms producing goods and services in these typical areas. Therefore, the leading global players of knowledge activities have recognized the innovative capability of the Asian countries and revealed in a recent UNCTAD survey their preference to locate R&D centers in Asian countries. Foreign affiliate R&D centers have been growing at a fast pace in the Asian countries. China alone received 700 foreign affiliate

R&D centers between 2002 and 2004. India and Singapore is now hosting more than hundred foreign affiliate R&D centers respectively. China, India and Singapore have a very high degree of incidence of establishing foreign affiliate R&D centers up to 2004. The situation assessment survey has also revealed that the leading TNCs will prefer to locate R&D centers in most of the Asian countries (Table 5). China and India have emerged undisputed sites for location of foreign R&D centers between 2005 and 2009 and were preferred by 61.8 per cent and 29.4 per cent respectively of the firms surveyed in 2004. Their respective global ranks are first and third. Other important Asian countries, which have been highly rated as preferred location for R&D centers by global knowledge players, are Singapore (rank 11), Taiwan (rank 12), Malaysia (rank 15), South Korea (rank 16) and Thailand rank (17) (Table 5). This is an ample proof of the well-developed innovative infrastructural facilities and conducing innovation institutional arrangements along with highly skilled innovative and cheap human capital.

4. Public Policy Support for Innovations across Asian Countries

Economic growth and competitive advantage of national economies in the post world war period remained highly dependent on public support policies (Stern, 2004). Economic agents of production have been nurtured through the support of right kind of economic incentives and institutional arrangements. Innovativeness of the economic agents of production in a national economy thus has remained also highly dependent on technology policy instruments and institutional arrangements (Yusuf, 2003). It has been widely acknowledged and recognized that the leading developed countries and industries, which are adding to the global pool of knowledge through novel innovations and maintaining competitive edge, are highly dependent on well enacted public support system in terms of instruments and institutions (Jaumotte and Pain, 2005; Ruttan, 2001). Public support-direct and indirect-for technology generation and diffusion has been justified on the ground that economic agents of production generally under invest in innovation related activities compared with socially desirable level (Arrow, 1962; Nelson, 1959). Why do firms generally under-invest because of the fact that knowledge has a quasi-public good characteristic? Therefore, knowledge is difficult to appropriate perfectly by the generators even if what so ever the institutional arrangements for appropriation of knowledge are made. If there exist a knowledge gap between the two economic agents of production, then follower have an advantage of receiving some amount of knowledge without paying for it has been characterized as spillover effect. Innovations are risky activities and involve huge amount of resources along with proven lower private returns than that of the public returns (Jones and Williams, 1998). Thus, private funding agencies and institutions are usually reluctant to finance such projects. This results into shortage of financial resources to individual agents, which are involved in innovative activities and is popularly called as financial market failures. Innovative activities usually employ highly skilled labour and in the absence of appropriate educational institutions, skilled labour shortages generally result. This is an accepted responsibility of the state to mitigate the skill shortages of the labor which will provide desired human capital to private economic agents engaged in innovative activities. Asymmetric information is the other source of justification for the public policy intervention in innovative economic activities and also direct and indirect support to those who are engaged in innovative activities.

In order to address the market failure, governments of the developed countries have been putting in place a whole host of direct and indirect measures to encourage economic agents to commit more resources for innovative activities. The governments of developed countries have now well designed set of five principal policies to alleviate particular forms of market failure leading to under-invest in innovation (see for detail Jaumotte and Pain, 2005). This response of the governments of the developed countries have not only eased perceived constraints on the incentive to private agents to innovate but have also allowed them to provide lead to push forward technology frontiers and remain competitive in the fast changing international economy.

East Asian countries have emerged as front-runners in industrial economic activities during the import substitution regimes and have accumulated vast experience of public policy making. Public policy making in Asian countries and elsewhere have not only addressed appropriately market failures but also fundamentally remained developmental in nature. Economic transition has allowed these countries to accumulate technology development experience while putting in place desired instruments and institutional arrangements which have had helped innovations to take place. The national innovation system in each one of the Asian countries has evolved during the period of economic transformation to address the problem of backward technology, which recently has shown dividends. This process of moving from imitation to innovation has been covered in relatively at a short span of time compared with the developed countries. However, there exist wide differentials in stage of technology development and support of public technology policy across Asian countries. One commonality which emerged from the technology development policy in committing resources for R&D is the dramatic shift from public funding to private one (Yusuf, 2003).

Government support extended by Singapore and Taiwan to their respective firms doing R&D in terms of subsidies and tax concessions is ranked very high among the 80 countries for which data was collected by the World Economic Forum. Singapore and Taiwan recorded score points 5.4 and 5.2 out of seven points scores and ranked second and third respectively in the global reckoning (Table 6). Singapore government allowed firms double deduction on R&D expenses as tax incentive for R&D. The government has also enacted incentive schemes for companies such as innovation development scheme, funds for industrial clusters and promising local enterprise scheme. The tax system of Taiwan has also provided full deductibility for R&D expenses and also allowed accelerated depreciation. Malaysia and Korea were ranked 8th and 12th with score points 4.7 and 4.6 respectively so far as tax incentives and subsidies are concerned. Malaysia supported firms' R&D while providing nine different categories of tax incentives. The Korea government successfully supported private R&D by giving tax credits, allowed accelerated depreciation and lowering of import tariffs. Two emerging innovative countries-India and China- have been able to successfully support, in terms of providing subsidies and tax incentives, firm level R&D. Global ranks of Indian and Chinese subsidies and tax credit support at firm level were 18th and 21st with scores points 4.2 and 4.0 respectively (Table 6). Firm's perception of fiscal support of the government of Thailand is also quite satisfactory. However, the other South Asian and East Asian countries have shown the availability of fiscal incentives for innovative activities but the firm perception and global ranking is quite low. This is understandable because of the fact that input and output indicators of these countries have also shown the early stage of development of their innovation systems.

Table 6. Institutional support indicators of innovations across Asian countries.

Country	Subsidies and tax credit for firm-level R&D	Quality of science and math education	University-industry research collaboration	Govt. procurement of advance technology products	Intellectual property protection
Bangladesh	2.2 (69)	3.3 (68)	2.2 (77)	2.5 (73)	2.1 (77)
India	4.3 (18)	5.1 (17)	3.4 (42)	3.3 (55)	3.4 (51)
China	4.0 (21)	4.4 (31)	4.5 (16)	4.7 (10)	3.6 (45)
Sri Lanka	3.1 (39)	4.0 (44)	2.9 (57)	4.5 (13)	4.0 (37)
Indonesia	2.3 (67)	3.6 (60)	3.5 (40)	3.7 (40)	2.4 (72)
Philippines	2.6 (61)	3.6 (58)	3.2 (49)	3.0 (64)	2.7 (64)
Thailand	3.4 (30)	4.0 (45)	3.8 (29)	3.8 (34)	4.0 (38)
Malaysia	4.7 (8)	4.5 (28)	3.8 (28)	4.7 (7)	4.4 (33)
South Korea	4.6 (12)	4.9 (22)	4.3 (20)	4.8 (6)	4.5 (29)
Hong Kong	2.0 (45)	4.1 (43)	3.6 (35)	3.9 (29)	5.2 (17)
Singapore	5.4 (2)	5.3 (10)	5.0 (9)	5.2 (1)	5.7 (12)
Taiwan	5.2 (3)	5.2 (15)	5.2 (7)	5.1 (3)	4.6 (27)

Note: Figures in parentheses are global ranks according to scores based on Executive Opinion Survey, 2002.

Source: Cornelius, Porter and Schwab (2003).

The model of innovations emerged in the recent past in developed countries is the relationship between government, university and business enterprises. This is known in the literature of national innovation system as triple helix era. The university has emerged as a knowledge enterprise where government and business enterprises invest in research and draw on the commercially viable new knowledge generated by the university. This linkage is now considered essential for speedy delivery and uses of knowledge by business enterprises so that pace and competitive edge can be maintained in the dynamic global economy. It needs to be noticed here that Taiwan, Singapore and China have emulated the model of innovations triple helix era. This is clear from the high global ranking recorded by the business enterprises obtained on the basis of score points as per the perceptions of the business enterprises (Table 6). South Korea has also scored quite high on this count but still regarded as relatively having

weak linkage between public research institutions and business enterprises (Yusuf, 2003). University-industry linkage was very weak in most of the Asian countries. It is almost at the stage of inception. This is where governments of these countries have to take measures such as extending financial support to educational institutions and public research institutions to graduate themselves from mere knowledge disseminator institutions to creators of knowledge. It is important to note here that supply and quality of researchers required for R&D was regarded very highly for countries such as Singapore, Taiwan and India (Table 6). Other countries of Asian need substantive efforts in this respect to fulfill the requirements of the firms to ensure supply and quality of the skilled manpower. Government support in terms of procurement of advance technology products has been rated high and secured global ranks first, third, sixth, seven and tenth by Singapore, Taiwan, Korea, Malaysia and China respectively (Table 6). However, South Asian country ranks on this count are very low except Sri Lanka compared with East Asian countries. Technology development experience of East Asian countries has shown that capability building and strengthening national innovation system under the lax intellectual property regime were quite helpful. It needs to be noted here that the stage of development and intellectual property protection is positively correlated. However, protection of intellectual property at early stage of national innovation system inhibits innovative activities. Therefore, lower global ranking in intellectual property protection recorded by the business perception survey is understandable (Table 6). On the whole, East Asian countries have emerged among the front-runners in terms of technology policy support to business enterprises a reason of successful development of national innovation system especially of Taiwan, Korea and Singapore. South Asian countries and other developing countries needs to learn a lesson or two from innovative and dynamic public technology policy support extended by the East Asian countries in terms of instruments and institutions for making business enterprises innovative.

5. Open National Innovation System and Policy Agenda for National and International Public Agencies

National innovation systems have been evolved in the developed countries without external intervention and political pressures. Competitive edge of developed economies and of industries has been achieved with substantive public support both direct and indirect. This does not mean that developed countries have not learned from the experience of each other's during the evolution and development of national innovation system. Firms chosen to invest in other developed countries as well as formulated joint ventures to draw on the best practices of others are an ample proof of learning from each other's. Therefore, the national innovation systems have remained quite open and learning took place mainly under the framework of national technology policy.

On other hand, East Asian economies surged ahead in transformation process and succeeded in industrialising their economies as well as building innovation capabilities during the last quarter of the twentieth century. National innovation system is still at its stage of infancy. South Asian countries are striving to put in place the national innovation system, which allows its firms to be productive and competitive. It is important to note here that there are wide differentials in productivity and per capita income across countries. This reflects the

knowledge gaps and application of knowledge gaps for productive economic activities. However, openness in trade based on rules and regulations framed by global governance institutions have allowed in securing monopoly rights to firms that have gained competitive edge from their respective national innovation systems. The intellectual property rights enacted and implemented by World Trade Organisation has been increasingly being questioned both by the academic economists and governments as well as some global institutions. An interesting contribution in this regard is by the World Development Report of the World Bank 1998/1999. This report clearly identified the role of the government in developing countries to develop the capabilities to generate knowledge at home along with providing help to domestic agents of production to take advantage of the large global stock of knowledge. It is significant to note here that the United Nations Development Prorgramme (UNDP) has gone much ahead in terms of identifying the knowledge gaps existing between developed and developing countries and articulated the arguments against the strict intellectual property rights regime enacted and implemented by the World Trade Organization (WTO). Furthermore, the UNDP has not only suggested innovative and fundamental role of the governments of the developing countries in generating capabilities that matter for knowledge development but also identified knowledge as a global public good and role of international community in reducing the knowledge gaps (UNDP, 2001; and Stiglitz, 1999). Apart from making suitable public innovation policies to strengthen national innovation systems, the government of developing countries should also strive hard to seek cooperation among themselves as well as of the international institutions and agencies to negotiate in the WTO framework. Specifically, the negotiation should be with regard to MNCs operation in their markets, for doing similar innovative investment as has been done in the home countries. It should also assess losses of domestic firms and seek compensation for using it to create innovative capabilities to strengthen innovative infrastructure at home. The two-step strategy suggested above will go a long way to make capable domestic agents of production to catch up spillover effect created by the international capital and fill the knowledge gap for sustained economic growth.

6. Conclusion

The analysis of structural transformation and national innovation system of Asian countries show that there are wide differentials in the pattern of structural transformation and technology development. Some of the East Asian countries have emerged another pole of innovations and technology development. East Asian experience of technology development has numerous lessons for the developing countries in general and South Asian countries in particular in a fast globalizing world economy. First and foremost lesson, which should be learnt from East Asian experience to succeed in the global economy, is to reinvent the role of state to strengthen the national innovation institutional system. The developing countries are engaged in economic reforms to reduce the role of the state and provide larger space to market forces, which essentially make the state scarce in economic activities. This strategy of making the state scarce in developing countries suffers from the draw back of substitutability of the state and the market and reduces the competitiveness of the domestic agents of production in the international economy. It is important to note here that intervention of the state in a fast globalizing world economy is more difficult but at the same time is very crucial

and strategic. Therefore, reinventing the role of government policy in crafting the national innovation institutional arrangements for building and strengthening competitive advantage is direly needed. The East Asian economies have grown in an environment of import substitution and lax intellectual property regime which now is not available to the developing economies. Intellectual property regime enacted and imposed by the WTO has been restricting developing economies to put in place the national innovation system which has proven adverse effect on the global innovations and more particularly least developed countries. Multinational corporations invade developing country markets without contributing towards generation of domestic innovation capabilities. The role of international institutions is to evolve policies which should decrease the knowledge gap through imposing conditions on multinational corporations to contribute in an equal measure the percentage of sales revenue expenditure on R&D in the host country as is being done in the home country. Reduction of fiscal deficit under the reform programme has easy options for the governments of the developing countries to cut down expenditure on institutions, which are the backbone of economic development such as education, health and infrastructure. Further curtailing support to the R&D institutions- public and private-has a capacity to weaken the institutions, which from a long-term perspective matter a lot for economic growth and welfare.

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Chapter 12

ON THE ROLE OF COMMUNICATIONS NETWORKS IN REGIONAL ECONOMIC DEVELOPMENT

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Abstract

This study develops a multi-region model that captures the role of communications networks in enhancing interregional trade in intermediate business services. A link between the adoption of communications networks and improved regional performance is explored. The paper also examines the relationship between interregional trade in business services and international trade in goods.

Keywords: Communications networks; interregional trade in business services; international trade in goods; economic development

JEL Classifications: D43, F12, R12

1. Introduction

Over the last decade, the Internet, mobile telecommunications networks, and myriad other types of communications networks have come to play a crucial role in economic activities. In particular, it is increasingly recognized that the growing connectivity of individuals and organizations is achieved through improved communications networks and a consequent increase in the flow of business services (e.g., business software development, accounting,

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data processing) across regions or cities.[1] Because of this, the achievement of better economic performance via the use of advanced communications technologies has become a major interest. Success stories include the strong showing of the U.S. economy during the 1990s, with the help of the largest and most sophisticated communications infrastructure in the world. In some countries, however, the infrastructure is still immature and quite inefficient.[2] Such countries have become increasingly aware that the competitiveness of firms and regions is more and more strongly dependent on the adoption of new information and communications infrastructure.

In the existing literature on economic theory, however, little attention has been given to the role of communications networks and interregional services trade in the process of regional development.[3] This study develops a model that captures that role. We focus here on the nature of the *interregional tradability* of business services. In the literature, intermediate business services are usually regarded as *non-tradable* goods.[4] This assumption comes from the characteristics of service transactions, which usually require that there be a double coincidence in both time and spatial proximity for the buyer and seller. An adoption of communications networks, however, might eliminate the necessity for the buyer and seller to be at the same location, even though the coincidence in time may still be necessary.[5] Evidences of this include, for example, the fact that sophisticated software engineers from one region can deliver their services to another region via the Internet. Even though not every service can be traded interregionally, the advancement of information and communications technologies seems to suggest that the assumption of nontradable business services should be accompanied by a focus on interregional service trade through communications networks.[6]

Harris (1998) was one of the first to investigate the influence of communications networks on the interregional tradability of business services. He emphasized the *fixed cost nature of communication costs* and explored an important relationship between trade in business services and communications networks: that advanced networks facilitate the enhancement of interregional trade in intermediate business services.[7] He termed this aspect

[1]Business services provide critical linkages in an economy: they allow other industries to operate more efficiently. Input-output analyses reveal that the dependence of the manufacturing sector on business services increases with per capita income. See Park and Chan (1989).

[2]Examples of this are a backbone network (an overarching network to which multiple regional networks connect) and mid-level networks of the Internet: MacKie-Mason and Varian (1997) report that connections between European national networks are often slow or of low quality.

[3]Empirical studies have found an important relationship between interregional trade in services and economic development. Gilles (1987), for example, notes that 'import substitution' in services is as important a regional-development goal as export promotion. See also Harrington et al. (1991) for a survey of empirical studies.

[4]For the relevance of this assumption, see Matsuyama (1995) and Rodriguez-Clare (1996).

[5]Coyle (1997, Ch. 9) suggests that the use of telematics (i.e., information and communications technologies) is breaking the traditional geographic linkage between local demand and local supply of business services. Jones and Kierzkowski (2003) also suggest that the impact of the reduced communication costs is the most profound in lowering the service costs required to coordinate spatially separated production fragments.

[6]Throughout this paper we assume that business services are internationally nontradable, which may be rationalized by language, cultural, and legal system differences among countries. We concentrate on the implications of *interregional* service tradability. For a discussion about *international* service tradability, see Section 5.

[7]Harris (1995) also emphasized the distinction between transport costs and communication costs: the former

the *virtual mobility of business services* . However, he focused on the effects of the introduction of networks on labor markets, such as the emergence of the skill premium. In contrast, this study focuses on the role of country-specific communications networks through which business services are traded interregionally, and examines the impact of these networks on regional development. We model a country as a collection of regions which produce intermediate business services, and consider the impact of a network on regional performance. It will be shown that the impact of networks depends on a number of factors including the number of regions covered by the communications infrastructure, and the cost of providing the network.

The next section presents a basic multi-region model of monopolistic competition. Section 3 deals with the effect of a network on interregional service trade. The relationship between *interregional* service trade and *international* goods trade is considered in Section 4. Some extensions are considered in Section 5, followed by concluding remarks in Section 6.

2. The Model

Suppose that a country consists of m geographically distinct regions (or cities). In the following two sections, this country is assumed to be closed. Each region produces three types of goods. Two of the goods, Good X and Good Y, are potentially tradable, and the third type–business services such as software development, accounting, and consulting– is not traded across regions. Each region is endowed with L units of labor, and labor is assumed to be physically immobile across regions. Throughout this section, the equations are for a representative region.

Good Y is produced competitively under constant returns using only labor. Labor units are chosen such that their unit input coefficient is unity. The Good X sector is also competitive with constant returns but uses only business services as inputs. The production and unit cost functions for Good X are respectively:[8]

$$X = \left(\sum_{i=1}^{N} {x_i}^{\theta} \right)^{1/\theta}, \quad 0 < \theta < 1, \tag{1}$$

$$G = \left(\sum_{i=1}^{N} {p_i}^{\theta/(\theta-1)} \right)^{(\theta-1)/\theta}, \tag{2}$$

where N is the number of *available* intermediate business services, x_i and p_i are the quantity and price of service i respectively, and $1/(1-\theta)$ is the elasticity of substitution between every pair of services.

Intermediate business services are supplied by monopolistically competitive *service firms*. The central assumption is that both the production and the distribution of business services require communications activities. This emphasizes the fact that highly differentiated services require communications capable of transferring complex information.

is a variable cost which is positive, while the marginal cost of communications is assumed to be zero – the costs of a communications network are all fixed.

[8] See Ethier (1982) and Markusen (1989).

In the initial situation service firms are assumed to be purely region-specific; a region is defined as a geographic area sufficiently small that service activities can occur via face-to-face meetings and without the communications network.[9] We shall call this situation a *communications autarky*. In this situation service firms both sell their outputs and purchase their inputs in the same regional market. Given the symmetry, the initial equilibrium will be one in which the number of services is equal across all regions.

To produce x units of service, $\alpha+\beta x$ units of labor are required.[10] Given a Dixit-Stiglitz specification with constant elasticity $1/(1-\theta)$, and a wage rate w, each service firm sets its price as $p/w = \beta/\theta$. Hence, the unit cost of Good X, given by (2), is simplified to

$$G(N) = N^{(\theta-1)/\theta}(\beta w/\theta). \tag{3}$$

This equation has the property that as input differentiation increases, unit cost decreases ($G' < 0$). With free entry and exit, the level of output that generates zero profits is given by $x^A = \alpha\theta/\beta(1-\theta)$, where A refers to the communications autarky value.

Let n be the number of business services *produced* within a region. In the communications autarky case, the price of Good X, P, must be equal to its cost:[11]

$$P = G(n) = n^{(\theta-1)/\theta}(\beta/\theta). \tag{4}$$

Assuming that a constant fraction μ of income is spent on Good X, the communications autarky number of service firms in each region becomes $N^A \equiv n^A = \mu(1-\theta)L/\alpha$ and we get

$$P^A = [\mu(1-\theta)L/\alpha]^{(\theta-1)/\theta}(\beta/\theta). \tag{5}$$

Given that both goods are produced, income in terms of Good Y remains constant. Thus, N (or P) can be used as the index of welfare: an increase in the number of available services increases the welfare level of the region.

3. Introducing the Communications Network

Now assume the introduction of a communications network infrastructure that covers all regional markets. The introduction of the network allows any firms in the Good X sector to purchase intermediate business services from any other regional markets. Thus the country-specific communications network effectively integrates the business services sector interregionally. Note that this technological change is not costless: each service firm must pay γ (hereafter, *the network cost*) in order to be on the network. This brings the fixed costs per service firm up from α to $\alpha+\gamma$.

The country-specific communications network can be thought of as being provided by a public monopoly that employs average-cost pricing. One of the main assumptions is that there are only fixed costs in the provision of the network, which is linear in the number of

[9] Following Harris (1998), we assume that face-to-face meetings are perfect substitutes for communications via the network (virtual meetings), which is a dramatic simplification. Gasper and Glaeser (1998) explored the complementary relationship between these two activities.

[10] Since we concentrate on the symmetric equilibrium, we drop subscript i hereafter.

[11] Note that $w = 1$ holds because Good Y is produced regionally.

regions.[12] For tractability, we assume a simple cost function for the monopolistic provider: $K(m) = mF$, where F represents the fixed costs of network provision for each region. Because of average-cost pricing, the network costs per service firm are simply[13]

$$\gamma(n) \equiv K(m)/mn = F/n. \tag{6}$$

This implies that the network cost per service firm falls as the number of firms in the business services sector increases, allowing more users to share the common cost of providing the network, F. The level of output that generates zero profits becomes

$$x^T = [(\alpha + \gamma)\theta]/[\beta(1-\theta)],$$

where T represents the situation after connection. As the number of firms increases, the level of output per service firm decreases. This cost-sharing effect is a natural consequence of the existence of a large fixed cost for the provision of the communications network.

After the introduction of the network there is now interregional business services trade where previously there was none.[14] The volume of business services imports in a single region is given by $n^T x^T(m-1)/m$, where n^T is the number of business services *produced* within each region. Thus, in aggregate, the number of available intermediate business services in each region changes from $N^A = n^A$ to $N^T = mn^T$ upon adopting the network.

In the new equilibrium the price of Good X becomes [15]

$$P^T = (m[\mu(1-\theta)L - F]/\alpha)^{(\theta-1)/\theta}(\beta/\theta). \tag{7}$$

Let L_B be the amount of labor devoted to the production of business services in each region. Comparing (5) and (7), $P^T < P^A$ (or $N^T > N^A$) holds if [16]

$$L_B^T = \mu L > mF/[(1-\theta)(m-1)]. \tag{8}$$

This relationship is summarized graphically in Figure 1. On the horizontal axis is the level of labor input for the business services sector in each region, L_B. On the vertical axis is the number of available business services, N. The two solid lines reflect the technologies of production: line AA' is for the communications autarky, and steeper line TT' is for the interregional service trade through the communications networks.[17]

Condition (8) indicates that if (a) the level of the construction cost (shown by the horizontal segment AT) is sufficiently small and/or (b) the number of regions (shown by the slope of line TT') is sufficiently large, each region's welfare will be raised by interregional

[12] This assumption emphasizes the public-good nature of the communications network.

[13] Note that we concentrate on the symmetric equilibrium.

[14] Note that there is only intraindustry trade in business services.

[15] By using the labor market equilibrium condition, $n^T = [\mu(1-\theta)L - F]/\alpha$ can be obtained.

[16] Note that the first equation is derived from the labor market equilibrium condition: fraction μ of the total labor supply is devoted to the production of business services.

[17] Note that the lines correspond to the following conditions.

$$AA': \quad N^A \equiv n^A = (1-\theta)L_B/\alpha,$$
$$TT': \quad N^T \equiv mn^T = m([(1-\theta)L_B] - F)/\alpha.$$

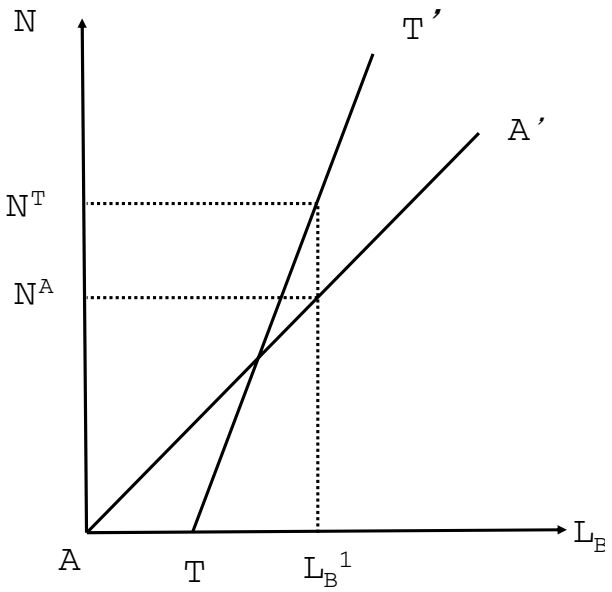

Figure 1.

service trade.[18] For example, when the level of labor input is $L_B{}^1$, the number of available business services will be increased (and the price of Good X will be decreased) relative to the autarky situation. The productivity benefits of interregional connection are the gains from trade that accrue from increased specialization in the provision of business services. On the other hand, if condition (8) does not hold, each region will lose from a decrease in the total number of service firms since more resources are devoted to network provision costs.

Proposition 1: *If condition* (8) *holds, every region will gain from interregional service trade through the communications network.*

4. Interregional Trade in Business Services and International Trade in Goods

In this section, the relationship between *interregional trade in business services* and *international trade in goods* is examined. Suppose that a country opens its final goods markets and has a trade relationship, while business services are nontradables across countries. [19]

[18] Note that these results are closely related to those obtained by Murphy et al. (1989), who examined the interdependence between investment in infrastructure and industrialization.

[19] This assumption implies that communications networks are purely country-specific, which may be rationalized by language, cultural and legal system differences. For example, international trade in engineering consultancy is hindered by governments which set technical standards that differ too much from the standards of others. Kikuchi (2003) explores the impact of the interconnection of country-specific networks.

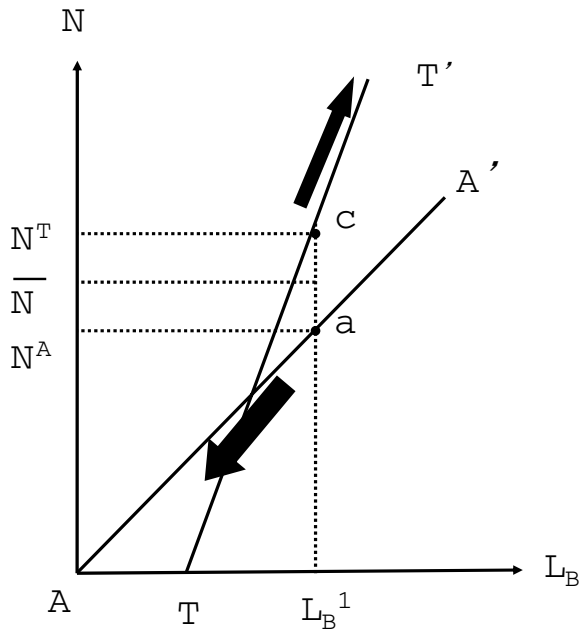

Figure 2.

Also suppose that the country is a small open economy, and let the world relative price of Good X and the corresponding number of business services be $\bar{P}$ and $\bar{N}$, respectively:

$$\bar{P} = G(\bar{N}) \equiv \bar{N}^{(\theta-1)/\theta}(\beta/\theta). \tag{9}$$

Assume that there is a simple entry-exit process whereby service firms enter the business service sector if profits are positive and slowly exit when they incur losses. Given this process, if $P^i < \bar{P}$ ($N^i > \bar{N}$) for $i = A, T$, this country specializes in Good X, whereas if $P^i > \bar{P}$ ($N^i < \bar{N}$), it specializes in Good Y. In the latter case, no business services are produced in this country and the welfare level becomes lower compared to the former case. Thus, in the present model, there are multiple equilibria with underdevelopment traps: the country may get trapped in a historical pattern of inadequate specialization.

Here we would like to emphasize the role of communications networks in compensating for historical handicaps. Consider the following case:[20]

$$N^A < \bar{N} < N^T. \tag{10}$$

Condition (10) implies that, without a regional network, the production costs of Good X are higher than the world relative price of Good X $[G(N^A) > \bar{P} = G(\bar{N})]$. This will cause service firms to exit the business services sector, and the production costs of Good X will increase due to the decreased number of business services available. This process continues until the economy completely specializes in Good Y, as represented in Figure

[20]Note that (8) is the necessary condition for this.

2 by downward arrows starting from point a on line AA'. In the case of specialization in Good Y, the wage rate in terms of Good X becomes:

$$\left(\frac{w}{P}\right)^{Y} = \frac{1}{\bar{P}} = \bar{N}^{(1-\theta)/\theta}\left(\frac{\theta}{\beta}\right), \tag{11}$$

where superscript Y represents the case of specialization in Good Y.[21]

Here we would like to emphasize that the country might have a large number of business services (i.e., the total number of business firms mn^A might be greater than $\bar{N}$). Due to the lack of connectivity, however, this country cannot take advantage of its business services availability.

In summary, without the communications network, the opening of international trade in goods prevents a country from allocating resources to the production of Good X and business services. Alternatively, by adopting a network before the opening of international trade in goods, this problem can be overcome. With a network, the international price is so favorable $[G(N^T) < \bar{P} = G(\bar{N})]$ that the only equilibrium involves complete specialization in Good X. Let us consider this dynamic process in detail. Given that $\bar{N} < N^T$ holds, the opening of trade provides an opportunity for entry into each region's business services sector. Thus the total size of the country's network (mn) will expand, which makes the unit cost of Good X much lower through the increased interregional service trade (i.e., the increased degree of specialization), and the export of Good X increases. This process continues until the economy completely specializes in both Good X and business services, as represented in Figure 2 by upward arrows starting from point c on line TT'. Let N^X be the number of available services when this country completely specializes in Good X. There will be a cumulative process in which the export of Good X provides an opportunity for the enhancement of trade in business services, and enhanced *interregional* trade in services promotes *international* trade in goods. There are gains both from the increased specialization in services and from the increased trade in goods. Furthermore, there are additional gains from efficient utilization of the network: as the number of service firms increases, the monopolistic provider can spread the fixed costs of network provision over service firms.

In the case of specialization in Good X, the wage rate becomes:

$$\left(\frac{w}{P}\right)^{X} = \frac{w}{\bar{P}} = \left(N^X\right)^{(1-\theta)/\theta}\left(\frac{\theta}{\beta}\right), \tag{12}$$

where superscript X represents the case of specialization in Good X. Given that $N^X > \bar{N}$ holds, this equilibrium clearly dominates the case of specialization in Good Y [see (11) and (12)]. This result illustrates the potential role of regional communications networks in correcting historical handicaps.

Proposition 2: *By introducing a regional communications network, a country may overcome historical handicaps and gain through specialization in both Good X and business services.*

[21] This equation can be obtained from equation (9).

5. Discussion

In this section we describe three directions in which the model could be extended. Firstly, let us consider the assumption about the international tradability of business services. For simplicity, we have assumed that the business services are nontradable across countries. Of course, this assumption is quite restrictive: more and more business services, which can be traded via communications networks, have become internationally tradables. Recent examples include India, which has emerged as a popular provider of a range of intermediate activities in services. The inclusion of internationally tradable business services, however, does not change the qualitative results from the basic analysis. We can interpret the rise of internationally tradable business services as an increase in the number of regions through which business services can be traded. In this interpretation, international tradability strengthens the gains from trade in business services. In order to analyze the relationship between the degree of international tradability of business services and the regional economic performance, this kind of extension needs further consideration.[22]

Secondly, let us consider the assumption of symmetric regions. With size asymmetries among regions, the outcomes in a communications autarky would be different from those discussed in the previous sections. Due to the lack of service availability, some small regions might end up specializing in Good Y. Then, the introduction of a network would have a different impact on regional economic performance. Thus the model could be enriched with the inclusion of size asymmetries among regions.

Thirdly, let us consider the market structure of the communications industry. In order to simplify the argument, we have assumed that the network services are provided by a public monopoly which employs average-cost pricing. In reality, however, this monopoly may exhibit some monopoly power and raise the network cost for each service firm, which weakens the potential role of communications networks in correcting historical handicaps. Therefore, it is important to realistically model the market structure of the communications industry: there is room for further investigation.

6. Concluding Remarks

The Internet, mobile-phone systems, and other types of communications networks have raised the use of business services to a new level. This study models some of the factors which play important roles in the way communications networks affect regional development. A country-specific communications network, through which business services are traded interregionally, is characterized by (1) the existence of large fixed costs of provision, and (2) a public monopoly that employs average-cost pricing.

It should be emphasized that the technological conditions of the communications network infrastructure determine the degree of regional economic development. For example, given that the number of regions covered by the network is relatively large, each region will gain through interregional business services trade–each region will gain from an increased degree of specialization in the business services sector. In other words, if there is a lack of substantial network infrastructure, the scale advantage of a large country in provid-

[22] Kikuchi (2002; 2003) explore the role of international tradability of business services.

ing services will be eliminated: a large country may simply consists of a large number of disconnected regional economies.[23] What really matters for economic development is the connectivity of regional economies rather than the size of a country.

More noteworthy is that, in an open economy setting, a country-specific communications network can lead a country towards a more desirable equilibrium. The adoption of communications networks may facilitate interregional business services trade, which further promotes international goods trade.

Although these results are derived under the assumption that communications networks are purely country-specific, it appears that something similar to this will occur in a more general setting. The present analysis must be regarded as tentative. Hopefully it provides a useful paradigm for considering how communications infrastructure works as a driving force for regional development.

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Chapter 13

COMPETITION FOR FDI AND THE DEMAND FOR INFORMATION – ARE SIGNALLING STRATEGIES USEFUL TOOLS FOR DEVELOPING COUNTRIES?*

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Abstract

In an environment of intense global competition the importance of information in the process of location choice increases sharply. This is due to location cost differences – that either stem from local regulation or natural location factors – which may contribute in a decisive manner to total costs of production. Particularly such investors who consider locations in developing countries need authentic and credible information about a site's productivity. Trying to influence an investor's location choice, developing countries use instruments of location marketing including fiscal incentive policies. These activities aim not only to draw investor's attention to the mere existence of a region but may even contain credible information about the productivity of the respective location factors. This paper attempts a comparison between means of marketing policy on product markets and instruments of business location marketing, which current research up to now failed to attempt. We present a study of analogies and illustrate it by using the figure of a location market on which location-seeking mobile factors and location-offering jurisdictions exchange services to the benefit of both. From the observation that location demanders cannot achieve complete knowledge about the quality of the location we deduce the existence of information asymmetries to the location demanders' disadvantage. We point out the exceptional usefulness of signalling strategies for developing country locations in this context. A simple model serves

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as an answer to the question in how far introductory offers such as upfront subsidies or tax holidays, advertisement and the instrument of lighthouse policy, having acquired some fame in Eastern Germany after the fall of the iron curtain, are suited to alleviate the location demanders' informational disadvantages and to allow the risk connected with deciding for a location to become more calculable.

1. Tendencies towards Globalisation and Demand for Information

Due to the international tendency towards globalisation the competition between communities, regions and nations for critical resources has been intensified. Thus, locations are competing for highly qualified human capital, for mobile invested capital, or for business settlements. Taking into account a (globalisation driven) growing supply of possible location alternatives and increased investors' expectations on the service offered by a site, one has to assume that information is of increasing importance in the location-choice-process. Especially on geographically extended location markets which exceed a local or regional frame of reference, additional demand for information is regularly to be expected on the investors' side.

This is due to location cost differences which may contribute in a decisive manner to total costs of production. Location cost differences stem from a wide range of location particularities. Such particularities can be grouped roughly into natural, institutional and intermediate factors with "intermediate" meaning institutional factors which aren't fully independent from natural ones (e.g. infrastructural services such as transport networks). The productivity of all these factors is both location- and business-specific. Another way to classify the causes of location cost differences uses as a cornerstone the locations ability to make a calculable offer. Market failure theory suggests that location seekers unawareness of location quality as an input factor leads to inefficient spatial allocation of economic activity. This "unawareness" may be due to experience or credence good properties of a location. It seems to be useful to distinguish between these two classes of location cost imponderabilities because the degree of cost uncertainty influences expected location costs thus being a significant source of cost differences itself. Experience good properties of a location can be politically overcome by signalling activities of local authorities if these posses private information about their jurisdictions adequacy as the home of a particular production facility or business activity. Such information policy can make use of signals addressed directly to a selected investor (e.g. a firm specific tax holiday) or addressed indirectly to potential investors (e.g. budgetary incentive programs). Credence good properties (e.g. political trustworthiness) of a location may be an even stronger source of expected cost differences although they rather trace back to institutional factors of a location than to the mere nature of a site. Political stability and credibility frame the process of location choice either through the assumption that one given local government will behave opportunistic or through a conjectured distribution of trustworthy local authorities over the choice set of site alternatives. However, because a third world investor needs a reliable guess about his expected location costs he needs a robust projection on the probability of expropriation by the local authorities either.

It follows that hitherto unexplored places of a certain business or production activity increase their use of instruments of location marketing, when investment capital becomes mobile on a global scale. Business attracting policies respond to the increase of spatially

fluent economic processes. These activities' natural aims are to draw investors' attention to the respective region *and* to offer information about the location. Developing countries face an exceptional intense need of signalling strategies in this competition process. They are newcomers on the global site-market which means their location-offer being potentially unknown with respect to productivity and effective tax price. Developing-country-locations haven't acquired yet reputational capital which could serve as a costless source of information and insurance for pioneer investors. Thus an incalculable price-performance-ratio is a serious obstacle for location-seeking investors which may withdraw their business activities due to market properties with asymmetric information in favour of the market's supply side.

This article points out three different opportunities of how locations can signal their quality. In this paper, we will transfer the signalling strategies known from product markets on the competition between locations entering the location market and thus amplifying the location choice set. Furthermore, we will attempt to explain the observation that newcomer-jurisdictions grant seemingly excessive benefits (e.g. in the form of subsidies for their settlement) to certain companies. As an example (although it represents rather a transition country than a developing country), one could name the high expenses taken by the South African City of Coega for foreign investors. Coega provides discounted electricity to industrial users[1].

High local investment incentives in favour of a widely known MNE is called 'lighthouse policy'. Whereas the term is used quite frequently by German politicians and journalists, it does not occur in economic literature at all.[2] Here we try to convey the investment incentive policy of industrial locations, especially those which are targeted to selected investors such as 'lighthouse policy', to an economic study. We herewith rely on the reflections made by KLEIN and LEFFLER [1981], MILGROM and ROBERTS [1986], BAGWELL and RAMSEY [1988], and SHAPIRO [1983], who have shown that in case of the demanders' feeling insecure about the quality (here a location's productivity) advertisement expenses or low introductory prices can function as signals of quality. These can provide the demanders (in this case location-seeking companies) with references to the quality which is offered through a location's bundle of services and performances. In this connection, it will become clear that lighthouse policy is a version of low introductory prices including the consideration of reputational spillovers and can be interpreted as exactly such signal of quality.

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1 The main beneficiary of Coega's cheap energy, the Canadian firm Alcan, agreed in December 2006 to a quarter-century power supply deal from Eskom — the world's fourth-largest power company — at an extremely generous price, less than the two cents per hour that bulk industrial consumers pay. This is already the world's cheapest electricity, but Alcan insisted on the subsidy due to volatile commodity prices, a factor that has caused consternation in prior deals the South African government made with large mining houses and metals smelters such as BHP Billiton, the Anglo American group and Mittal Steel. See BOND (2006).

2 „Modern motor industry is one of the economic lighthouses which have been established under the former Minister President Biedenkopf and now start to radiate into the surrounding regions. […] the lighthouse of motor industry stands for the possibility of progress in East Germany and shows that it is worth while to contribute to building up East Germany and not to move to West Germany." BURGER [2004:4]. "Biedenkopf developed the concept of lighthouse policy which includes a concentration of business development on a few future-oriented industries." SCHNEIDER (2002:12)

2. Settlement Decisions and Heterogeneous Quality of Locations– The Problem of Quality Unawareness

Not only companies compete with each other. So do communities, regions and countries. The motives are quite similar and can be described as the ACIR describes them as a: "[…] rivalry among governments in which each is trying to win some scarce beneficial resource (e.g., a high-tech firm) or is seeking to avoid a particular cost (e.g., a hazardous waste dump)." [3] Competition can concentrate on a variety of critical resources. In this way industrial locations can compete for highly qualified human capital, for mobile invested capital, or for other resources in short supply. In general, one can characterise this competition between locations as a region's immobile factors competing for mobile factors.[4] To simplify matters – but without loss of generality -, we will assume that the locations examined in this article only compete for business settlement.[5] We start from the assumption that in each period a certain number of companies exists who are willing to settle and will decide for a location in this period. By enrolling companies low developed or underindustrialised jurisdictions can achieve higher policy objectives such as raising the tax revenue, providing jobs and public services which accrue to the utility of both domestic and foreign investors. Consequently, they try to present themselves as an attractive location for companies. From the point of view of traditional finance theory, the country which, in the eyes of the company, offers the most attractive bundle of services will be successful. Although it has often been suggested[6] that taxes and duties at the respective place (the location's price) play the most important role in the settlement decision of a company, the services offered, e.g. infra-structure (the location's quality) and even the so called business climate are of great importance as well. Therefore, the above-mentioned competition for business settlements between locations is a competition in which different product bundles are offered at different (tax) prices. Therefore the competition features at least two parameters of competition.[7] In opposition to SINN's apprehensions [1990, 2002][8] it is not necessarily the location with the lowest tax price or fewest environmental regulations which succeeds in such a competition. On the contrary, owners of mobile production factors possibly pay a fair tax price after they have achieved certainty about the extent and the quality of the return service.

In the following considerations we will try an isolated acknowledgement of the significance of information in location decisions. The importance of information (quality signals, to be precise) in settlement decisions is analysed against the background of location demanders' uncertainty about or unawareness of the location's quality. Since requirements on

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3 U.S. ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS (1991:9).

4 Cf. APOLTE [1999:3].

5 The following remarks about lighthouse policy can of course be applied to diverse locations' interest in natural people as citizens. The debate about several Swiss communities' trying to get the family of Michael Schumacher had a considerable effect on the public. It may well be taken as an example of the competition of communities which want to utilise the effects of the prominent family's reputation for their location.

6 See inter alia BELLAK (2008) and HÜHNERBEI and SEIDEL (2007).

7 Whether the reputation of the location can be seen as a third significant parameter of competition will be discussed in chapter 3.3 and following chapters.

8 "The owners of immobile factors, and among them will be many providers of simple work, invalids and weak persons, do not receive money from rich owners of capital in the competition of systems. This is not a race *to* bottom, but in a certain sense it is even a race *below* bottom." SINN [2002:402, emphasis in the original].

service bundles of locations become more and more complex in the course of economic development, this information has to be considered to be of growing importance

On a perfect neoclassical spot market, on which suppliers as well as demanders are perfectly informed about the price and quality of the listed good, the respective supplier's or demander's reputation doesn't matter. In a world of perfectly informed agents there is no need for signals since the demanders know about the qualities which are offered and their prices anyway. But if we leave this stylized world in which the acting agents have perfect information, the situation changes. NELSON [1970] and AKERLOF [1970] have shown that on product markets situations are possible in which market failure may emerge from demanders insufficiently assessing the offered product qualities. For this reason, the market allocation can be obstructed or it does not take place at all. As companies are offered a whole bunch of opportunities to signal to the demanders that they sell only high-quality products,[9] locations and communities can also choose most different ways to send out quality signals.

Not only on product markets demanders may face difficulties to judge the quality which is offered. Companies which want to settle often only insufficiently know about the qualities (service bundles) which are offered at the location. Especially against the background of the fact that the communities' service offerings are of a heterogeneous nature, it becomes more difficult to draw a comparison between the individual service bundles. The complexity of the decision problem increases because these service bundles to a great extent take on the character of a "take it or leave it"-offer. Consequently, splitting up the components of the service bundle is not very practicable for the location demanders. Although in long-run investment decisions the search for information on the investors' side is more distinctly developed than in buying decisions on product markets, it can be assumed that even carefully planning investors can only insufficiently judge the actual quality of the location.[10] Location quality may have black-box-character from the investor's point of view if his activities do not depend on fundamental location properties which can be checked easily. PIRINSKY and WANG (2006) show that location quality has a severe influence on a company's performance even in such cases where fundamental location factors are more or less of the same value. Especially on geographically extended location markets which exceed a local or regional frame of reference, the investors can be regularly expected to be behind with information. Thus it seems obvious that developing countries as the entrants on the supply side of the location market lack reputation and credible information on their suitability for the conduct of a certain business.

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9 For a description of the companies' different opportunities to convince demanders of the quality of the products which are offered cf. AKERLOF [1970], NELSON [1974], SHAPIRO [1983], and KLEIN und LEFFLER [1981].

10 For extents of influence and motifs for investment in the interregional location choice in German industry cf. PIEPER [1994]. As PIEPER [1994: 143] discovered by doing interviews in different companies, the most important element of the location-seeking phase in former East Germany is research done by the company itself. Business acquaintances are named as second most important source of information, and settlement advertisement of the community is ranked third.

3. Quality Signals and Revelation Strategies of Industrial Locations – a Model Based Inquiry

3.1. Basic Assumptions

Let us assume that there are two kinds of locations *L* and *H* whose (constant) marginal costs for generating services at the height of c_H and c_L, respectively, are exogenously given and constant at $c_H > c_L > 0$.[11] This includes that c_H and c_L code the additional expenses on the location's part which result from the extension or improvement of the infrastructure bundle which follows the investment decision. This extension becomes necessary with the settlement of a company because expenditure for infrastructural services include a variable cost component. The quality standards on which *L* locations and *H* locations decide cause marginal expenses of a different amount for the production of the locations' service bundles. As explained above we further assume that companies lack the opportunity to directly observe the quality differences of the service bundles.[12] Companies choose a location at random, the eventuality of a company coming across an *H* location in their settlement process is to be termed likelihood α (with $\alpha \in [0,1]$). The gross utility which can be achieved by a company through settlement depends on the service bundle offered by the location. In the simplified representation of the model the gross utility is zero if the service bundle is of a low quality, and it is Π, with $\Pi > 0$, if it is of high quality.[13] Even on the market for business settlements, with which we are concerned here, the companies' unawareness of the service bundle's quality can possibly prevent the settlement to take place. This situation occurs if the companies' willingness to pay ($\alpha \cdot \Pi$) is below c_H, due to the uncertainty about the true quality of the location. Even if an *H* location sets a tax price in accordance to its marginal costs, i.e. a sum of $t = c_H$, no company settlements will take place. In such a situation an *H* location cannot succeed in the competition for company settlement unless it succeeds in signalling its actual quality.

Let us now turn to the decision calculus of a low developed country which finds itself a good investment ground for a selected company. Here we ask in which way the government can credibly signal to potential investors that it offers a location of high quality. Whereas the government (the location supplier) knows about the quality of a local site, companies (location demanders) only learn about the actual quality of a location after they have settled there. Obviously it makes sense for *L* locations as well as *H* locations to convince companies of the allegedly high quality of their location. Because the companies will anticipate such behaviour, it has to be asked how hitherto unknown locations can credibly convey a high quality offer. In the following discussion, three possible quality signals of *H* locations will be introduced: (1) introductory offers (tax holidays, targeted subsidies), (2) advertisement

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11 For the representation of our considerations we rely on the model by SHAPIRO [1984] and the reflections made by KLEIN and LEFFLER [1981] and make use of the formal representation by TIROLE [1999:262ff.].

12 Certainly companies can partly find out about the quality of the service bundle which is offered by doing research before they settle, but still there are differences in quality which can only be discovered by a company after settlement especially if one assumes that different companies value specific features of a location in a different way.

13 Π can also be seen as the maximum willingness to pay. A location can expect this willingness to pay as the tax price of its service bundle without causing the taxed companies to move. The assumption of a willingness to pay which depends on the quality level is based on a *ceteris paribus* lower willingness to pay in *L* locations.

expenses, and (3) communal lighthouse policy. The latter comprises a sort of reputation trading in which a firm is granted state aid for its radiance, i.e. its power to generate a reputative spillover which benefits other enterprises in this region. Even if these strategies can be applied side by side, it seems to make sense to investigate them separately concerning their functionality and their effects. Signalling effects only occur if the expenses for signalling are financed from the country's own budget and if a separating equilibrium can be derived.[14]

Let us have a look at the dynamic character of settlement decisions and assume that companies can change their location after period I has run out without having to take any expenditure of resources[15], even if this process can cause sunk costs in reality. To simplify matters, we take on the assumption of a free move This may be justified against the background of an 'globalisation driven' increase of capital mobility – mobility of real capital as well – which causes companies' geographical moves to become more and more easy. Companies can use several instruments to become less dependent from location-bounded investment. Here we think of rental factories, sureties or excess capacities (if capacity costs are low). The period length depends on the amount of time the company needs for observation and valuation of the location quality which is offered.

Companies can value the quality of the service bundle only after their settlement because the service bundle has strong experience good properties. In period I they settle at a location and at the end of the period they decide whether they remain at the selected location or not. If the companies meet with a low quality in their first settlement, they will leave the location after period I has run out, provided that the tax price in period II does not exceed Π. In period II no country tries to attract further investment but each country behaves like a leviathan and maximizes its revenue by setting a tax price which just not leads to the firm abandoning its business activity in the respective country[16]. Therefore, a company which settles at random will stay at an L location only for one period, which is the time period the investor needs to learn about the true quality of the location. On the other hand, an *H* country can extract the companies rent by setting a tax price of $t_2 = \Pi$ which just does not lead to the companies' move. In this way the location can extract the companies' maximum willingness to pay for its location in the country.

3.2. Quality Signal I: Introductory Offers

First, let us assume that an *H* country only tries to signal its quality through variation of the price of period I t_1, herein following SHAPIRO's model [1983] which refers to consumer goods markets. This seems appropriate against the background of our issue, which is the competition process of developing countries seeking to attract FDI. Direct investors need upfront signalling to overcome their informational disadvantage. There is an incentive for the

[14] The locations' expenses do not necessarily have to be mentioned in the budget (‚on-budget expenditures'). They can also be taken through deficiency in revenues in the course of off-budget expenditures. For a taxonomy of public subsidies cf. VAN BEERS and DE MOOR [2001:5].

[15] See for a somewhat extended model that considers location-bounded investment but doesn't bring about qualitatively different outcomes Bond and Samuelson (1986).

[16] We abstain from a third period in order to make our model independent from a subsidy-shopping of firms. This can be justified through interpreting the first period as the only learning period, in which information policies are effective.

countries which can be observed by demanders: Whereas location demanders can only insufficiently value the quality properties of locations before settlement, information on the locations' (tax) prices is easy to get, which is why a country can focus on price policy during the recruitment phase. We further assume that all companies willing to invest receive the price signals which were sent out. Under the circumstances which have just been sketched, is it possible for an *H* location to convince a company of the quality it offers by adjusting its tax price in period I (t_1) through an upfront subsidy or some kind of tax holiday? In this context we will have a look at the profits of an *H* country[17] when settlement takes place:

$$T_H = (t_1 - c_H) + \delta(\Pi - c_H) \tag{1}$$

An *H* country can pursue a discriminating setting of prices by demanding a tax price to the amount of t_1 in the first period and siphoning off the maximum willingness to pay, which just does not lead to the company's move, only in period II. On the basis of this reflection a higher tax price with $t_2 = \Pi$ is set in period II. The observable abundance of examples for location-price-increases after a company's settlement may even be interpreted through the country's learning about its own productivity. This (opposite) case with an information advantage on the location demander's side is explored by MIYAGIWA und OHNO (2004).

For the *H* location's tax price chosen in period I to have informative character, it must be unattractive for an *L* country to set an identical tax price. Because companies move away from an *L* location after period I has run out, this kind of locations only profits from setting t_1 in period I. The L country's revenue from the locally established production activity of a selected firm is

$$T_L = t_1 - c_L . \tag{2}$$

For the profit being smaller or equal zero, the condition $t_1 \leq c_L$ has to be fulfilled. In this case it also becomes unattractive for an *L* country to set a tax price to the amount of t_1. If an *H* location takes into consideration its low-quality competitor's calculations when setting the tax price of period I and therefore chooses $t_1 \leq c_L$, the profit of an *H* location results to be:

$$T_H \leq (c_L - c_H) + \delta(\Pi - c_H) \tag{3}$$

Since all companies willing to settle become aware of this signal and settle invest in the *H* country, it will profit from each of the newly-settling companies, according to the preceding relation (3). Therefore, two cases can be distinguished with respect to the profit of the *H* country: (1) The profit is smaller than zero if $\delta(\Pi - c_H) < c_H - c_L$. In this case, there is no informative separating equilibrium because the actual cash value of the profit gained in period II ($\delta(\Pi - c_H)$) does not suffice to lower the tax price of period I to such a

[17] The interest rate will be marked *r*, which results in the discount factor being $\delta = (1+r)^{-1}$. If the interest rate moves towards infinite, future payments become unattractive and δ tends towards zero. If *r* equals zero, then δ amounts to $\delta = 1$ and equal weight will be attached to payments in all periods.

degree that it becomes unattractive for an *L* country to set the same tax price for period I. To bring this about, an *H* country would have to put up with losses. (2) More interesting for our further consideration is the second case in which the following inequation is valid.

$$c_H - c_L \leq \delta(\Pi - c_H) \tag{4}$$

In this case an *H* country does not only gain a positive profit, it is also able to send out a credible signal of its high quality to the companies by setting a low tax price in period I. In such a case of an informative separating equilibrium the high-quality location demands a price below its marginal costs in period I ($t_1 \leq c_L < c_H$) and makes an 'introductory offer' to the companies, thus convincing them of the service bundle's high quality. The more the companies recognise that the tax price of period I falls short of the utility which had been expected from infrastructure services, the more transparent becomes the calculation of the country which, as an *H* country, is entitled to hope that its encumbrance of period I is re-financed in period II. The marginal costs of the countries c_H and c_L represent the lower limit of the their tax price. Only *H* countries can temporarily fall short of this lower limit of tax prices since future revenues enable them to fall below this limit in the introductory period. If the companies' net utility gained from the settlement (Π) is above the tax price of period I (t_1), companies will settle at the *H* country.

3.3. Quality Signal II: Expenses for Advertisement

Advertisement can influence demanders' decisions and send out quality signals. STIGLER [1961] and TELSER [1964] have already pointed out that advertisement plays an informative role in overcoming the asymmetries of information between the parties of the market. Apart from forms of advertisement which provide direct information about the product itself and its properties, a part of the broadcasted advertisement is 'non-informative'.[18] These advertising campaigns do contain only little information or no information at all about the respective product. However, MILGROM and ROBERTS [1986], and NELSON [1974] show that signals are sent out even through such 'non-informative' advertisement and that these signals enable demanders to draw conclusions about the quality of a product. In reality, such 'non-informative' advertising campaigns cannot only be observed on the product market. Regions, countries also go in for advertisement which does not convey direct information about the service bundle offered at the respective location. Campaigns like "*Leipzig kommt*" (Leipzig is coming), „*Wir können alles – außer Hochdeutsch – Baden-Württemberg*" (We can do everything – except speaking standard German), oder „*Sachsen macht kleine Anzeigen, damit mehr Geld für Investoren bleibt*" (The state of Saxony advertises on small scale to leave more money to investors) do not exactly provide information about the product (the respective jurisdiction's quality as a place to invest at) itself. Probably such campaigns are meant to

[18] As a particularly obvious example of non-informative advertisement on product markets one could mention the cigarette advertisement „WEST IN SPACE" which is set in outer space since it does not provide any information about the product itself.

signal to the companies willing to settle that the service bundle of the respective location has a high quality and thus to induce company settlements.[19]

In this context, it has to be asked how location quality is signalled through such non-informative expenditures for advertisement (A). Let us assume that, in opposition to the representation above, *L* countries and *H* countries set the same tax price of period I t_1 and differ only with respect to their expenses for general, non-informative advertisement *W*. In this case the profit per new settlement of an *H* country results to be:

$$T_H = (t_1 - c_H - W) + \delta(\Pi - c_H) \tag{5}$$

Unlike an *H* country, an *L* country, on the basis of the assumptions made in this paper, does not accommodate any companies in period II. If it sets a tax price at the amount of t_1 in period I, its profits result in:

$$T_L = t_1 - c_L - W \tag{6}$$

If the advertisement expenses of an *H* country are to generate information about quality for the demanders, it has to be unattractive for an *L* country to spend the same amount of expenses, i.e. the *L* country's profit has to be smaller than or equal zero. To fulfil this condition, the expenses have to be $W \geq t_1 - c_L$. If the *H* location takes this into consideration in the process of calculating advertisement expenses, and sets $W \geq t_1 - c_L$, the profit of the *H* location again meets the inequation (3). Again, one has to distinguish the two cases of separating equilibrium and pooling equilibrium, which have been touched earlier on.

In an informative separating equilibrium, countries with a low-quality service bundle will refrain from demonstrative advertisement expenses since these expenses are not compensated by earnings to an equivalent amount. This situation given, companies will settle only at *H* locations because they can be identified by the higher amount of advertisement expenses. Still, *H* locations cannot assess advertisement expenses at any amount they like because these expenditures have to be financed by setting a higher tax price. To create an incentive for potential investors to settle at an *H* country, the tax price of period I has to be lower than the gross utility of the settlement, i.e. $t_1 < \Pi$. If this condition is fulfilled, advertisement expenses and low introductory tax prices (upfront subsidies, tax holidays) are perfect substitutes for sources of information and quality signals. This is because low introductory prices as well as advertisement expenses are expenditures with an irreversible character (HAUCAP [1998:182]). In this case advertisement expenses can signal the high quality of the supplying party, similar to introductory offers in the model above.

[19] RIEGER [2000] illustrates the resonance to the Baden-Württemberg image campaign by naming the rapid increase in noncommittal inquiries by companies and the increased number of accesses to the Internet presentation of the state. About the costs of the campaign RIEGER [2000] says: "The state's administration intends to come across with 9 million Marks in this year and 15 million Marks in the following years. In the course of years the sum can mount up to 100 million Marks." As PIEPER then explains, Baden-Württemberg was the first state to choose television as a medium for its location campaign, with the price of a clip being about 10,000 Marks."

In analogy to the considerations of NELSON [1974] and MILGROM and ROBERTS [1986], such conspicuous and in part extravagant expenses can send signals by which demanders can be convinced of the advertising country's being a productive input of high quality.[20] Although these expenses do not contain direct information about the quality of the product, this kind of signal can convince demanders of high quality. In accordance with the representation above, the following consideration has an impact on the companies: Since companies only stay for period II if the location's service bundle is of high quality, 'money burning' by having expensive advertising campaigns and constructing reputation in period I only repays if the country really offers high-quality service bundles or more generally termed a productive business environment. Only in this case advertising expenses can be refinanced. Only *H* countries can realise future benefits from the companies' tax payments since they provide high quality and the companies remain in this place for a longer time.

3.4. Quality Signal III: 'Lighthouse Policy'

As shown by the simple model, low introductory prices and 'money burning' through advertisement expenses are possibilities to send a credible quality signal to the companies willing to settle. Both signals can help potential investors to distinguish the quality of the countries *ex ante*. Yet there is a latent need for sources of additional information since, according to the assumption, a country's bsiness environment is an experience good and its quality cannot be assessed with sufficient accuracy before settlement. In this context we will now develop a sketch to explain so-called 'lighthouse policy'.

In the following, the term 'lighthouse policy' will be used for efforts incurred by a country without own industrial reputation to settle companies with widely-known trade names and thus strong radiance in the respective community. 'Radiance' in this context means a company's ability to have a positive effect on its location's image through its own reputation. 'Lighthouse policy' is a strategy which can be observed in reality. It serves to gain benefits in the competition with other communities. KOTLER, HAIDER and RAIN [1994:292f.] report that between 1970 and 1990 several American communities followed the strategy of selectively recruiting company headquarters of the Fortune 500 company. The aim was to improve the image of the respective community. Such procedures are to be recognised in today's policy practice as well. DICKMANN [2002:5; author's translation] says:

> "With his 'lighthouse policy' Saxony's minister president Biedenkopf bets on selective promotion of centres of growth instead of pouring out the money with a watering can. Around the 'lighthouses' of AMD and Infineon "Silicon Saxony" grew out of the roots of the former GDR's centre of microelectronics in Dresden."

In analogy to the representation given so far, we assume that the gross utility from settlement in an *H* country and thus the willingness to pay (Π) is the same in all companies. Moreover, we will now assume that companies differ with regard to their 'radiance'. To simplify matters, let us assume that among the various candidates for settlement there is only

[20] MILGROM and ROBERTS [1986:797] say: "These ads carry little or no direct information other than that the product in question exists. But if that message been sent, these ads seem an inordinately expensive way to transmit the information. Indeed, the clearest message they carry is: 'We are spending an astronomical amount of money on this ad campaign.'"

one company which has 'radiance'. For example, such a company can have widely-known reputation as an innovative and highly profitable technology company, whereas other companies have no such reputation.

Locations can make use of a part of this reputation by pursuing 'lighthouse policy', i.e. they 'lease' a company's reputable trade name and use its radiating effect to send out a quality signal. The argumentation in this paper is similar but inverse to that pursued by HAUCAP and WEY [1999] as well as that of HAUCAP, WEY and BARMBOLD [1997]. They interpreted the settlement of companies at certain locations as an implicit franchise relation. But according to HAUCAP and WEY [1999], only those companies are franchise takers who are willing to pay higher taxes than in other countries for using an industrialised country of origin as a trade label, e.g. 'Made in Germany'. This paper follows just the reverse track of argumentation. Without denying that companies can make use of the effects created by their location's image, we will focuse on reputation transfer in the reverse direction.[21] This seems to be appropriate viewed against our object's background: The lack missing industrial reputation of developing countries. We argue that noted companies appear as 'franchise givers' and locations as 'franchise takers'. The settlement of certain companies, e.g. the automobile manufacturers BMW and Mercedes Benz in North Carolina and Alabama, is connected with an image improvement for the respective location and can be seen as a quality signal by other companies which want to settle.[22] In this context one has to emphasise the following result of a study done by PIEPER [1994:90; author's translation] which is concerned with the location choice of companies:

> "The fact that location image is named relatively frequent as a decisive factor of location choice is to be traced back to entrepreneurial corporate identity and corporate image strategies which become more and more important. These strategies attach great importance to corresponding representations of product range and entrepreneurial appearance. This can have effects on location choice in so far as the search is already restricted beforehand to locations and regions whose image is expected to have a positive impact on the company and its products (so-called origin goodwill […])."

If image is a soft but important location choice factor, as suggested by this statement, establishing and cultivating such an image is of strategic importance from the location's perspective.[23] In our opinion, one characteristic of lighthouse policy is exactly the fact that it utilises the image of a company for a location, which means that an image transfer from company to location takes place. A country of poor reputation can lease a company's reputation and radiance for several periods, but it either pays the leasing charge as early as in period I, or it gives allowances to the lighthouse company throughout the whole period in which the image transfer takes place. Locations do not allow general discount for settlement, but organise their settlement subsidies depending on reputation and image of the respective

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21 In reality, one has to proceed from the assumption that location demanders and suppliers mutually use and promote their image to their own benefit.

22 HEINRICH [2001] hopes that the settlement of the federal environment office will have a distinguishing effect on the image of the location Dessau: "When the federal environment office settles, we will distinctly stand out against the image of other cities in our function as environmental location."

23 BUß and FINK-HEUBERGER [2000: 51f.] hold the opinion that image management covers rather a prolonged period in comparison with the traditional marketing and advertising sector. For a detailed typology of the term 'image' cf. Ibid.

company willing to settle. Companies are differentiated with regard to the 'radiating power' of the specific company's trade name. If the company in question leaves the location, the radiance which is used by the location gets lost as well. Since the image transfer is in fact an implicit franchise contract which has no judicial value, a location has to be prepared for the respective company's move and the end of the image transfer.

To take the lighthouse-policy up on our formal representation in the preceding chapter we assume that locations do not take other advertising expenses (W = 0), that the tax price in period I is the same at all locations (t_1) and that locations try to signal their quality only through lighthouse policy. For that purpose we further assume that, in the periods in which the lighthouse company is resident, the countries expect an increased profit (e.g. tax revenue, more attractive jobs, follow-up investment) from implicitly buying this company's reputation. The expected increase in earnings caused by the lighthouse company's presence we will call R.[24] For that purpose we act on the assumption that the acquired image has profitable effects on the location and that it causes monetary backflows (B), for instance because all companies in a country have a higher willingness to pay if the country has a high reputation. The higher willingness to pay could result from the fact that the resident companies can use the image of the location at which they produce for profit-increasing purposes.[25] For the same reasons one has to expect new companies to move in which bring about additional earnings for the country.[26] Apart from companies moving in or following other companies, follow-up investment can also be a result of a suitable lighthouse company's settlement. This possibility is also hinted at in KLEPPER's [2002] observations which show that 'spin-offs' out of successful R&D-intensive companies (in our nomenclature lighthouse companies) can contribute to cluster development. Causing a lighthouse company to settle can be understood in analogy to the focal point concept by SCHELLING [1960].[27] According to this theory, other companies' search for a location is focused on the lighthouse location, which makes it more likely for these companies to settle.

If an H country takes into consideration these expected backflows and takes expenses for the lighthouse company's settlement (LE) in period I, the profit of this location results to be:

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[24] The idea that a ‚radiating' company earns a location a positive image and brings about future taxation potential can be understood just the other way round, which means that negative image transfers are imaginable as well. In this context the development of the US state Columbia's textile industry has to be recalled which completely withdrew from the high-quality segment after a severe loss of reputation of one of its line members (cf. CHISIK [2001:1]). As a reverse lighthouse principle one could also name the Broken Window Theory of the former New York Mayor (Giuliani) which states that one broken window pane which is not repaired can lead to the decline of a whole district.

[25] When a lighthouse company settles, future taxation potential can also result from psychological factors. The location's old-established residents themselves can be confirmed in their 'spirit of entrepreneurship' through a signal which conveys euphoria and optimism. The belief in a positive future development would spread. In this function lighthouse policy rather serves as a policy of improving business climate.

[26] The settlement of a lighthouse company probably causes clusters of industrial sectors to develop because competitors possibly aim at competition parity with regard to their location in order to limit the number of competition parameters. The thesis of coincidence and path dependency [KRUGMAN [1991]) as a decisive reason for cluster development can be illustrated by a long list of real examples of cluster development. To single out one we point at the North Italian region Friaul which accommodates about 1200 chair manufacturing companies who produce one third of the world's chair production (o.V.[2002:30]).

[27] SCHELLING [1960:57] says: "People can often concert their intentions or expectations with others if each knows that the other is trying to do the same. […] Most situations […] provide some clue for coordinating behavior, some focal point for each person's expectation of what the others expects him to expect to be expected to do."

$$T_H = (t_1 - c_H + R - LE) + \delta(\Pi + R - c_H) \tag{7}$$

If it is an *L* country, all companies who have settled there in period I move out after this period because they have recognised its poor productivity. This means that a company with radiance like any other company that meets our mobility assumption leaves the location after period I. Reputation and backflows connected with it run dry. The *L* country's profits therefore can be measured as:

$$T_L = t_1 - c_L + R - LE \tag{8}$$

If an *H* country takes into consideration the profit situation of its *L* rival, it has to promise payments to the companies which cannot be raised by an *L* country. For the profits of an *L* country to be smaller than or equal zero, the condition $LE \geq t_1 - c_L + R$ has to be fulfilled. If this condition is inserted into equation (7), the result is:

$$T_H \leq (c_L - c_H) + \delta(\Pi + R - c_H) \tag{9}$$

If the following inequation (10) is fulfilled, an informative separating equilibrium is created:

$$c_H - c_L \leq \delta(\Pi + R - c_H) \tag{10}$$

If this inequation (10) is valid, an *H* country's loss caused by lighthouse policy in period I is smaller than the expected backflows in period II. In this situation the proceeds resulting from lighthouse policy necessarily supersede the marginal additional costs for producing the service bundle at 'premium locations' (*H* locations), as shown by inequation (11):

$$\delta(\Pi + R) \geq (1 - \delta)c_H - c_L \tag{11}$$

Of course, there is no guarantee that the radiance 'leased' and paid for in period I actually persists throughout the two periods. That means that pursuing lighthouse policy is connected with the risk of the company losing its radiance or using it up at its own account. On the basis of these considerations, it seems reasonable to choose a company which has shown in the past that it attaches great significance to keeping its reputation. Therefore, it is plausible for a country to choose a company with a long-established high reputation. There is a greater risk in newly-founded companies for the radiance not to be produced or to collapse after a while. In this context, one could mention the development of the lighthouse companies *Cargolifter* (an assumedly hopeful manufacturer of modern dirigibles) and *Eurospeedway* (a conceived F1-circuit operator) in the East German state of Brandenburg. With these companies going insolvent, their radiance got lost to the state as well. Thus, lighthouse policy can result in building so-called 'cathedrals in the desert'. Apart from this 'lighthouse extinction', the represented instrument only unfolds its full signalling effect under the condition of being financed from the location's own means, as explained at the beginning. Thus development aid

may abate the informational effect of upfront subsidies if the financial consequences of an L-country's inadequate use of such aid for FDI attraction are not beard by the local decision makers.

4. A Comparison of Signalling Strategies

According to KRUGMAN [1991:15], location decisions are decisively influenced by path dependencies as they result from agglomeration advantages. As KRUGMAN [1991:35] further stresses, it depends on historic coincidence in which place industrial concentration occurs. Therefore, it appears desirable for locations to influence this coincidence. The strategies which have been introduced above appear suited for an influence like this. All three of them serve to take an influence on spatial allocation of mobile factors by revealing differences in quality which had not been noticeable *ex ante*. All signalling strategies which have been described change the likelihood of location-seeking companies' settling at a quality location. KRUGMAN [1991:90] also thinks that such a guiding influence is possible.[28]

Let us now have a look at the differences and similarities of the three signalling strategies which have been introduced. For the companies, introductory offers result to be a lower tax price in period I. Unlike general advertising expenses, this approach has the advantage of the companies directly profiting from the location's signalling expenditure, with their net utility rising. Companies only indirectly profit from a country's general advertising expenses, if they profit at all. The latter consideration suggests that the equivalence of advertising expenses and introductory discount, as derived from the model introduced above, can only be perceived by the country. The companies certainly will prefer low tax prices in period I to general advertising expenses of the locations because a monetary transfer in form of tax price reduction in all probability has a stronger influence on a company's profit. If both instruments show the same effects and do not differ with respect to their informative character, low introductory prices are superior to advertisement from the point of view of welfare economy [HAUCAP 1998:182]. For companies willing to settle advertising expenses only supply a quality signal without having a positive effect on settling companies' profits to the same amount. Thus, an investor facing two identical H-countries as location alternatives will invest in the country that uses introductory offers rather than in the country which "burns" money in advertisement campaigns. While both instruments are suited to outplay L-countries introductory offers can even provide a competitive advantage compared to H-rivals. The advertising campaign of the state of Saxony („Saxony advertises on small scale to leave more money to investors") illustrates that investors profit from direct transfers (tax price reduction, subventions) to a higher degree than from general expenses for location advertisement.

Unlike introductory offers and advertising expenses, lighthouse policy opens up a larger scope for quality-indicating signals. A confrontation of the inequations (4) and (10) shows that lighthouse policy can still have a signalling function even if advertisement and

[28] "[...] modest policy actions at the critical point can tip the balance in one regions favor. Imagine that it is 1860, and you perceive correctly that the invention of railroad is about to lead to the division of your continent into a manufacturing nation that contains a core and an agricultural nation that does not. Then you might very plausibly advocate a temporary tariff to ensure that you get the core. Once you have established a decisive lead in manufacturing, you can remove the tariff – and lecture the other country, which has effectively become your economic colony, on the virtues of free trade." KRUGMAN [1991:90].

introductory offers do not permit the different locations to have separate signalling strategies. If the difference between $c_H - c_L$ is greater than $\delta(\Pi - c_H)$, introductory discounts and advertising expenses lose their signalling quality. If the profit expected from the settlement of a lighthouse company is greater than zero ($R > 0$), pursuing lighthouse policy enables an *H* location to take higher expenses for quality signals I and II in period I.

Even if all three of the quality signals sufficiently convey the quality of the service bundle, that is if they are all able to establish an informative separating equilibrium, lighthouse policy, in contrast to the other two instruments of regional economic policy, diminishes the necessary expenses without direct return service ('money burning') to build up or to gain reputation. Whereas these expenses have to amount at least to $c_H - c_L$ as far as quality signals I and II are concerned, lighthouse policy makes it possible to reduce the expenses by δR. This result is of course based on the assumption that the mere presence of a company with radiance can provide the country with benefits in the periods in which it resides at the respective location.[29] Unlike advertisement or low introductory prices, the signal has an effect which does not only last for one period. It continues as long as the lighthouse company resides at the location (in our example two periods). If a country manages to prompt image-promising companies of settling by taking high expenses for lighthouse policy, this demonstrates that the location can spend much money, especially because it expects these expenses to be re-financed by future tax income. Therefore a rationally planning country will only put up with great losses in period I if equivalent takings are expected in the following time periods. But the profit expected from the well-directed settlement of a lighthouse company ($R + \delta R$) does not necessarily have to meet with the expenses for lighthouse policy. On the contrary, in reality it is to be observed that locations often spend more money than the amount which the individual settlement promises to earn in form of backflows. In this sense, JUNG [2000:91, author's translation] asks, looking at the settlement of A-380 *Airbus* production:

> "[…] Does the financial expenditure taken by the 33-billion-marks-indebted city state ever repay? Or does Hamburg possibly pay an exaggerated price for a prestige object?"

In the sense of the consideration uttered in this paper, it is not necessary that $LE \leq R + \delta R$. Following our argument, lighthouse policy is a combination of two instruments. On the one hand, there is the implicit purchase of reputation to the amount of $R + \delta R$, on the other hand it is a case of 'money burning'. Every amount exceeding $R + \delta R$ is essentially a burning of money. Especially by taking high expenses for settling certain companies, a location can send out a quality signal which derives from the same logic as the realisation of advertising campaigns which explain nothing about the product: Both signals indicate that the quality provided by the offering party lasts longer than one period.[30]

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[29] This grant for benefits by a company's own radiating power, which communicates itself to the location in form of positive reputation, can be interpreted as a local positive external effect internalised in the course of lighthouse policy. For internalisation of local external effects cf. STEINRÜCKEN and JAENICHEN [2002].

[30] If this thought is applied to individual behaviour and to signals of demonstrative consumption, location quality signals can be interpreted in the sense of DOUGLAS and ISHERWOOD [1978:143]: „Individual luxuries, acquired by themselves, signal nothing in particular. But in consistent array, understood by the other consumers, at least signals credit-worthiness. "

Therefore, it is easy to understand that there is little incentive for a country to conceal how much they have spent on settling a certain company. On the contrary, it will attach great importance to other investor's knowing how much money they have spent on the settlement of a 'lighthouse'. In the case of BMW Automobiles the highest legal (with respect to European state aid regulation) promotion rate for regional subsidies, amounting to 35 per cent of total investment, was entirely exhausted. Subsidies to the amount of 418.6 million Euros were paid for the settlement in Leipzig and this fact was made known to the public.[31] In this way, other companies willing to settle can draw conclusions about the service bundle quality of the location Leipzig. For the city of Leipzig it is possible that this signal could have taken an influence on the decision of the Porsche concern which did not receive any direct subsidies from public budget. In making public the fiscal incentives given to investors, locations pursue an improvement of their business climate as investors perceive it.

If we realise that in different sectors *H* countries and *L* countries are differently classified, lighthouse policy can be a device to send out a more specific signal to companies willing to settle than granting introductory tax holidays to selected or subsidies to all companies or advertising in a non-informative way. The BMW concern's settlement in Leipzig possibly signals that Leipzig is a convenient location for car production. Leipzig does not necessarily have to be a convenient location for manufacturing designer furniture. Whereas general advertising expenses ("We can do everything – except speaking standard German") and introductory discounts are vague quality signals, the settlement of a widely-known company belonging to a specific business sector conveys more pointed information about a country's quality. Apart from doing research on their own, location-seeking companies rely on the advice of business associates and acquaintances as a source of information. Therefore, it has to be assumed that the location decision of competing companies within the respective industrial sector is not utterly unimportant for a company's location decision.

Lighthouse policy means treating companies willing to settle in a different way. The expenses an *H* country spends on lighthouse policy are country-specific investment incentives and may have both a qualitative (location choice) and a quantitative (capacity choice) impact on the location decision. Lighthouse expenses provide an advantage to a 'radiating' company and have a positive effect on its profits. All the other companies only receive the quality signal, but see no chance of a further direct increase of gross utility (Π). All companies directly benefit from low introductory prices whereas advertising expenses do not develop direct effects on profits. Lighthouse policy allows at least 'radiating' companies to profit whereas companies without radiance have to do without these direct profit improvements. Only location demanders with a reputable brand name receive subsidies for their settlement. With respect to their image, a varying discrimination takes place between the individual companies willing to settle. This discrimination probably influences competition if there is competition between reputable ("radiating") and nameless companies.

[31] The settlement of image-promising companies is also spread by different media so that public attention is attracted by media coverage as well. In opposition to low introductory prices or advertisement, the location only has to meet a part of the costs spent on spreading the advertisement-like news.

5. Concluding Remarks

In a different manner, all three of the location marketing instruments we discussed are used by communities, regions, nations for the purpose of attracting business activities to these jurisdictions. Apart from providing an incentive for the investors to decide in favour of a specific country, they all have the potential to serve as a signalling instrument. The signalling effect varies depending on the extent of spatial mobility of a specific company, i.e. the speed at which it can change its settlement decision. Variation is also to be observed with respect to the signalling instrument which has been chosen. Lighthouse policy is definitely able to establish the greatest differentiation between countries with high and low location quality.

The effect of all signalling strategies presented in this paper results from the fact that using means of information policy earns a higher yield in *H* countries than in *L* countries. For all signalling strategies, this is based on the companies' willingness to pay for the service bundle of their location being generally lower at *L* locations. The consideration was focused on lighthouse policy, which seems to be particularly appropriate for newcomers on the location market such as developing countries. We interpret business settlements caused by lighthouse policy as implicit franchise contracts between individual companies and the host country. It has already been shown by KLEIN [1980] that franchise arrangements can prove helpful for overcoming potential market failure. Franchise agreements caused by lighthouse policy are to be understood as exactly those signals which help locations to establish a certain image concerning brand or quality. Lighthouse companies therefore receive a settlement subsidy as a return for the location's using their image. Empirical studies actually show that companies take into account the location's image when they choose a site (PIEPER [1994]).[32] There are also hints that locations attach importance to the image of the company about to settle (BURGER [2002], HEINRICH [2001]).

Even if classical instruments of communal location marketing like introductory tax holidays or upfront subsidies and advertisement convey information about the location, current development suggests that jurisdictions make increased use of the instrument of lighthouse policy. From an economic point of view, lighthouse policy is to be interpreted as a coupling of introductory offers and classical location advertisement. Because this instrument, similar to introductory offers, is to be understood as a subsidy for specific companies, the application of this instrument is connected with a potentially anticompetitive intervention by the state. But if every image-promising company can enjoy this kind of public transfer, the negative effect on competition becomes relativised.[33] If the criteria of allocation were transparent, subsidizing a lighthouse company would be equivalent to an official purchase of reputation by a tendering procedure. This purchase would enable companies with a high reputation effect on the public to get the benefit of transfers out of the public purse.

Although the thoughts sketched here are focused on the use of location demanders' images ('lighthouses') from the location's point of view, this consideration can be extended into a more general version. In this version, it can be applied to the reverse side of using an image: companies use the image of a location, which implies that image transfers cannot only be paid on a monetary level (subsidies, taxes), but also by ways of image exchange. Apart

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[32] Especially concerning investment goods, the image of a location plays a special role, as illustrated by PIEPER [1994:148].

[33] For an analogous idea about the market for air traffic services cf. STEINRÜCKEN and JAENICHEN [2004].

from that, we have developed several arguments which show that lighthouse policy is especially suited as a strategic instrument of regional economic policy. In contrast to general instruments like location advertisement and introductory tax discounts, the advantage of lighthouse policy is a higher ability to distinguish between high and low site quality. Furthermore, lighthouse policy makes it possible to send out a more specific signal. This being in control of the signal which has been sent out makes it possible to take a guiding influence on economic structure and to take into consideration the preferences of the respective country's population.[34]

The individual location marketing instruments have different advantages and disadvantages. But in a world economy which integrates not only in goods markets but factor markets too, using signalling instruments seems to become more and more important for communities. This could also be an explanation and legitimation for the developing nations taking an increased interest in today's business development and new instruments of location marketing.

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[34] For the idea that state aid, having the function to influence the spatial allocation of production factors, can be defended its efficiency enhancing effect on the location choice process cf. STEINRÜCKEN and JAENICHEN [2002].

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Chapter 14

'SWING TO THE LEFT' AND ITS IMPACT ON INVESTMENT DECISIONS IN LATIN AMERICA THE EXAMPLE OF THE ENERGY SECTOR IN BOLIVIA AND THE COMMERCIAL REAL ESTATE MARKET IN BRAZIL

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Abstract

Western media have used the term 'swing to the left' to describe tendencies towards nationalisation and increasing state control in Latin American countries such as Bolivia and Brazil. Using the energy sector in Bolivia and the commercial real estate market in Brazil as case studies, this contribution shows how investors react to radical changes in economic policy, political uncertainty and market opaqueness. The example of Bolivia makes clear that resource richness can exert direct influence on a country's political and socio-economic stability. The example of Brazil provides a broader perspective on the significance of global buzz. Impressions, rumours and moods influence and guide current thinking on political developments and along with this, ideas on "right" or "wrong" investment locations.

Key words: Latin America, foreign direct investments, investment decisions, political instability, real estate market, energy sector, Brazil, Bolivia

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Introduction

The political and economic course of some Latin American countries such as Bolivia has been characterised by radical changes. Western media have used the term 'swing to the left' to describe tendencies towards nationalisation and increasing state control. Opinion-makers such as consulting firms and rating agencies have contributed to this discourse by reinforcing the general opinion on what are 'right' and 'wrong' investment locations. Brazil is a case in point. When Lula came to power, expectations were of a strong shift to the left, but his government turned out to be quite moderate and pro-economy. Hesitancy on the part of foreign investors should not come as a surprise when it comes to investing in countries facing potentially radical political and economic changes. Often, these are countries with added problems, such as the high levels of violence experienced in some Latin American metropolises (e.g. São Paulo). But cases also appear to exist where investors are relatively unimpressed by political instability, choosing instead to maintain their existing courses set by past decisions.

This contribution shows that either one of these scenarios is too simple. Using Bolivia as a case study example, we show how investors in the energy sector deal with radical changes in economic policy, which is epitomised in Bolivia in trends towards nationalisation. We then consider the case of real estate investors in Brazil and show how actors in this field deal with political uncertainty and opaqueness in their investment decisions[1].

The Case of Bolivia

Rich in Resources but Poor Nevertheless

Although it is rich in natural resources, Bolivia is also one of the poorest countries in Latin America. In order to understand this discrepancy, a more detailed analysis of the Bolivian economy and society is required. Here, we use the energy sector as an example to probe the conflicts that surround ownership and use of the country's energy resources. Resource curse theory represents a theoretical concept that can highlight the relationships that exist between resource availability on the one hand and societal development within a national economy on the other. The theory assumes that Bolivia's richness in resources is a determining factor in the country's socio-economic development. At the same time, resource richness also carries with it enormous conflict potential since different interest groups such as foreign investors, state and civil society actors all seek to profit from commodities.

[1] Empirical data is based on a series of guided interviews. In Brazil, 20 guided interviews were carried out with decision-makers representing global and Brazilian real estate investors in São Paulo. In Bolivia, 20 guided interviews were carried out with political and economic decision-makers in the Santa Cruz region. Interviews were carried out between 2004 and 2007.

Resource Curse Theory

Within Resource curse theory[2] a number of studies have been carried out to highlight the relationship between resource richness, socio-economic development and causes for violent conflict. The term ‚resource curse' was coined by Richard Auty whose 1993 study shows that in many economies, richness in natural resources is accompanied by below-average GDP growth rates and low levels of development. "Dutch disease[3]" and over-reliance on a single economic sector at the expense of others contribute to low economic growth and favour the spread of poverty and unemployment within the population. An added difficulty is that state institutions are rarely efficient enough to ensure the just distribution of income derived from commodities. Whilst economic and political elites therefore profit from commodity yields, sometimes considerably so, the majority of the population does not (see Ross 2001: 325; Ross 1999).

Another aspect is that resource-rich states seem inherently prone to violent conflict. Collier/Hoeffler (2004: 588) conclude that increased likelihood of civil war is best predicted by a high proportion natural resource exports in the GDP, compared to relatively poor predictive power of political suppression, social injustice and ethnic polarisation. LeBillon (2001: 581) agrees and states that richness in natural resources is not only used to finance armed conflict, but actually motivates it. His research highlights a positive correlation between high dependency on natural resources and society's vulnerability to armed conflict: Such dependency is considered to reduce the ability of political institutions to resolve conflicts peacefully.

Current research considers resource richness in the context of institutional settings (e.g. Jones Luong/Weinthal 2006). This takes into account the role of state institutions, active resource management, a country's current state of development and existing governance structures. In theory at least, the latter could counterbalance any negative effects that might arise from resource richness. The following applies Resource curse theory to Bolivia, a resource-rich state with a high poverty rate and low rates of GDP growth. A focal point is the question whether resource richness contributes to the spread of conflict, which in turn would negatively influence foreign company's investment behaviour. The much-debated Bolivian energy sector is chosen as a case study example on account of its growth rates and the strategy of nationalisation that is currently pursued by the Morales government.

Natural Gas Boom and Conflict Potential in Bolivia

Bolivia has the second-largest reserves of natural gas in South America, topped only by Venezuela (Fig. 1 and 2). Since the late 1990s the Andean state has been characterised by above-average growth and investment rates throughout the entire energy sector, but this has been particularly notable in the natural gas industry. The 'natural gas boom' was triggered by

[2] "Paradox of Plenty" is an alternative term found in literature.

[3] "Dutch Disease" explains the connection between intensive resource exploitation and the economic decline of individual sectors. If a national economy exports a significant amount of a certain commodity (e.g. natural gas), trade surpluses result. This leads to revaluation of the national currency, which impedes other export-based sectors. Whilst one export prospers, others enter into crisis, at which point the country begins an economic decline. This phenomenon was first noted in the Netherlands when new natural gas reserves were discovered in the 1960s.

privatisation of the national company *Yacimientos Petrolíferos Fiscales Bolivianos (YPFB)* in 1996. That year, the *Ley 1689 de Hidrocarburos* was passed, which transferred ownership of extracted gas to the extracting companies. The role of the Bolivian state was reduced to that of a tax collector. Taxes amounted to 50% with existing and 18% with newly discovered gas fields[4].

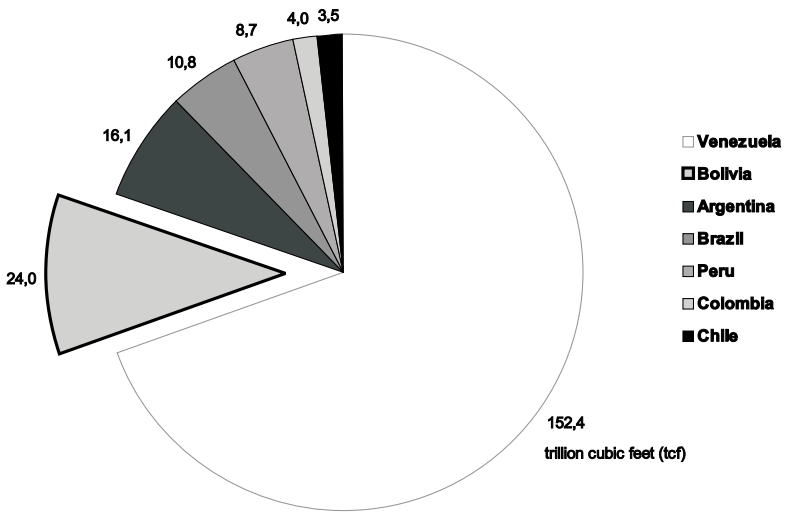

Figure 1. Proven Natural Gas Reserves in South America, by country (Oil and Gas Journal 2007).

Privatisation was accompanied by the World Bank's *Energy Sector Management Assistance Programme* and led to a rapid increase in direct foreign investment in the Bolivian energy sector. Between 1996 and 2004, multinational companies invested 3.25 billion US$ in the exploitation and exploration of the country's energy resources. The figure for proven natural gas reserves went up by a factor of seven. Major profiteers were transnational corporations such as Repsol-YPF, British Gas, Total and Petrobras, which were able to independently set prices and decide on commercial exploitation and export. In 2007, natural gas exports reached a record high of 381 trillion cubic feet (tcf).

Proven Natural Gas Reserves:	24 trillion cubic feet (tcf)
Natural Gas Production:	466 billion cubic feet (bcf)
Natural Gas Export:	381 bcf
Natural Gas Consumption:	85 bcf
Organization:	Government controlled via YPFB
Major investors:	Repsol-YPF, British Gas, Total, Petrobras
Major Natural Gas Fields:	Margarita (13.4 tcf), Ipati (12.0 tcf), San Alberto (11.8 tcf), Sabalo (10.8 tcf)
Major Gas Ports:	None (landlocked country)
Major Pipelines (capacity):	Gasbol (1.0 bcf/d)

Figure 2. An overview of the gas sector in Bolivia (Energy Information Administration 2006/2007).

[4] only 3% of extraction sites were classified as existing.

Resource curse theory can be used to explain the discrepancy between the natural gas boom and the low state of development in Bolivia. On the one hand, Bolivia has 680 billion m³ of non-associated[5] natural gas reserves, the second largest in Latin America. On the other, its GDP of 9.3 billion US$ and a PPP per-capita income of 2,810 US$ make it one of the poorest economies of Latin America (see also INE 2007). One reason for this is the strong economic dependency on natural resources, in particular the natural gas sector. Natural gas has a 50% share in Bolivia's total exports (UDAPE 2006: 35). Distribution effects also need to be taken into account. There are significant discrepancies in geographic distribution, access to resources and the distribution of income from the natural gas sector. Bolivian gas reserves are concentrated in the Eastern lowlands (85.5% in Tarija Department and 10.5% in Santa Cruz Department), which has contributed to growing economic and regional disparities. Income generated from the natural gas sector first of all benefits the foreign investors and the economic elites, as well as shareholders and investment partners. The majority of the population is excluded. As a result, there is persistent poverty and socio-economic exclusion. Numerous indicators provide evidence of this: On to the Human Development Index (HDI), Bolivia scores 0.695, which makes it 117th out of 177 listed states. In addition, socio-economic inequality is above-average in Bolivia, as shown by the Gini-Index[6] value of 60.1. 60% of the population are classed as poor, and more than 40% live on less than 2 US$ per day (UNDP 2007). Inter-regionally, poverty is greatest in rural regions populated mainly by indigenous peoples (Quechua, Aymará), where 90% are classed as poor. As a consequence, resource richness has served to reinforce inequality and poverty, bringing with it considerable potential for conflict. In addition, weak state institutions and continuous political instability (Winter/Scharmanski 2005) prevent the country's problems from being resolved quickly and efficiently.

"Guerra del Gas"

It is well established that resource richness can not only lead to slow economic growth and poverty, but actively trigger conflicts (Collier/Hoeffler 2004). Little research has so far been done on how conflict in resource-rich states influences investment behaviour of foreign companies. Many resource-rich states, in particular developing countries, are unable to sufficiently valorise their existing resources without the engagement of foreign investors. Pull-out of investment capital as a response to domestic conflict can therefore have serious impacts on their socio-economic development. The following shows how the ongoing conflict within the gas sector and the course of nationalisation pursued by the Morales government influence the investment behaviour of foreign energy companies.

The "Guerra del Gas" first flared up in September 2003. Back then, the Bolivian public was engaged in a vigorous debate of export options that existed for the plentiful Bolivian gas. This debate was intensified by the discovery of new gas fields in the lowland departments of Tarija and Santa Cruz. It was the modalities of gas export that were the main point of contention. The Pacific LNG, a consortium of British Gs, Repsol (37.5% each) and Panamerical Energy (25%) had entered negotiations of an export agreement with the US-

[5] i.e. natural gas reserves that are not associated with oil fields

[6] The Gini Index is a measure of inequality often applied to the distribution of income. 0 equals perfect equality, 100 perfect inequality.

American energy provider Energy Sempra. From the gas field Margarita in Tarija, the gas was to be transported to a Chilean port via a pipeline. There, it was to be converted to liquid gas and primarily exported to California and Mexico. This proposal was widely rejected by Bolivian society and caused countrywide protest. The natural resource debate was stoked up by the image of Chile as an enemy, an image that has been a defining element of national identity ever since Bolivia lost the Pacific war (1879-1884, see Winter 2007). Economic policy is therefore only one of many driving forces that exist within the natural resource debate. Issues of domestic and foreign policy, such as the relationship between Chile and Bolivia, also contribute to the debate and add incendiary potential. Evo Morales, then leader of the opposition, and the radical trade union leader Felipe Quispe used the divisions within society to mobilise their supporters. Some violent demonstrations took place in the indigenous centres of El Alto, La Paz and Cochabamba and became an expression of civil society protest against poverty, inequality and disadvantage. Countrywide shortages resulted, affecting both consumers and entrepreneurs. The situation was exacerbated when the military use of force, which resulted in large numbers of injured and over 60 dead. President Sánchez de Lozada finally resigned in October 2003.

The subsequent government, led by Carlos Mesa, went to considerable efforts to resolve this resource-based conflict. On 17 June 2004 a referendum was held, supposedly marking the beginning of a new energy policy. Effectively, however, nothing much changed, and even the passing of the *Ley de Hidrocarburos 3058*, which introduced a direct tax of 32% on natural gas, was unable to mollify the populace[7]. Once again, protests and street blockades erupted, leading to the resignation of President Mesa in 2005.

> ‚Some are concerned with justice and social participation, others with attracting foreign technology and capital. But we all know that the current economic policy has not resulted in the desired economic upswing for our country.' (Interview BOL-08)

Initially, "the Guerra del Gas" was mainly waged by the indigenous population. Increasingly however, other groups such as trade unions, factory workers, students and urban middle classes joined in the protest movement. A large part of society was able to unite behind the issue of resource policy. Natural resources thus became a catalyst (Quiroga 2006: 81) for bringing together a range of heterogeneous demands of the population:

- The rejection of the neo-liberal economic model in Bolivia, taking a stand against the World Bank, the International Monetary Fund and against too much influence wielded by the USA. Many people also took to the streets to demand more social justice and political participation.
- The struggle for political power. The ability to instrumentalise the resource conflict was a decisive advantage for the mobilisation of marginalised groups. Within a short spate of time, they were able to develop significant political pressure and influence government decisions as a result.
- The actual conflict surrounding national economic and resource policy. The modalities of natural resource exploitation are a central bone of contention for investors in the energy sector, the political and economic elite of the country and

Bolivian civil society (Perreault 2006: 162). This last aspect will be considered in greater depth using the policy of nationalisation pursued by the Morales government as an example. The relationship between this policy and the conflict situation in Bolivia will be explored with a view to establishing how this influences the behaviour of investors.

Nationalisation of Oil and Gas Deposits

Evo Morales won the national elections in late 2005 because he was able to link the issue of resource policy to social justice and ethnic disintegration. His government is betting on a policy of nationalisation for raw material extraction, transport and distribution. Foreign investors in the energy sector will be degraded to plant operators. By 2009, the Bolivian state hopes to have recouped all the facilities that were privatised in the 1990s.

> ‚We need to solve the social problems, the economic problems of the majority, changing those economic models which blocked the development of the Bolivian population. So it is important to do business, good business for Bolivia. Only producing we will overcome poverty. (…) [But] the pillage of our natural resources by foreign companies is over. (…) In Bolivia, the neoliberal model does not go anymore.' (Evo Morales, 2006)

This 'nationalisation plan' led to a new conflict. On the one hand, civil society no longer took to the streets against government. On the other, there was mounting tension between the economic elites, investors, foreign government (especially Brazil) and international financial organisations and government. Neither multinational corporations nor international organisations had an interest in a drastically stronger state as far as the politics of natural gas were concerned. On 1 May 2006, despite strong protests, the Morales government announced a nationalisation decree, giving companies 180 days in which to re-negotiate conditions of extraction and adjust to the prospect of an 82% tax burden on all revenues generated from the energy business. The energy companies Andina, Chaco and Transredes, which were privatised in 1997 and where BP and Repsol are shareholders, will be majority state-owned (at least 50.1% of shares). The same applies to Valle Hermoso and Palmasola refineries, which were sold in 1999/2000 at below average market price to the Brazilian energy company Petrobras. Foreign companies are thus forced into "communal enterprise" where they will be subject to state control. By the end of the deadline at the end of October 2006, individual contracts were in the process of re-negotiation, but numerous re-negotiations between the state and investors have stalled in view of the uncertain legal situation.

Investor Reaction: To Stay or to Go?

Since the latest nationalisation campaign the Bolivian energy sector has stagnated. As government prepares to take private plants and companies into state ownership, many investors face an uncertain future. Even though the majority of foreign investors such as

[7] Mesa did not sign Law 3058 because of existing obligations to the International Monetary Fund. Nevertheless, the law was passed by Parliament because Mesa did not veto it.

Repsol-YPF, Total or Petrobras plan to remain in the country, they are cautious when it comes to investments in existing or new wells.

> ‚We are waiting to see how Bolivia will develop economically. But as investors, we too have to keep asking ourselves whether the present conflicts and legal uncertainties are a significant threat to what we seek to achieve here as a company' (Interview BOL-11)

Many investors are nervous because of the legal uncertainties and political instability in the country. As a consequence, production levels are stagnant although many gas fields remain unexplored and foreign demand is immense. Bolivia produces 42 million m³ of natural gas per day. Nearly two thirds are sold to Brazil, and another 8 million m³ are needed for domestic use. By contract, the remaining 5 million m³ are to be supplied to Argentina, but at present Bolivia is only able to deliver half the amount. This has repeatedly caused shortages and problems for the Argentine economy. A specially convened energy summit between Bolivia, Brazil and Argentina in late February 2008 did not produce a solution.

Bolivia's Position vis-à-vis Foreign Investors

The swing to the left has led to increasing apprehension and negative reactions on the part of foreign investors. In response, the Bolivian government increasingly seeks to appease them together with their respective governments. The Energy Minister Villegas and Foreign Secretary Choquehuanca are keen to emphasise that Bolivia's purpose is not re-nationalisation per se, but a means to achieve greater justice in the distribution of profits from the energy business. Another purpose is to encourage the voluntary re-negotiation of those contracts that are incommensurate. Restructuring was necessary because formerly state-owned plants and companies had been sold below market prices in the 1990s and the tax burden for foreign investors in the energy sector was disproportionately small. The Bolivian government, they say, has not noted any reduction in investments. On the contrary, the Andean state expects a total investment volume of 1.3 billion US$ for 2008 alone. This includes investments in the re-founded state company YPFB. The twelve energy companies that are active in the country have already agreed to provide 75% of the total sum needed, with additional regional investors lined up to provide the rest. Apart from Brazil, it is the internationally controversial governments of Venezuela and Iran that are acting as partners and willing investors in Bolivia. Iran, for instance, plans to invest around 1 billion US$ in various sectors of the Bolivian economy over the next five years. Relatively few investments, however, are so far confirmed by contract.

New Conflict Potential and Ways out of the Crisis

It seems unlikely that investors will withdraw from Bolivia en masse. The natural gas resources in the country's lowlands are too significant, and potential profits are too lucrative for them to do so. From a political perspective, an added point is that the international community is keen on keeping the left-wing government as a political and economic partner. Brazil, for example, has signalled readiness to invest in its neighbour in an attempt at counterbalancing any undue influence that might be exerted by countries such as Venezuela

and Iran. But Brazil is not only interested in maintaining good neighbourly relations. It does depend on Bolivian gas and is interested in securing a slice of the exploitation cake for its own Brazilian gas companies.

> ‚If the Bolivians do not get fair value for their country's natural wealth, their prospects are bleak. Even if they do, they will need assistance, not only to extract their resources, but also to improve the health and education of all Bolivians – to ensure long-term economic growth and social welfare.' (Joseph E. Stiglitz, 2007)

With reference to the resource curse theory, it can be noted that resource richness is central to the political, economic and social development of the country. Domestic strife and conflicts of distribution, however, are not only triggered by resource richness in itself. Primary factors in this context are persistent poverty, social inequality and social exclusion of the majority of the population. Although controversial, the election of Evo Morales and his policy of nationalisation open up prospects for possibly resolving this conflict. More comprehensive measures are necessary though, which ensure that revenues generated from the natural gas industry are used to fight poverty and encourage diversification of the national economy. Integration of the indigenous population should also be pursued at a political and economic level. Bolivia's richness in resources will only benefit the entire population if a stable political, economic and social framework is created.

The Bolivian government is in a tight spot: More public revenue is necessary to combat poverty, which can easily be realised in the highly profitable oil and gas business. At the same time, the country lacks its own investment capital to expand state plants and technological know-how for their operation at world market standards. Wholesale nationalisation of the energy sector is therefore unlikely to solve the country's problems. On the contrary, Bolivia is dependent on the engagement of foreign investors, their capital and technology. Re-negotiating extraction licenses at world market conditions and establishing joint ventures would seem eminently sensible since this would generate higher revenues whilst also ensuring technological spill-over effects.

The Case of Brazil

From Left-Swing Forecasts to a Contender for Investment Grade

If Lula wins, this will lead to massive capital outflow and a fundamental loss of trust in Brazil's economy. Such was common talk in the world's financial centres before the Brazilian presidential elections in 2002. Instead of repaying debts, many financial experts feared that the mountain of debt would continue to grow if the left opposition leader's election programme was ever implemented.

Ultimately, the fears that permeated the world of finance were groundless. Lula continued the economic course of stability that had been set by his predecessor. Nevertheless, some financial turbulence resulted. Doubting the reliability of Brazil as a debtor, and fearing a potentially socialist President Lula, some banks and other owners of government bonds withdrew their capital from Brazil. This was the beginning of a chain reaction: Government was forced to buy out matured bonds or offer much higher interest rates, the national currency took a dive, and the country only just avoided insolvency. Investor insecurities became

manifest in the dip in cross-border portfolio transactions, which were reduced by a quarter in 2002 compared to the previous year. Although direct investment flows are generally considered less volatile, a considerable drop was noted here too (Fig. 3).

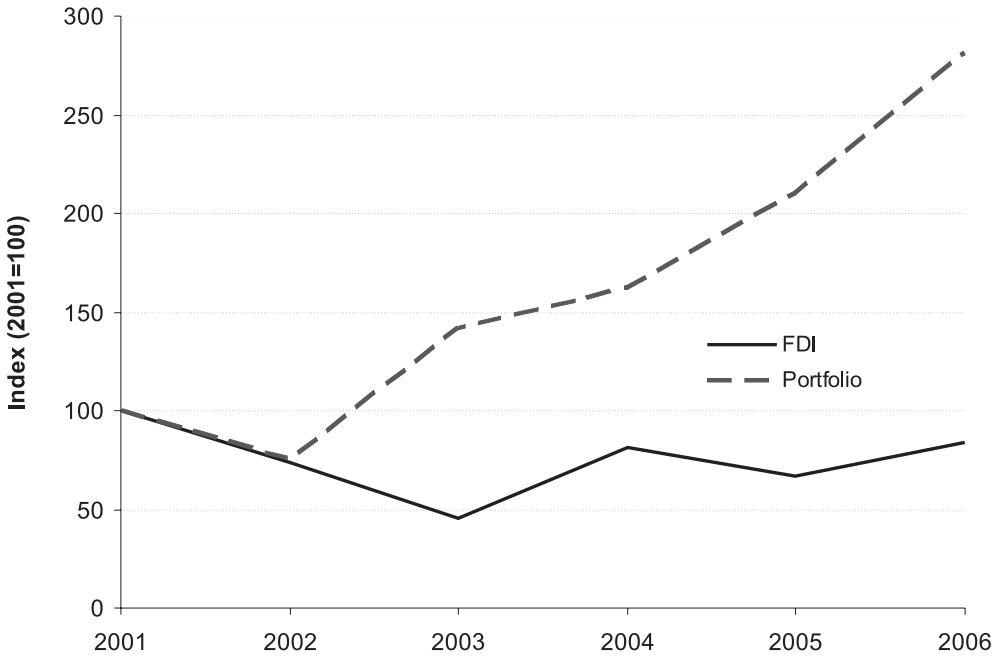

Figure 3. Foreign Direct and Portfolio Investment in Brazil (2001-2006; UNCTAD 2008).

Despite corruption charges, four years later the Lula government was re-elected. Government party functionaries (*Partido dos Trabalhadores*) supposedly engaged in illegal campaign financing and established an entire system for siphoning off money from state-owned companies. Some close confidants of Lula had to step down, resulting in nervous foreign exchange and external loan markets. Larger economic upheaval however did not materialise. This is due to the fundamental stability of institutions and economic framework conditions which remain unperturbed by changes in government or even scandals. This is emphasised by the following statement of a foreign investor:

> 'Years ago such news would have triggered a full-scale panic. But today Brazil is sailing smoothly through the current political storm. The Brazilian economy is bullet-proof. Investors are not panicking over the corruption scandals, because the country's economic fundamentals are strong'. (Interview BR-16)

After the transition to democracy in the 1980s and the economic reforms of the 1990s Brazil can now point to an economy that is characterised by free exchange rates, checks on inflation and stability-oriented financial and fiscal policies (Fig. 4). Lower country risk, decreasing levels of interest rate and lower risk premiums on the stock exchange encouraged more and more foreign companies to invest in Brazil or to expand their activities (*Allianz Dresdner Economic Research* 2007; *Deutsche Bank Research* 2006/2007). In 2006, Brazil

received nearly 4 billion US$ more foreign direct investment than the previous year (+ 25%), with portfolio investments showing an increase of 60 billion US$ (+ 70%) (*UNCTAD* 2008; *IMF* 2008). The positive mood is reinforced by the prospect of the country making “investment grade” by 2009. Investment grade would enable large foreign institutional investors such as insurance companies or pension funds to access Brazilian government bonds. Apart from the monetary advantages that could be derived from such a quality label, this would also yield considerable psychological gain.

	2002	2003	2004	2005	2006	2007e	2008f	2009f
GDP change in % (real)	1.4	0.5	4.9	3.2	3.8	5.2	4.5	4.8
Inflation in % (annual average)	6.8	12.6	5.7	5.8	3.3	3.6	4.2	4.0
Interest rate	28.8	23.3	16.3	19.1	15.5	12.1	11.0	9.0
Stock market Bovespa index		6447	7384	11700	14568	21535	20486	
Exchange rate (Real per USD)	2.35	3.08	2.93	2.43	2.17	1.95	1.70	1.80

e = estimate; f = forecast

Figure 4. Brazil - Economic indicators and forecasts (Deutsche Bank Research 2007).

Positive economic news ensured that Brazil became a focal point for real estate investors looking for the high rates of return no longer available in the USA and Europe. However, as international investors overcome political, economic and legal barriers they enter a new dimension of risk. This is particularly true for opaque real estate markets such as Brazil, whose legal and political framework conditions are subject to frequent changes and where reliable market information is often unavailable. The following shows the degree to which real estate investors take into account political uncertainties and opaqueness when it comes to taking investment decisions. On the one hand, the reaction of the financial world to Lula’s re-election suggests increasing disassociation between economic development and political stability. One investor expresses this as follows:

> ‚If Lula wins we won’t have problems. The economic stability is increasingly independent from the political circumstances’. (Interview BR-04)

On the other hand developments prior to 2002 the presidential elections highlight the power wielded by opinion-makers such as consultancies or rating agencies, which were able to influence thinking on political developments and opinions on “right” and “wrong” investment locations.

Rumours and Moods Spread by Global Buzz

Searching for potential destinations, real estate investors usually use some form of screening to exclude those locations from further consideration that do not match company policy or the company’s cautionary principles or fail to meet other basic standards. The criteria that are applied include company attitudes to risk and strategic pre-emptory decisions taken by

management. Minimum and maximum values of certain knock-out criteria also count, which particularly concern political stability and the legal certainty provided by a country. Estimates of the latter are usually provided by country analyses, rankings and data provided by public institutions, transnational consultancies and rating agencies. The spread of modern information and communication technologies provide easier access to data and information, but significant gaps in the available data remain. At no point in time do decision-makers have all the information they would need to carry out a complete screening of all conceivable investment destinations worldwide. Existing data sources provided by rating agencies and legal and real estate advisors are insufficient to adequately reflect the 'real' world of real estate for investors.

In order to circumvent individual decision-making, along with having to subsequently justify these decisions, investors often allow themselves be guided by commonly held lead principles and behave in line with the 'global buzz" (*Bathelt/Malmberg/Maskell* 2004). Generally, buzz develops when professionals from a sector work in close proximity. It consists of impressions, rumours, moods, interpretations and experiences and is often generated in large centres of finance which act as nodes in a global network for transferring management knowledge (*Glueckler* 2007). Conferences and trade fairs also offer a platform for exchanging opinions and moods *(Maskell/Bathelt/Malmberg* 2006). Importantly, then, 'global buzz' has an impact on constructions of reality, for example when real estate investors estimate a country's political or legal stability. Through global buzz, misjudgement and unfounded fears can spread rapidly and gain a foothold within the real estate community. This in turn influences investment and can lead to certain destinations being avoided. In the process of spreading opinions and estimations, stronger market players often act as guides. Frequently, their behaviour is emulated (*French* 2001, S. 405), as stated by one interviewee:

> 'If some big real estate investor moves to Brazil, I'm sure everybody else will say: Why did they do that? And they will watch the market, too'. (Interview BR-10)

Opinion-makers such as consultancies or rating agencies broaden and deepen existing lead discourses by pronouncing views of what constitutes the 'right' or 'wrong' investment location. Transnational advisers express their views by means of city or investment rankings, which serve to set the position of other real estate actors:

> 'Somebody has to grab your focus or your attention and say: look here. And that's what the brokers function is to do. They have to say: here is market. Thus they can influence the decisions of the investors by their market studies'. (Interview BR-18)

Currently, the image of Brazil is characterised by discussions of booming BRIC markets, rising share values and a stable economy. The BRIC story in particular serves to guide current assessments of investment opportunities in Brazil. The much-quoted study ‚*Dreaming with the Brics: The Path to 2050*' by the Goldman Sachs investment bank forecasts linear growth for Brazil, Russia, India and China. In 2040, BRIC states are expected to be a stronger economic power than the G6-states of Japan, Germany, France, Great Britain and Italy (*Goldman Sachs* 2003). The investment recommendations made by this study also impact on the real estate sector, as the following statement shows:

> 'At present everyone's focused on the BRIC states. Not least because of the Goldman Sachs study. The more is published about it, the more attention is generated and the greater the number of interested investors. These studies therefore generate markets.' (Interview BR-02)

Economic Upturn versus Corruption and Crime

Risks were not only discussed in the context of the supposed political swing to the left, but also in terms of the tense security situation in Brazilian cities and apparently widespread corruption. The escalation of the ongoing feud between the mafia organisation PCC (*Primeiro Comando da Capital*) and the police made history as '*guerra urbana'*. Excess violence, so the fear of investors, could put off companies and lead to a fall in rents in São Paulo. Corruption also increases the market entry costs to foreign investors. A study by *Transperência Brasil* states that a quarter of the companies questioned set aside 5 to 10% of their total turnover for bribes (*Weber Abramo* 2008). Corruption and bureaucracy make up *custom Brasil*, describing additional costs incurred in Brazil, much to the exasperation of many an entrepreneur.

This section shows that global investors rarely estimate economic stability on the basis of indicators alone. Their decisions are also influenced by global buzz, which transports assessments, estimates, moods, stereotypes etc. It is worth noting that the global buzz does not reflect 'real' reality, but can also produce distorted images of the actual situation.

Investor Reaction

It seems unlikely that global real estate investors will ignore Brazil because of its political situation. Its economic stability is too persuasive, and the yields that can be generated in the commercial property market are too lucrative to be put off by a potential swing to the left. So far, most foreign investors have concentrated their activities on the metropolitan area of São Paulo, which has become an established node in the global economic network. With a total of 2.2 million square metres (classes AA and A), São Paulo represents the most important and largest commercial property market in South America (*Jones Lang LaSalle* 2007). After a period where foreign investment rarely exceeded 200 million US$ per year, the situation changed in 2005, when according to a local broker foreign direct investment in the commercial property sector jumped to around 2.5 billion US$. Investors now hope that Brazil will be a repeat of the Mexican story, where economic stability, lower country risk and broad-based financing resulted in a construction boom.

Market entry in Brazil however is hampered by opaque market structures. Opaqueness manifests itself in the lack of market information, institutional gaps (incomplete legal frameworks etc) and low transaction security (corruption, lacking professionalism of actors etc). Local presence, or close co-operation with local actors is therefore essential, not only because of the immovable character of commercial property, but also because local information and knowledge are highly relevant.

A wide range of global-local arrangements is thus characteristic for the opening of a market, ranging from loose co-operation to strategic alliances, joint ventures, shareholding and fusion. Working with local Brazilian partners lowers the perceived political risks, as is illustrated in the following statement by a USA investor:

> 'Political uncertainty is low risk. All of the people in our office are Brazilian. So, we're here, we know the country, it's not something that worries us.' (Interview BR-02)

Instead of slowly establishing networks, dealing with local rules and regulations and recruiting staff with market knowledge, the US-American project developer *Tishman Speyer* formed a joint venture in the late 1990s with the local real estate company *Método Engenharia*. To circumvent opaqueness, foreign investors also attempt to use the stock exchange to profit from the economic upswing in the real estate market. When the four leading construction and real estate companies *Cyrela*, *Rossi*, *Gafisa* and *Company* went public, they joined in. In the case of *Gafisa*, foreign investors now own as much as 70% of the capital.

Political uncertainties, however, can also delay investment in real estate. *Tishman Speyer*, for instance, brought to a halt construction of the *Rochaverá Corporate Towers* in São Paulo, thus responding to a drop in demand that sprung from uncertainties emerging prior to the 2002 presidential election. Work did not continue until 2005 when the much-vaunted swing to the left had failed to materialise and foreign companies' fears had been allayed. Engaging in the Brazilian real estate sector therefore requires patience and a long-term strategy rather than short-term profit taking.

> 'When the market turned we stopped construction. In Brazil, success requires nerves of steel and a willingness to be in the country for the long haul, rather than panic and sell out'. (Interview BR-16)

The strong current interest in investment opportunities, in particular in São Paulo, can thus be put down to two main factors. On the one hand, high yields can be had in the commercial property sector (up to 12%), which can no longer be obtained in the transparent real estate markets of the core economies. This is enhanced by stable economic indicators for Brazil, which together with President Lula's course of economic stability create a positive climate of investment. Nevertheless, concerns regarding a possible swing to the left are still widespread amongst investors in Brazil: *‚Brazilians could tire of the apparent inability of liberal market policies to deliver faster growth and elect a populist or merely more interventionist president.'*

Conclusion

Using the economies of Bolivia and Brazil as case study examples, this contribution has shown how investors react to radical changes in economic policy, political uncertainty and market opaqueness.

The example of Bolivia has made clear that resource richness can exert direct influence on a country's political and socio-economic stability. The discovery of large natural gas reserves and the recruiting of foreign investors in the energy sector have triggered a natural gas boom in Bolivia. At first glance, this should be welcomed: foreign direct investment brings with it capital and world market technologies, which can enhance socio-economic prosperity by creating spillover effects. These however have failed to materialise. Instead, clashes ensued between civil society and investors, last time over government plans for re-nationalisation. The policy of nationalisation has not yet driven out investors in the Bolivian

energy sector. In the face of continued legal uncertainty and civil unrest, however, there is no increased willingness of foreign companies to invest. Bolivia can emerge from the crisis if it is forced into the world market at fair conditions. This requires stable political institutions that will not be tempted to sell off the country ('capitalisation'), but also rein in any restrictive policies of nationalisation ('nationalisation'). Bolivia should say yes to investment from abroad, but this should be guided by standard market conditions.

The example of Brazil has provided a broader perspective on the significance of global buzz. Impressions, rumours, moods and interpretations, which spread a long way from the actual investment destinations in economic centres or institutionalised fora such as conferences, workshops and trade fairs (interaction sites), influence and guide current thinking on political developments and along with this, ideas on "right" or "wrong" investment locations. Sometimes distorted images are produced. This was the case before the Brazilian presidential elections, when fears arose concerning a potential swing to the left. Opinion-makers such as consultancies or rating agencies often generate and spread moods, which in extreme cases can result in capital outflow and financial crises. In many places, the general rule is that investment will continue as long as there is a good rate of return and an acceptable economic framework. Some hesitation can arise in cases of political change or increased crime rates and corruption. Brazil however shows that political stability is viewed increasingly independently of economic stability. If the economic framework is positively rated, investors will continue their engagement in a country even in the face of political and social conflict.

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Chapter 15

WINNERS AND LOSERS POST DEMOCRATIC REFORM IN NIGERIA: A LOOK AT ECONOMIC AND LABOR MARKET OUTCOMES

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Abstract

In this chapter, the question of differential welfare impacts, across interest groups post democratic reform in a developing country, is explored. There is data evidence that welfare has improved post democracy in Nigeria. However, the distribution or concentration of the benefits of democracy in subgroups of the population is unknown. I break down the population into interest groups along the lines of sector, region, age cohort and education. The analysis shows these groups all benefitted from reforms post democracy but the magnitude differed significantly. I find that individuals with tertiary education are the big winners post democratic reform in Nigeria. Part of the high benefit of democratic reform on those with tertiary education is explainable from policy choices and reform. However, a part of it is linked with general equilibrium effects of a movement to democracy.

1. Introduction

Nigeria has been controlled by military governments for most of her independent life. Between 1986 and 1998, Nigeria experienced its worst political regimes since its independence. Political instability, extractive institutions, pervasive corruption, lack of security, poor policy choice and poor governance were the hallmarks of this period. The last of these military regimes ended abruptly with the death of General Abacha in 1998. In May 1999, Olusegun Obasanjo became the president of Nigeria, ushering in the present democratic dispensation. The period between 1999 to present has been the longest stretch of democratic government in Nigeria[1].

The democratization of Nigeria led to significant political, economic, macroeconomic and institutional reforms (see Okonjo-Iweala and Osafo-Kwaako 2007). There is evidence

[1]The previous democratic government lasted four years between 1979-1983.

from annual data that on an average, welfare has improved in Nigeria post democracy [FOS, 2004]. However, there is anecdotal evidence that these economic benefits are being enjoyed by only a few selected groups in the population [Sesay, 2007]. Besides, some Nigerians believe that some interest groups are actually fairing worse post democracy. In this chapter, claims of inequality in benefits post democracy with respect to labor market outcomes and other welfare indicators are investigated. Specifically, I answer two questions. First, are there substantial subgroup differences in the welfare impact of democratic reform? Second, can be classify some as winners and losers post democratic reform in Nigeria based on these differences? The labor market indicators/outcomes I consider are wages, probability of employment, returns to education, inequality and poverty measures. The groups of interest compared with respect to these indicators are: sector (urban versus rural), region[2], birth cohort and education attainment groups.

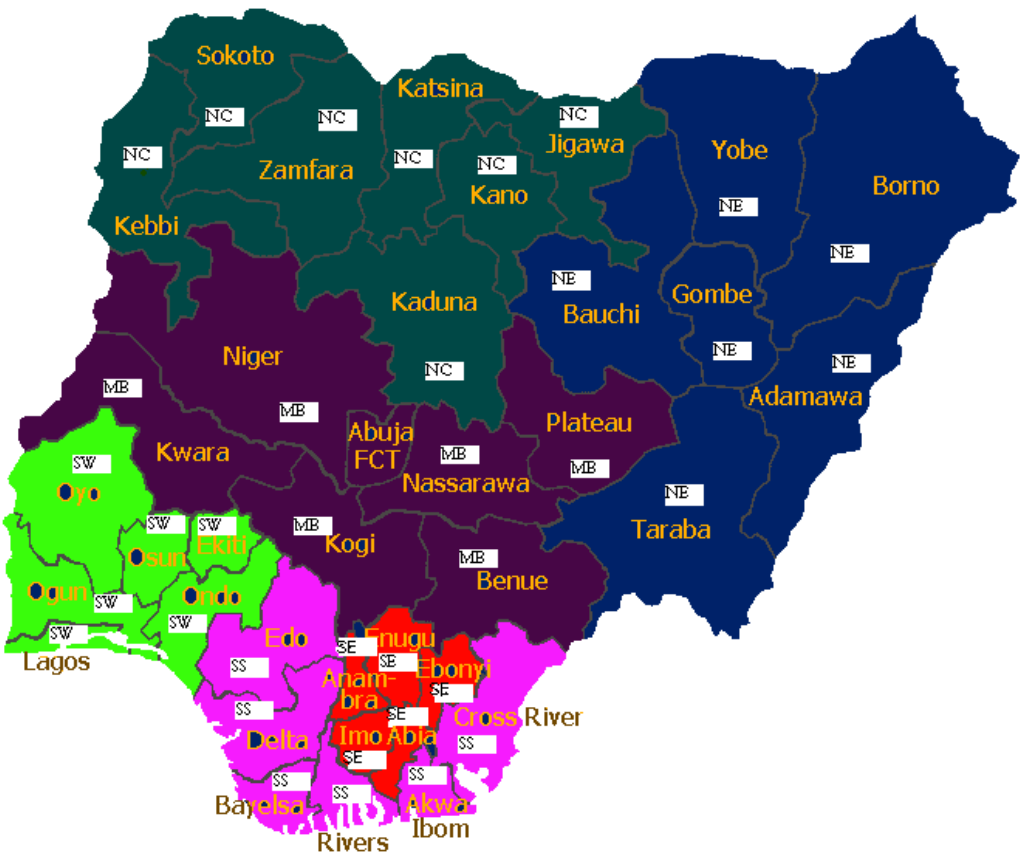


Figure 1. Geopolitical Regions in Nigeria.

Code: SE-South East, SW- South West, MB- Mid Belt, SS-South South , NC-North Central and NE- North East.

[2]Figure one is a map of Nigeria showing the regions in Nigeria: Southeast(SE), Southwest (SW), Mid Belt (MB), South-South(SS), North-Central (NC) and Northeast (NE).

To answer these questions, first, the average income before and post democracy for the different subgroups of the population considered is estimated. Next, I compute the level of poverty and severity of poverty for each period using the Foster-Greer-Thorbecke (FGT) index (Foster et al, 1984). Third, to measure change in inequality, I estimate the before and after Gini coefficient for each subgroup. Finally for each interest group, the probability of employment and the returns to education are estimated using econometric techniques. For each of these measures of welfare, I compute the percentage change in the measured coefficient over the two time periods and the simple difference. Conclusions on the existence of disparities in welfare outcomes post democratic reform, are based on these results. Potential losers and winners post democracy in Nigeria are then characterized based on the magnitude of these differences.

The results show that though welfare increased on average post democratic reforms in Nigeria, there are substantial disparities across groups. In addition, I find those with tertiary education and those from the Northeastern part of the country are the big winners post democracy. Post democracy in Nigeria, mean income for those with tertiary education increased by 52% and returns to tertiary education increased by 57%. Similarly for the Northeast, mean income increased by 40% and average returns to education (ARTE) increased by 58%. The large increase in welfare of the tertiary educated is not unexpected given that many government reforms with direct effects largely on this group. However some of the welfare increases for those with tertiary education may be linked with general equilibrium effects linked with democracy in Nigeria. What is surprising is the substantial economic improvement in the Northeastern region. Possible reasons for these are: government distributional bias, networks, interest groups and politicians favoring one region over another. However, these potential explanations are speculative and need further examining. Third, I find that besides the between group disparities in benefits post democracy, there are significant increases in inequality within groups. An unexpected groups that experienced increase in inequality is rural dwellers (inequality increased by 16% among those living in the rural sector).

This chapter contributes to the literature by providing empirical evidence of the disparity in impact of institutional change for subgroups of a population. There are many theoretical papers on the impact of regime or institutions change on economic indicators. However, empirical evidence is not as common especially for developing countries. This chapter adds to the limited empirical literature for developing countries. In addition, this chapter provides evidence of subgroup disparities in the economic impact of reforms in Sub-saharan Africa. The mode of analysis is the first of its kind for an African country. The results provide information that is useful for policy design, redistributive efforts and program targeting in Nigeria. These are especially relevant as Nigeria begins its next democratic dispensation. It is important to note at this junction that since the impacts noted here are linked with democratic reform more so than democracy per se, the effects may not be generalizable to other developing countries. Meaning movements to democracy in other developing countries might not lead to similar outcomes.

The remainder of this chapter is organized as follows: In the next section I review the relevant literature and highlight the interest groups being considered. In section 3 I briefly describe Nigeria pre and post democracy and the data is presented in section 4. Section 5 highlights initial data analysis. In section 6 the measures of welfare used in the analysis are

described in detail. Section 7 presents the results and the last section is the conclusion.

Related Literature

According to Pommerehne (1978), a more democratic system, is likely to produce political outcomes that are closer to the preferences of the median voter than a less democratic system. Consequently, a shift to democracy or a shift in institution towards more democratic institutions can be expected to raise individuals well-being ceteris paribus.

There already is an extensive literature on the economic effects of democracy, levels of democracy, shifts to democracy and change in institution. Some papers within the literature have looked within countries while others have looked across countries. For example, Milanovic (2005) finds that own democracy has a significant positive impact on growth, which increases as a country's income goes up. Dorn et al (2005) look at the relation between democracy and perceived subjective well-being, in a cross-national analysis covering 28 countries, using data from the 1998 International Social Survey Program (ISSP). They find a positive and significant relationship between democracy and well-being even after controlling for numerous aspects, especially culture and income.

There are also papers that look at distributional benefits of changes in institutions or the influence of specific institutions on redistribution among groups in the population. Early empirical studies of the 60s and the 70s that looked at the relationship between democracy and inequality was comprehensively surveyed by Sirowy and Inkeles, (1990). They conclude based on their review of 12 previous studies that political democracy does not widely exacerbate inequality. Sirowy and Inkeles, (1990) result is quite different from the findings of Gradstein and Milanovic (2004), who surveyed the more recent literature. They conclude that the recent evidence indicates an inverse relationship between measures of democracy, based on civil liberties and political rights, and inequality. Interestingly, there are some exceptions in the literature to this inverse relationship. Take for example, Milanovic et al's (2001) cross-country empirical analysis, covering 126 countries from 196098. They find that in Judeo-Christian societies, increased democratization appears to lead to lower inequality. In contract, in Muslim and Confucian societies, it has an insignificant effect.

Apart from empirical evidence, the link between differences in institutions and economic outcomes like inequality has been discussed theoretically. Lipset (1959) and Lenski (1966) both present the theoretical case on the link between democracy and inequality in the mid 20th century. There are many other papers that consider theoretically and empirically the relationship between income or inequality and democracy.[3] It is not necessary to go over all these papers in detail because though they are related to inequality and/or democracy, there are not directly applicable to our questions of interest.

Unfortunately, despite the large related literature on democracy and its impact, most papers have focused on the relationship between democracy and income, transfers or inequality. Very few papers look at the relationship between democracy or institutional change and other economic indicators/outcome. Fleisher et al (2005) is one of such papers while

[3]Milesi-ferretti, Perotti and Rostangno (2002) study using a panel of OECD countries, Acemoglu and Robinson (2000), Acemoglu et al (2004), Rodrik and Rigobon (2004), Minier (1998) and Glaeser et al (2004) are examples of such papers.

Cao and Nee (2005) examines inequality and other indicators.[4] There are several possible explanation for focusing on income or inequality as against other welfare measures. One explanation could be the lack of theoretically economic arguments, for a relationship between democracy and other indicators, to serve as a basis for analysis. It is also important to mention that most of the papers above are based on developed countries or on cross-country regressions that include very few African countries. This is one reason why the simple analysis in this paper is useful. An important developing country in Africa is considered and evidence of disparate change, across groups, in economic outcomes post democratic reform is highlighted.

2. Nigeria pre and post Democracy

For most of her independent life, Nigeria has been controlled by the military government. The military government first took over in 1966 toppling the elected civilian regime in a coup d'etat. Several authors have written on the military government in Nigeria and its negative impact on every sector of the economy.[5] Between 1986 and 1998, Nigeria experienced its worst political regimes since its independence. Political instability, pervasive corruption and poor military government with extractive institutions were the hallmarks of this period. The last military regime is known to be the most oppressive, corrupt and divisive. This regime ended abruptly with the death of General Sanni Abacha on the 8th of June 1998.

The death of a person usually makes people sad, but not for many Nigerians who saw a ray of hope for the future with the demise of Abacha.[6] and the beginning of transition to democracy. The transition government lasted until May 1999. It was led by General Abdusalam Abubakar, a high-ranking commander in the late general's cabinet. It was a period of setting up the institutional and political framework for the shift to democracy. In May 1999, Olusegun Obasanjo became the president of Nigeria.

At the inception of the Obasanjo administration in 1999, the morale of Nigerians was at the lowest ebb because of several problems that characterized the past military regimes. These problems include: unemployment, high level of corruption, total decay of infrastructure, malfunctioning public utilities, inefficient state enterprizes and soaring inflation. Within a few months of democratization, political, economic and institutional areas for reforms, to deal with these issues, were identified. Over the next few years, many reforms were initiated including the liberalization of key sectors of the economy, restructuring of the public service, review of government budgeting and taxation laws, governance and institutional strengthening, and debt management. Okonjo-Iweala and Osafo-Kwaako 2007 in their review paper highlight many of the marco-economic reforms post democracy. Another noticeable democratic reform was the over 100% increase in the Federal minimum wage for civil service workers in May 2000. This was followed by increases in state minimum wage for civil service worker and the enacted of the new minimum wage law. Uwaifo (2008) documents the potential impact of this reform. In addition, Folawewo (2007) investigates the macroeconomic effects of this minimum wage reform using a general equilibrium

[4]They examine how the rise of a market economy in urban China redefines the rules governing economic activities though they also look at the effects on earnings inequality.

[5]Examples of authors on this subject are Dibie (2000), Nwagwu (2002)& Sanda et al (1987).

[6]Recently US$770 million of stolen state cash was recovered from Abacha's family.

framework.

Along with these reforms, several policies and program were put in place to improve education and health, reduce women's disadvantage in the labor market, encourage investments and improve labor market outcomes in general. In addition, several regulations were put in place to ensure that political and non political appointments and government contracts are awarded solely on expertise and education. This is in contrast to pre-democracy when appointments were more arbitrary and linked mostly to social networks. Another important action taken by the president was to address corruption. The government blocked many of the illegal channels of income transfer from government funds to private accounts. The active campaign against corruption started in 2003 post the reelection of the president. The Federal government of Nigeria has been actively fighting corruption at higher levels with low ethnic bias. The firing of a notable minister from the same ethnic group as the president and the arrest of the inspector general of police in 2005 are evidence of this.

Another big change in Nigeria post democracy is the business climate. Post 1999, several international firms returned to Nigeria and new international and local firms entered the market. This increase in firms led to an increased demand for highly skilled labor. Factors that led to the change in the investment climate post 1999 include: large-scale economic reforms, political stability, improvement in enforcing the rule of law and the existence of a skilled local labor force, better enforcement of intellectual property rights and lower expropriation risk Though there are differences in opinion on the impact of the shift to democracy, the anecdotal and data evidence leans more in favor of positive welfare impacts. The issue however is whether or not the shift to democracy improved the welfare of interest groups in Nigeria equally. In addition, I investigate whether or not winners and losers emerge in post democratic Nigeria.

3. Data and Descriptive Evidence

3.1. A Little about the Data

This study makes use of cross-sectional data from the General Household Survey (GHS) of Nigeria. The GHS is one of the major sample surveys carried out by the federal office of statistics (FOS). For more on this dataset, see Uwaifo (2006). The survey sample was drawn randomly from all the 36 states in Nigeria including the federal capital territory. I make use of data from 1997/1998, 1998/1999, 1999/2000 and 2005 for answering both questions. The data contains information on 32,024 households in 1997/98 with 131,477 observations, 24,889 households in 1998/99 with 106,325 observations and 34,105 households in 1999/2000 with 149,411 observations, 28,268 households in 2005 with 97,689 observations. To ensure that the monetary data are comparable over time, current monetary values had to be deflated to base year prices.[7]

3.2. Evidence of General Welfare Improvements Post Democracy

As mentioned above, there is macroeconomic evidence of improvements in Nigeria post democracy. In this section, I provide evidence of these general improvements post democ-

[7] The base year is 1985.

Table 1. Summary Statistics

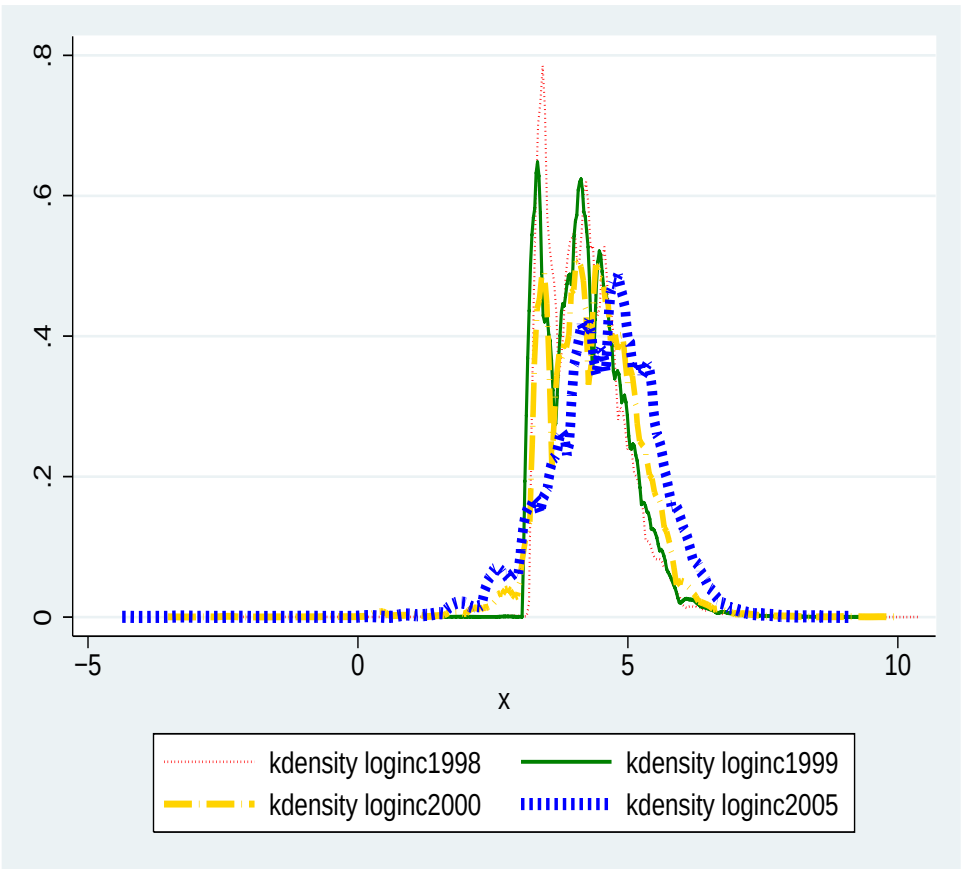
	Pre Democracy (σ)	Post Democracy (σ)
Observations	237802	246800
Age	23.41	23.00
	(18.12)	(18.38)
Sex	0.52	0.51
(male=1)	(0.5)	(0.5)
Sector	0.24	0.22
(urban=1)	(0.42)	(0.42)
Years sch	4.19	4.56
	(5.13)	(5.38)
HH size	6.23	6.92
	(3.48)	(4.26)
Income	93.14	123.52
	(246.68)	(267.35)
Married	37.85%	35.91%

racy using microeconomic data. First in table one, I present summary statistics of key demographic and economic variables pre and post democracy. I combine the two datasets pre democracy (1997/98 & 1998/99) and do the same for the datasets post democracy (2000 & 2005). It is important to present these averages for several reasons. Most importantly, we need the population surveyed before democracy to be no significantly different from the population surveyed post democracy. This is one of the necessary conditions to attribute changes over the two time periods to post democratic reform. Other arguments as to why this pre and post comparison for the Nigerian case is valid and does not capture simple time trend effects are expounded in Uwaifo (2007) and Uwaifo (2008). Otherwise, the changes could be as a result of changes in population structure or population sample.

These papers also provide arguments why the changes in welfare are not driven by the oil boom post 2003.

The pre and post estimates of the demographic variables in Table 1 confirm that the population structure did not change significantly. In addition, estimates of mean real income pre and post democracy provide microeconomic evidence of positive income change post democracy. To be precise, there was about a 28% increase in real mean income post democracy. This is a substantial change but is not entirely unexpected given the rapid changes in post democratic Nigeria highlighted earlier. To capture the evolution of the change in income across the population over the four year period, I graph the distribution of income using a kernel density function for the four years of data used in the analysis (1998, 1999, 2000 and 2005).[8] From Figure two, the rightward shift in income distribution post democracy (2000 and 2005) is apparent. This result supports other findings pointing to general

[8]Log income is used in the kernel density graphing.



Note: 1998 and 1999 are pre democracy and 2000 and 2005 are post democracy.

Figure 2. Kernel Density of Log Income Pre and Post Democracy.

welfare improvement in Nigeria as a whole post democracy.

4. Empirical Analysis-Measures of Welfare

There are several ways the welfare of individuals can be characterized. In this paper, the economic wellbeing of individuals before and after democracy is measured in five ways. These five measures of economic wellbeing or welfare and how they are estimated are highlighted below.

4.1. Change in Mean Income

One way of measuring wellbeing is by looking at individual's mean income. Real mean income is computed for all the subgroups considered both before and after democracy, using 1985 as the base year. I am not interested in mean income per se for the groups being compared. Also, the initial disparity in income across the interest groups is not the focus. The

point of interest here is if the interest groups being compared have benefitted equally from democracy in terms of income changes. To answer this question, the percentage change in mean income of each interest group is computed (see equation 1 and 2 below). Along with the percentage change, I also calculate the simple difference.

$$\bar{x_{jt}} = \frac{1}{N_{jt}} \sum_i x_{ijt} \tag{1}$$

Here j is a subgroup of interest for example women or rural dwellers. t is the time period pre democracy or post democracy [t=1 pre democracy and t=2 post democracy]. N is the total number of subgroups considered. While $\bar{x_{jt}}$ is the mean income of group j at time t.

$$\Delta \bar{x_j} = [\frac{\bar{x_{j2}} - \bar{x_{j1}}}{(\bar{x_{j2}} + \bar{x_{j1}})/2}] \times 100 \tag{2}$$

If $\Delta \bar{x_d} > \Delta \bar{x_z}$ where d and z represent subgroups being compared, then subgroup d benefitted more or suffered less (if outcome is negative) from changes post democratic reform.

4.2. Measures of Poverty

Poverty is defined and measured in many different ways. However, underlining most definitions and measures of poverty is a threshold of income, or other measures of wellbeing below which individuals are labeled as poor. For this analysis, the poverty line is equivalent to about a dollar a day. The measures of poverty considered are from the Fooster-Greer-Thorbecke (FGT) Index (Fooster-Greer-Thorbecke) commonly called the P_α class of poverty measures (see equation 3 below). I estimate P_0 and P_2 for all subgroups of the population considered, at the two time periods. P_0 is also known as the head count ratio while P_2 captures the severity of poverty. P_2 is used as a standard poverty measure by the World Bank. It is sensitive to distribution among the poor and satisfies standard criteria of a good poverty measure. Usually, poverty measures are estimated using household expenditure. Unfortunately, the GHS data set has information on income but not expenditure. Hence, I calculate these measures using household income. I do not envisage significant issues with using income instead of expenditure because of the strong correlation between expenditure and income in Nigeria. For example, an over 90% correlation was noted between income and expenditure using data from the National Consumer Survey of Nigeria in 1990 & 1996.

$$P_{\alpha jt} = \frac{1}{N_{jt}} \sum_{i=1}^{H} (\frac{Y_p - Y_i}{Y_p})^\alpha \tag{3}$$

Here α is 0 or 2. H is the head count. Y_p is the poverty line. j is the subgroup being considered, Y is income and t is the time dispensation (pre or post democracy).

As above, we calculate the change in these poverty measures over these two time periods for each subgroup.

$$\Delta P_{\alpha j} = [\frac{P_{\alpha j2} - P_{\alpha j1}}{(P_{\alpha j1} + P_{\alpha j2})/2}] \times 100 \tag{4}$$

Similar to the analysis for mean income above, if the change in a poverty measure for a group is greater than the comparison group, this group is said to have benefitted more (or suffered less) post democracy in Nigeria.[9]

4.3. Inequality

Inequality can be measured in several ways. Some of the most commonly used measures include the Gini coefficient Gini (1912), the decile ratio, the Atkinson index [Atkinson (1970); and Theil's entropy [Theil (1967)]. In this analysis, I calculate income inequality within subgroups of interest using the Gini coefficient. The Gini is calculated by taking difference between all pairs of incomes and then totalling the absolute differences. This total absolute difference is then normalized by dividing by population (squared) and average income (see equation 5). For this analysis, the bootstrapped statistics of the Gini measure is calculated.

$$G_{jt} = \frac{1}{2N_{jt}^2\mu}\sum_{i=1}^{m}\sum_{k=1}^{m} n_i n_k |y_{ijt} - y_{kjt}|. \tag{5}$$

.

$\mu = \bar{x_{jt}}$ is the mean income for a group at time t. Similar to the mean and poverty measures above, I calculate the change in inequality (see equation 6).

$$\Delta G_j = [\frac{G_{j2} - G_{j1}}{(G_{j1} + G_{j2})/2}] \times 100 \tag{6}$$

In the case of the ΔG_j, if $\Delta G_j > 0$ then inequality has increased for the group and if $\Delta G_j < 0$ inequality has decreased for the group. $\Delta G_j < 0$ is a positive outcome that reflects a reduction in inequality. In contrast, if $\Delta G_j > 0$ for all j being compared, the smaller the ΔG_j the better the outcome with respect to changes in inequality.[10]

4.4. Probability of Employment

The next measure of welfare considered is the probability of employment. The probability of employment is computed for each of the groups of interest before and after democracy (see equation seven). First, the probability of being unemployed or not working $Pr(Uemp)$ is calculated. This ratio is conditional on not being in school, not keeping the home and not being involved in voluntary work.

$$Pr[Emp_{jt} = 1] = [1 - Pr(Emp_{jt} = 0)|v] \tag{7}$$

Where Emp means employed and v is individual not in school, not a home keeper or involved in voluntary work.

The change in probability of employment for each subgroup between the two regimes is also calculated as in equation 8. If $\Delta Pr(Emp_{jt} = 1) > 0$, then the probability of being unemployed has fallen post democracy. If three groups a, b and c in the population are being compared, if $\Delta Pr(Emp_{ct} = 1) > \Delta Pr(Emp_{bt} = 1) > \Delta Pr(Emp_{at} = 1)$. Then group c has experienced the largest positive change in employment probability.

[9] This is dependent on if the change is positive or negative.

[10] Here I assume inequality is a "bad" society wants less of.

$$\Delta Pr(Emp_{jt}=1) = [\frac{Pr(Emp_{j2}=1) - Pr(Emp_{j1}=1)}{(Pr(Emp_{j1}=1) + Pr(Emp_{j2}=1))/2}] \times 100 \quad (8)$$

4.5. Returns to Education

To estimate the returns to education for groups considered, two functional forms of the wage equation are used. First, the average returns to education (ARTE) are estimated using ordinary least squares (OLS) on a simple Mincer type earnings function (equation 9) for each time period and for different groups (Mincer, 1974). The groups considered are region (northeast (NE), southeast (SE), southwest (SW), south-south (SS), northwest (NW) and mid-belt (MB)), sector(urban vs rural) and cohort of birth.

$$log(y_{ijt}) = \alpha_{jt} + \beta_{jt}S_{ijt} + \phi_{jt}X_{ijt} + \kappa_{jt}X_{ijt}^2 + \rho_{jt}D_{ijt} + \epsilon_{ijt} \quad (9)$$

Here X_{ijt} is age of individual i in group j at time t , S_{ijt} is years of schooling of individual i in group j at time t and D_{ijt} are all other possible exogenous/control variables including dummies for individual i in group j at time t and y_{ijt} is income of individual i in group j at time t .

The returns to education are also estimated at each level of education using another form of the Mincer equation (see equation 10). With this functional form, the returns to an extra year of schooling for primary, secondary and tertiary education can be estimated. I estimate this regression for each group of interest, at each time period.

$$log(Y) = \alpha_2 + \gamma X + \delta X^2 + \varrho yrpri + \varphi yrsec + \varsigma yruniv + \lambda_2 Z + \epsilon_2 \quad (10)$$

where Y is a vector of incomes, X is a vector of age, Z is the matrix of all relevant control variables and year dummies, yrpri is years of primary education, yrsec is years of secondary education and yruniv is years of tertiary education.

It is important to mention that the returns to schooling estimate ($\beta, \varrho, \varphi, \varsigma$) in equation 9 and 10 estimated using OLS, potentially suffer from endogeniety and omitted variable bias. Typically to deal with this problem, the return to schooling is re-estimated using instrumental variables in a two stage least squares framework. In Uwaifo (2006), the ARTE in Nigeria pre and post democracy are estimated using the IV approach. She notes no significant difference in estimates using the IV and the OLS methods. The inference from this result is that OLS estimates of ARTE, in the Nigerian case are consistent. Based on this finding, I assume that OLS estimates of ARTE for subgroups in Nigeria are likewise also consistent. There is a slight possibility however that this assumption might be invalid. However, given that the interest in this analysis is comparison across groups with respect to change in economic indicators, inference can still be valid even if bias in OLS estimates exist. For inference to be valid in the mist of potential bias in OLS estimates, bias must not be significantly different for comparison groups. For example, the bias in the OLS estimate of ARTE for the rural sector should be equal to the bias in the OLS estimates for the urban sector.[11]

[11]The assumption of equal bias is not farfetched. If we believe that ability is the omitted variable in the regression analysis leading to potential bias in the OLS estimates, we do not expect the distribution of ability to differ across groups being compared.

For the estimation of returns to education at the different levels of education, Uwaifo (2006) does not show if OLS estimates of return to education at each level of education are biased or not.[12] The OLS estimates at the different levels of education may not be biased given the lack of bias in estimates of ARTE for Nigeria. However, the possibility of biased estimates cannot be ruled out given that ability affects level of education attainment and is not controlled for in this analysis. Despite this constraint, given our interest is the comparison among education levels in changes in returns, the inferences are valid whether or not estimates are biased if bias is not time variant.[13]

Like with the other measures of welfare highlighted earlier, the change in ARTE over time for each group excluding the education categories is calculated (see equation 11). The change in the returns to each level of education is also calculated using equation 12-14. Positive changes in ARTE imply improvements in returns to education post democracy. However, the magnitudes of these changes are more important in the comparisons across groups.

$$\Delta\beta_j = [\frac{\beta_{j2} - \beta_{j1}}{\beta_{j1} + \beta_{j2}/2}] \times 100 \tag{11}$$

$$\Delta\varrho = [\frac{\varrho_2 - \varrho_1}{(\varrho_1 + \varrho_2)/2}] \times 100 \tag{12}$$

$$\Delta\varphi = [\frac{\varphi_2 - \varphi_1}{(\varphi_1 + \varphi_2)/2}] \times 100 \tag{13}$$

$$\Delta\varsigma = [\frac{\varsigma_2 - \varsigma_1}{(\varsigma_1 + \varsigma_2)/2}] \times 100 \tag{14}$$

5. Results

5.1. Change in Mean Income

Table two and three present the results for the mean real income pre and post democracy. As expected, those in urban area earn more than the rural sector and this trend continued post democracy. Unfortunately, the gap is on the rise. This results for the urban and rural comparison is worrisome and may imply that policy attempts to reduce sector gaps, in income by the democratic government, are ineffective. The rural to urban income gap increased post democracy by about 25 real Naira. With respect to regional comparisons, the results are mixed. The income gap between some regions reduced while the gap increased between some other regions. For example, the gap between the NE and the SW, SS, SE and MB decreased. However, the income gap between the NE and the NC increased post democracy. Though all regions showed significant increase in income post democracy($> 20\%$), the big winners are the NE and SW.[14] With respect to level of education, there is

[12] She is not able to use the IV approach for the estimation across levels because she has only one instrument and would not be able to satisfy exclusion restriction given the existence of three potentially endogenous variables.

[13] There is no reason to believe that a bias in the estimate of the returns to a particular level of education, if it exists, will change over time.

[14] Interestingly, the first president post democracy is from the SW and his vice president is from the NE.

marked disparities in benefits from reforms. The income gap across levels of education increased substantially. The big winners are those with tertiary education who saw an over 50% increase in their income on average.

Table 2. Mean Income Pre and Post Democracy

Interest Group	Pre Democracy (S.D)	Post democracy (S.D)	Δ	%Δ
		Sector		
Urban	112.98	163.23	50.25	36.4%
	(155.07)	(200.8)		
Rural	85.24	110.27	25.03	25.60%
	(274.4)	(284.91)		
		Region		
North East	84.23	126.13	41.87	39.8%
	(403.16)	(352.82)		
North Central	80.65	104.52	23.87	25.8%
	(201.41)	(152.6)		
Mid Belt	96.92	121.99	25.07	22%
	(188.23)	(289.02)		
South East	97.88	122.0	24.12	21.9%
	(133.4)	(250.72)		
South West	97.04	131.90	34.86	30.45%
	(96.22)	(175.89)		
South South	101.45	131.55	30.1	25.8%
	(336.95)	(313.86)		

*__Note:__ computed income is real mean income with a 1985 base year.

Individuals with secondary education also experienced significant increases in income post democracy. However, the average income gap between those with tertiary education and those without increased by over 75 real naira. Similar dynamics are noted when birth cohorts are compared. The income gap between some cohorts increased (1931-1940 vs 1941-1950) and the income gap between some cohorts decreased (1961-1970 vs other older cohorts). Some of the differences across cohorts are expected given general earning profiles over the life time of an individual and the school to work transition for the younger cohorts. For example, we do not expect to see substantial changes in income for those born before 1930 because many of them have retired and post democracy, even more would have retired. Hence, that a positive increase in income is noted for the oldest cohort, points to the wide spread nature of income increases across groups post democracy in Nigeria.

It is important to note that mean income rose for all subgroups of the population considered. Which shows that in terms of income on average, no important group is doing worse post democracy. However, it is clear that there is substantial disparity across groups in how mean income changed.

Table 3. Mean Income Pre and Post Democracy

Interest Group	Pre Democracy (S.D)	Post democracy (S.D)	Δ	$\%\Delta$
	Education Level			
No Schooling	78.1	93.70	15.6	18.16 %
	(255.10)	(232.38)		
Incomplete primary	103.81	106.77	2.96	2.82%
	(584.49)	(191.31)		
Primary	95.93	119.19	23.26	21.62%
	(143.24)	(270.51)		
Secondary	115.32	156.61	41.29	30.37%
	(135.77)	(277.11)		
Tertiary	165.3	282.45	117.15	52.33%
	(205.39)	(409.32)		
	Age Cohort			
$<$ 1931	93.42	101.51	8.09	8.3%
	(175.29)	(119.26)		
1931-1940	97.5	122.31	24.81	22.6%
	(301.2)	(331.38)		
1941-1950	103.42	135.52	32.1	26.9%
	(426.05)	(271.24)		
1951-1960	95.91	138.54	42.63	36.4%
	(170.3)	(290.67)		
1961-1970	89.14	130.65	41.51	37.8%
	(158.65)	(284.27)		
1971-1980	76.2	106.62	30.42	33.3%
	(117.35)	(218.26)		
$>$ 1980	50.79	52.72	1.93	3.7%
	(47.02)	(91.75)		

***Note:** computed income is real mean income with a 1985 base year.

5.2. Poverty Analysis Results

Table four and five highlight the estimated poverty indices across groups and the change over the two periods considered. The results in this table are similar for some group comparisons but different for others. First, the number of people under the poverty line decreased generally for all groups (in most cases over 10% decrease in head count ratio). Also, the severity of poverty measured by P_2 decreased for all groups considered. However, disparities in changes to poverty indices exist across groups. Take for example sector, poverty decreased substantially more in the urban than the rural areas. Hence, the gap in poverty between the rural and urban areas has increased significantly post reform despite general decrease in poverty in both sectors.

The results of the region comparisons are also interesting given the results on mean income previously highlighted. The drop in the head count ratio in the SW is substantially larger than for other regions. The NE, that experienced the greatest rise in mean income, ranked 4th in terms of reduction in head count but ranked highest in reduction in the severity

Table 4. Poverty Measures Pre and Post Democracy

	Head Count Ratio (P_0)				**Poverty Severity** (P_2)			
Interest Group	Pre Dem (S.E)	Post Dem (S.E)	Δ	% $\triangle$	Pre D. (S.E)	Post D. (S.E)	Δ	% $\triangle$
				Sector				
Urban	0.620	0.470	-0.15	-27.52	0.19	0.14	-0.06	-30.30
	(0.002)	(0.002)			(0.001)	(0.001)		
Rural	0.840	0.740	-0.1	-12.66	0.34	0.28	-0.05	-19.35
	(0.001)	(0.001)			(0.001)	(0.001)		
				Region				
NE	0.900	0.770	-0.13	-15.57	0.41	0.31	-0.05	-27.78
	(0.001)	(0.003)			(0.001)	(0.001)		
NC	0.910	0.810	-0.1	-11.63	0.42	0.34	-0.08	-21.05
	(0.001)	(0.004)			(0.001)	(0.002)		
MB	0.810	0.710	-0.1	-13.16	0.29	0.25	-0.04	-14.81
	(0.001)	(0.003)			(0.001)	(0.001)		
SE	0.700	0.580	-0.12	-18.75	0.23	0.18	-0.05	-24.39
	(0.002)	(0.003)			(0.002)	(0.001)		
SW	0.550	0.420	-0.13	-26.80	0.12	0.11	-0.01	-8.70
	(0.003)	(0.002)			(0.002)	(0.001)		
SS	0.710	0.600	-0.11	-16.79	0.22	0.19	-0.03	-14.63
	(0.003)	(0.003)			(0.001)	(0.001)		

Note: Poverty is calculated using income and not expenditure.

of poverty. This result might point to disparate benefits from democracy within this region or highlight the severity of poverty in this region prior to democracy. Implying that people in this region were so poor prior to democracy that though income increased significantly, many are still under the poverty line.[15] With respect to education levels, the results are similar to that of mean income. Poverty has drastically reduced for those with tertiary education which is likely driven by the rapid increase in income. The significant improvement in the welfare of those with tertiary education comes as no surprise given the choice of policies and reforms post democracy, which have direct impact on those with higher education. Across the cohorts, the highest decline in the head count ratio was among those in the 1971-1980 birth cohort. This change might be due to the fact that many in this cohort are just entering the job market at this time while prior to democracy, part of this cohort were still in school. Hence it is hard to differentiate for this cohort the effect of reform from the normal school to work earning transition.

[15] In the results on within group inequality, this issue is revisited.

Table 5. Poverty Measures Pre and Post Democracy

	Head Count Ratio (P_0)				**Poverty Severity** (P_2)			
Interest Group	Pre Dem (S.E)	Post Dem (S.E)	Δ	% $\triangle$	Pre D. (S.E)	Post D. (S.E)	Δ	% $\triangle$
			Education Level					
No Sch.	0.860	0.770	-0.09	-11.04	0.36	0.30	0.06	-18.18
	(0.001)	(0.001)			(0.001)	(0.001)		
1-5yrs.	0.800	0.690	-0.11	-14.77	0.29	0.26	-0.03	-10.91
	(0.002)	(0.002)			(0.001)	(0.001)		
Primary	0.710	0.600	-0.11	-16.79	0.23	0.19	-0.04	-19.05
	(0.002)	(0.002)			(0.001)	(0.001)		
Sec.	0.540	0.430	-0.11	-22.68	0.15	0.13	-0.02	-14.29
	(0.003)	(0.003)			(0.002)	(0.001)		
Tertiary	0.440	0.310	-0.13	-34.67	0.15	0.11	0.04	-30.77
	(0.007)	(0.005)			(0.003)	(0.001)		
			Cohort					
<1931	0.730	0.670	-0.06	-8.57	0.3	0.27	-0.03	-10.53
	(0.006)	(0.010)			(0.005)	(0.005)		
1931-1940	0.710	0.620	-0.09	-13.53	0.24	0.22	-0.02	-8.70
	(0.004)	(0.007)			(0.003)	(0.004)		
1941-1950	0.730	0.620	-0.11	-16.30	0.25	0.21	-0.04	-17.39
	(0.003)	(0.005)			(0.002)	(0.002)		
1951-1960	0.750	0.630	-0.12	-17.39	0.27	0.22	-0.05	-20.41
	(0.002)	(0.004)			(0.002)	(0.002)		
1961-1970	0.720	0.620	-0.1	-14.93	0.26	0.23	-0.03	-12.24
	(0.002)	(0.004)			(0.001)	(0.002)		
1971-1980	0.750	0.610	-0.14	-20.59	0.28	0.22	-0.06	-24.00
	(0.002)	(0.003)			(0.001)	(0.002)		
>1980	0.850	0.720	-0.13	-16.56	0.34	0.26	-0.08	-26.67
	(0.001)	(0.002)			(0.001)	(0.001)		

Note: Poverty is calculated using income and not expenditure.

5.3. Results from Inequality Estimation

The estimation of inequality within subgroups and the change in this inequality yields interesting results (see Table 6). One of the surprising results is the marked increase in inequality within each group post democracy. The increase in inequality as reflected in the positive change of the Gini coefficient is not an isolated change for one subgroup but is consistent over all the subgroups of the population considered. In this case, there are no winners with respect to reducing within group inequality post democracy. However it is possible to differentiate the size of the increase across groups. For instance inequality in income in the rural areas increased faster than in the urban areas (about 10 percentage point more). This result may suggest that programs implemented post democracy, to improve welfare of poor rural dwellers, had selective or no impact.

With respect to regional comparisons, the increase in inequality within each region is similar [range between 11-16%]. The Northern regions continued to have higher inequality

than the Southern regions. However, the NE and NC regions experienced lower increases in inequality. Turning our attention to education levels, the results show that inequality increased least among those with tertiary education.[16] This finding may seem surprising given the massive increase in income post democracy for this group and the possible effects of the minimum wage reform. However, given the fact that labor market opportunities increased for this level of education substantially, and those with tertiary education are the main beneficiaries of many labor market reforms post democracy, the result are explainable. With respect to birth cohorts, the results show substantial differences in the magnitude of increase in inequality across cohorts. Older cohorts experienced smaller changes in inequality than the younger birth cohorts.

Table 6. Gini Coefficient Pre and Post Democracy

Interest Group	Pre Democracy	Post democracy	Δ	$\%\Delta$
	Sector			
Urban	0.42	0.45	0.03	6.90
Rural	0.44	0.52	0.08	16.67
	Region			
North East	0.49	0.55	0.06	11.54
North Central	0.45	0.51	0.06	12.50
Mid Belt	0.45	0.53	0.08	16.33
South East	0.42	0.49	0.07	15.38
South West	0.40	0.47	0.07	16.09
South South	0.43	0.49	0.06	13.04
	Education Level			
No Schooling	0.44	0.50	0.06	12.77
Incomplete primary	0.49	0.49	0	0.00
Primary	0.41	0.47	0.06	13.64
Secondary	0.40	0.44	0.04	9.52
Tertiary	0.41	0.42	0.01	2.41
	Age Cohort			
<1931	0.45	0.47	0.02	4.35
1931-1940	0.46	0.51	0.05	10.31
1941-1950	0.47	0.50	0.03	6.19
1951-1960	0.44	0.49	0.05	10.75
1961-1970	0.42	0.49	0.07	15.38
1971-1980	0.42	0.50	0.08	17.39
>1980	0.36	0.66	0.30	58.82

Note: Inequality is calculated using income and not expenditure.

[16]Those with incomplete education are the only group that did not experience an increase in inequality.

5.4. Results on Changes in Employment

Table 7 captures the probability of employment pre and post democracy and the change in the probability. The general finding from this table is consistent with some of the post democratic reforms. Employment increased for most groups in the population. However, the concern here is the difference in change across comparison groups in the population. For example, the probability of employment conditional on not being a home maker, in school or involved in volunteer work, (probability of paid employment) increased for women post democracy while for men there was no change. This result may point to the effectiveness of female empowerment programs post democracy. Post democracy, the gap in the probability of employment for men and women deceased by 5 percentage point. As expected the probability of employment in the rural areas is higher than the urban areas. [17]

Table 7. Probability of Employment Pre and Post Democracy

Interest Group	Pre Democracy	Post democracy	Δ	$\%\Delta$
	Sector			
Urban	0.89	0.90	0.01	1.12
Rural	0.92	0.94	0.02	2.15
	Region			
North East	0.92	0.96	0.04	4.26
North Central	0.92	0.96	0.04	4.26
Mid Belt	0.90	0.95	0.05	5.41
South East	0.91	0.91	0	0.00
South West	0.93	0.92	-0.01	-1.08
South South	0.89	0.87	-0.02	-2.27
	Education Level			
No Schooling	0.92	0.93	0.01	1.08
Incomplete primary	0.90	0.95	0.05	5.41
Primary	0.90	0.96	0.06	6.45
Secondary	0.87	0.88	0.01	1.14
Tertiary	0.91	0.91	0	0.00
	Age Cohort			
$<$ 1931	0.76	0.70	-0.06	-8.22
1931-1940	0.94	0.90	-0.04	-4.35
1941-1950	0.98	0.98	0	0.00
1951-1960	0.98	0.99	0.01	1.02
1961-1970	0.95	0.99	0.04	4.12
1971-1980	0.80	0.92	0.12	13.95
$>$ 1980	0.63	0.79	0.16	22.54

[17] Higher levels of employment is usually noted in rural areas given the agricultural nature of the sector. The challenge however is underemployment.

Table 7 shows that despite the increase in employment in the urban areas, the gap in employment between the two sectors increased post democracy. A surprising result is the difference across regions in the changes post democracy in employment. All the northern regions of Nigeria experienced a boost in employment probability. In contrast, the southern regions experienced no change (SE) or negative changes. No easy explanations comes to mind for why these differences. Hence, there is need for further investigation. The results when comparing probability of employment across education levels is also interesting. Despite the findings that those with tertiary education had benefitted more than other levels from reforms post democracy, probability of employment for this group remained the same. Surprisingly, those at primary levels of education experienced the greatest increase in employability post reforms. Prior to democracy, the probability of employment was higher for those with tertiary education than those with primary education. However, the substantial increase in employability for individuals with primary school level attainment post democracy has led to higher probability of employment for this group than the tertiary educated. The change in employability for the different cohorts is more difficult to interpret. This is because changes in employability are a result of both the reforms and normal life cycle transition to work, and out of work for different birth cohorts.

5.5. Results for Estimating Returns to Education

The returns to education estimates for each subgroup is presented in Table 8 and 9. Recall as earlier mentioned that the point estimates of ARTE may be biased if our earlier stated assumptions do not hold. Based on the types of reforms that took place post democracy, high returns to education is hypothesized. The results in table 8 and 9 first point to the substantial positive changes in ARTE across groups post democracy. The result for the sector comparison is surprising but positive. The ARTE rose more in the rural than the urban areas. Hence, the returns to education gap between the sectors reduced post democracy. For the regional comparisons, the ARTE gap between regions decreased. Meaning there is less variance in the ARTE among regions post democratic reform. The South-South region and the Northeast experienced the largest jump in returns post democracy overtaking regions like the Southeast and Southwest. For the comparison across cohorts, cohorts born after 1940 experienced similar increases in ARTE. Another interesting observation from the cohort break down is the positive relationship between ARTE and birth cohort for those born after 1940 (the older the cohort the higher the ARTE). It appears that ARTE varies over the life cycle and this trend is captured in the varying returns to different birth cohorts at a given period in time.

The results with respect to returns at different levels of education is consistent with inference from other measures. Prior to democracy, ARTE were low at all levels but post democracy, the returns to education for those with higher education is relatively high. The gap in ARTE has also increased between those with tertiary education and those with lower levels of education. With a greater increase in the gap between those who are tertiary educated and those who have secondary education. A 5% point increase in returns to education for those with tertiary education is substantial given that returns to education only rose by 1.2% points for the other levels of education. The target recipients of some key reforms (both labor market and other reforms) post democracy are the well educated (those with

Table 8. Return to schooling Pre and Post Democracy

Interest Group	Pre Democracy (S.D)	Post democracy (S.D)	Δ	$\%\Delta$
	Sector			
Urban	0.036	0.050	0.014	32.56
	(0.001)	(0.001)		
Rural	0.026	0.043	0.017	49.28
	(0.001)	(0.001)		
	Region			
North East	0.027	0.049	0.022	57.89
	(0.002)	(0.002)		
North Central	0.030	0.043	0.013	35.62
	(0.001)	(0.002)		
Mid Belt	0.024	0.038	0.014	45.16
	(0.040)	(0.001)		
South East	0.037	0.046	0.09	21.69
	(0.001)	(0.002)		
South West	0.034	0.044	0.01	25.64
	(0.001)	(0.001)		
South South	0.028	0.048	0.020	52.63
	(0.001)	(0.002)		

tertiary education). Hence, the preceding result is not entirely surprising. Nevertheless, it is fascinating to know that reforms can lead to returns to education increases. [18]

6. Conclusion

In this chapter, several welfare and labor market outcome indicators are estimated pre and pro democracy with the goal of answering two questions. First are there substantial differences in the economic impact of democratic reform across subgroups? Second are there winners and losers post democratic reform in Nigeria in terms of the economic/ labor market outcomes considered.

With respect to the first question, the answer is yes. This conclusion is based on comparing the percentage change in returns to education post democracy across groups for statistic and economic significance. Some of these results have been highlighted in the previous sections. Three important examples of these disparities in the impact of reforms are highlighted below. First, the differential impact on mean income across education levels (over 20% point difference in impact comparing those with tertiary education and other levels). [19]

[18] In Uwaifo(2006), the author shows why changes in return to education can be attributed to reforms post democracy.

[19] By impact, I am referring to the change in a measure over the two time periods. Making the assumption

Table 9. Returns to Schooling Pre and Post Democracy

Interest Group	Pre Democracy (s.e)	Post democracy (s.e)	Δ	$\%\Delta$
	Education Level			
Primary	0.020	0.032	0.012	46.15
	(0.001)	(0.001)		
Secondary	0.036	0.048	0.012	28.57
	(0.001)	(0.001)		
Tertiary	0.062	0.112	0.050	57.47
	(0.003)	(0.004)		
	Cohort			
<1931	0.034	0.043	0.09	23.38
	(0.004)	(0.004)		
1931-1940	0.034	0.039	0.005	13.70
	(0.002)	(0.003)		
1941-1950	0.033	0.051	0.018	42.86
	(0.001)	(0.002)		
1951-1960	0.031	0.048	0.017	43.04
	(0.001)	(0.001)		
1961-1970	0.027	0.046	0.019	52.05
	(0.001)	(0.001)		
1971-1980	0.023	0.036	0.013	44.07
	(0.020)	(0.001)		
>1980	NA	0.024	NA	
		(0.001)		

*NA-Not applicable.

Second, the differential impact of democracy on returns to education across regions and levels of education (percentage change in returns to education differed by over 20% point between some regions and also between some levels of education). Lastly, the differential impact of democracy on poverty reduction across levels of education (over 15% point difference in impact comparing tertiary to other levels of education).

With regards to the second question, the answer depends on how we define a winner or a loser. If a loser is defined as a negative impact post democracy and a winner a positive outcome, then for most measures of welfare, there are no losers post democracy in Nigeria. The exceptions are as follows. First, the probability of employment in the South-South and South West decreased post democracy. Second, the probability of employment decreased for the two oldest cohorts post democracy. This result is less worrisome than the first because of the birth cohorts for which this negative change is noted. Individuals in these cohorts may simply just be retiring. The more important negative outcome post democracy is the rise in inequality across all groups considered. Inequality in income increased

based on Uwaifo ((2007) that the change is driven mostly by democratization and action taken post democracy.

differently across groups but increased for all groups considered. Increases in inequality post democratization is not unexpected. There are both theoretical arguments and empirical evidence that point to a relationship between democracy and inequality (see Lenski (1966), Justman and Gradstein, (1999), Simpson (1990), Gradstein and Milanovic (2004)). However, this increase in inequality post democracy is an important result that needs to be highlighted.

Table 10. Tabulating Winners and Losers

Interest Group	Winner	Loser
	Sector	
Mean Income	Urban	Rural
Head count ratio of Poverty	Urban	Rural
Severity of poverty [P_2]	Urban	Rural
Gini Coefficient	Urban	Rural
Probability of Employment	Rural	Urban
Returns to Education	Rural	Urban
	Region	
Mean Income	NE	SE
Head count ratio of Poverty	SW	NC
Severity of poverty [P_2]	NE	SW
Gini Coefficient	NE	MB
Probability of Employment	MB	SS
Returns to Education	NE	SE
	Education Level	
Mean Income	Tertiary	Incomplete primary
Head count ratio of Poverty	Tertiary	No Schooling
Severity of poverty [P_2]	Tertiary	Incomplete primary
Gini Coefficient	Incomplete primary	Primary
Probability of Employment	Primary	Incomplete primary
Returns to Education	Tertiary	Primary
	Age Cohort	
Mean Income	1961-1970	> 1980
Head count ratio of Poverty	1971-80	< 1930
Severity of poverty [P_2]	> 1980	1931-40
Gini Coefficient	< 1930	> 1980
Probability of Employment	> 1980	< 1931
Returns to Education	1961-70	1931-40

Defining winners and losers post democracy differently from above, leads to other conclusion. For example, a winner when comparing subgroups can be defined as one who experiences the statistically significant greatest or greater positive change in measurable outcome post democracy. While the loser is one who experiences the statistically signif-

icant lowest or lower change in measurable outcome post democracy. See Table 10 for a summary of winners and losers based on this definition/criteria.

Using these definitions of winner and losers, Table 10 highlights different winners and losers post democracy in Nigeria depending on the economic indicator. For changes in mean income, the winners are men, urban dwellers, the Northeast, tertiary educated and the 1961-70 birth cohort. In terms of losers, rural dwellers, Southeast, incomplete primary educated, and the oldest birth cohort. In contrast, for changes in returns to education, the big winners are rural, Northeast, tertiary educated and the 1961-1970 birth cohort. Given these differences depending on the measure used, stating general winners or losers post democracy in Nigeria is difficult. However, tertiary educated individuals and the Northeast region are the two groups that are winners consistently over most indicators. In summary, reforms post democracy led to differential welfare impacts for subgroups of the population. Despite these disparities in benefits, the good news is that welfare as measured by income, ARTE, employment and poverty reduction improved for most subgroups of the population considered.

The results above provide significant evidence that the big winners post democracy in Nigeria are those with tertiary education and those from the Northeast. The result for the tertiary educated as mentioned above is explainable given the focus of the reforms. The result for the Northeast however needs further investigation. The vice president during the 1999-2007 presidency and some key government officials come form the Northeast of Nigeria. Biased transfers to this region from those in power might explain this trend but this conclusion is speculative.

Based on the findings in this chapter, Nigeria's government needs to target specific groups of the population in an attempt to reduce the gap in welfare benefits of democracy which may keep growing over time if unchecked. This is important because civil unrest is an impediment to growth and is positively related to growing disparities within a population. In addition, growing disparity in income among those in the rural sector needs to be investigated. Finally, though tertiary educated individuals are without doubt the big winners post democracy in Nigeria, the probability of employment has not changed. There is still a 9% probability of being unemployed with higher education in Nigeria which is significant. This relatively high probability of being unemployed with tertiary education needs further investigation.

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Chapter 16

THE EFFECT OF DEMOCRATIZATION ON GROWTH OF DEVELOPING COUNTRIES

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Abstract

We investigate the effect of the level and continuity of democratization on growth of developing countries by estimating growth equations based on panel and cross-section data with economic and socio-economic variables. We provide three main sets of results. Firstly, we conduct panel data analysis that chiefly tries to answer whether the level of democratization has a statistically significant effect on growth for developing countries. This set of results adds to the literature on the growth and economic freedom literature as well as providing evidence for the link between political freedom and economic growth. This is complemented by a cross-section analysis that aims to answer if the set backs in the democratization process has a statistically significant effect on growth of countries. Thirdly, we also ask whether there is convergence in the level of democratization. Our finding of no convergence in democracy is troubling, however, our analysis indicates that stability of democracy might be more important than the level of democratization.

Introduction

Considering the enormous literature on growth, it is somewhat disquieting that so few arguments about growth can boast a consensus among scholars. Amidst this immense pool of evidence of growth and its determinants, democracy, has emerged as an avenue that promises the lighting of a torch on the road on the road to prosperity for developing countries since the nineties. On the one hand, democracy represents accountability and transparency of institutions which would positively affect the production process through confidence in the

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system and the protection of rights (Acemoglu and Robinson 2000, Persson and Tabellini 1992). On the other hand, China, in particular, but other Asian economies as well, have demonstrated that a developing economy plagued with poverty and unemployment may achieve spectacular growth in an authoritarian regime (Rodrik 2006) at least for a while. The collapse of the Soviet Union and the emergence of new nations that lack the democracy tradition have brought new impetus to the discussion on the democracy-growth relationship. Does the answer to why we have failed to bridge the gap between developed and developing economies lie in democracy?

The empirical evidence regarding the relationship between growth and democracy is far from decisive, however, most of this evidence is about growth between the sixties and nineties. The democracy-growth relationship has possibly taken another turn with globalization and the collapse of the Soviet Union that sparked a worldwide movement in nation-building. In this chapter, we investigate the effect of the level and continuity democratization on growth of developing countries in the globalization era which we believe is a more relevant period to study this relationship. Democracy has never been an issue debated so intensely in this century as it has been after the collapse of the Soviet Union.

We tackle the effect of democracy on growth from two perspectives. We are not only interested in the level of democracy but also in the stability of democracy. We look at annual growth as well as average long-term growth. We provide three main sets of results. Firstly, we conduct panel data analysis that chiefly tries to answer whether the level of democratization has a statistically significant effect on growth for developing countries. This set of results adds to the literature on the growth and economic freedom literature as well as providing evidence for the link between political freedom and economic growth. This is complemented by a cross-section analysis that aims to answer if the set backs in the democratization process has a statistically significant effect on growth of countries. Thirdly, we ask whether there is convergence in the level of democratization. Convergence in income levels is widely analyzed; however, we argue that convergence in the level of democratization is as important a question. The analysis will be based on a sample of developing and developed countries and will cover the period 1990 through 2006 in order to focus on the issue of globalization and the effect globalization might have had on the relationship between growth and democratization. Freedom House database of indicators of democratization will be used as measures of democratization and its stability.

Growth and Democracy

The empirical economic growth literature is vast. The starting point is usually the Solow growth model extended to include other determinants that might be of interest for economic growth. In this framework, one could cite Barro (1991, 1996), Barro and Sala-i-Martin (1995), and Mankiw, Romer and Weil (1992) as reviews of the determinants of long-term economic growth based on cross-section analysis. Evans (1993), Islam (1995) and Lee, Pesaran and Smith (1997) estimate panel growth regressions in the same framework. A large part of the empirical growth literature is loosely related to the theory of growth in the sense that variables that are suggested by growth theories are included to the extent that they can be measured or proxies can be devised, but other variables that the researcher deems relevant for growth are frequently included without any specific link to growth theory.

In this section, we estimate growth equations for developing countries with the goal of uncovering the effect of democracy on growth in the globalization era. The relationship between democracy and growth has been investigated in the literature to some extent. Easton and Walker (1997), Wu and Davis (1999), Gwartney et al. (1999), De Haan and Sturm (2000), Sturm and De Haan (2001) suggest that economic freedom stimulates economic growth. Fidrmuc (2003) finds a significant positive relationship between growth and economic liberalization for transition economies. Barro (1996) analyzes the relationship between growth and democracy for a panel of about 100 countries from 1960 to 1990 and finds that the overall effect of democracy on growth is weakly negative, controlling for beginning level of real per capita GDP. Minier (1998) finds that countries that democratize are found to grow faster than a priori similar countries, while countries that become less democratic grow more slowly than comparable countries. Minier (1998) covers the time period between 1960 and 1989 for 81 countries. Empirical relationship between democracy and growth is also studied by Tavares and Wacziarg (2001). They find that the overall effect of democracy on economic growth is moderately negative. Their results indicate that democratic institutions are responsive to the demands of the poor by expanding access to education and lowering the income inequality, but do so at the expense of physical capital accumulation. Wu and Davis (1999) investigate the relationship between Political freedom (democracy) and growth for a panel of about 100 countries from 1972 and 1992. Their main results are: given economic freedom, the rate of economic growth is independent of political freedom (democracy) and the level of income; given the level of income, political freedom (democracy) is independent of economic freedom and the growth rate. Plümper and Martin (2003) find that an increase in democracy tends to raise growth rates of per capita income. They run a growth regression with conventional independent variables including democracy for 83 countries from 1975 to 1997.

As the above discussion underlines, there is no consensus in the literature about the relationship between democracy and economic growth. The issue begs for more empirical investigation. We will add to the above literature by providing empirical evidence about the relationship between growth and the level and stability of democracy.

Most articles in the literature investigate the relationship for about 100 countries from 1960 to 1990. This work differs by the time period and the number of countries included in the analysis. The democracy-growth relationship is investigated for about 152 countries from 1990 to 2006. This period, we argue, is more relevant to study the effects of democracy since after the collapse of the former Soviet Union, democracy has been at the forefront of much academic and political discourse. We observe a dramatic increase in the number of studies published on democracy in the nineties. However, the period of analysis is over dominantly between 1960 and 1990. Our analysis is based on a larger sample than the previous body of work as we are able to capture the increase in the number of countries after the collapse of former Soviet Union

Following the empirical literature, we include, as regressors conventional determinants of economic growth such as fertility, investment to GDP ratio, trade volume as a percentage of GDP and GDP per capita. We do not include education variables as we find them to be highly correlated with fertility and our data has fewer observations on education than on fertility. Our goal is to investigate the effect of democracy on growth and we construct a democracy index for all developing countries based on the political right and civil liberties indices of Freedom House. The macroeconomic and socioeconomic variables are from the World Bank

World Development Indicators Database (WDID). Descriptive statistics are presented in Table 1 below and the sample of countries is given in Appendix 1. Please refer to Appendix 2 for correlation matrices of variables used in regressions.

Mean growth rate for all developing countries is 3.5 percent per annum. In the table, three standard deviations are reported. The overall standard deviation is decomposed into between and within components, the between standard deviation which is the standard deviation of country mean growth rates and within standard deviation is the standard deviation of growth rates from each country's mean in the sample period[1]. Note that the overall standard deviation is 6.7 percent. The within standard deviation is almost as high at 6.1 percent The standard deviation of mean growth rates between countries is 2.9 percent, less than half the overall standard deviation and the within component. The minimum average growth rate is -3.1 percent and the maximum is 20 percent. Minimum annual growth rate in the sample is negative 50 percent and the maximum is 72.5 percent. These numbers are extreme to say the least and represent outliers, the overall and within standard deviation are 6.7 and 6.1 percent. On growth, we have data on 130 countries for an average of 16.7 years and a total of 2129 observations.

The mean GDP per capita of developing countries in our sample is $2295 in 2000 US dollars with a standard deviation of $3170.The standard deviation of mean GDP per capita of developing countries is $3303. The minimum mean GDP per capita is $113 and the maximum is $22895. The minimum GDP per capita in a given period is $82 and the maximum is $26169.

Number of births per woman is used as a measure of fertility. The mean number of births per woman for developing countries in our sample is 3.33 with a standard deviation of 1.74. The standard deviation of mean number of births is slightly lower at 1.7. The highest mean number of births is 8 and the highest number of births per woman measured in the sample period is 8.2. On average we have data on fertility for developing countries for 9 years.

Mean investment to GDP ratio is 21.3 percent with a standard deviation of 8.8 percent. The standard deviation of mean investment rates is somewhat lower at 7 percent. The minimum mean investment rate is 8 percent and the maximum is 55 percent. The minimum annual investment rate reported in the sample is -24 percent and the maximum is 114 percent. We have data on GDP per capita on 127 countries, for an average of 17 years and a total of 2120 observations. We have data on investment for an average of 16 years.

The mean trade volume to GDP ratio of developing countries is 81 percent with a standard deviation of 41 percent. So developing countries are open economies. The standard deviation of mean trade to GDP ratios is 38 percent. The minimum mean trade ratio 21 percent and the maximum is 212 percent. We have data on trade to GDP ratios for an average of 16 years.

The mean democracy level for developing countries is 8.2 with a standard deviation of 3.5. The between component of the standard deviation is greater than the within component suggesting that countries differ amongst themselves in term of democracy levels more than the variation in democracy for countries during the sample period. We have observations of 130 countries for and average duration of 16.7 years and a total of 2168 observations.

[1] The between sample is composed of $\overline{X}_i$ and the within sample is composed of $X_{it} - \overline{X}_i - \overline{X}$.

Table 1. Descriptive Statistics for Developing Countries

Variable		Mean	Std. Dev.	Min	Max	Observations	
Growth	overall	3.512231	6.733518	-50.2481	85.9	Total	2129
	between		2.896919	-3.11721	20.1073	Countries	130
	within		6.119059	-50.2137	72.54643	Years (Avg)	16.3769
Dem	overall	8.187269	3.535434	2	14	Total	2168
	between		3.237992	2	14	Countries	130
	within		1.438374	2.320603	17.24609	Years (Avg)	16.6769
GDP	overall	2295.078	3170.736	82.15826	26168.87	Total	2120
	between		3302.989	113.0233	22894.84	Countries	127
	within		476.0427	-94.2737	6870.185	Years (Avg)	16.6929
Fertility	overall	3.332043	1.737968	1.09	8.1886	Total	1169
	between		1.700225	1.33125	8.037914	Countries	130
	within		0.40384	1.771872	5.113415	Years (Avg)	8.99231
Inv	overall	21.32167	8.760373	-23.7626	113.5779	Total	2085
	between		7.02059	8.19431	54.88985	Countries	130
	within		5.419221	-22.3879	80.00967	Years (Avg)	16.0385
Trade	overall	81.27066	40.87306	10.83072	280.361	Total	2099
	between		37.66074	20.90157	211.7103	Countries	130
	within		16.53515	-37.4296	199.6962	Years (Avg)	16.1462

To serve as a comparison, we also estimate a panel growth regression for developed countries. Table 2 presents descriptive statistics on this sample. Note that the mean growth rate for developed countries is quite is 1 percent lower per annum when compared with developing countries. Also in comparison with developing countries, the variation around the mean is low as are the minimum and maximum annual growth rates and mean growth rates observed. Mean GDP per capita is $22875, ten times greater than the mean GDP per capita of developing countries. Mean investment to GDP and trade volume to GDP ratios are similar for developed and developing countries but differences emerge in the variation around the means. Investment ratio has a much higher standard deviation for developing countries but variation in trade ratios is similar. Fertility rate in developed countries is half of that of the developing world.

The mean democracy index is 2.3 with a standard deviation of 0.59. This is where the difference between the developed and the developing world is as striking as the difference

between per capita GDPs. Among the developed countries, the maximum democracy index number observed is 4 which is half the mean democracy level for developing countries.

Table 2. Descriptive Statistics for Developed Countries

Variable		Mean	Std. Dev.	Min	Max	Observations	
Dem	overall	2.334118	0.591917	2	4	Total	425
	between		0.521377	2	3.882353	Countries	25
	within		0.297977	1.334118	3.687059	Years (Avg)	17
Growth	overall	2.745712	2.20479	-6.38736	11.681	Total	423
	between		1.152327	1.29982	6.643314	Countries	25
	within		1.893663	-5.74601	8.103294	Years (Avg)	16.92
Fertility	overall	1.693014	0.334208	1.15	2.98	Total	391
	between		0.346603	1.25	2.887833	Countries	25
	within		0.090874	1.274889	2.069889	Years (Avg)	15.64
Inv	overall	21.01059	3.232406	15.31423	32.54765	Total	393
	between		2.476973	16.85124	27.19067	Countries	25
	within		2.143319	11.76023	30.00181	Years (Avg)	15.72
Trade	overall	80.03404	49.73724	16.10923	293.8737	Total	393
	between		49.10143	19.6118	229.6987	Countries	25
	within		12.08438	33.66421	144.209	Years (Avg)	15.72
GDP	overall	22875.55	8832.038	6609.827	54778.65	Total	423
	between		8536.192	8663.626	42292.22	Countries	25
	within		2849.418	13056.04	35361.99	Years (Avg)	16.92
Lngdp	overall	9.957305	0.416476	8.796312	10.91106	Total	423
	between		0.40859	9.0583	10.63929	Countries	25
	within		0.118656	9.54226	10.36587	Years (Avg)	16.92

Notes: Growth: the growth of real gdp (in constant 2000 US$ from the WDID), GDP: GDP per capita in 1990 in 2000 US$ from the WDID, Fertility: Total births per woman from WDID, Trade: The ratio of the sum of exports and imports to GDP as reported in WDID, Inv: The ratio of gross fixed capital formation to GDP as reported in WDID, Dem: The sum of civil liberties and political right indices from the Freedom House.

We estimate the growth regression by fixed-effects. Country specific effects are likely to be important in panel growth regressions even when GDP per capita levels, fertility rates, investment levels, democracy and openness are controlled for. Hence, the appropriate estimation technique is the least-squares dummy-variable approach also known as the covariance or the fixed-effects model[2].

The fixed-effects model is usually denoted as where Xs are the determinants of growth, Ds are the dummy variables for each country, βs and γs are coefficients, and ε is a classical

[2] Notable examples include Hausman's (1978) work on wages and Kiefer's (1979) on education.

error term. Countries are indexed by i, time is indexed by t. The dependent variable, Y, is the annual growth rate of real GDP per capita (Hsiao, 1989). In other words, we are estimating a linear regression model for each country where the slope coefficients of the explanatory variables are the same for each country and only the intercept term varies across countries. Hence, we are allowing for country-specific fixed effects.

$$Y_{it} = \sum_j \beta_j X_{it,j} + \sum_n \gamma_j D_{it,n} + \varepsilon_{it} \quad (1)$$

At this point we need to address whether country-specific effects should best be modeled as fixed or random. Hausman (1978) found that treating individual-effects as random produced significantly different estimates from the fixed-effects treatment and it has since become common practice, when dealing with panel data, to also estimate what is known as the error component or random-effects[3] model and compare the relative efficiency of the two models.

Random effects are considered more appropriate when the sample is drawn from a large population and here our sample is a large proportion of the population to ensure reliability of results. For a detailed discussion on this see Greene (2000). While it is acknowledged that it makes more theoretical sense to use the fixed-effects specification; we opted for fixed versus random effects in the model not only based on theoretical considerations but due to statistical evidence that our empirical analysis revealed, as discussed below.

The fixed-effects model was compared to the random-effects model via the Hausman test. The conventional way to test whether the random-effects model provides a significant improvement over the fixed-effects model is via the Hausman test where under the null hypothesis both fixed and random effects are consistent but fixed-effects is inefficient and under the alternative random-effects is inconsistent. The test statistic is distributed as $\chi^2(k)$ where k is the number of regressors excluding the dummy variables in the fixed-effects model.

The value of the test statistic for developing countries was 185.29 and 240.63 for the other sample which are both higher than the critical value for $\chi^2(5)$. So we estimated panel growth equations by fixed-effects. However, in growth equations endogeneity is an issue documented in much of the literature that biases the estimates from fixed-effects regressions.

[3] The reasoning behind the random-effects model is that, since the error term is generally considered to represent the effect of omitted variables, and some of the omitted variables could represent factors peculiar to individuals or time periods or both. The model (Hsiao, 1989) then can be represented as

$$Y_{it} = \mu + \sum_j \beta_j X_{it,j} + \nu_{it}$$

where $\nu_{it} = \alpha_i + \lambda_t + \upsilon_{it}$. In this regression y is the dependent variable, Xs are explanatory variables, μ is the intercept term, βs are the slope coefficients and ν_{it} is the error term that constitutes of three effects: factors peculiar to individuals (α_i) or time periods(λ_t) and both (υ_{it}). Note that the country dummies in the fixed effects model are replaced by a single intercept term.

The advantage of using an error component model is that we save a number of degrees of freedom, since we do not need to estimate individual-specific intercepts, and thus obtain more efficient estimates of the regression parameters. The disadvantage is that if the cross-sectional characteristic were also captured by the explanatory variables in the regression, the estimates would have become biased and inconsistent.

We follow the literature and treat investment and trade as endogenous Democracy has been argued to be endogenous in the literature as well (Barro1996, Tavares and Wacziarg 2001) but we deviate from the literature at this point. We argue that in the sample period of interest, there is evidence that democracy is not endogenous to growth. We base this conclusion on the results from the convergence regression we present in Tables 8 and 9 which we discuss thoroughly the coming sections but for the time being suffice it to say that we find GDP per capita to be statistically insignificant for democracy when beginning level of democracy is controlled for in a cross-section regression. Tavares and Wacziarg (2001) acknowledge the endogeneity of democracy in the growth regression and instruments democracy by including all set of exogenous variables in the system. Tavares and Wacziarg (2001) investigate the relationship between democracy and growth between the time period 1970 and 1989 for 65 countries. Barro (1996b) analyzes the relationship between growth and democracy for a panel of about 100 countries from 1960 to 1990. We argue that democracy might have been endogenous before the nineties (Barro1996b, Tavares and Wacziarg 2001) and but the relationship between democracy and growth since the nineties which we refer to as the globalization era is different.

Table 3. Fixed-Effects Regression Results for Panel Growth Equations

Standard errors are in parenthesis

	Developing Countries	**Developed Countries**
GDP	-11.76342*** (1.253512)	-7.494278*** (.9923336)
Dem	-.3951754** (.1589393)	-.0120916 (.2712016)
Fertility	-4.59579*** (.6102917)	-6.425721*** (1.167092)
Inv	.3177658 *** (.043045)	.3616458*** (.0617617)
Trade	.0499132*** (.0133599)	.078294*** (.0126462)
Observations (Countries)	961 (127)	359 (25)
Obs. per Country	Min = 2 Average = 7.6 Max = 15	Min = 10 Average = 14.4 Max = 15
R-sq: within	0.2051	0.3175

Notes: Above regressions were estimated by 2SLS where investment and trade ratios were taken to be endogenous and one period lags of these variables were used as instruments. GDP is the natural logarithm of GDP per capita

In Table 3, fixed-effects regression results for panel growth equations are presented. We regress growth on lagged natural logarithm of GDP per capita, fertility, investment, trade and democracy. We have used the 2SLS (or IV) technique to address endogeneity where we substitute lagged values of investment and trade ratios as instruments for the endogenous explanatory variables.

The sample on developing economies includes 127 countries. We have a minimum of two observations for each country, and an average of 7.6 observations. For the sample of developed countries that includes 25 countries, we have a minimum of 10 observations and an average of 14.4 observations. Considering the length of our time period, the sample of developed countries has very few missing observations

All variables are statistically significant at 5 percent for developing countries. The democracy variable is not statistically significant in the growth regression for developed countries. Lagged GDP per capita has a negative effect on growth indicating lower growth rates for countries with higher GDP per capita levels. Fertility is negatively significant, that is increases in fertility depress growth rates. If number of births increase by 1, growth rate decreases by approximately 5 percent. Higher investment to GDP rates lead to higher growth. 1 percent increase in investment ratio adds 0.3 percent to annual growth rate.

Openness is also positively associated with growth for developing countries. A 10 percent increase in trade volume to GDP ratio adds half a percent to annual growth rate.

Democracy index is statistically significant and negative. We would like to remind the reader that higher index numbers correspond to lower democracy. Hence, less democracy leads to lower growth.

This set of results adds to the literature on the growth and economic freedom literature as well as providing evidence for the link between political freedom and economic growth. The findings on fertility, trade, GDP per capita and are consistent with findings in the existing literature, however, in contrast to Barro (2003) we find investment to be statistically significant for both samples. Based on panel growth regressions, we find that increases in the democracy index from one year to the next, that is declines in freedoms, result in lower growth. Due to the nature of this type of panel data analysis, we cannot capture the effect of the level of democracy on growth of different countries.

We address this issue in the next section.

Growth and Stability of Democracy

In this section, we investigate the effect of the level and continuity of democracy on growth of developing countries. Altug, Filiztekin and Pamuk (2007) argue that stability of democracy matters for growth. We estimate cross-section growth equations and ask whether the volatility of democracy has any effect on growth. We present two sets of results based on a sample of developing countries and to serve as a comparison, a sample of both developed and developing countries. We cannot estimate growth equations for developed countries only due to small sample size. Tables 4 and 5 present descriptive statistics on the two samples. Average growth rate of GDP per capita between 1990 and 2006 is regressed on GDP per capita in 1990, average number of births per woman in the sample period, average investment to GDP ratio in the period, average trade volume to GDP ratio in the period and average democracy index in the period and the standard deviation of the democracy index between 1990 and 2006. The sample size of regressions is 145 as that is the number of observations we have for all variables.

To give a quick overview of the samples we employ, average growth is 3.45 percent with a standard deviation of 2.7 percent. Minimum average growth rate is -3.1 percent and maximum is 20.1 percent. Mean GDP per capita in 1990 is $5116.7 with a standard deviation

of $7840. Minimum GDP per capita is $122.9 and maximum is $33279.5. Mean number of births per woman is 3.36 with a standard deviation of 1.72. Minimum number of births is 1.25 and maximum is 8. The mean trade ratio is 81 percent with a standard deviation of 40 percent. The minimum trade openness in the sample is 20 percent and the maximum is 230 percent. Regarding investment, the mean is 21 percent with a standard deviation of 6.5 percent.

Mean democracy in the sample for all countries 7.11 with a standard deviation of 3.6. Minimum and maximum democracy index numbers in the sample are 2 and 14 respectively, which are the minimum and maximum possible democracy index levels. Hence, our sample includes countries at both ends as it should since the sample is a large proportion of all countries in the world. Stability of democracy as measured by the standard deviation in the democracy index between 1990 and 2006 is 1.32. Minimum standard deviation is zero indicating that there are countries in the sample that without any changes in the democracy index for the period. Maximum standard deviation is 5.2.

Table 4. Descriptive stats – All countries

Variable	Obs	Mean	Std. Dev.	Min	Max
Growth	155	3.450709	2.707637	-3.117212	20.1073
GDP90	145	5116.738	7840.25	122.934	33279.51
Fertility	155	3.364842	1.724387	1.25	8.037914
Trade	155	81.0962	39.54979	19.6118	229.6987
Inv	155	21.24522	6.500223	8.19431	54.88985
Democracy	155	7.112713	3.622877	2	14
Volatility of Democracy	155	1.317884	1.084562	0	5.206755

Notes: Growth: average growth of real gdp (in constant 2000 US$ from the WDID) between 1990 and 2006, gdpcapita90: gdp per capita in 1990 in 2000 US$ from the WDID, Fertility: Total births per woman from WDID, Tradegdp: sum of exports and imports over gdp as reported in WDID, Invgdp: gross fixed capital formation to gdp ratio as reported in WDID, Democracy: average of the sum of civil liberties and political right indices from the Freedom House for the period 1990-2006, Volatility of democracy : the standard deviation of democracy index (the sum of political right and civil liberties indices) in the period 1990-2006.

For developing countries, the sample size for regressions is 120. Mean growth rate is slightly higher than for all countries at 3.59 with a higher standard deviation of 2.9. Mean GDP per capita in 1990 for developing countries is $2083 which is quite a bit lower when compared with $5117 for the whole sample. Fertility for developing countries is higher at 3.68 births per woman with a standard deviation of 1.7. Mean trade to GDP ratio is slightly higher, that is developed countries are not as open as developing countries. Investment to GDP ratio is higher for developing countries which is surprising; however, the difference is slight.

Average democracy index for developing countries is 8 which should not be taken to imply that developing countries are less democratic on average. There are 25 developed countries in the sample and from Table 2, we know that they are a lot more democratic than developing countries based on the indices of Freedom House. Standard deviation of democracy is higher for developing countries when compared with the sample that includes the developed countries as well.

Table 5. Descriptive stats – Developing countries

Variable	Obs	Mean	Std. Dev.	Min	Max
Growth	130	3.585139	2.896919	-3.117212	20.1073
GDP90	120	2082.729	3010.555	122.934	26168.87
Fertility	130	3.684054	1.700225	1.33125	8.037914
Trade	130	81.36229	37.66074	20.90157	211.7103
Inv	130	21.28775	7.02059	8.19431	54.88985
Dem	130	8.031674	3.215882	2	14
Volatility of Democracy	130	1.532855	1.051194	0	5.206755

Notes: See Table 4.

Table 6 presents cross-section growth regressions for the two samples. Regression 1 is for all countries and regressions 2 and 3 are for developing countries only. In regressions fertility, investment to GDP and stability of democracy are the only statistically significant variables. Volatility of democracy reduces growth. For developing countries, GDP per capita in 1990, fertility, stability of democracy and investment to GDP are significant at 5 percent. The effect of volatility is significant and negative. Trade to GDP is significant and negative.

Regression 3 estimates a growth equation for developing countries without the stability of democracy as a regressor. This regression serves as a robustness check for the significance of stability of democracy. The results are unaffected, when regression 1 is also run without this variable[4]. We conclude that the level of democracy is not statistically significant with or without the stability of democracy in the regression but the stability of democracy is.

At this point, we could compare findings for annual growth and long-term average growth. Noteworthy findings when cross-section results are contrasted with panel growth regressions are the following: Level of democracy is not significant in cross-section growth regressions with or without stability of democracy. In panel growth regressions the democracy variable is significant suggesting that deviations from mean democracy have growth implications. Secondly fertility has a negative and significant effect on growth in panel growth regressions but a significant positive effect in cross-section regression that is, cross-section regressions find that countries with higher fertility rates have higher growth. This result requires some explanation as it is inconsistent with previous findings. In the sample period, countries with low fertility have exhibited low growth rates (See Figure 1). Developing countries have higher fertility rates than developed countries (Tables 1 and 2) and higher mean growth rates hence the greater effect for developing countries compared to the overall sample.

[4] The first model was estimated without the volatility variable and democracy remained insignificant as in regression 3. These estimates are not reported but are available form the authors upon request.

Table 6. Regression Results for Cross-section Growth Equation

Robust standard errors in parenthesis

	All countries	Developing Countries	
	(1)	(2)	(3)
Fertility	.3839627* (.2102717)	.4556735** (.2163576)	.6958525*** (.2153713)
Trade	-.0005111 (.0042321)	-.0086258 (.005284)	-.0131947** (.0057282)
Inv	.2210728*** (.0693405)	.2453909*** (.0727669)	.2692739*** (.0735796)
Democracy	.0525453 (.0641842)	.0245252 (.0710761)	.0193734 (.0776404)
Volatility of Democracy	-.7332652*** (.1740672)	-.6991775*** (.173451)	
GDP90	-.0472816 (.2105831)	.1941076 (.2444732)	.6104984*** (.2422748)
# of obs	145	118	118
F-statistic (d.f.)	5.65 (6,136)	5.88 (6,111)	3.72(5,112)
R-squared	0.4435	0.4722	0.4228

Above regressions were estimated by 2SLS where investment and trade ratios were taken to be endogenous and ratios in 1990 were used as instruments. All three models were estimated with an intercept.

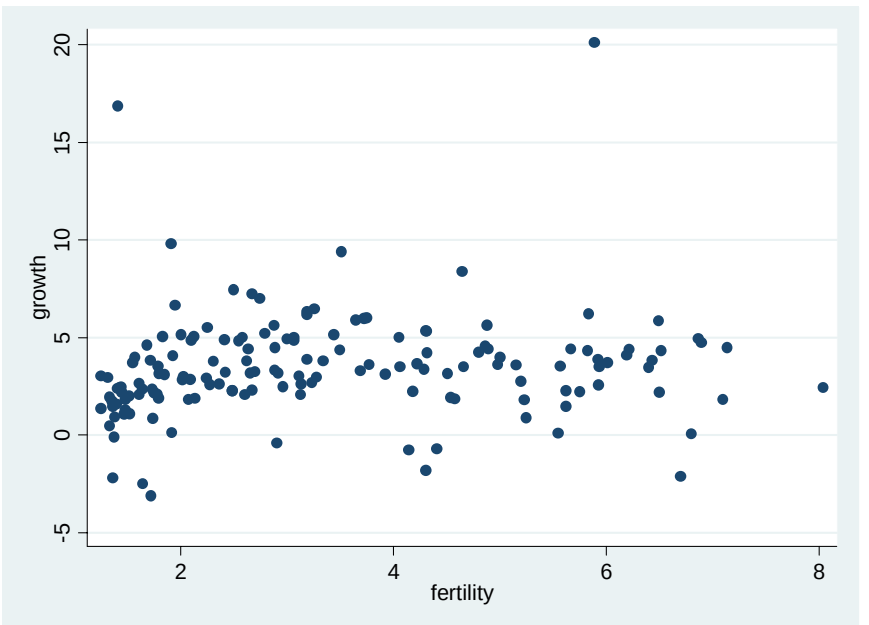

Figure 1. Growth and Fertility.

Convergence in Democracy

Our results indicate that democracy is important for growth of developing countries. If there is convergence at high levels of democracy, this constitutes a brighter future in terms of growth of developing countries. It is observed that average level of political freedom in the world is increasing over time (Nieswiadomy and Strazicich, 2004). So, is there convergence in democracy? We try to answer this question by running regressions for convergence of democracy for 152 countries of the world. The sample of countries is given in Appendix 1. We compute the level of democratization based on three different measures. We use the political rights index and the civil liberties index of Freedom House. Freedom House argues that political rights index measures the level of participation of people freely into political process. In a free society, all eligible adult voters can vote and compete for public offices and public policies. Civil liberties index is a better measure of a different aspect of democratization. Civil liberty index measures the level of freedom to develop views, institutions, and personal autonomy independent of the state. In some regressions, the sum of both political right and civil liberties indexes is used to capture the democracy variable in a more composite way as in Akdede and Hwang (2008).

We investigate democratization between 1990 and 2006 which constitutes the era of. globalization and the era of greater economic integration. We therefore also investigate, in this section, whether economic integration coincides with convergence in democracy. Convergence in per capita income growth is investigated almost exhaustively in the economic growth literature (Barro and Sala-i Martin 1992, Mankiw et al., 1992). However, convergence in democracy, to our knowledge has not been subjected to the tools of economics. This paper is second to that of Nieswiadomy and Strazicich (2004) in terms of convergence in democracy, and first in investigating convergence in democracy for the years of economic integration. Nieswiadomy and Strazicich (2004) investigate convergence in democracy between 1972 and 2001 for 132 countries. Our paper, however, investigates the period between 1990 and 2006 and for 152 countries since the number of countries in the world increased after the collapse of socialism in the former Soviet Union. We think that the period between 1990 and 2006 is more relevant for investigating convergence since this period has seen more globalization and economic integration. Nieswiadomy and Strazicich (2004) find convergence for half of the countries in their sample. This is not surprising since most countries in the seventies were not governed by democracy. Some of those countries in the nineties increased their level of democracy, having convergence with already relatively democratic countries. In addition to the differences in the time period and the number of countries included, methodologies are also different in two papers. Nieswiadomy and Strazicich (2004) use the coefficient of variation as a measure of convergence along with stochastic tests for convergence. We however run regressions with the beginning level of democracy as one of the independent variables which truly captures the spirit of convergence. Beginning level of democracy is a simple average of democracy levels for the years 1990-1994. End of period democracy is a simple average of democracy levels for the period 2001-2006. Averaging has advantages over simply using the index for one year. Among developing countries of conflict, we observe significant variation in the level of democracy from one year to the next. Level of democracy before a short-lived conflict is an indication of how fast the country will again reach this level of democratization once the conflict is over. Therefore, we

believe an average of beginning period democracy is a more robust measure of democracy especially for developing countries. Descriptive statistics are given in Table 7.

Table 7. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Beg-Pr	155	3.87828	2.063776	1	7
Pr	155	3.426882	2.106052	1	7
Beg-Cl	155	3.78129	1.720071	1	7
Cl	155	3.423656	1.714912	1	7
Beg-Dem	155	7.65957	3.738793	2	14
Dem	155	6.850538	3.78075	2	14
GDP	152	5740.533	8862.35	113	42292

Notes: Beg-Pr is the average of the political rights index of Freedom House for the period 1990-1994, Pr is the average of the political rights index of Freedom House for the period 2001-2006, Beg-Cl is the average of the political rights index of Freedom House for the period 1990-1994, Cl is the average of the political rights index of Freedom House for the period 2001-2006, Beg-Dem is the average of the democracy index we construct (sum of political rights and civil liberties indices of Freedom House) for the period 1990-1994, Dem is the average of the democracy index political rights index for the period 2001-2006, GDP is the average GDP per capita of real GDP (in constant 2000 US$ from the WDID) between 1990 and 2006.

Table 8. Regression Results on Convergence of Democracy

Robust standard errors are in parenthesis (H3)

	Dem	Pr	Cl
Beg	0.871381*** (0.0604389)	0.850795*** (0.0631903)	0.844867*** (0.0638324)
GDP	0.025893 (0.15125)	0.001054 (0.0866594)	-0.01178 (0.0715124)
Intercept	-0.03483 (1.59016)	0.113678 (0.8860473)	0.306909 (0.7695081)
# of obs	152	152	152
F-statistic (2,149)	357.92	265.77	369.07

In Table 8, we present convergence regressions for political rights, civil liberties and democracy. The results indicate that there is no convergence in democracy. We run convergence regressions for three measures of democracy. Political right index, civil liberties index and the sum of the two. In all regressions, we find that there is no convergence in democracy. Level of democracy at the beginning of the period is significantly positive indicating divergence in the level of democratization in the sample period. In the regressions we control for level of income and find that this is not a significant determinant of democratization when level of democracy at the beginning of period is controlled for.[5] To test

[5] There is a positive relationship between level of democratization and level of income. We find the income variable to be statistically significant when level of democratization at the beginning of period is not included in the regression as in Akdede and Hwang (2008).

the robustness of our results, we also run the above regressions taking into account the censoring in the data. The Tobit regressions confirm our initial findings.

Table 9. Tobit Regressions for Convergence

	Dem	Pr	Cl
Beg	.9541682*** (.0644253)	1.063893*** (.0856789)	.9388264*** (.0636998)
GDP	-.0897252 (.1510975)	-.178812 (.1110807)	-.0520954 (.067633)
Intercept	-.0237584 (1.49738)	.2663838 (1.040286)	.155644 (.6868562)
Sigma	2.104291 (.1311725)	1.485166 (.1074817)	.9457873 (.0591417)
# of obs	152	152	152
# of left censored[1]	19	41	19
# of right censored[2]	3	8	3
LR (X^2 (2))	209.48	180.96	206.33
Pseudo R^2	0.2597	0.2967	0.3547

[1] Left censored observations are when political rights and civil liberties indexes are 1, and when the sum of the two indexes is 2.

[2] Right censored observations are when political rights and civil liberties indexes are 7, and when the sum of the two indexes is 14.

Our convergence regressions find per capita income as an insignificant determinant of democracy, whereas Barro (1999) finds per capita income as one of the significant determinants of democracy. We argue that this is due to the difference in time periods under study. Barro (1999) analyzes the 1960-1995 period, whereas we concentrate on post 1990 as we are mainly interested in democracy in years of greater economic integration.

Contrary to Nieswiadomy and Strazicich (2004), we find no convergence in democracy between the period 1990 and 2006. This confirms our insight that the world is getting more integrated (homogeneous) economically, staying isolated politically and culturally.

Conclusion

In this chapter, we investigate the effect of democracy on growth. We are not only concerned with the effect of the level of democracy on growth, but also with the effect of stability of democracy on growth. We use the political rights and civil liberties indices of Freedom House as indicators of democracy. We estimate growth equations based on panel and cross-section data with economic and socio-economic variables. Our panel regressions of annual growth suggest that lagged GDP per capita and fertility have negative effects on growth whereas investment and trade have a positive influence. The democracy variable is statistically significant in the growth regression for developing countries but not for developed countries and conclude that loss of freedoms result in lower growth.

We complement the aforementioned results by a cross-section analysis that aims to answer if the set backs in the democratization process have a statistically significant effect on

growth of countries. Cross-section growth equations reveal that the stability of democracy and not the level of democracy have any bearing on growth.

We also investigate if there is convergence in the level of democratization between 1990 and 2006 and try to determine if economic integration coincides with convergence in democracy. We find no convergence in democracy and conclude that the world is getting more integrated (homogeneous) economically, but more disintegrated or isolated politically and culturally.

Appendix 1

Below is a list of countries used in regressions. These are all the countries Freedom House reports on except Korea and Serbia which were excluded as only 3 years of democratization data was available. Barbados, Cuba and Qatar do not have GDP per capita figures in the World Development Indicators Database and hence are excluded.

Albania	Chile	Greece
Algeria	China	Grenada
Angola	Colombia	Guatemala
Antigua and Barbuda	Comoros	Guinea
Argentina	Congo, Dem. Rep.	Guinea-Bissau
Armenia	Congo, Rep.	Guyana
Australia	Costa Rica	Haiti
Austria	Cote d'Ivoire	Honduras
Azerbaijan	Croatia	Hungary
Bahrain	Cyprus	Iceland
Bangladesh	Czech Republic	India
Belarus	Denmark	Indonesia
Belgium	Djibouti	Iran, Islamic Rep.
Belize	Dominica	Ireland
Benin	Dominican Republic	Israel
Bhutan	Ecuador	Italy
Bolivia	Egypt, Arab Rep.	Jamaica
Bosnia and Herzegovina	El Salvador	Japan
Botswana	Equatorial Guinea	Jordan
Brazil	Eritrea	Kazakhstan
Brunei	Estonia	Kenya
Bulgaria	Ethiopia	Kuwait
Burkina Faso	Fiji	Kyrgyz Republic
Burundi	Finland	Latvia
Cambodia	France	Lebanon
Cameroon	Gabon	Lesotho
Canada	Gambia, The	Libya
Cape Verde	Georgia	Lithuania
Central African Republic	Germany	Luxembourg
Chad	Ghana	Macedonia, FYR

Madagascar	Pakistan	Sweden
Malawi	Panama	Switzerland
Malaysia	Paraguay	Syrian Arab Republic
Mali	Peru	Tajikistan
Malta	Philippines	Tanzania
Mauritania	Poland	Thailand
Mauritius	Portugal	Togo
Mexico	Romania	Trinidad and Tobago
Moldova	Russian Federation	Tunisia
Mongolia	Rwanda	Turkey
Morocco	Saudi Arabia	Ukraine
Mozambique	Senegal	United Arab Emirates
Namibia	Seychelles	United Kingdom
Nepal	Sierra Leone	United States
Netherlands	Slovak Republic	Uruguay
New Zealand	South Africa	Uzbekistan
Nicaragua	Spain	Venezuela, RB
Niger	Sri Lanka	Vietnam
Nigeria	Sudan	Yemen, Rep.
Norway	Suriname	Zimbabwe 1.051194
Oman	Swaziland	

Appendix 2

Correlation matrices of variables in regressions

For Cross-section Regressions

	Growth	**GDP 90**	**Fertility**	**Trade**	**Inv**	**Democracy**	**Vol of Democracy**
Growth	1						
GDP 90	-0.0596	1					
Fertility	0.1701	-0.4908	1				
Trade	0.0901	0.0787	-0.1918	1			
Inv	0.3574	0.0307	-0.3386	0.3633	1		
Democracy	0.1188	-0.5726	0.6102	-0.1325	-0.1031	1	
Vol of Democracy	-0.2946	-0.515	0.1563	0.0232	-0.0097	0.2765	1

For Panel Regressions

	Growth	**Democracy**	**GDP**	**Fertility**	**Inv**	**Trade**
Growth	1					
Democracy	0.0415	1				
GDP	-0.011	-0.5906	1			
Fertility	0.0564	0.5754	-0.449	1		
Inv	0.2588	-0.0193	-0.0147	-0.1953	1	
Trade	0.1214	-0.1096	0.0766	-0.1919	0.311	1

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