

**IMPACT OF EXTERNAL DEBT, FOREIGN AID
AND GOVERNANCE ON ECONOMIC GROWTH:
AN EXTENSION OF RAMSEY-CASS-KOOPMAN
MODEL**

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Dedicated in gratitude and affection to
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May ALLAH give them long life and health.

Nomenclatures

| | |
|---------|------------------------------------------|
| 2SLS | Two Stage Least Squares |
| ARDL | Autoregressive Distributed Lag |
| ADF | Augmented Dicky-Fuller |
| CPI | Consumer Price Index |
| DAC | Development Assistance Committee |
| DEDH | Direct Effect of Debt Hypothesis |
| DIF-GMM | Differenced-Generalized Method of Moment |
| DOH | Debt Overhang Hypothesis |
| FE | Fixed Effect |
| GDP | Gross Domestic Product |
| GMM | Generalized Method of Moment |
| GNI | Gross National Income |
| GNP | Gross National Product |
| HIPIC's | Highly Indebted Poor Countries |
| ICRG | International Country Risk Guide |
| IMF | International Monetary Fund |
| IPS | Im, Pesaran and Shin |
| LCH | Liquidity Constraint Hypothesis |
| LL | Levin and Lin |
| NGO's | Non-Governmental Organizations |
| ODA | Official Development Assistance |
| OLG | Overlapping Generation Model |
| OLS | Ordinary Least Square |
| PNG | Papua New Guinea |
| RE | Random Effect |
| SIDS | Small Island Developing States |
| SYS-GMM | System-Generalized Method of Moment |
| VAR | Vector Autoregressive |
| VECM | Vector Error Correction Mechanism |
| WDI | World Development Indicator |
| WPI | Whole Price Index |

CHAPTER 1

1. Introduction

Developing countries usually have scarce resources and low tax revenues. In order to fulfill the gap between the expenditures and revenues or to overcome the budget deficit, they have to rely on the foreign capital. However the efficiency of foreign capital depends on governance and the institutional quality. Good governance enables a country to achieve its development goals and become prosperous, by establishing a conducive environment for the high and sustainable economic growth. Good governance establishes an impartial, predictable and consistently enforced rules in the form of institutions and is thus crucial for the sustained growth (Keefer and Knack 1997). Where as many studies have been conducted in recent years to examine the relationship between economic growth and external debt, economic development and foreign aid, impact of foreign aid on governance and institutional quality, the role of institution in the economic performance of country, little attention has been paid to explore the inter-linkages among foreign aid, external debt, governance and economic growth in a unified framework.

Theoretically high level of foreign aid can result in favorable as well as unfavorable impact on the quality of governance. On the one hand, foreign aid enables governments to focus on enforcing rules of law, fighting against corruption effectively by releasing them from binding revenue constraint (Shanta Devarjan, David R.Dollar and Torgny Holmgren 2001). High foreign aid inflows with clear development plans can be used to improve rule of law, the quality of civil services, central institutions, policy and planning capacity as the case of Taiwan and South Korea in the East Asia are good example in this respect (Jerker Carlsson, Gloria Somolekae and Niconlas Van De Walle 1997; Rodrik, 1996). But on the other hand, high level of foreign aid can block or delay essential reforms that can improve governance quality due to rent seeking and moral hazard problems, the poaching of qualified government staff members for aid projects, as donors

organizations by paying higher salaries hire away the skilled and efficient public officials, can result in a deterioration of governance (Van Rijckeghem and Weder 1997).

Similarly recent studies of foreign aid and economic growth have found that foreign aid has a positive and significant impact, when given to those countries that have good macroeconomic policies and sound institutions. Foreign aid contributes in enhancing the economic development; positive levels of economic growth can generate tax revenues and effective management, leading to good governance. All these factors help to improve investment climate leading to more economic activity which in turn contribute additional revenues and improvement in the credit worthiness of government, eventually helping to improve government quality.

On the contrary, however, foreign aid may dampen the incentive for greater resource mobilization through taxation leading to a decline in government revenues, also goods imported by foreign aid projects are often exempted from import duties. Personnel working for foreign aid agencies and NGOs rarely pay local income taxes (Elliot Berg 1993). External resources can reduce pressure on recipient governments to set up the efficient institutions and policies, essential in order to attract private investment that promote the economic growth (Rodrik 1996: 31).

Foreign assistance can even accentuate political instability in situation where the government tends to grab the aid money and neglects economic development leading to political pressure and general unrest in the masses. Political scientists have argued that aid weakens legislative accountability, by impeding the growth of well “civil society” hurting the rule of law and democracy. Foreign aid in developing countries may decrease the government’s dependence on its citizens for tax revenues. With high level of foreign aid, recipient governments are answerable mainly to foreign donors rather than the tax payer, in this way the sovereignty of the country is also compromised, as the donors play influential role that may not be a good thing because the donors actually do not know exactly the system of the recipient country.

Lack of domestic capital compels the government to look for additional financial resources, so it is supplemented by funds from abroad in order to accelerate the investment activities and the economic growth. Many development economists are of the view that capital is essential for economic growth and it does not matter from where it is financed. But the impact of external debt on the economic growth is controversial, in the literature there exist different hypotheses including the Liquidity Constraint Hypothesis (LCH), Debt Overhang Hypothesis (DOH), Direct Effect of Debt Hypothesis (DEDH) and uncertainty.

The Debt Overhang Hypothesis states that high level of current debt worsens the economic performance because it leads to an increase in the future tax on the output that alters the individuals' incentive to save and invest (Krugman (1988), Corden (1988), Sachs (1989), Froot (1989)). The DOH reduces the incentives to invest in new technologies and the human capital, it also makes government not to invest in the activities like structural reforms and fiscal adjustments (Sachs, 2002). The Liquidity Constraint Hypothesis states that in case of highly indebted countries the debt service payments are so high which reduce the funds available for investment (Hoffman and Reisen(1991)).

In order to check the impact of external debt on investment and savings DOH and LCH has been tested empirically. Some studies are in favor of DOH while other supports the LCH; by and large the results are mixed. IMF (1989), Fainy and DeMelo (1990) and Fry (1989) provide evidences that supports DOH and conclude that highly indebted countries experience low rates of capital formation and the debt affects investment negatively. Hoffman and Reisen (1991), Cohen [1993], Clements *et al.* [2003], Hansen [2004] and Presbitero [2005] find little empirical evidence in favor of DOH, they conclude on the basis of their findings that the high debt service payments crowd out the investment and hence negatively affect the economic growth.

Uncertainty is another factor associated with the external debt; it makes the inflation and interest rates more volatile that affect the economic performance through the volatility in investment. Future capital inflows also depend on the perceived sustainability, risk of default, rescheduling of debt payments and outstanding debt that increase the volatility of future lending (Gunning and Mash, 1998). The short term debt and macroeconomic instability diminish the efficiency and productivity of capital that in turn reduce the economic growth (Moss and Chiang, 2003).

High level of external debt and debt service payments are deleterious for investment as on the one hand they induce high tax rates on future output while on the other hand high debt service payments decrease the funds required for investment. DEDH states that even if the debt service payment does not adversely affect investment and saving it may decline the output growth directly through diminishing productivity due to adverse change in investment mix. DOH, LCH, and uncertainty imply a negative impact of foreign borrowing on investment level that leads to a decline in the economic growth, but the DEDH on the other hand states that debt burden may influence the efficiency and productivity of existing capital even if it does not affect investment. In this way it will influence the output level and the economic growth (Fosu, (1996)).

1.1. Objectives

A lot of work has been done on foreign aid, external debt, governance and economic growth but little attention has been paid to explore the impact of foreign aid and external debt on economic growth by taking into consideration the governance quality. This study develops a theoretical model and extends the Ramsey-Cass-Koopman Model by incorporating the foreign aid, external debt and governance quality. Empirically we will also estimate an econometric model that has strong underpinning in the theoretical model being developed here. The main objectives of this study are to

- i. Develop a theoretical model by extending Ramsey-Cass-Koopman Model by incorporating the external debt, foreign aid and governance.
- ii. Analyze empirically the effect of external debt and foreign aid on the economic growth by considering the governance quality.

1.2. Scheme of the Study

The study is divided into 6 chapters. Chapter 2 provides a brief review of literature that is further sub-divided into three sections. Each section illustrates the literature review regarding Foreign aid, debt and governance and their relationship with economic growth. Chapter 3 lays out the theoretical framework of the study while the empirical methodology is explained in chapter 4. Chapter 5 provides the interpretation of empirical findings and finally the conclusion and policy recommendations are elucidated in chapter 6. All the tables are given in the appendix and at the end references.

CHAPTER 2

2. Literature Review

Substantial work has been done that links individually external debt, foreign aid and governance with economic growth. In some papers foreign aid as well as external debt have been related to economic growth taking into account the quality of governance. But little attempt is made to consider the simultaneous impact of these three variables on economic growth. This is the sole reason due to which this section has been divided into different parts. The first section describes the literature linking foreign aid to economic growth. The second and the third sections present the literature review of the impact of external debt and institutions on the economic growth respectively.

2.1. Debt and Economic Growth:

Fosu (1996) empirically estimates the impact of external debt on the economic growth of Sub-Saharan Africa over the period 1970-1986 in the augmented production framework. Fosu argues that even if the debt has little impact on the rate of investment it is possible that external debt adversely impacts on economic growth through declining the productivity of capital. The study empirically tests the "Direct Effect of Debt Hypothesis (DEDH)" using Ordinary Least Square (OLS) technique. To examine the error structure for possible heteroscedasticity, likelihood ratio test is employed. The Results indicate that either debt service or debt outstanding, whatever is used as a measure for debt burden, negatively affects the GDP growth rate via decreasing the marginal productivity of capital. The results provide evidence in favor of the DEDH and also suggest that in the long run the impact of debt is non-monotonic i.e. at low level of investment debt inflows enhance economic growth but after the threshold level of 16% of gross domestic investment to GDP, it becomes negative.

Chowdhury (2000) examines the key analytical issue of whether external debt burden is a symptom or a cause of economic slowdown, a case study of Australia. Sachs (1990) and Kenen (1990) are of the view that the external debt overhang is a main root cause of economic slowdown. Bulow and Rogoff (1990) argue that the external debt is a symptom of bad economic management and performance and it's not a primary cause of economic growth. The results of Granger causality test indicate the unilateral causation flowing from gross external debt, non-official external debt and net external debt to gross domestic product. These different sorts of external debt affect the output positively in the long run but this impact is very small. Chowdhury (2000) in this study does not find any evidence that supports the propositions of Bulow-Rogoff and Kenen-Sachs.

Were (2001) states that Kenya is categorized in the highly indebted poor countries (HIPC) and has experienced difficulties in the management of its huge stock of external debt and debt service payments. The economic performance continues to get worse and since 1990s there has been significant net outflow of resources to meet the debt obligations. The study examines the structure of Kenya's external debt and its impact on economic growth. To check the stationarity of different series ranging from 1970 to 1995, Augmented Dicky Fuller test are applied and to find out the long run relationship between the external debt and economic growth Engel-Granger Cointegration has been applied. The empirical results indicate that external debt stock has a negative impact on private investment and economic growth; this verifies the presence of debt overhang problem in Kenya. In addition the current debt inflows stimulate the private investment, debt service payments do not appear to effect growth negatively but has some crowding out affect on private investment.

Xiaoyong and Gong (2007) work out the inter-linkages between foreign aid, domestic capital accumulation and foreign borrowing. The study uses an infinite horizon model with Marshallian time preferences; through comparative static analysis the study concludes that in the long run domestic capital accumulates, consumption increases and the foreign borrowing decrease whenever there is a permanent increase in foreign aid. In the short run the comparative static analysis shows that a representative agent becomes

more patient and initially the investment increases and foreign borrowing declines if the foreign aid level increases. This study also provides basic support regarding a significant impact of foreign aid on the economic growth and development in the case of developing countries. Many empirical studies on external finance and its impact on domestic savings, investment and economic growth have been supported by theoretical findings of Cui Xiaoyong and Liutang Gong, such as those of Burnside and Dollar (2000,2004), Svensson (2003), Collier and Dollar (2001, 2002) and Collier and Dehn (2001).

Abu Bakar and Hassan (2008) focus on the impact of external debt burden on economic growth of Malaysia using the growth accounting framework. The study also examines the magnitude as well as the composition of Malaysia's external debt and the analysis is performed both at the aggregate as well as the disaggregate level. The Solow's (1956) and Romer's (1996) models are extended by incorporating external debt, where it is entered as a separate input in a neoclassical production function. The VAR model is estimated empirically and the results indicate that total external debt affects economic growth positively at the aggregate level. More precisely we can say that one percentage point increase in external debt enhances economic growth by 1.29 percentage points in the long run. This reveals that in case of Malaysian economy the debt overhang problem does not exist which creates unfavorable incentive effects on the long term economic growth. At disaggregate level the project loans contribute positively but market loans do not significantly promote economic growth in the long run.

Hameed *et al* (2008) and Malik *et al* (2010) analyze the long run and short run relationships between external debt burden and economic growth of Pakistan for the period 1970-2003 and 1972-2005 respectively. Hameed *et al* (2008) examine the dynamic effect of GDP, debt service, capital stock and labor force on economic growth by fitting a production function model. The results indicate that the debt servicing burden has a negative impact on the productivity of capital and labor, which in turn adversely affect economic growth. Debt service ratio affects the GDP negatively and thereby the long run economic growth which weakens the debt servicing ability of a country. By following Cunningham (1993) vector error correction mechanism (VECM) has been

applied, the estimated error correction term reveals the existence of causal short run as well as long run relationship running from debt service to GDP. Malik *et al* (2010) findings are also on the same lines as that of Hameed *et al* (2008).

Ezeabasili *et al* (2011) investigate the inter-linkage between external debt and economic growth of Nigeria for the period 1975-2006. In order to check the long run relationship Johnson co-integration approach has been applied that confirms the existence of one co-integrating vector at 1% and 5% level of significance. Error correction estimates indicate negative relationship between the external debt and economic growth i.e. 1% increase in external debt decrease the Gross Domestic Product by 0.027% while 1% increase in debt service results in 0.034% decrease in Gross Domestic Product. The Granger causality test reveals the presence of uni-directional causality between external debt service payment and economic growth. These results are significant at 10% level of significance.

2.2. Foreign Aid and Economic Growth

Boone (1995) examines the effectiveness of foreign aid and the political regimes in aid recipient countries. The study setup a model of political behavior by considering the case in which foreign aid is effective and the case when foreign aid is not effective. Using the data set of 96 countries regarding non military aid flows the study concludes that the impact of foreign aid is best predicted by the models of elitist political regimes. Foreign aid just increases the size of government while it fails to enhance investment and economic growth significantly.

Easterly (1999) using data for 88 aid recipient countries, spanning the period 1965-95, estimates the Financing Gap Model (Harrod-Domar-Chenery Two Gap Model). According to this model foreign aid and investment has one for one relation i.e. one dollar increase in foreign aid will increase investment also by one dollar and in short run there is a fixed linear association between growth and investment. Investment to GDP ratio is taken as dependent variable while official development assistance to GDP ratio as independent variable. Just 6 countries out of 88 have the positive and significant coefficient greater than or equal to one. To test the linear relationship between investment

and growth 138 countries have been considered in a regression of growth on the lagged investment. This time just four countries pass the test and there is just one country that shows results completely in favor of Financial Gap Model that is not enough to support the model empirically. There is no theoretical and empirical rationalization for assuming a short run proportional relationship between investment requirement and economic growth; hence filling a financial gap determined by the investment requirement will not increase investment or growth in short run.

Burnside and Dollar (2000) to examine the relationship between foreign aid, policy and growth of per capita GDP using the neo classical growth model, for 56 developing countries and six four-year periods from 1970-1973 to 1990-1993. They use new data base just had been developed by World Bank on foreign aid. In order to determine the policy variable, a scalar policy index has been generated by considering three variables i.e. fiscal surplus, inflation and trade openness. Using Two Stage Least Square (2SLS) approach they estimate a number of regressions for economic growth in terms of per capita income, foreign aid, aid interacted with policies and an index that measures institutional and policy distortions. In some specifications dummy variables for certain regions as well as variables like ethnic fractionalization and assassinations has also been considered. They find that in case of developing countries that have good fiscal, monetary and trade policies, foreign aid has a positive impact on the economic growth as the coefficient of interaction term between foreign aid and policy is significant. In the presence of bad economic policies foreign aid does not affect growth positively, and these results are robust for various specifications that either include or exclude middle income countries, outliers and consider policy variables as exogenous and endogenous.

Lensink and Morrissey (2000) attempt to explore the positive impact of foreign aid on growth by accounting aid instability as a measure of uncertainty. The principle concern of this study is to analyze the growth impact of foreign aid through the level and efficiency of investment. The study argues that uncertainty on the magnitude and timings of foreign aid implies negative impact on the investment that in turn may dampen the economic performance of a country. The study considers all the developing countries as well as the

sub group of African developing countries for the period 1970 to 1995 for analysis. The empirical analysis shows that uncertainty in the foreign aid inflows adversely affects economic growth and this result is robust. It seems as the investment plays a significant role in determining the growth performance of an economy but when foreign aid is included with investment in the regression equation then it does not have a robust impact on growth.

Dalgaard *et al.* (2004) theoretically as well as empirically analyze the effectiveness of foreign aid using Overlapping Generation Model (OLG). The study shows that in general foreign aid affects long run productivity but the magnitude and path of impact may depend on policies, size of foreign aid inflows and organizational characteristics. Although foreign aid stimulates economic activities in the recipient countries but the other geographic factors such as climate related circumstances also play a vital role in determining the direction of stimulus. Dalgaard *et al.* use OLS and standard pooled panel GMM-regressions with endogenous foreign aid and policies; in addition they also look at panel GMM-regressions at first difference. To tackle the problem of unobserved heterogeneity in the dynamic panel data they used DIF-GMM proposed by Arellano and Bond (1991) and SYS-GMM proposed by Blundell and Bond (1998). They also argue that if foreign aid usefulness is associated to climate then donor agencies should consider the Collier-Dollar allocation rule. On the basis of their findings they also suggest that foreign aid is not a panacea for poverty eradication and in itself, foreign aid will not ensure the convergence rather it just stimulate the process.

Easterly *et al.* (2004) reassess linkage between foreign aid and economic growth given good policies using the methodology of Burnside and Dollar (2000). The study reconstructs the data base from original sources and makes extension by considering both the cross-section and the time series dimensions; enlarging the sample size from 275 observations to 356 by adding six more countries ranging from 1970-1997. The study does not test the robustness of the results provided by Burnside and Dollar to a substantial number of variations; they just include those observations that were not available to Burnside and Dollar. The results if confined to the original limited data, show same

outcomes as presented by Burnside and Dollar but when the extended sample is used the interaction term of aid and policy becomes insignificant and its coefficient changes its sign from positive to negative. Easterly *et al* conclude that the interaction term is not robust to the extended sample size so it's not necessary that foreign aid enhance growth just in the presence of good policy environment.

Islam (2005) examines the economic policies and the effect of foreign aid on growth by taking into account the regime changes using the cross-section of 65 countries for the period 1968 to 1997. For estimation ordinary least square and two stage least square methods have been used and the results show that on average foreign aid has no significant impact on the growth irrespective of the policies whether good or bad but the political stability is a determining factor that makes the foreign aid flows effective in promoting economic growth. The empirical results provide evidence for the existence of aid Laffer curve in the countries that are politically strong and stable. Whenever the ratio of foreign aid to GDP goes beyond 5.8 percent the returns to foreign aid become negative. The Latin American countries are relatively more unstable as compared to other developing countries and East Asian countries are found to have comparatively better policies than others, so the data from different developing countries must not be pooled together without letting the coefficients to differ with political instability.

Feeny (2005) investigates foreign aid effectiveness and economic growth conditioned upon the level of economic policy and governance. The study estimates an empirical model using the time series data from 1965 to 1999 and Autoregressive Distributed Lag (ARDL) approach to cointegration proposed by Pesaran and Shin (1995) and Pesaran et al. (1996). The study concludes that foreign aid has little impact on economic growth of Papua New Guinea (PNG) but in case of World Bank Structural Adjustment Program financed through foreign aid some evidence emerges that supports the hypothesis of foreign aid's positive impact on economic growth. The governance level has no impact on economic growth of PNG but the structural adjustment policies seem to be more effective in enhancing the growth being financed by the foreign aid.

Murphy and Tresp (2006) work out the role of economic policy in stimulating economic growth of developing countries that utilize foreign aid. The data set originally used by Burnside and Dollar (2000) has been updated and modified by taking into account the critique presented by Easterly *et al.* (2004). As the relationship among foreign aid, growth and policy is nonlinear, so probit model for thresholds growth has been presented. Using ordinary least square and two stage least square, the results show that the relationship among foreign aid policy and growth is quite fragile and depends significantly on the set of countries being included in the analysis. When the sample size that has been used by Burnside and Dollar is considered, policy plays an important role in determining the effectiveness of foreign aid in generating economic growth, but this relationship vanishes in case of expanded sample size of countries. The results prove that the critique proposed by Easterly *et al.* is correct and little evidence is there which supports the view that good policy enhances the probability of foreign aid to contribute positively to economic growth.

Oechslin (2006) analyzes the effectiveness of foreign aid in promote economic growth in economies that may grow faster by the adoption of productive technologies. The study states that if the government invests more in judiciary it will translate into better enforcement of contracts between the foreign technology supplier and the domestic firms that will lead to rapid growth. But if the government is self-interested then the additional resources to overcome the financing gap may not be able to establish better institutions. The study develops a simple endogenous growth model and through panel data estimation, finds that during 1980s and 1990s foreign aid makes the political system to be more unstable. The model lays emphasis on the ineffectiveness of foreign aid in the current institutional scenario and there exists decreasing returns to scale in higher foreign aid inflows. It also highlights the fact that higher inflows may worsen the political instability that may harm the economy whose performance is comparatively sound. But the countries with low institutional quality may perform well whenever such inflows increase. Now it becomes apparent as to why the literature does not provide a robust empirical association among foreign aid effectiveness, economic growth and institutional quality.

Mallik (2008) examines the effectiveness of foreign aid for economic growth in the highly aid dependent poor six African countries. In order to check out the long run relationship between per capita GDP, investment as a percentage of GDP, foreign aid as a percentage of GDP and openness Johnson Co-integration analysis has been applied after analyzing the unit root test of all the series for these six highly indebted poor countries (HIPC). The study concludes that in the short run foreign aid doesn't affect per capita real GDP growth for all the countries except Niger. In the long run foreign aid has a significant negative impact on the per capita real GDP growth.

Alvi *et al* (2008) assess the role of policy and foreign aid in promoting economic growth when the inter-linkage among them is nonlinear. In the existing empirical literature there is no consensus on the role of policy and foreign aid on economic performance. Conflicting and contradicting results prevails that create a lot of confusion among economists. The parametric and semi-parametric estimations show that the policy plays an important role in the economic growth of a country. Foreign aid successfully boosts up the growth activity in the presence of good policy environment.

Feeny and McGillivray (2010) investigate the relationship between foreign aid and economic growth in the small island developing states (SIDS) by econometrically analyzing cross-sectional data for the period 1980 to 2004. The analysis uses annual and averaged data; for estimations ordinary least square (OLS), generalized method of moment (GMM) and the fixed effect (FE) methods are used. To explore whether development assistance is less efficient in weak and extremely weak economies of SIDS, various interactive terms are included in the empirical models. The results indicate diminishing returns to high level of foreign aid inflows and the threshold level of foreign aid is estimated to be 35 percent of GDP. Foreign aid is effective and spurs growth below the threshold level; further results suggest that foreign aid is less effective in highly fragile SIDS as they face severe binding constraints regarding the absorptive capacity.

Selaya and Thiele (2010) present an empirical evaluation of the hypothesis that in recipient countries foreign aid is disadvantageous for external competitiveness and growth. The main distinguishing aspect of this study is that the evidence is based on sectoral decomposition, using sample of 65 developing countries for the period of over 40 years ranging between 1962 and 2001. In aid-growth econometric model the changes in the real exchange rate have also been incorporated. GMM-SYS approach proposed by Arellan and Bover (1995) and Blundell and Bond (1998) has been used for estimations. The key findings point to the nonexistence of Dutch disease effect, the foreign aid has positive marginal impact on growth at aggregate level as well as on disaggregate level. The size of coefficients remains almost same for tradable and non-tradable sector; this finding is robust to different specifications. In countries with bad and weak policies the marginal effect of foreign aid approaches zero and is also insignificant, it suggests that in order to increase the level of foreign aid, in recipient countries there must be a way to maintain incentives and to overcome structural impediments like low productivity of agricultural sector in tropical areas.

2.3. Governance and Economic Growth

North (1992) argues that the institutions as well as the ideology shape economic performance. While taking into account the technology used, institutions affect economic performance by determining the cost of transaction and production. Formal rules, informal constraints and characteristics of enforcing those constraints together formulate the institutions. Institutions affect economic performance and the differential in performance of economies is basically influenced by the way institutions evolve. The neoclassical economic theory is of little help in investigating the sources beneath economic performance because institutions are taken for granted in their models. Factor and product markets perform efficiently in the presence of good political and economic institutions that ensure low transaction costs and credible commitment.

Dawson (1998) analyzes the alternative channels through which institutions impact economic growth. This paper formalizes the alternative channels i.e. whether institutions directly affect the long-run growth by enhancing total factor productivity or indirectly through investment channel. In this context, basic theoretical framework used by Dawson is an extension of Mankiw, Romer and Weil's (1992) human capital augmented version of the Solow (1956) model. Using the cross-sectional and panel data for the period of 1970-1990, and Ordinary Least Square Method, empirical evidence indicates that institutions have a significant positive impact on economic growth in case of large sample size. The results are robust for alternative specifications that ensure the absence of reverse causation and there exists no significant difference among results of both pure panel and cross-sectional data analysis. The study concludes that institutions stimulate economic growth directly by raising the total factor productivity as well as indirectly by enhancing the investment.

Decker and Lim (2008) examine various elementary drivers of economic growth focusing in part on political as well as the economic institutions. Whereas controlling for geographic endowments and economic integration, the distinction between the two types of institution makes it possible to determine the inferior or superior performance of an economy based on either or both of these two types of institutions. The core empirical model is that of Rodrik *et al.* (2004) with some variations to accommodate the dynamic aspects. Static and dynamic models for cross-sectional and panel data set are estimated using Ordinary Least Square (OLS), Two Stage Least Square (2SLS) and System Generalized Method of Moment (System GMM) (Arellano and Bover, 1995; Blundell and Bond, 1998). To solve the problem of endogeneity, the lagged values of endogenous variables are taken as instruments. The results show that political-economic institutions play a significant positive role in determining the level of income while the political institutions (democracy) are insignificant may be due to the non-linearity of the development of democratic rights. Developing countries should pay more attention to political-economic institutions like the rule of law (La Porta *et al.*, 1998) and the enforcement of property rights (Djankov *et al.*, 2002) to stimulate economic growth rather than concentrating on political institutions.

Acemoglu and Robinson (2008) argue that the difference in the economic performance or per capita income across countries is due to the differences in the economic institutions. Countries with poor economic institutions have to focus on the reformulation of these institutions. Unfortunately, it's not an easy task as economic institutions are collective choices generated by the political process. The economic institutions depend on the political institutions as well as the distribution of political power in a country. The knowledge regarding the key factors that direct a society into a political equilibrium and hold up fine economic institutions is preliminary. However, it's clear that institutional equilibrium depends highly on the political environment so this political nature makes it very hard to restructure economic institutions. There are countries that go through political evolution, reformulate their institutional framework and for better development outcomes.

Feld and Kirchgassner (2008) conduct a survey of recent empirical studies on institutions and economic growth and conclude that from the experience of Germany and Korea after World War II, we can hardly deny the vital role played by institutions in promoting the economic growth but the literature that has been reviewed in this paper is mostly inconclusive. Nearly every paper argues that its results are more efficient and significant but their statistical significance, selection of variables as well as the measures used for institutional quality are questionable. Actually, the question regarding the effectiveness of institutions is debatable. Not only the institutions matter for growth, but also the governance and human capital matter a lot. Today mostly economists are of the view that the economic institutions matter more for economic development rather than the political institutions. But we should not ignore the political institutions as well because the political instability is negatively related to growth of output. So economic development needs economically as well as politically stable environment for proper functioning of the market mechanism.

Hall *et al* (2010) investigate the role of institutions in determining economic growth by considering investment in physical and human capital. Recent studies indicate that even increase in capital does not ensure the high levels of output so there is a need to examine the role of institutions. This paper follows Dawson (1998) in augmenting the growth model of Mankiw, Romer, and Weil (1992) to incorporate the quality of country's institutions. The data set for 96 countries ranging from 1980 to 2000 has been used for empirical estimations and results show that institutions are positively linked with the output growth. Those countries which have good institutions show positive growth rates whenever the stock of capital increases but the countries with bad institutions, increase in capital investment may lead to negative growth rates due to rent seeking and other unproductive activities.

CHAPTER 3

3. The Theoretical Framework

3.1. Ramsey-Cass-Koopmans Model for Governance and Foreign aid in an Open Economy

3.1.1. Setup of the Model

Ramsey-Cass-Koopmans model assumes infinite time horizon; while making decision regarding consumption parents take into account the welfare of their coming generations. Parents maximize their utility by taking into consideration the budget constraint over an infinite horizon. The basic model assumes that all the household units are identical; each family unit has similar preference parameters, assets per person, marginal product of labor, population growth rate but in the present case constant population and all variables in per capita term has been considered. It also assumes that the markets are perfectly competitive, homogeneous agents receive wage in return of their services while the capital that owned by the households receives rent. For simplicity it is assumed that there is no depreciation. Here we extend the basic model by incorporating foreign aid and governance in an open economy. Production function is purely neoclassical and fulfills all the basic properties. we consider the technological progress as neutral, following the definition of Harrod (Harrod neutral) and the labor augmented production function specified by Robenson (1938) and Uzawa (1961):

$$Y(t) = f \left[\hat{K}(t), \hat{L}(t), \Theta(t) \right]$$
$$\Theta(t) = \Theta(0)e^{Q(t)+N(t)}$$

Where $Y(t)$ is the output produced, $\Theta(t)$ technological progress that depends on $Q(t)$ quality of governance (Index of Governance that include corruption, law and order and quality of bureaucracy) and $N(t)$ exogenous rate of technological progress, $\hat{K}(t)$ and $\hat{L}(t)$ is the capital and labor input respectively.

$$L(t) = \hat{L}(t) \cdot \Theta(t)$$

Here $L(t)$ is the effective labor, the production function can be written as

$$Y(t) = f \left[\hat{K}(t), L(t) \right]$$

In per capita form the production function can be expressed as:

$$y(t) = f(k(t)) \tag{1}$$

It is assumed for simplicity that the depreciation rate is zero and the production function is strictly concave and satisfies the following Inada conditions:

$$f(0) = 0, \quad f'(0) = \infty, \quad f''(\infty) = 0$$

Household's utility function can be expressed as:

$$U = \int_0^{\infty} U(C(t)) e^{-\theta t} dt \tag{2}$$

$C(t)$ is the consumption of the household, $U(\cdot)$ is the instantaneous utility function that is nonnegative increasing, concave and twice differentiable. The parameter θ represents the subjective discount rate that is assumed to be strictly nonnegative.

$$U'(C(t)) \geq 0, \quad U''(C(t)) \leq 0$$

In case of an open economy the equality between the saving and investment does not hold as the international trade in goods and assets is allowed. The imbalances in current account can be financed through the external debt and the country can borrow and lend freely at the constant world interest rate θ . From national income identity

$$f(k(t)) \equiv C(t) + \frac{dk(t)}{dt} + G(t) + NX \tag{3}$$

NX is the net export, $C(t)$ is the expenditure on consumption while $dk(t)/dt$ represents the change in capital stock that is investment. Here the government expenditure has been subdivided into the expenditure on Governance $Z(t)$ and expenditures on public goods G_0 .

$$f(k(t)) \equiv C(t) + \frac{dk(t)}{dt} + Z(t) + G(0) + NX \quad (4)$$

$$Z(t) = g(t)f(k(t)) \quad (5)$$

$$\frac{dk(t)}{dt} = I(t) = i(t) \left[1 + T\left(\frac{i(t)}{k(t)}\right) \right] \quad (6)$$

Where $iT(\cdot)$ is the cost of installation, in order to increase the capital stock by i units firm has to face the cost that is equal to $iT(\cdot)$. The installation cost function $(i/k)T(\cdot)$ is non negative and convex as shown in the figure 1. When there is no investment or zero investment, the installation cost function takes its minimum value that is zero. Here investment and disinvestment both are costly.

$$T(0) = 0, \quad T(\cdot) > 0, \quad 2T'(\cdot) + \frac{1}{kT''(\cdot)} > 0$$

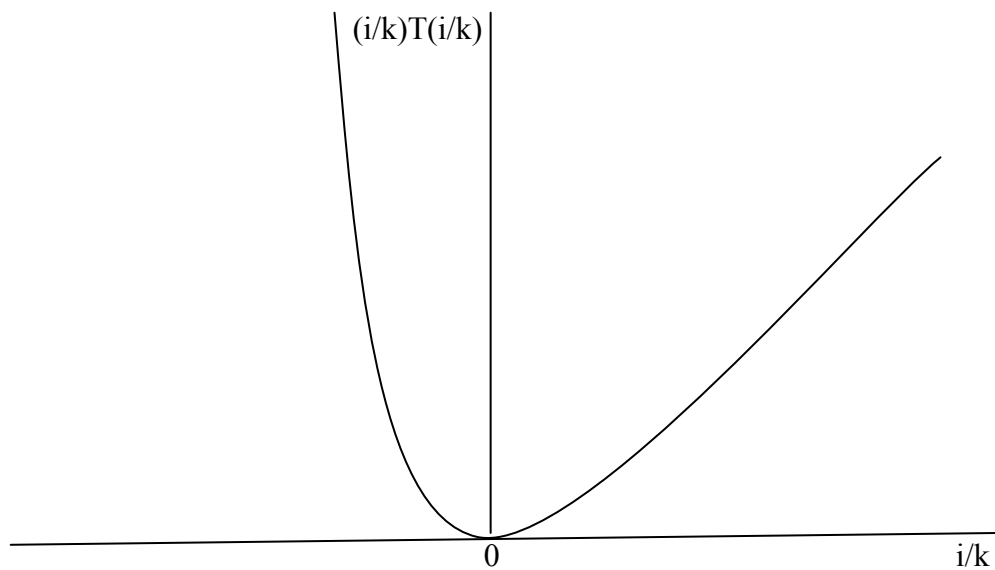


Figure 1

Cost of installation for investment

By putting in equations (4) the values of government expenditures and investment from above specifications we get

$$f(k(t)) \equiv C(t) + i(t) \left[1 + T \left(\frac{i(t)}{k(t)} \right) \right] + g(t)f(k(t)) + G(0) + NX \quad (7)$$

The current account deficit is equal to the change in external debt, which is equal to the interest payments minus net exports.

$$\frac{db(t)}{dt} = \theta b(t) - NX$$

$$NX = \theta b(t) - \frac{db(t)}{dt}$$

By putting the value of net exports into equation (7) and incorporating the foreign aid (A) the final budget constraint is derived as

$$f(k(t)) + A(t) = C(t) + i(t) \left[1 + T \left(\frac{i(t)}{k(t)} \right) \right] + g(t)f(k(t)) + G(0) + \theta b(t) - \frac{db(t)}{dt}$$

$$\frac{db(t)}{dt} = C(t) + i(t) \left[1 + T \left(\frac{i(t)}{k(t)} \right) \right] + g(t)f(k(t)) + G(0) + \theta b(t) - f(k(t)) - A(t) \quad (8)$$

If the country is able to borrow an unlimited amount at the prevailing interest rate it will induce ponzi game so in order to avoid it the restriction of non ponzi game has been applied i.e.

$$\lim_{t \rightarrow \infty} b(t)e^{-\theta t} = 0 \quad (9)$$

To solve the underlying optimization problem the present value Hamiltonian has been used in which the utility function (2) is maximized subject to budget constraint (8) and the capital accumulation equation (6), the costate variables are $-\mu(t)e^{-\theta t}$ and $\mu(t)q(t)e^{-\theta t}$ respectively.

$$H = \left[U(C(t)) - \mu(t) \left\{ C(t) + i(t) \left[1 + T\left(\frac{i(t)}{k(t)}\right) \right] + g(t)f(k(t)) \right\} + \mu(t)q(t)i(t) \right] e^{-\theta t} \\ + G(0) + \theta b(t) - f(k(t)) - A(t)$$

$$\frac{\partial H}{\partial C} = [U'(C(t)) - \mu(t)]e^{-\theta t} = 0 \quad (11)$$

$$\frac{\partial H_t}{\partial k} = -\mu(t)e^{-\theta t} \left[-f'(k(t)) - \left(\frac{i(t)}{k(t)}\right)^2 T'\left(\frac{i(t)}{k(t)}\right) + g(t)f'(k(t)) \right] = 0 \quad (12)$$

$$\frac{\partial H_t}{\partial i} = -\mu(t)e^{-\theta t} \left[1 + T\left(\frac{i(t)}{k(t)}\right) + \left(\frac{i(t)}{k(t)}\right) T'\left(\frac{i(t)}{k(t)}\right) \right] + \mu(t)q(t)e^{-\theta t} = 0 \quad (13)$$

$$\frac{\partial H_t}{\partial g} = -\mu(t)f'(k(t))e^{-\theta t} \quad (14)$$

$$\frac{\partial H_t}{\partial b} = -\mu(t)\theta e^{-\theta t} \quad (15)$$

From the above first order condition the following equations has been derived respectively.

$$U'(C(t)) = \mu(t) \quad (16)$$

$$\frac{d(\mu(t)q(t)e^{-\theta t})}{dt} = -\mu(t)e^{-\theta t} \left[(1 - g(t))f'(k(t)) + \left(\frac{i(t)}{k(t)}\right)^2 T'\left(\frac{i(t)}{k(t)}\right) \right] \quad (17)$$

$$1 + T\left(\frac{i(t)}{k(t)}\right) + \left(\frac{i(t)}{k(t)}\right)T'\left(\frac{i(t)}{k(t)}\right) = q(t) \quad (18)$$

$$\frac{d(-\mu(t)e^{-\theta t})}{dt} = -H_b$$

$$\frac{d(-\mu(t)e^{-\theta t})}{dt} = \mu(t)\theta e^{-\theta t} \quad (19)$$

$$\lim_{t \rightarrow \infty} -\mu(t)b(t)e^{-\theta t} = 0 \quad (20)$$

$$\lim_{t \rightarrow \infty} \mu(t)q(t)k(t)e^{-\theta t} = 0 \quad (21)$$

Equations (17) and (19) are the Euler equations for capital and external debt respectively. Equations (20) and (21) are the respective transversality conditions associated with debt and capital.

3.1.2. Consumption

In order to find out the growth rate of consumption, differentiate equation (19) with respect to time.

$$\frac{d(-\mu(t)e^{-\theta t})}{dt} = \mu(t)\theta e^{-\theta t}$$

$$-\left[\frac{d\mu(t)}{dt}e^{-\theta t} - \theta\mu(t)e^{-\theta t}\right] = \mu(t)\theta e^{-\theta t}$$

$$\left[\frac{d\mu(t)}{dt} - \theta\mu(t)\right]e^{-\theta t} = -\mu(t)\theta e^{-\theta t}$$

$$\frac{d\mu(t)}{dt} = \theta\mu(t) - \mu(t)\theta$$

$$\frac{d\mu(t)}{dt} = 0 \quad (22)$$

As from equation (16)

$$U'(C(t)) = \mu(t)$$

$$\frac{dU(C(t))}{dt} = \frac{d\mu(t)}{dt} = 0$$

$$\frac{\dot{C}(t)}{C(t)} = 0 \quad (22')$$

We can say that the consumption is smooth over time and it is independent of the interest rate and the subjective discount rate or the rate of time preference.

3.1.3. Consumption level

In order to find out the level of consumption, integrate the flow constraint (18) using transversality condition (20).

$$\frac{db(t)}{dt} = C(t) + i(t) \left[1 + T \left(\frac{i(t)}{k(t)} \right) \right] + gf(k(t)) + G(t) + \theta b(t) - f(k(t)) - A(t)$$

$$0 = \int_0^{\infty} \left[C(t) + i(t) \left(1 + T \left(\frac{i(t)}{k(t)} \right) \right) + gf(k(t)) + G(t) + \theta b(t) - f(k(t)) - A(t) \right] e^{-\theta t} dt$$

$$\int_0^{\infty} C(t) e^{-\theta t} dt = - \int_0^{\infty} \left[i(t) \left(1 + T \left(\frac{i(t)}{k(t)} \right) \right) + gf(k(t)) + G(0) - f(k(t)) \right] e^{-\theta t} dt - \int_0^{\infty} \theta b(t) e^{-\theta t} dt + \int_0^{\infty} A(t) e^{-\theta t} dt$$

$$\int_0^{\infty} C(t) e^{-\theta t} dt = \int_0^{\infty} \left[f(k(t)) - i(t) \left(1 + T \left(\frac{i(t)}{k(t)} \right) \right) - gf(k(t)) - G(0) \right] e^{-\theta t} dt - \int_0^{\infty} \theta b(t) e^{-\theta t} dt + \int_0^{\infty} A(t) e^{-\theta t} dt \quad (23)$$

$$\int_0^{\infty} \theta b(t) e^{-\theta t} dt = b(0) \quad \text{as} \quad \lim_{t \rightarrow \infty} \theta b(t) = b(0)$$

$$\int_0^{\infty} A(t)e^{-\theta t} dt = A(0) \quad \text{as} \quad \lim_{t \rightarrow \infty} A(t) = A(0)$$

Using above conditions equation (23) can be written as

$$\int_0^{\infty} C(t)e^{-\theta t} dt = \int_0^{\infty} \left[f(k(t)) - i(t) \left(1 + T \left(\frac{i(t)}{k(t)} \right) \right) - gf(k(t)) - G(0) \right] e^{-\theta t} dt - b(0) + A(0)$$

$$\int_0^{\infty} C(t)e^{-\theta t} dt = V(0) \tag{24}$$

The present discounted value of consumption is equal to net wealth at time zero $V(0)$, the present discounted value of net output (the contents of the braces and foreign aid minus initial level of debt). Since consumption is constant above equation implies that

$$C(t) = C(0) = \theta V(0) \tag{24'}$$

3.1.4. Investment

Equation (18) indicates that the investment rate is a function of $q(t)$ which is the shadow price of installed capital in terms of consumption goods. It also implies that:

$$q(t) = \mathcal{G} \left(\frac{i(t)}{k(t)} \right), \quad \mathcal{G}' \geq 0 \quad \text{and} \quad \mathcal{G}(0) = 1$$

From the above specification, inverse function can be formulated as:

$$\frac{i(t)}{k(t)} = \xi(q(t)) \quad \xi' \geq 0 \quad \text{and} \quad \xi(1) = 0$$

Put this value in the capital accumulation equation (6) and after replacement, it takes the form as:

$$\frac{dk(t)}{dt} = i(t) = k(t)\xi(q(t)), \quad \xi' \geq 0 \quad \text{and} \quad \xi(1) = 0 \tag{25}$$

Capital accumulation (investment) is a function of shadow price $q(t)$, to determine the value of this price consider equation (17), given (22),

$$\frac{dq(t)}{dt} = \theta q(t) - (1 - g(t))f'(k(t)) - \xi(q(t))^2 T'[\xi(q(t))] \tag{26}$$

Integrate equation (26) subject to transversality condition (21)

$$\begin{aligned}
0 &= \int_t^{\infty} \left[\theta q(t) - (1 - g(t)) f'(k(t)) - \xi(q(t))^2 T' \{ \xi(q(t)) \} \right] e^{-\theta t} dt \\
\int_t^{\infty} \theta q(t) e^{-\theta t} dt &= \int_t^{\infty} \left[(1 - g(t)) f'(k(t)) + \xi(q(t))^2 T' \{ \xi(q(t)) \} \right] e^{-\theta t} dt \\
q(t) &= \int_t^{\infty} \left[(1 - g(t)) f'(k(t)) + \xi(q(t))^2 T' \{ \xi(q(t)) \} \right] e^{-\theta t} dt \tag{27}
\end{aligned}$$

The shadow price $q(t)$ is equal to the present discounted value of marginal product. From equation (27) it becomes clear that investment is independent of the consumption, foreign aid and debt. As the economy is open so in the presence of exogenous real interest rate investment does not depend on the savings at all but the most exciting and significant result is that the investment decision is not independent of Governance expenditures. Whenever marginal propensity to invest in Governance increases it will encourage more investors to make investment.

3.1.5. Saving, Investment and Current Account

Saving is given as

$$S(t) = f(k(t)) - C(t) - g f(k(t)) - G(0) - \theta b(t) + A(t) \tag{28}$$

As we know that

$$C(t) = \theta V(t)$$

By putting the value of consumption in equation 28 we get

$$S(t) = f(k(t)) - \theta \int_0^{\infty} \left[f(k(z)) - i(z) \left(1 + T \left(\frac{i(z)}{k(z)} \right) \right) \right] e^{-\theta(z-t)} dz + (1 - \theta) [A(t) - g(t) f(k(t)) - G(0)]$$

From the final equation of saving, it becomes clear that whenever output is high compared to future expected output savings will be high. Savings are not independent of foreign aid; increase in foreign aid will lead to enhance savings positively but governance and public expenditures affect negatively. The equality of the marginal propensity to consume and interest rate simply implies whenever debt increases it will decrease the income and consumption equally, leaving savings unaffected.

Current Account Surplus = Saving - Investment

The difference between the savings and investment is known as current account surplus. Savings and investment are independent of debt stock and so the current account surplus but foreign aid affects it positively. Whenever government increase its expenditures either they are related to governance or other public expenses, it affects the current account surplus negatively.

3.1.6. Steady State and Dynamics

Equations (25) and (26) show the dynamics of the economy that determine capital, investment and output. The consumption level and the dynamics of debt are determined by (24') and (8).

3.1.6.1. Dynamics of Capital and Investment

In the steady state we know that

$$\frac{dk(t)}{dt} = \frac{dq(t)}{dt} = 0$$

From equation (25) it becomes clear that whenever $\xi(1) = 0$ it implies that change in

capital is equal to zero i.e. $\frac{dk(t)}{dt} = 0$ when $q(t)=1$. So in the steady state

$$q^* = 1$$

$$f'(k^*) = \theta$$

If we put this steady state value of q^* and marginal productivity of capital in equation (26) we find that:

$$\frac{dq(t)}{dt} = 0$$

This equation shows that in the steady state the rate of investment is equal to zero. The shadow price of capital must be equal to replacement cost while the marginal product of capital is equal to the discount rate, which is itself equal to the rate of time preference.

To analyze the dynamics of capital and investment around the steady state neighborhood equations (25) and (26) have been linearized around $q^* = 1$ and k^* . From equation (25)

we know that $\frac{\dot{k}(t)}{k(t)} = \xi(q(t))$ we can write it as

$$\frac{\dot{k}(t)}{k(t)} = \frac{d \ln(k(t))}{dt} = \xi(e^{\ln(q(t))}) = h_1(\ln(q(t))) \quad (30)$$

Using equation (26) we can write

$$\frac{\dot{q}(t)}{q(t)} = \theta - \frac{(1 - g(t))f'(k(t))}{q(t)} - \frac{\xi(q(t))^2 T'[\xi(q(t))]}{q(t)}$$

As we know that

$$\frac{\dot{q}(t)}{q(t)} = \frac{d \ln(q(t))}{dt}$$

We can rewrite the above equation as

$$\frac{d \ln(q(t))}{dt} = \theta - (1 - g(t))f'(e^{\ln(k(t))})e^{-\ln(q(t))} - \xi(e^{\ln(q(t))})^2 T'[\xi(e^{\ln(q(t))})]e^{-\ln(q(t))} = h_2(\ln(k(t)), \ln(q(t))) \quad (31)$$

The Taylor series approximation at $(k, q)=(k^*, l)$ simplifies because

$$h_1(\ln(q(t))) = h_2(\ln(k(t)), \ln(q(t))) = 0$$

The relevant partial derivatives of the equations (30) and (31) are

$$\frac{\partial h_1(\ln(q(t)))}{\partial \ln(q(t))} = \frac{\partial [\xi(e^{\ln(q(t)})]}{\partial \ln(q(t))} = \xi' \cdot e^{\ln(q(t))} = \xi' \cdot q(t) \quad (32)$$

$$\begin{aligned} \frac{\partial [h_2(\ln(k(t)), \ln(q(t)))]}{\partial \ln(q(t))} &= \frac{\partial \{ \theta - (1 - g(t))f'(e^{\ln(k(t))})e^{-\ln(q(t))} - \xi(e^{\ln(q(t))})^2 T'[\xi(e^{\ln(q(t)})]e^{-\ln(q(t))} \}}{\partial \ln(q(t))} \\ &= (1 - g(t))f'(e^{\ln(k(t))})e^{-\ln(q(t))} - \xi'(e^{\ln(q(t))})^2 T'[\xi(e^{\ln(q(t)})]e^{\ln(q(t))} + \xi(e^{\ln(q(t))})^2 T''[\xi(e^{\ln(q(t)})] \\ &\quad - \xi(e^{\ln(q(t))})^2 T'[\xi(e^{\ln(q(t)})]e^{-\ln(q(t))} \end{aligned} \quad (33)$$

$$\frac{\partial [h_2(\ln(k(t)), \ln(q(t)))]}{\partial \ln(k(t))} = \frac{\partial \{ \theta - (1 - g(t))f'(e^{\ln(k(t))})e^{-\ln(q(t))} - \xi(e^{\ln(q(t))})^2 T'[\xi(e^{\ln(q(t)})]e^{-\ln(q(t))} \}}{\partial \ln(k(t))}$$

$$\frac{\partial [h_2(\ln(k(t)), \ln(q(t)))]}{\partial \ln(k(t))} = -(1 - g(t))f''e^{-\ln(q(t))}$$

$$\frac{\partial [h_2(\ln(k(t)), \ln(q(t)))]}{\partial \ln(k(t))} = -\frac{(1 - g(t))f''}{q(t)} \quad (34)$$

By evaluating equation (32), (33) and (34) at steady state values of capital and shadow prices we get the following results respectively:

$$\frac{\dot{k}(t)}{k(t)} = \xi'(1) \cdot \ln\left(\frac{q}{q^*}\right) \quad (35)$$

$$\frac{\dot{q}(t)}{q(t)} = (1 - g(t))f'(k^*) \ln\left(\frac{q}{q^*}\right) - (1 - g(t))f'' \ln\left(\frac{k}{k^*}\right) \quad (36)$$

The log linearized equation (35) and (36) can be written in the matrix form as:

$$\begin{pmatrix} \frac{dk}{dt} \\ \frac{dq}{dt} \end{pmatrix} = \begin{pmatrix} 0 & \xi'(1)k^* \\ -(1-g(t))f''(k^*) & (1-g(t))f'(k^*) \end{pmatrix} \begin{pmatrix} k - k^* \\ q - 1 \end{pmatrix} \quad (37)$$

Figure 2 shows the dynamic behavior of investment and capital graphically corresponding to (37). The $dk(t)/dt=0$ locus shows the dynamics of capital, this line is horizontal at $q^*=1$; $dq(t)/dt=0$ locus is downward sloping. (The $dq(t)/dt=0$ locus is negatively sloped around the neighborhood, whenever the restriction of close neighborhood is violated there is no assurance that away from the steady state it is negatively sloped without the imposition of further restrictions on the $T(\cdot)$ function. However the restrictions imposed on $T(\cdot)$ are sufficient to ensure the negative slope of $dq(t)/dt=0$ locus around the steady state.)

The arrows show the direction of motion, the line SP is the saddle path that is negatively sloped and indicates a unique path converging to steady state. The saddle path indicates the dynamics of investment. Let k_0 indicates the initial level of capital at which $q_0 > q^*=1$. As the shadow price is greater than unity, capital accumulates over time. Output increases and so does net output while investment decreases over time due to diminishing marginal productivity.

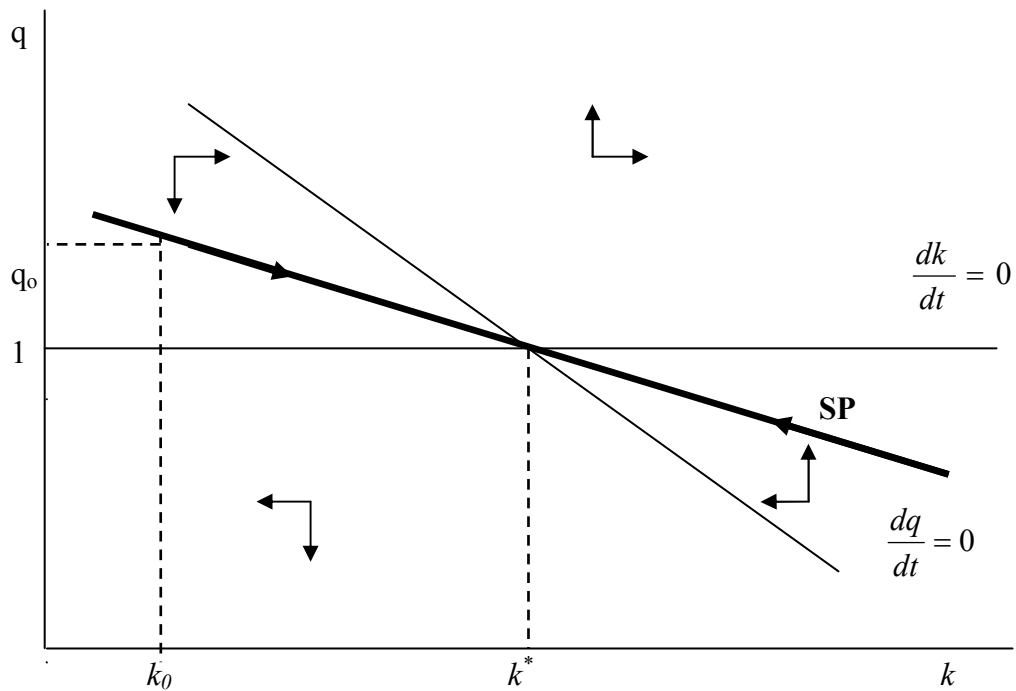


Figure 2
Dynamics of capital and investment

3.1.6.2. Dynamics of Consumption and Debt

From the Euler equation 22' for consumption it becomes clear that the consumption is smooth over time and it is independent of the interest rate or the rate of time preference. The consumption level is constant over time as revealed by the equation 24'. The level of consumption depends on the net output that is defined as:

$$\text{Net Output} = \text{Total Output} + \text{Foreign Aid} - \text{Stock of Debt} - \text{Cost of investment}$$

Let the stock of debt and foreign aid be zero initially then from equation 24, the present discounted value of net output minus consumption must be zero. Alternatively one can say that the present discounted value of current and future trade surpluses is zero.

Figure.3 describes this fact graphically, the area $AA'ODD'$ must be divided by horizontal consumption line in such a way that makes the present value of area $AA'O$ equals to present value of $DD'O$.

Net output depends on the changes in capital stock i.e. investment. Let the economy start somewhere below the steady state level with some initial capital stock k_0 (see figure.2), as the capital stock increases to its steady state level k^* , the net output also increases over time (see Figure.3). Net income increases from the level below consumption (see point A in Figure 3) and eventually exceeds consumption (see point O).

In the start net output is less than consumption and this gap will be financed by foreign aid and debt or by running current account deficit. Debt accumulates in the region $AA'O$ and after point O net income exceeds the consumption. The area $DD'O$ shows the trade surplus, in steady state the current account must be balanced. The interest payments on debt offset the trade surplus $\theta b^* = DD'O$, where b^* is the steady state level of debt that is positive.

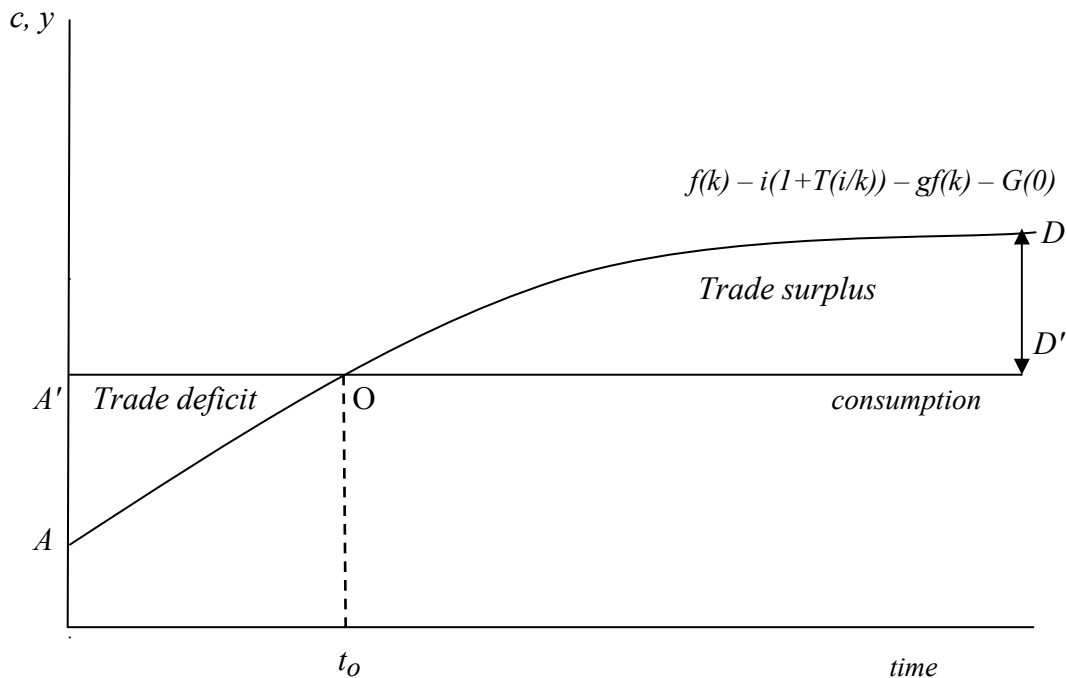


Figure 3
Consumption, net output, trade and current accounts

3.1.6.3. Governance and the Steady State Dynamics

Governance plays an important role in all the economic activities of a country. Good economic institutions promote growth by increasing the efficiency of factors of production. Governance has been taken as exogenous so whenever quality of governance improves it shifts the production function upward as shown in figure 4.

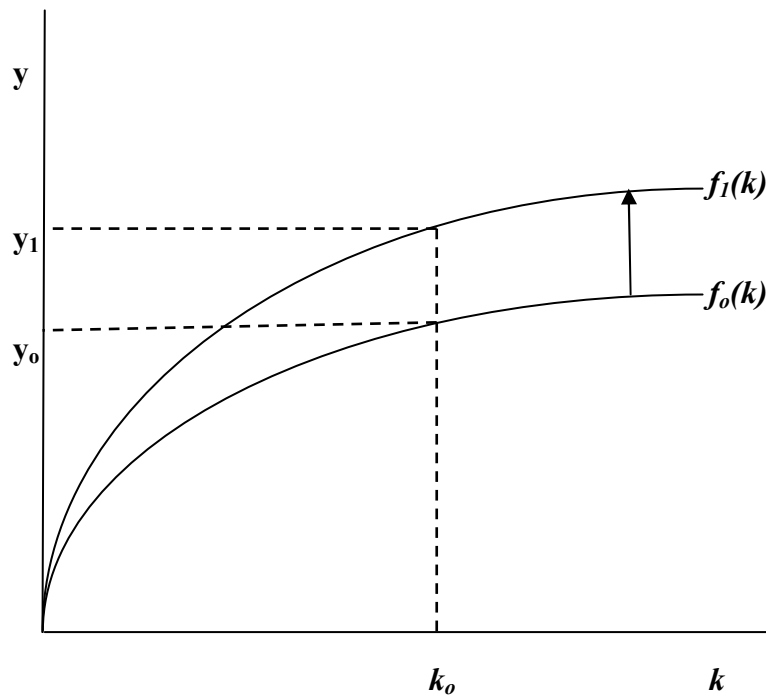


Figure 4
Governance and output

Improvement in the quality of governance increases the output for a given level of capital stock. Investment depends on the output as well as governance, so whenever output increases or the institutional quality improves it will enhance the investment.

Figure 5 shows the dynamics of investment and capital when quality of governance improves. Governance acts as a shifting parameter and it shift the $dq/dt=0$ locus to the right, the $dk/dt=0$ locus does not change its position.

The steady state of the economy shifts from P to P' , the steady state level of capital also increases from k^* to k'^* . SP' is the new saddle path, due to improvement in the quality of governance investment increases abruptly from P_0 to O as shown in figure 5. Then in the long run downward movement along the saddle path takes place from O to P_1 . Rate of investment is positive but decreasing over the period of time due to diminishing marginal productivity of capital.

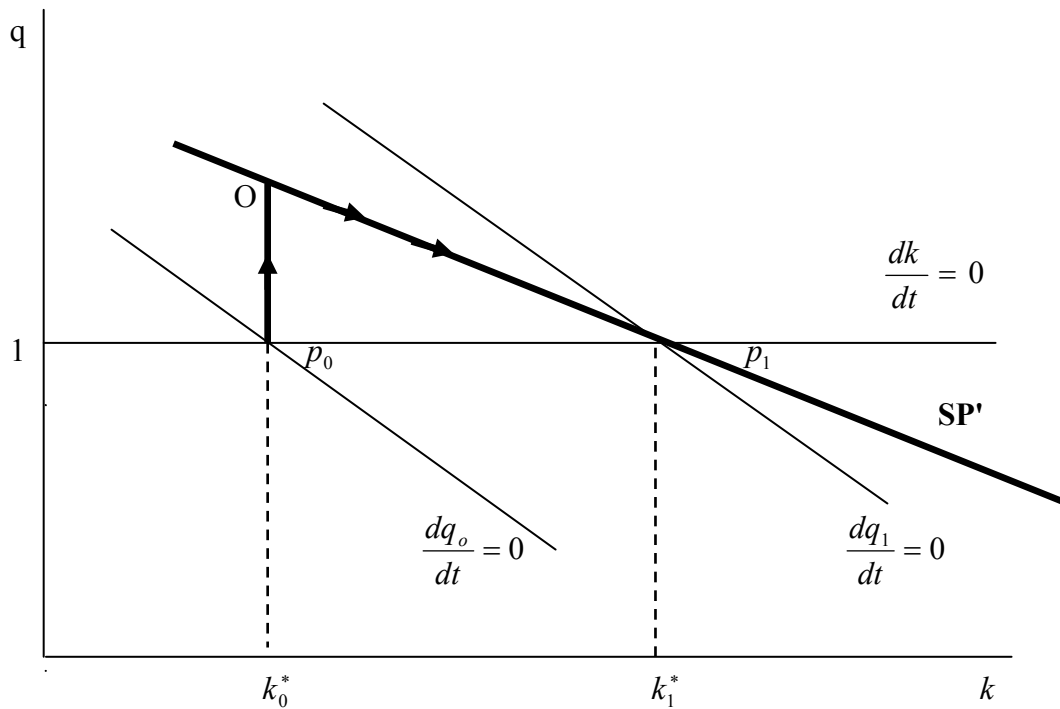


Figure 5
Effect of good governance on capital and investment

Initially whenever governance improves it enhance productivity, but it will increase consumption more than the net output due to which the deficit increases but in the long run net output increases and deficit turns into surplus, as shown in figure 6. In the start the deficit was equal to OEC but when consumption level increases it shifts the consumption curve from C to C' , now equilibrium shifts from E to E' and deficit increases by an area equals to $CC'EE'$.

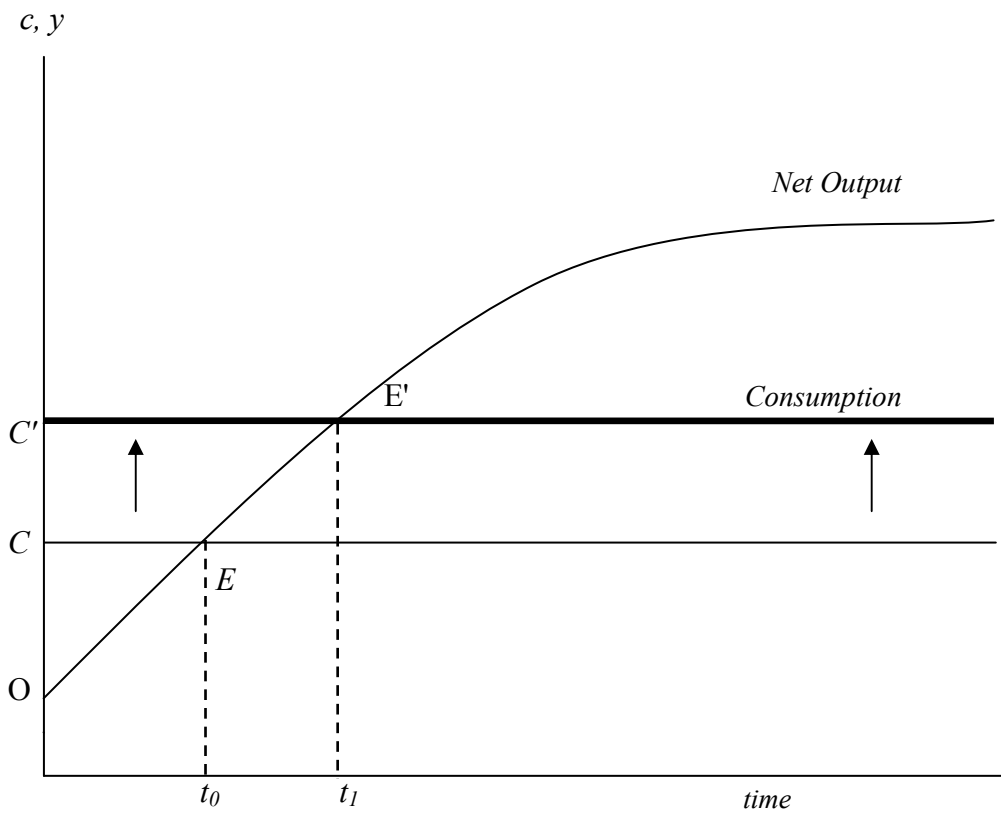


Figure 6
Effect of good governance on Consumption and net output

CHAPTER 4

4. Econometric Setup

This section describes in detail the empirical setup by illustrating the data sources, variables, empirical model and econometric estimation approaches.

4.1. Data Description and Sources

The sample consists of sixty developing countries that utilize foreign aid and external debt to fulfill the requirements for additional capital. Although data for economic growth are available for almost all the developing countries but the data for other variables like foreign aid, debt, governance and other control variables are not available for all the developing countries, this is the sole reason for the selection of sample of sixty countries. All the data in annual frequency have been taken from the World Development Indicators (WDI) and International Country Risk Guide (ICRG) published by the PRS Group. Due to the lack of earlier data for the quality of Governances, this analysis covers the period 1984 to 2008. The detailed description of variables with data sources and list of developing countries has been shown in table 1 and table 2 respectively.

4.1.1. Economic Growth (Y)

In economic literature, GDP growth or GDP per capita growth rates are used as proxy for economic growth. Many economists like Islam (2005), Feeny (2005), Fosu (1996), Lensink and Morrissey (2000) use GDP growth as proxy while Boone (1996) use per capita GNP growth. This study considers GDP per capita (annual percentage) to measure the economic growth.

4.1.2. Foreign Aid (ODA)

In order to measure Foreign aid Lensink and Morrissey (2000), Feeny (2005), Boone (1996) and Easterly (1999) use development aid as percentage of GDP, foreign aid to GDP and official development assistance to GDP ratio respectively. Net ODA received

as percentage of Gross National Income (GNI) has been considered in this study to measure foreign aid. Net official development assistance (ODA) includes loans that have at least 25% grant element in it (calculated at a rate of discount of 10 percent). To promote economic development in countries and territories in the Development Assistance Committee (DAC) list of ODA recipients, different organizations like multilateral institutions, official agencies of the members of the (DAC) and non-DAC countries give loans (net of repayments of principal) made on concessional terms and grants (World Development Indicator 2008).

4.1.3. External debt (ED)

Different studies such as that of Faini and DeMelo (1990), Fry (1989), Hoffman and Reisen (1991) and Fosu (1996) use Outstanding debt to exports ratio as well as Outstanding debt to GNP ratio as proxy for external debt burden, some other studies also consider debt service payment as a proxy. We use total debt service as a percentage of Gross National Income (GNI). Total debt service consists of interest and principal repayments on long-term debt actually paid in foreign currency, services, or goods, interest paid on short-term debt and repayments (charges and repurchases) to the IMF (World Development Indicator 2008).

4.1.4. Governance Quality (GOV)

To measure the quality of governance an index of 18 point scale has been generated, previously used by Knack and Keefer (1995) and then by Easterly (2003). The data set of 6 point scaled variables i.e. corruption, rule of law and bureaucratic quality has been taken from International Country Risk Guide (ICRG), where the lowest value indicates high corruption, bad quality of bureaucracy and rule of law.

4.1.5. Financial Development (M2)

Easterly (2003), Dalgaard and Hansen (2000), Hansen and Headey (2010) and many other economists in their studies use money and quasi money (M2) as a proxy for the development of financial sector. In the present study we take M2 as a percentage of GDP as a control variable. Money and quasi money (M2) can be defined as the sum of demand

deposits other than those of the central government, currency outside banks, savings deposits, time deposits and foreign currency deposits of resident sectors other than the central government (International Financial Statistics; World Development Indicator, 2008).

4.1.6. Physical Capital (INV)

Different economists use various proxies to capture the effect of physical capital accumulation on economic growth, but these are all close substitute to each other. Mosley (2000) and Pellegrini and Gerlagh (2004) use ratio of private investment to GDP and rate of physical capital investment as a proxy measure of physical capital accumulation respectively. We use gross fixed capital formation as a percentage of GDP as control variable. (see e.g. Levine and Renel, 1992; Mauro, 1995).Gross fixed capital formation takes account of land improvements (drains, ditches, fences etc); the construction of railways, roads, hospitals, offices, schools, private residential dwellings, and commercial and industrial buildings; plant, machinery and equipment acquisitions as well as net acquisitions of valuables are also considered as capital formation (World Development Indicator 2008).

4.1.7. Labor force (LF)

Labor force as a percentage of total population is used as a control variable. Total labor force includes all those employed and unemployed people with minimum age of 15 years, who supply labor during a specified period for the production of goods and services. While total population takes into account all residents regardless of their citizenship or legal status except refugees not settled permanently in the country of asylum, which are usually considered as part of the population of their country of origin (World Development Indicator, 2008). To capture the demographic impact Islam (2005), Knack (2001), Boschini and Olofsgard (2007) use population as a control variable.

4.1.8. Inflation (INF)

Inflation has been considered as variable separating macroeconomic conditions, taking GDP deflator as a measure for inflation.

4.1.9. Trade Openness (TO)

Trade openness is also a control variable that captures the liberalization policy of an economy. Trade openness is the sum of exports and imports of goods and services measured as a share of gross domestic product (GDP).

4.2. Econometric Methodology

4.2.1. Panel Unit Root Test

To test the stationarity of panel data the Im, Pesaran and Shin (IPS) test has been applied. Pesaran and Shin (1997) by using dynamic model with fixed effects proposed a test for random walk residuals. They assume that the number of cross section N and time T tend to infinity. Im, Pesaran and Shin basically extended the Levin and Lin (LL) test by permitting heterogeneity on the coefficient of $Y_{i,t-1}$ variable, IPS test allows different specifications of the residual variance, the parametric values and the lag lengths. They estimate the individual unit root test for each cross section and then calculate the average of the individual unit root test statistics. Model for IPS test can be specified as:

$$\Delta Y_{i,t} = \alpha_i + \rho_i Y_{i,t-1} + \sum_{k=1}^n \Pi_k \Delta Y_{i,t-k} + \delta_i t + u_{it}$$

The null hypothesis formulated here is that all series have unit root i.e. they all are non-stationary while the alternative hypothesis assumes that some of the series in the panel are stationary.

$$H_0: \rho_i = 0 \text{ for all } i$$

$$H_a: \rho_i < 0 \text{ for at least one } i$$

Im, Pesaran and Shin (1997) assume that T should be similar for all cross-sections, in order to compute the \hat{t} -statistic balanced panel is required. The \hat{t} -statistic is calculated by taking average of the individual ADF t -statistics for testing $\rho_i = 0$ for all i denoted by $t_{\rho i}$.

$$\hat{t} = \frac{1}{N} \sum_{i=1}^N t_{\rho i}$$

Under certain specific assumptions t_{ρ_i} converge to a statistic expressed as t_{iT} that is iid and also has finite mean and variance. The values for the mean $E[t_{iT}\rho_i = 0]$ and variance $\text{Var}[t_{iT}\rho_i = 0]$ of t_{iT} statistic has been calculated for different values of N and lags included in the augmented term of main equation. Using these values, the IPS statistic has been constructed for testing stationarity in panels that follow standard normal distribution as $T \rightarrow \infty$ followed by $N \rightarrow \infty$ sequentially.

$$t_{IPS} = \frac{\sqrt{N} \left(\hat{t} - \frac{1}{N} \sum_{i=1}^N E[t_{iT}\rho_i = 0] \right)}{\sqrt{\text{Var}[t_{iT}\rho_i = 0]}}$$

4.2.2. Empirical Model

Based on the theoretical consideration discussed earlier, the impact of foreign aid, external debt and Governance on economic growth has been estimated using fixed effects and random effects methods. Hausman test is used to make choice between both the methods.

4.2.2.1. The Fixed Effects Method

The fixed effect method allows the unobserved individual effects that are correlated with the included variables. This formulation of the model assumes that differences across groups can be captured in differences in the constant term. Constant term for each cross-section is treated as unknown parameter to be estimated. In the fixed effects model the constant is treated as country-specific. This means that the model allows for different constants for each country. So the model can be written as:

$$Y_{it} = \alpha_i + \alpha_1 A_{it} + \alpha_2 D_{it} + \alpha_3 G_{it} + \alpha_4 Z_{it} + v_{it}$$

Where Y_{it} is the annual per capita growth rate of GDP, A_{it} is net official development assistance as a percentage of GNI, D_{it} is debt service payment as a percentage of GNI, G_{it} is composite index of Governance, Z_{it} is a set of control variables that includes trade openness, population and M2 while v_{it} is error term.

4.2.2.2. The Random Effect Method

An alternative method of estimation is the random effects model. The difference between the fixed effects and the random effects model is that the latter takes the constants for each country not as fixed, but as random parameters. If the individual effects are strictly uncorrelated with the regressors, then it might be appropriate to model the individual specific constant terms as randomly distributed across countries. Hence the variability of the constant for each country can be expressed as:

$$\alpha_i = \alpha + \eta_i$$

Where η_i is standard random variable with zero mean. The Random effect model therefore takes the following form:

$$Y_{it} = \alpha + \alpha_1 A_{it} + \alpha_2 D_{it} + \alpha_3 G_{it} + \alpha_4 Z_{it} + (v_{it} + \eta_i)$$

4.2.2.3. Random Effect Verses Fixed Effect Method

In order to choose the appropriate method between random effect and fixed effect methods, the Hausman test has been used. The null and alternative hypothesis can be formulated as:

H₀ : Random effects are consistent and efficient.

H_a : Random effects are inconsistent.

The Hausman test statistics follow chi square distribution and we can estimate the test statistics using the following formula:

$$H = (\Omega^{FE} - \Omega^{RE})' [\text{Var}(\Omega^{FE}) - \text{Var}(\Omega^{RE})]^{-1} (\Omega^{FE} + \Omega^{RE}) \sim \chi^2$$

Here Ω is a vector of slope coefficients. If the difference between the parameters being estimated by random effect and fixed effect method is high then the value of Hausman test statistics will be high significantly. Large value of test statistic provides evidence against the null hypothesis while small value refers to the rejection of alternative hypothesis.

CHAPTER 5

5. Empirical Findings

Based on the empirical setup described in the previous chapter, this part explains the empirical results. For this purpose the chapter is further subdivided into different sections that explain in detail the summary statistics, correlation matrix, covariance matrix, stationarity of variables, empirical model interpretation and its robustness in a subsequent manner.

5.1. Summary Statistics

Table 3 describes the summary statistics i.e. mean, median, standard deviation, skewness etc for all the variables. Table 4 and Table 5 explain the correlation matrix and covariance matrix. From correlation matrix it is depicted that governance, investment, labor force, M2, inflation and trade openness is positively correlated with the per capita income. This indicates the fact that whenever there is an increase in these variables it will enhance the per capita income of an economy. It becomes more evident from table 4 that the foreign aid and external debt affect the per capita income adversely; it looks like a burden on the economy. The covariance matrix also explains the results in a similar manner, foreign aid and external debt covariate with per capita income negatively while all the other variables covariate positively.

5.2. Unit Root Test

To check the stationarity of the all variables, Im, Pesaran and Shin (IPS) test has been applied. Results are shown in table 6. External debt, foreign aid and investment as a percentage of GNI, Per capita income and governance are stationary at level with an intercept i.e. integrated of order zero, as the probability is less than 0.05 for all these variables that provides an evidence to reject the null hypothesis of individual unit root. M2 as a percentage of GNI and the variable of trade openness are also stationary at level with intercept and trend. Inflation as well as the labor force is non-stationary at level, both the variables are co-integrated of order one $I(1)$ with an intercept.

5.3. Hausman Test

The basic empirical model as specified in the last chapter has been estimated using fixed effect method as well as Random effect method, results are shown in table 7. To check out which method is more appropriate Hausman test that is among the widely used class of tests in the subject of econometrics, has been applied. The underlying rationale behind the Hausman test is to contrast the two different set of estimates. It compares both the estimation methods in a way so that, one set of estimate is consistent under the null as well as the alternative hypothesis while the other one is consistent just under the null hypothesis. Larger is the distance between the two sets of estimates the evidence will go in favor of alternative hypothesis. Table 8 describes the outcomes of Hausman test; results are further divided into three sub-sections. The first section illustrates the test statistic and an overall summary of results, which provides evidence against the null hypothesis i.e. random effects are consistent and efficient.

The second section presents additional details about Hausman test, here two sets of estimates are shown, of which the one belongs to fixed effects method and the other to random effects method. The variance of the difference between two set of estimates has also been presented along with associated probabilities for the null hypothesis i.e. no difference between the two set of estimates. The results indicate except governance and investment all the other variables have probability less than 0.05 that simply rejects the null hypothesis. It can be concluded from all these indications that there exist a distance between the coefficients belonging to two different set of estimates and it favors the fixed effect method which is more consistent and efficient. The third section simply estimates the model using fixed effect method.

5.4. Model Estimation and Interpretation of Results

As the Hausman test is in favor of fixed effect method, so the empirical model has been estimated using this technique. Per capita income has been taken as the dependent variable; governance, foreign aid and external debt are the main variables of concern while investment, labor force and M2 are taken as control variables. Results are described in table 7. The R-square value shows the regression fit and its value is 0.25 and 0.23 in Model (1) and Model (2) respectively. Although the value of R-square is low but the probability of F-statistics is zero, this ensures the effectiveness of empirical estimates.

The first and the most important variable of interest is governance, in model (1) & (2) the coefficient of governance is positive and also highly significant that shows good governance enhances the output. Whenever governance of an economy improves it will definitely promote economic growth and the positive sign of coefficient is in accordance with the expectations. Improvement in governance means low corruption, high quality of bureaucracy and sound rule of law, all of these factors will reduce the economic cost of transaction and create a favorable environment for investment.

The second variable of main concern is aid/GNI, in model (2) lagged variable of aid/GNI has been used that is significant at the level of 1%. The current inflows of foreign aid in an economy will not affect economic activities and output immediately, time is required for the management and the utilization of funds that are coming in the form of foreign aid. In order to inject these funds in an economy a properly planned projects are required, unfortunately in case of developing countries the issue of lack of funding is always there and they usually depend on foreign aid for the implementation of new projects, but the availability of resources in the form of foreign aid is not guaranteed most of the time. All these factors hinder economic growth and provide main reasons due to which the lagged values for foreign aid variable has been taken. The result shows that whenever there is 1% increase in aid/GNI, it will spur per capita growth rate by 0.065%.

The third variable that is especially relevant to this study is the external debt, debt service payment/GNI has been taken as proxy for the debt burden and it is affecting the economic growth negatively. The coefficient of debt/GNI is significant at the level of 5%. If debt burden increases by 1% it will adversely affect economic growth by 0.047%. The outflow of debt service payments actually reduces the funds that can be alternatively used for investment purpose, more indebted an economy is the more will be the debt service payment and less will be economic growth.

Investment/GNI and labor force/population are taken here as control variables that are significant at the level of 1%, both have positive coefficients, implying any increase in investment activity or labor force will boost up economic growth. The results point out that if investment/GNI and labor force increase by 1% it will amplify economic growth by 0.16% and 0.36% respectively.

5.5. Sensitivity Analysis and Robustness

The results can be challenged potentially, as subject to omitted variable bias. There is a possibility of exclusion of those variables that are closely related to the variables under study. To check out the robustness of the main variables of interest, sensitivity analysis has been conducted by adding and dropping different control variables in the basic model. For this purpose ten different regressions using fixed effect method have been estimated and the results are shown in table 9. In model (1) key variables have been included in the regression equation and the results do not change in this case. Governance and foreign aid have positive while debt has negative impact on economic growth, all the relevant coefficients are also highly significant. In model (2) investment has been included but again the results remain consistent and significant. Similarly in the subsequent models different variables have been included in alternative ways and despite of various different specifications the sign and significance of coefficients of governance, foreign aid and debt remain consistent. This sensitivity analysis confirms the robustness of the results.

CHAPTER 6

6.1 Conclusion

In this study we have developed a model for governance; the Ramsey-Cass-Koopmans model has been extended by incorporating governance in an open economy. External debt and foreign aid do not affect the growth rate of consumption but have level impact on consumption. Foreign aid and governance encourage the economic growth but external debt creates a burden on the economy. Both Investment and saving are independent of external debt and thus the current account surplus. Foreign aid does not affect investment directly but it has a direct positive impact on the savings in the economy. Improvements in the quality of governance will stimulate the output and consumption rapidly and it acts like a catalyst. Steady state dynamics of output, governance, debt, consumption, capital and investment have been discussed in detail.

On the bases of theoretical model being developed in chapter 3 an empirical model has been developed in the succeeding chapter that has strong underpinnings in it. Empirically this model has been estimated using the fixed effect method for the data set of 60 developing countries (1984-2008). Impact of governance, foreign aid and external debt on the economic growth has been tested; all the results are significant and according to expectations. The results are consistent with the theoretical model developed in chapter 3. Governance stimulates the output positively, foreign aid also behaves in a similar manner but the external debt has adverse impact on the output growth. Variety of different specification has been applied for the sensitivity analysis and it proves the robustness of the regression results.

6.2. Policy Implications

The theoretical as well as the empirical results are of immense relevance for policy purpose. On the basis of results it is recommended that to achieve elevated economic growth rates; developing countries must have impartial and consistent set of rules that ensure the preeminent quality of governance. Good governance is essential and it plays a vital role in determining the destination of a country. Most of the developing countries usually have poor governance and it is the major obstacle that hinders the economic reform and development process.

Foreign aid and external debt are the sources through which developing countries finance their budget deficit. Foreign aid has a positive impact on economic growth and it is playing a constructive role in spurring the economic activity of an economy. External debt has a negative impact on economic growth and it's a burden that puts an economy into trouble. It is recommended on the basis of this study that developing countries should finance budget through foreign aid and not depend on the external debt as it affects the economic activities adversely. If government pays more attention to the institutional quality and uses foreign aid effectively then it will have good impact on economic growth in the long run. Developing countries should try to pay more attention to the issue of lack of quality governance and side by side they must indulge in those activities that augment the tax revenues.

APPENDIX

Table 1
Description of Variables

| S. No. | Variable | Description / Source |
|---------------|---------------------------|---------------------------------------------------------------------------------------------------------------------|
| 1. | <i>Economic Growth</i> | GDP per capita growth (% annual). / WDI |
| 2. | <i>Foreign Aid</i> | Net Official development assistance as a percentage of GNI. /WDI |
| 3. | <i>External Debt</i> | Total debt service as a percentage of GNI. /WDI |
| 4. | <i>Governance Quality</i> | ICRG Composite index of bureaucracy quality, Rule of law and corruption, annual data (0-18 point scale)./PRS Group. |
| 5. | <i>Financial Depth</i> | Money and quasi money (M2) as % of GNI / WDI |
| 6. | <i>Investment</i> | Gross fixed capital formation as percentage of GNI. /WDI |
| 7. | <i>Labor Force</i> | Total labor force/Total Population. /WDI |
| 8. | <i>Inflation</i> | GDP deflator. / WDI |
| 9. | <i>Trade Openness</i> | Sum of Imports and Exports as a ratio of GDP. / WDI |

Table 2

| List of Developing Countries | | |
|-------------------------------------|---------------|------------------|
| Algeria | Ghana | Panama |
| Bangladesh | Guatemala | Paraguay |
| Bolivia | Kenya | Peru |
| Botswana | Guinea-Bissau | Pakistan |
| Brazil | Guyana | Papua New Guinea |
| Burkina Faso | Honduras | Philippines |
| Cameroon | India | Senegal |
| Chile | Indonesia | Sierra Leone |
| Colombia | Iran | Sudan |
| Congo | Jamaica | Sri Lanka |
| Congo, DR | Jordan | Syria |
| Costa Rica | Madagascar | Uruguay |
| Cote d'Ivoire | Malawi | Thailand |
| Dominican Republic | Malaysia | Togo |
| Ecuador | Mali | Tunisia |
| Egypt | Mexico | Turkey |
| El Salvador | Morocco | Uganda |
| Ethiopia | Mozambique | Venezuela |
| Gabon | Nicaragua | Zambia |
| Gambia | Niger | Zimbabwe |

Table 3
Summary Statistics

| | Mean | Median | Maximum | Minimum | Std. Dev. |
|-----|--------|--------|---------|---------|-----------|
| Y | 1.42 | 1.94 | 21.76 | -29.48 | 4.47 |
| GOV | 7.06 | 7 | 13 | 1 | 2.32 |
| ODA | 7.44 | 3.2 | 98.75 | -0.73 | 10.74 |
| ED | 6.37 | 5.37 | 107.37 | 0.03 | 5.82 |
| LF | 38.8 | 39.63 | 57.62 | 0.96 | 7.54 |
| M2 | 37.49 | 30.01 | 144.56 | 0.52 | 24.66 |
| INV | 20.96 | 20.62 | 60.62 | -12.6 | 7.3 |
| INF | 108.53 | 101.86 | 369.28 | 2.81 | 41.43 |
| TO | 71.28 | 61.39 | 302.48 | 10.92 | 41.88 |

Table 4
Correlation Matrix

| | Y | GOV | ODA | ED | INV | LF | M2 | INF | TO |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|----|
| Y | 1 | | | | | | | | |
| GOV | 0.17 | 1 | | | | | | | |
| ODA | -0.07 | -0.18 | 1 | | | | | | |
| ED | -0.07 | 0.07 | 0.15 | 1 | | | | | |
| INV | 0.24 | 0.24 | -0.05 | 0.16 | 1 | | | | |
| LF | 0.09 | 0.03 | 0.05 | 0.02 | 0.05 | 1 | | | |
| M2 | 0.1 | 0.28 | -0.26 | 0.21 | 0.34 | -0.11 | 1 | | |
| INF | 0.01 | -0.08 | 0.05 | -0.23 | -0.03 | 0.27 | -0.12 | 1 | |
| TO | 0.06 | 0.12 | 0.05 | 0.33 | 0.44 | 0.12 | 0.47 | -0.03 | 1 |

Table 5
Covariance Matrix

| | Y | GOV | ODA | ED | INV | LF | M2 | INF | TO |
|-----|-------|-------|-------|--------|-------|--------|--------|--------|--------|
| Y | 19.94 | | | | | | | | |
| GOV | 1.79 | 5.4 | | | | | | | |
| ODA | -3.23 | -4.6 | 115.2 | | | | | | |
| ED | -1.74 | 0.88 | 9.07 | 33.87 | | | | | |
| INV | 7.9 | 4.05 | -4.18 | 6.69 | 53.23 | | | | |
| LF | 2.98 | 0.61 | 4.38 | 0.93 | 2.89 | 56.85 | | | |
| M2 | 11.35 | 16.29 | -67.7 | 30.72 | 60.61 | -20.13 | 607.9 | | |
| INF | 1.24 | -7.57 | 22.54 | -55.38 | -8.99 | 84.54 | -120.1 | 1716 | |
| TO | 10.81 | 11.23 | 21.62 | 79.94 | 134 | 38.46 | 486.4 | -44.42 | 1752.8 |

Table 6
Panel Unit Root Test
Im, Pesaran and Shin W-stat

| Variables | Statistic | Probability | Intercept & Trend | Order of Integration |
|-----------|-----------|-------------|-------------------|----------------------|
| Y | -17.8925 | 0.0000 | Intercept | I(0) |
| GOV | -2.1056 | 0.0176 | Intercept | I(0) |
| ED | -5.7528 | 0.0000 | Intercept | I(0) |
| ODA | -5.8128 | 0.0000 | Intercept | I(0) |
| INV | -3.3685 | 0.0004 | Intercept | I(0) |
| M2 | -2.9152 | 0.0018 | Intercept & Trend | I(0) |
| TO | -2.7619 | 0.0029 | Intercept & Trend | I(0) |
| INF | -16.3490 | 0.0000 | Intercept | I(1) |
| LF | -11.2676 | 0.0000 | Intercept | I(1) |

Table 7
Empirical Findings
Dependent Variable (Y)

| Variable | Fixed Effect (1) | Fixed Effect (2) | Random Effect (3) |
|---------------------|------------------------|------------------------|-----------------------|
| GOV | 0.1932 (2.5057)* | 0.2124 (3.1994)* | 0.2162 (3.7295)* |
| ODA(-1) | 0.0660 (3.5410)* | 0.0653 (3.7402)* | 0.0237 (1.7851)*** |
| ED | -0.0462 (-1.9242)** | -0.0474 (-2.0640)** | -0.0684 (-3.3060)* |
| INV | 0.1532 (6.2530)* | 0.1601 (7.2624)* | 0.1570 (8.3453)* |
| LF | 0.4058 (6.3602)* | 0.3623 (6.7677)* | 0.0659 (3.0125)* |
| M2 | -0.0637 (-5.1300)* | -0.0512 (-4.6893)* | -0.0045 (-0.6738) |
| C | -16.6688 (-6.5271)* | -15.7494 (-7.3937)* | -5.4929 (-5.4459)* |
| AR(1) | 0.1329 (-4.8855)* | | |
| R-squared | 0.2515 | 0.2297 | 0.0767 |
| Adjusted R-squared | 0.2139 | 0.1933 | 0.0728 |
| Durbin-Watson stat | 2.0254 | 1.7387 | 1.6176 |
| F-statistic | 6.6839 | 6.3032 | 19.8262 |
| Prob(F-statistic) | 0.0000 | 0.0000 | 0.0000 |
| No. of Observations | 1380 | 1440 | 1440 |

Note: All the values in the parenthesis denote the student t-statistics. The *, ** and *** indicates the significance level at 1%, 5% and 10% respectively.

Table 8
Hausman Test

| Correlated Random Effects - Hausman Test | | | |
|------------------------------------------|-------------------|--------------|--------|
| Test cross-section random effects | | | |
| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
| Cross-section random | 73.9858 | 6.0000 | 0.0000 |

Cross-section random effects test comparisons

| Variable | Fixed | Random | Var(Diff.) | Prob. |
|----------|---------|---------|------------|--------|
| GOV | 0.2124 | 0.2162 | 0.0010 | 0.9066 |
| ODA(-1) | 0.0653 | 0.0237 | 0.0001 | 0.0002 |
| ED | -0.0474 | -0.0684 | 0.0001 | 0.0357 |
| INV | 0.1601 | 0.1570 | 0.0001 | 0.7842 |
| LF | 0.3623 | 0.0659 | 0.0024 | 0.0000 |
| M2 | -0.0512 | -0.0045 | 0.0001 | 0.0000 |

Cross-section random effects test equation

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| C | -15.7494 | 2.1301 | -7.3937 | 0.0000 |
| GOV | 0.2124 | 0.0664 | 3.1994 | 0.0014 |
| ODA(-1) | 0.0653 | 0.0175 | 3.7402 | 0.0002 |
| ED | -0.0474 | 0.0230 | -2.0640 | 0.0392 |
| INV | 0.1601 | 0.0221 | 7.2624 | 0.0000 |
| LF | 0.3623 | 0.0535 | 6.7677 | 0.0000 |
| M2 | -0.0512 | 0.0109 | -4.6893 | 0.0000 |

Effects Specification

Cross-section fixed (dummy variables)

| | | | |
|--------------------|--------|----------------------|--------|
| R-squared | 0.2297 | F-statistic | 6.3032 |
| Adjusted R-squared | 0.1933 | Prob(F-statistic) | 0.0000 |
| Durbin-Watson stat | 1.7387 | Hannan-Quinn criter. | 5.7417 |

Table 9
Robustness Check & Sensitivity Analysis

| Variable | 1 | 2 | 3 | 4 | 5 |
|-------------------|---------------------|---------------------|----------------------|----------------------|-----------------------|
| C | -0.043 (-0.067) | -3.364 (-5.182)* | -14.885 (-6.961)* | -16.669 (-6.527)* | -14.902 (-6.873)* |
| GOV | 0.196 (2.385)** | 0.160 (2.382)** | 0.189 (2.836)* | 0.193 (2.506)* | 0.205 (3.090)* |
| ODA(-1) | 0.083 (4.301)* | 0.064 (3.642)* | 0.073 (4.168)* | 0.066 (3.541)* | 0.060 (3.402)* |
| ED | -0.064 (-2.579)* | -0.065 (-2.813)* | -0.045 (-1.947)** | -0.046 (-1.924)** | -0.043 (-1.882)*** |
| INV | - | 0.173 (7.738)* | 0.160 (7.218)* | 0.153 (6.253)* | 0.151 (6.723)* |
| LF | - | - | 0.293 (5.649)* | 0.406 (6.360)* | 0.323 (5.664)* |
| M2 | - | - | - | -0.064 (-5.130)* | -0.054 (-4.919)* |
| TO | - | - | - | - | 0.015 (2.034)** |
| INF | - | - | - | - | - |
| AR(1) | 0.177 (6.569)* | - | - | 0.133 (-4.8855)* | - |
| R-squared | 0.196 | 0.199 | 0.217 | 0.252 | 0.232 |
| Adj R-squared | 0.157 | 0.163 | 0.181 | 0.214 | 0.195 |
| D-Watson stat | 2.028 | 1.697 | 1.740 | 2.025 | 1.746 |
| F-statistic | 5.087 | 5.433 | 5.967 | 6.684 | 6.285 |
| Prob(F-statistic) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| No. of Obs. | 1380 | 1440 | 1440 | 1380 | 1440 |

Note: All the values in the parentheses show the t-statistics. Values that are significant at 1%, 5% and 10% levels of significance are indicated by *, ** and *** respectively

Table 9 (Continued)
Robustness Check & Sensitivity Analysis

| Variable | 6 | 7 | 8 | 9 | 10 |
|-------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| C | -3.486 (-4.316)* | -14.433 (-5.456)* | -3.484 (-4.154)* | -5.672 (-6.706)* | -4.600 (-5.235)* |
| GOV | 0.165 (2.473)** | 0.248 (3.152)* | 0.176 (2.626)* | 0.157 (2.347)** | 0.171 (2.563)* |
| ODA(-1) | 0.050 (2.791)* | 0.077 (4.073)* | 0.069 (3.853)* | 0.068 (3.778)* | 0.060 (3.330)* |
| DEBT | -0.057 (-2.443)** | -0.043 (-1.768)*** | -0.051 (-2.1385)** | -0.040 (-1.669)*** | -0.040 (-1.672)*** |
| INV | 0.154 (6.768)* | - | 0.172 (7.726)* | 0.155 (6.784)* | 0.152 (6.708)* |
| LF | - | 0.385 (5.553)* | - | - | - |
| M2 | -0.041 (-3.757)* | -0.070 (-5.444)* | -0.037 (-3.403)* | - | -0.046 (-4.195)* |
| TO | 0.029 (4.192)* | 0.022 (2.558)** | - | 0.022 (3.200)* | 0.028 (4.032)* |
| INF | - | - | 0.012 (3.366)* | 0.009 (2.559)* | 0.011 (3.166)* |
| AR(1) | - | 0.146 (5.409)* | - | - | - |
| R-squared | 0.214 | 0.233 | 0.211 | 0.210 | 0.220 |
| Adj R-squared | 0.177 | 0.194 | 0.173 | 0.172 | 0.182 |
| D-Watson stat | 1.714 | 2.026 | 1.700 | 1.725 | 1.723 |
| F-statistic | 5.758 | 6.042 | 5.637 | 5.611 | 5.859 |
| Prob(F-statistic) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| No. of Obs. | 1440 | 1380 | 1440 | 1440 | 1440 |

Note: All the values in the parentheses show the t-statistics. Values those are significant at 1%, 5% and 10% levels of significance are indicated by *, ** and *** respectively.

References:

- (IMF), I. M. (1989). IMF World Economic Outlook, Supplementary Note 1.
- Abu Bakar, N., & Hassan, S. (2008). Empirical Evaluation On External Debt Of Malaysia. *International Business & Economics Research Journal* , 7 (2), 95-108.
- Acemoglu, D., & Robinson, J. (2008). The Role of Institutions in Growth and Development. *Commission on Growth and Development. Working Paper No.10* .
- Alesina, A. a. (2000). Who gives foreign aid to whom and why? *Journal of Economic Growth* , 5 (1), 33-63.
- Arellano, M., & Bover, O. (1995). Another Look at the Instrumental Variable Estimation of Error Component Models. *Journal of Econometrica* , 68 (1), 29-51.
- Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy* , 98 (5), 103-26.
- Blancherd, O. J., & Fischer, S. (1994). *Lectures on Macroeconomics* (8th ed.).
- Blundell, R., & Bond, S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics* , 87 (1), 115-143.
- Boone, P. (1996). Politics and the effectiveness of foreign aid. *European Economic Review* , 40, 289-329.
- Boschini, a., & Olofsgard, A. (2007). Foreign aid: An instrument for fighting communism. *Journal of Development Studies* , 43 (4), 622-648.
- Brautidam, D. (n.d.). Aid dependence and governance. *Stockholm: Almqvist & Wiksell International* .
- Brautigam, D. A., & Knack, S. (2004). Foreign aid, institutions and governance in Sub-saharan Africa. *Economic Development and Cultural Change* , 52 (2), 255.
- Buhr, A. a. (2008). Volatility of development aid : from frying pan into the fire . *World Development* , 2048-2066.
- Buhr, A., & Hamann, A. (2003). Aid volatility : An empirical assessment. *IMF staff papers* , 50 (1), 64-89.
- Burnside, C. a. (2000). Aid, policies and growth. *American Economic Review* , 90 (4), 847-868.
- Burnside, C. a. (2000). Aid, policies and growth: revisiting the evidence. *World Bank Policy Research Paper O-2834* .
- Casella, A. a. (1994). Can foreign aid accelerate stabilization. *National Bureau of Economic Research Working Paper, 4694* .

- Chenery, H. B. (1966). Foreign assistance and economic development. *American Economic Review* , 56, 679-733.
- Chowdhury, K. (2000). Australia's External Debt: Is it a Symptom or a Cause of Economic Slowdown? *Journal of Economic and Social Policy* , 5 (1).
- Clements, B. R. (2004). "External Debt, Public Investment, and Growth in Low-Income Countries". *IMF Working Paper* , 249 (3).
- Cohen, D. (1993). "Low Investment and Large LCD Debt in the 1980's". *The American Economic Review* , 83 (3).
- Collier, P. a. (2004). Aid, policy and growth in post-conflict societies. *European Economic Review* , 48 (5), 1125-1145.
- Corden, W. M. (1998). Debt relief and adjustment incentives. *IMF Papers* , 35, 628-643.
- Crawford, G. Foreign aid and political conditionality: Issues of effectiveness and consistency. *Democratization* , 4 (3), 69-108.
- Dalgaard, C. a. (2001). On aid, growth and good policies. *Journal of Development Studies* , 37 (6), 17-41.
- Dalgaard, C. H. (2004). On the empirics of foreign aid and growth. *The Economic Journal* , 114 (496), 191-216.
- Dawson, J. W. (1998). Institutions, Investment and Growth: New Cross-Country and Panal Data Evidence. *Economic Enquiry* , XXXVI, 603-619.
- Decker, J. H., & Lim, J. J. (2008). What Fundamentally Drives Growth? Revisiting the Institutions and Economic Performance Debate. *Journal of International Development* , 698-725.
- Djankov, S., La Porta, R., Lopez-de, S., & Shleifer, A. (2002). The Regulation of Entry. *Quarterly Journal of Economics* , 117 (1), 1-37.
- Dollar, D., & Pritchett, L. (1998). Assessing aid: What works, what doesn't and why. Newyark: Oxford University Press.
- Easterly, W. (2003). Can foreign aid buy growth. *Journal of Economic Perspectives* , 17 (3), 23-48.
- Easterly, W. R. (2004). Aid, policies and growth: Comment. *American Economic Review* , 94, 774-780.
- Easterly, W. (1999). The Gost of Financing Gap: Testing the Growth Model Used in the International Financial Institutions. *Journal of Development Economics* , 60 (2), 423-238.
- Ekanayake, E. M., & Chatrna, D. (n.d.). The effect of foreign aid on economic growth in developing countries. *Journal of International Business and Cultural Studies* .

- Ezeabasili, V. N., Isu, H. O., & Mojekwu, J. N. (2011). Nigeria's External Debt and Economic Growth: An Error Correction Approach. *International Journal of Business and Management* , 6 (5), 156-170.
- Faini, R., & J, D. (1990). Adjustment, investment and real exchange rate in developing countries. *Economic Policy* , 11, 492-512.
- Feeny, S. (2006). Economic impact of foreign aid to Melanesia. *Journal of the Asia Pacific Economy* , 12 (1), 34-60.
- Feeny, S. (2005). The impact of foreign aid in economic growth in Papua New Guinea. *Journal of Development Studies* , 41 (6), 1095-1117.
- Feld, L. P., & Kirchgassner, G. (2008). Institutions and Economic Growth: A survey of the Recent Empirical Evidence. *SCALA Discussion Paper No. 11/2008* .
- Foreign Capital Inflows and Growth in Pakistan: A Simultaneous Equation Model. (2005). *South Asia Economic Journal* , 6, 207-219.
- Fosu, A. K. (1996). The impact of external debt on economic growth in Sub-Saharan Africa. *Journal of Economic Development* , 21 (1), 93-118.
- Friedman, M. (1958). Foreign economic aid. *Yale Review* , 47 (4), 500-516.
- Fry, M. J. (1989). Foreign debt instability: An analysis of national saving and domestic investment response to foreign debt accumulation in 28 developing countries. *Journal of International Money and Finance* , 8, 315-344.
- Gomanee, K. G. (2005). Aid and growth in Sub-Saharan Africa: accounting for transmission mechanisms. *Journal of International Development* , 17 (8), 1055-1075.
- Gounder, R. (2001). Aid-growth nexus: empirical evidence from Fiji. *Applied Economics* , 33 (8), 1009-1019.
- Griffin, K. (1970). Foreign capital, domestic savings and Economic development. *Oxford Bulletin of economics and Statistics* , 32, 99-112.
- Guillaumont, P. a. (2001). Aid and performance: a reassessment. *Journal of Development studies* , 37 (6), 66-92.
- Gunning, J. W., & Mash, R. (1998). "Fiscal Implications of Debt and Debt Relief: Issues Paper". Mimeo.
- Hall, J. C., Sobel, R. S., & Crowley, G. R. (2010). Institutions, Capital and Growth. *Southern Economic Journal* , 77 (2), 385-405.
- Hameed, A., Ashraf, H., & Chaudhary, M. A. (2008). External Debt and its Impact on Economic and Business Growth in Pakistan. *International Research Journal of Finance and Economics* , 20, 132-140.

- Hansen, H. a. (2001). Aid and growth regressions. *Journal of development Economics* , 64 (2), 547-570.
- Hansen, H. a. (2000). Aid effectiveness disputed. *Journal of International Development* , 12 (3), 66-87.
- Hansen, H. (2002). The Impact of Aid and External Debt on growth and investment. *CREDIT Research Paper* , 26 (2).
- Hansen, H., & Heady, D. (2010). The short run macroeconomic impact of foreign aid to small states: An agnostic time series analysis. *Journal of Development Studies* , 46 (5), 877-896.
- Hoffman, B. a. (1991). Some evidence on debt related determinants on investment and consumption in heavily indebted countries. *Weltwirtschaftliches Archiv* , 127 (2), 280-297.
- Hudson, J. a. (2000). Aid, policies and growth: in search of the Holy Grail. *Journal of International Development* , 13 (7), 1023-1038.
- Islam, M. (. (2005). Regime changes, economic policies and the effect of aid on growth. *Journal of Development Studies* , 41 (8), 1467-1492.
- Islam, M. (2003). Political regime and the effect of foreign aid on economic growth. *Journal of Developing Areas* , 37, 35-53.
- Khilji, N. M. (1991). The fungibility of US assistance to developing countries and the impact on recipient expenditures: A case study of Pakistan. *World Development* , 19 (8), 1095-105.
- Knack, S. a. (1995). Institutions and economic performance: Cross country tests using alternative institutional measure. *Economics and Politics* , 7, 207-227.
- Knack, S. (2001). Aid dependence and the quality of governance: Cross-country empirical tests. *Southern Economic Journal* , 310-329.
- Krugman, P. (1988). "Financing vs. forgiving a Debt Overhang". *Journal of Development Economics* (29), 253-268.
- Krugman, P. (1988). Financing vs forgiving a debt overhang: Some analytical notes. *Journal of Development Economics* , 29, 253-268.
- La Porta, R., Lopez-de, S. F., & Vishny, R. (1998). Law and Finance. *Journal of Political Economy* , 106 (6), 1113-1155.
- Lensink, R., & Morrissey, O. Aid instability as a measure of uncertainty and the positive impact of aid on growth. *The Journal of Development Studies* , 36 (3), 31-49.
- Lensink, Robert. and White, H. (2001). Are there negative returns to aid? *Journal of Development Studies* , 37 (6), 42-64.
- Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *American Economic Review* , 82 (4), 942-963.

- Levy, V. (1988). Aid and growth in Sub-Saharan Africa: The recent experience. *European Economic Review* , 32 (9), 1777-95.
- Levy, V. (1987). Anticipated development assistance and temporary Relief aid. *Quarterly Journal of Economics* , 97, 446-58.
- Levy, V. (1987). Does concessionary aid lead to higher investment rates in low-income countries? *Review of Economics and Statistics* , 69, 152-156.
- Lucas, R. E. (1988). On the mechanics of economic development . *Journal of Monetary Economics* , 22 (1), 3-42.
- Lucas, R. E. (1990). Why doesn't capital flow from rich to poor countries? *American Economic Review* , 80 (2), 92-96.
- Maizels, A. a. (1984). Motivations for aid to developing countries. *World Development* , 12 (9), 879-900.
- Malik, S., Hayat, M. K., & Hayat, M. U. (2010). External Debt and Economic Growth: Empirical Evidence from Pakistan. *International Research Journal of Finance and Economics* , 44, 87-97.
- Mallik, G. (2008). Foreign Aid and Economic Growth: A Cointegration Analysis of the Six Poorest African Countries. *Economic Analysis and Policy* , 38 (2), 251-260.
- Mankiw, N. G., & Romer, D. a. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics* , 107 (2), 407-37.
- McGillivray, b. s. (2010). Aid and growth in small island developing states . *Journal of Development Studies* , 46 (5), 897-917.
- McGillivray, M. F. (2006). Controversies of the development impact of aid : it works; it doesn't; it can, but that depends.... *Journal of International Development* , 18 (7), 1031-1050.
- McKinlay, R. a. (1977). A Foreign policy model of US bilateral aid allocation. *World Politics* , 30 (1), 58-86.
- McKinlay, R. a. (1978a). Foreign policy model of the distribution of British Bilateral aid: 1960-70. *British Journal of Political Science* , 8, 313-322.
- McKinlay, R. a. (1978b). The French aid relationship:A foreign policy model of the distribution of French Bilateral aid: 1964-70. *Development and Change* , 8, 313- 322.
- McKinlay, R. a. (1979). The US aid relationship: A test of the recipient need and doner interest models. *Political Studies* , 27 (2), 236-250.
- Morrissey, O. (2001). Pro-Poor conditionality for aid and debt relief in East Africa. *CREDIT Research Paper* , 15 (1).
- Mosley, P., & Huson, J. a. (1987). Aid, the public sector and the market in less developed countries. *Economic Journal* , 97, 616-641.

- Mosley, P., & John, H. J. (1991). *Aid and power: The World Bank and policy based lending. I*, p. 317. London: Routledge Press.
- Moss, T. J. (2003). *The Other Costs of High Debt in Poor Countries: Growth, Policy Dynamics, and Institutions*. Issue Paper on Debt Sustainability. Center for Global Development, Washington DC.
- Newlyn, W. T. (1973). The effect of aid and other resource transfers on saving and growth in less developed countries: A comment. *The Economic Journal* , 83, 867-69.
- North, D. C. (1992). Institutions, Ideology and Economic performance. *Cato Journal* , 11 (3), 477-488.
- North, D. C. (1992). Transaction Cost, Institution and Economic performance. *International Centre for economic Growth* ,30.
- Pack, H. a. (1993). Foreign aid and the question of fungibility. *Review of Economics and Statistics* , 75 (2), 258-65.
- Pack, H. a. (1990). Is foreign aid fungible? The case of Indonesia. *Economic Journal* , 75 (2), 188-94.
- Papanek, G. F. (1973). Aid, foreign private investment, savings and growth in less developed countries. *Journal of Political Economy* , 81, 120-30.
- Papanek, G. F. (1972). The effect of aid and other Resource transfers on saving and growth in less developing countries. *The Economic Journal* , 82, 934-50.
- Presbitero, A. F. (2005). *"The debt-growth nexus: an empirical analysis"*. Retrieved from www.unicatt.it/convegno/open_economy/Allegati/debt-growth_presbitero.pdf
- Rajan, R., & S. A. (n.d.). *Aid and growth: What does the cross-country evidence really show?* *NBER Working Paper 11513* .
- Rajan, R., & S. A. (2007). Does aid effect governance? *American Economic Review* , 97, 322-327.
- Ram, R. (2004). Recipient country's 'policies' and the effect of foreign aid on economic growth in developing countries: additional evidence. *Journal of International Development* , 16 (2), 201-211.
- Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: The Primacy of Institution over Geography and Integration in economic Development. *Journal of Economic Growth* , 9 (2), 131-150.
- Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy* , 94 (5), 1002-37.

- Sachs, J. (1989). "The debt overhang of developing countries", in G. Calvo, R. Findlay, P. Kouri and J. Macedo (eds), *Debt, Stabilization and Development: Essays in memory of Carlos Diaz Alejandro*, Oxford: Basil Blackwell, . 80-102.
- Sachs, J. D. (1989). "The Debt Overhang of Developing Countries". In *Debt, Stabilization and Development*. by Calvo, Guillermo A., Ronald Findlay, Pentti Kouri, and Jorge Braga de Macedo, (Oxford: Basil Blackwell).
- Savvides, A. (1992). Investment slowdown in developing countries during the 1980s: Debt overhang or foreign capital inflows. *Kylos* , 45 (3), 363-378.
- Svensson, J. (1999). Aid, growth and democracy. *Economics and Politics* , 11 (3), 275-297.
- Svensson, J. (2000b). Foreign aid and rent seeking. *Journal of International Economics* , 51 (2), 437-461.
- Svensson, J. (2000a). When is Foreign aid policy credible? Aid dependence and conditionality. *Journal of Development Economics* , 61 (1), 61-84.
- Weisskopf, T. E. (1972). The impact of foreign capital inflow on domestic savings in underdeveloped countries. *Journal of International Economics* , 25-38.
- Were, M. (2001). The Impact of External Debt on Economic Growth in Kenya: An Empirical Assessment. *World Institute for Development Economics Research. Discussion Paper No. 2001/116* .
- Xiaoyong, C., & Gong, L. (2008). Foreign aid, domestic capital accumulation and foreign borrowing. *Journal of Macroeconomics* (30), 1269-1284.