Foreign Aid, External Debt and Economic Growth Nexus in Low-Income Countries: The Role of Institutional Quality

UNBREEN QAYYUM and ADNAN HAIDER

1. INTRODUCTION

Foreign capital and institutional quality simultaneously play an important role in the development process of low-income countries. By and large developing nations fell short of funds necessary to spur the economic growth. Along with this constraint, they are facing the down fall in the quality of governance. Low earned revenues and high government expenditure increase the reliance upon the foreign capital mostly in the form of foreign aid and external debt. Just the availability of foreign funds is not sufficient to stimulate the economic growth, there is a need of good governance along with better quality of institutions that will act as a catalyst and improves the efficiency of capital, [see for instance, Agnor and Montiel (2010)]. Good governance establishes impartial, predictable and consistently enforced rules in the form of institutions and thus crucial for the sustained growth [North (1990 and 1992)]. 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, Hall, *et al.* (2010). In this context, 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 Agnor and Montiel (2010). Factor and product markets perform efficiently in the presence of good political and economic institutions that ensure low transaction costs and credible commitment. However, empirical facts of developing countries show a positive

correlation between per capital economic growth and quality of institutions in terms of good governance. Figure 1 strongly illustrates this fact, where average index of governance across host of developing countries is positively correlated with average growth per capita over the sample of 1984 to 2010.

Fig. 1. Scatter Plot (Economic Growth and Governance Relationship)
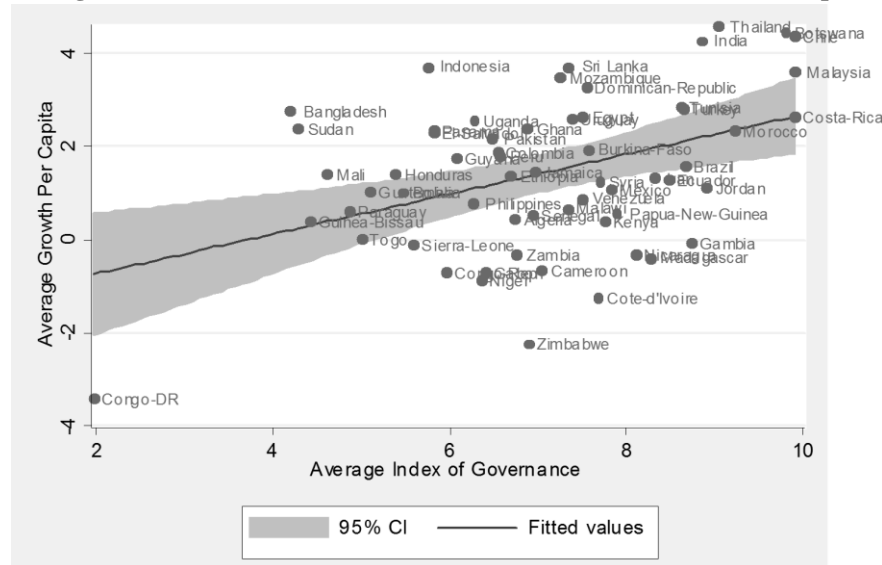
While analysing economic growth and governance nexus, earlier recent studies [for example, Acemoglu and Robinson (2008) and Hall, *et al.* (2010)] are of the view that the difference in the economic performance is primarily due to the differences in the economic institutions. Countries with poor economic institutions have to focus on the reformulation of these institutions. Unfortunately, it is 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 is 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.

Foreign aid and external debt has controversial impact on the economic growth of developing nations as found in the empirical economic literature. In the context of external debt and economic growth nexus, there exists different hypothesis like, Liquidity Constraint Hypothesis (LCH), Debt Overhang Hypothesis (DOH) and Direct Effect of Debt Hypothesis (DEDH). According to the Debt Overhang Hypothesis (DOH) that if the existing debt is high then it will make people to think of high future taxes so they would not like to save and invest more.[1] Economists test the DOH and conclude that high level of debt reduces the investment in an economy and it will definitely dampen the economic

---

[1]See for example, Krugman (1988), Corden (1988), Sachs (1989) and Froot (1989).

growth.[2] While according to Liquidity Constraint Hypothesis (LOH) the debt service payments in case of highly indebted countries are very high and it trim down the funds that can be used to augment investment, Hoffman and Reisen (1991). Empirical findings also favour LOH as the high debt service payments crowd out the investment and slowdowns the process of economic growth.[3] Direct Effect of Debt Hypothesis (DEDH) states that high level of debt may even reduce the productivity of the existing capital that will decrease the level of output, Fosu (1996). Motivating from these different hypothesis, we computed simple correlation for host of sixty developing countries. The countries have been classified into three sub-groups, low-income countries, low-middle income countries and upper-middle income countries. The correlation results are given in the form of scatter-plots, see Figure 2. These scatter plots clearly show negative associations between external debt and economic growth per capita across all sub-groups.

Alongside these linkages of external debt and economic growth, empirical literature also provides mix evidences of positive and negative relationship between foreign aid on economic growth. We can observe both kinds of relationships among these variables with the help of the following simple correlation scatter plots (as given in Figure 2).

Fig. 2. Foreign Aid, External Debt and Economic Growth Relationships

Economic Growth
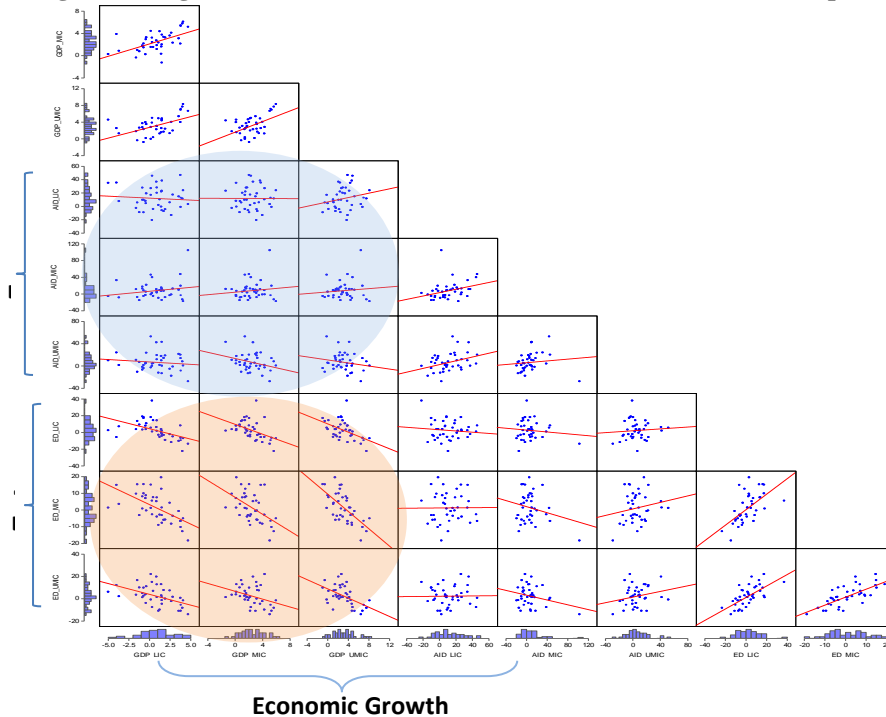
Data Source: World Development Indicators
Country Group Classification:
LIC: low income countries, MIC: middle income countries, and UMIC: upper middle income countries

[2]Notable studies are: DeMelo (1990), Fainy and Fry (1989) and IMF (1989).
[3]See for instance, Presbitero (2005), Hansen (2004), Clements, *et al.* (2003), Cohen (1993) and Hoffman and Reisen (1991).

We argue the positive channel works only in the presence of good macroeconomic policies and sound state institutions. Many empirical studies also highlight this point.[4] In the presence of good economic policies, foreign aid encourages the development process that will definitely improves the investment climate and generate more tax revenues in the long run. Now there is a question of its effective utilisation in promoting growth process. It is also argue that foreign aid can also help to improve the governance quality by removing the constraints regarding the low tax revenues and makes possible for government to invest on those activities that improve the quality of bureaucracy, reduce corruption and enforce rule of law.[5]

Despite the positive linkages of foreign aid, it may affect the economic growth negatively. In rent seeking societies, governments are not accountable toward the general public and can use the foreign aid in wasteful activities and increase the level of corruption. It will not invest in those activities that improve the institutional quality and economic policies; this leads to the down fall of economic activity as now people would not like to invest [Rodrik (1996)]. Oechslin (2006) on the other hand analyses the effectiveness of foreign aid in promote economic growth in economies that may grow faster by the adoption of productive technologies. 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. Higher inflows may worsen the political instability that may harm the economy whose performance is comparatively sound. But countries with low institutional quality may perform well whenever such inflows increase.

It becomes apparent as to why the literature does not provide a robust empirical association among foreign aid effectiveness, external debt and economic growth while taking into consideration the institutional quality. This point motivates us to analyse empirically the effect of external debt and foreign aid on the economic growth in a panel of developing countries, which mainly suffered from low level of governance. The rest of the paper is organised as follows: Section 2 discusses relevant literature review. Section 3 describes model specification, the choice of variables, data sources and selection criterion for countries under analysis. Estimation results are discussed in Section 4. Last section concludes the study.

2. REVIEW OF LITERATURE

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

---

[4]See for instance, Alvi, *et el.* (2008), Oechslin (2006), Islam (2005), Feeny (2005), Easterly, *et al.* (2004), Dalgaard, *et al.* (2004) and Burnside and Dollar (2000).

[5]Notable studies which argue it are: Easterly (2003); Islam (2003); Svensson, (2000a) and Dollar and Pritchett (1998).

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. Governance and Economic Growth

Decker and Lim (2008) examine various elementary drivers of economic growth focusing in particle 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. 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.

Dawson (1998) analyses the alternative channels through which institutions impact economic growth. This paper formalises 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. 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. 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. Hall, *et al.* (2010) follows Dawson (1998) in augmenting the growth model of Mankiw, Romer, and Weil (1992) to incorporate the quality of country's institutions. They try to investigate the role of institutions in determining economic growth by considering investment in physical and human capital. Results show that institutions are positively linked with the output growth.

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.

2.2. Debt and Economic Growth

Chowdhury (2000), Sachs (1990), Kenen (1990) and Bulow and Rogoff (1990) examines the key analytical issue of whether external debt burden is a symptom or a cause of economic slowdown. 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. Chowdhury (2000) does not find any evidence that supports the propositions of Bulow-Rogoff and Kenen-Sachs.

Were (2001) states 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. Fosu (1996) 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. Hameed, *et al.* (2008) argue that the debt servicing burden has a negative impact on the productivity of capital and labour, 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. Malik, *et al.* (2010) findings are also on the same lines as that of Hameed, *et al.* (2008).

Xiaoyong and Gong (2007) work out the inter-linkages between foreign aid, domestic capital accumulation and external debt. They argue that in the long run domestic capital accumulates, consumption increases and the external debt 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 external debt 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 Burnaside and Dollar (2000, 2004), Svensson (2003), Collier and Dollar (2001, 2002) and Collier and Dehn (2001).

2.3. Foreign Aid and Economic Growth

Dalgaard, *et al*. (2004) theoretically as well as empirically analyse 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 organisational characteristics. 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. Boone (1995) is of the view that

the foreign aid just increases the size of government while it fails to enhance investment and economic growth significantly. Oechslin (2006) finds that during 1980s and 1990s foreign aid makes the political system to be more unstable. The results lay emphasis on the ineffectiveness of foreign aid in the current institutional scenario and there exists decreasing returns to scale in higher foreign aid inflows. Lensink and Morrissey (2000) argue 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.

Alvi, *et al.* (2008) assess the role of policy and foreign aid in promoting economic growth when the inter-linkage among them is nonlinear. 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. Burnside and Dollar (2000) investigate the relationship between foreign aid, policy and growth of per capita GDP. 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. 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. Murphy and Tresp (2006) update and modify data set originally used by Burnside and Dollar (2000) by taking into account the critique presented by Easterly, *et al.* (2004). 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.* (2004) 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. Islam (2005) states 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. Feeny (2005) also investigates foreign aid effectiveness and economic growth conditioned upon the level of economic policy and governance. The study concludes that foreign aid has little impact on economic

growth of Papua New Ghana (PNG) but in case of World Bank Structural Adjustment Programme 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.

3. EMPIRICAL MODELING SETUP

In order to present empirical model, we have extended the neo-classical growth model of Solow-Swan. Consider the economy production function depends on Capital (*K*), Labour (*L*) and exogenous technological parameter (*A*) as:

$$Y(t) = A(t)F(K(t), L(t)) \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (1)$$

Where   K(t) = Capital Stock at time t.
        L(t) = Labour (Aggregate Labour) at time t.
        A(t) = Total Factor Productivity or Solow Residual at time t.

Consider, economy wide production function (1) is represented by standard Cobb-Douglas form, then:

$$Y(t) = A(t)K(t)^{\theta}L(t)^{1-\theta} \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (2)$$

Where, $0 < \theta < 1$, is capital share and $(1 - \theta)$ is labour share. Intensive form of the equation (2) is as:

$$y(t) = A(t)k(t)^{\theta} \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (3)$$

$$f'(k(t)) = A(t)\theta k(t)^{\theta-1} > 0, \text{ and } f''(k(t)) = -A(t)\theta(1-\theta)k(t)^{\theta-2} < 0,$$

With standard Inadda-Conditions:

$$\underset{k \to \infty}{Limit} f'(k(t)) = 0 \quad \text{and} \qquad \underset{k \to 0}{Limit} f'(k(t)) = \infty.$$

This implies that Cobb-Douglas form satisfies the properties of neo-classical production function. Equation of motion of Capital stock is given as:

$$k(t)^{\bullet} = s.f(k(t)) - (n+\delta).k(t) \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (4)$$

Substitute $y(t) = f(k(t)) = Ak(t)^{\theta}$ in Equation (4), we get:

$$k(t)^{\bullet} = s.A(t).k(t)^{\theta} - (n+\delta).k(t) \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad \ldots \qquad (5)$$

The term $(n+\delta)$ on the right hand side of equation can be thought as the effective depreciation rate for Capital-Labour ratio, $k \equiv K(t)/L(t)$. Rearranging Equation (5) will result in:

$$k(t)^{\bullet} \Big/ k(t) = sA(t)k(t)^{\theta-1} - (n+\delta)$$

Since we know that $y(t) = A(t)k(t)^{\theta}$ or $y(t)^{\bullet} = A(t)\theta k(t)^{\theta-1}$, Rearranging again and get the following equation:

$$y(t)^{\bullet} = A(t)\theta k(t)^{\theta}.k(t)^{-1} \quad \text{Or} \quad y(t)^{\bullet}\Big/_{y(t)} = \theta\left[\frac{1}{k(t)}\right]$$

$$y(t)^{\bullet}\Big/_{y(t)} = s.f'(k(t)) - (n+\delta)\theta \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (6)$$

Where $f'(k(t)) = A\theta k(t)^{\theta-1}$

The above model generality mimics the following form of growth rate of output per capita which depends on the parameters of the model as:

$$y(t)^{\bullet}\big/y(t) = g(s,\theta,\delta,A(t),n) \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (7)$$

In addition following standard literature on worker remittances, it is assumed that aggregate productivity ($A(t)$) depends positively on governance, G, foreign aid, FA and negatively related with external debt ED. Therefore, we will assume the following:

$$A(t) = g(G(t), FA(t), ED(t)) \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (8)$$

Therefore,

$$y(t)^{\bullet}\big/y(t) = g(s,\theta,\delta,G(t),FA(t),ED(t)) \quad \dots \quad \dots \quad \dots \quad \dots \quad (9)$$

This reduced form version of behavioural relationship between economic growth, foreign aid and external debt with a role of governance help us to write empirical version of model given as:

$$y_{it} = \alpha + \beta FA_{it} + \gamma ED_{it} + \theta G_{it} + \sum_{j} \psi_j X_{jit} + \kappa y_{it-i} + \varepsilon_{it} \quad \dots \quad \dots \quad \dots \quad (10)$$

Where, X is a vector of control variables.

3.1. Data Description and Sources

The data sample consists of sixty developing countries that utilise foreign aid and external debt to fulfil 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 2010. The detailed description of variables with data sources and list of developing countries has been shown in Table 1 and Table 2 respectively.

3.2. 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

Table 1

Description of Variables

S. No.	Variable	Description / Source
1.	*Economic Growth*	GDP per capita growth (% annual). /WDI
2.	*Foreign Aid*	Net Official development assistance as a percentage of GNI. /WDI
3.	*External Debt*	Total debt service as a percentage of GNI. /WDI
4.	*Governance Quality*	ICRG Composite index of bureaucracy quality, Rule of law and corruption, annual data (0-18 point scale)/PRS Group.
5.	*Financial Depth*	Money and quasi money (M2) as % of GNI. / WDI
6.	*Investment*	Gross fixed capital formation as percentage of GNI. /WDI
7.	*Labour Force*	Total labour force/Total Population. /WDI
8.	*Inflation*	GDP deflator. /WDI
9.	*Trade Openness*	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	1.47	1.95	21.76	−29.48	4.42
GOV	7.88	8.00	14.50	0.00	2.63
ODA	7.20	3.16	98.75	−0.73	10.44
ED	6.08	4.95	107.47	0.03	5.70
LF	39.63	40.14	57.30	20.11	6.20
M2	39.72	32.44	158.26	−1.08	26.31
INV	19.92	20.04	52.47	−12.32	7.23
INF	120.77	8.68	66212.30	−9.81	2316.93
TO	68.08	60.24	241.21	−1.08	38.77

Table 4

Correlation Matrix

	Y	GOV	ODA	ED	INV	LF	M2	INF	TO
Y	1.00								
GOV	0.17	1.00							
ODA	−0.07	−0.24	1.00						
ED	−0.08	0.08	0.15	1.00					
INV	0.24	0.26	−0.19	0.13	1.00				
LF	0.09	0.00	0.03	−0.05	0.03	1.00			
M2	0.10	0.33	−0.30	0.18	0.37	−0.08	1.00		
INF	−0.11	−0.04	0.02	−0.03	−0.08	0.07	0.05	1.00	
TO	0.07	0.10	−0.04	0.27	0.40	0.13	0.46	0.02	1.00

Table 5

Covariance Matrix

	Y	GOV	ODA	ED	INV	LF	M2	INF	TO
Y	19.3								
GOV	1.9	6.7							
ODA	−3.1	−6.6	111.0						
ED	−2.0	1.2	9.0	32.8					
INV	7.5	4.9	−14.4	5.4	52.4				
LF	2.4	-0.1	2.2	−1.9	1.3	38.2			
M2	11.9	22.4	−84.7	27.8	70.0	−12.9	699.1		
INF	−1122.2	−236.1	499.6	−410.4	−1289.7	989.2	3197.0	5364739.0	
TO	12.6	10.3	−15.3	61.3	114.1	30.7	470.6	2222.7	1519.3

covariance matrix. From correlation matrix it is depicted that governance, investment, labour 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.

4. EMPIRICAL FINDINGS

This section explains in detail the empirical model's interpretation and its robustness in a subsequent manner.

4.1. Results of Hausman Test

The basic empirical model has been estimated using fixed effect method as well as Random effect method, results are shown in Table 6. 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 favour of alternative hypothesis. Table 7 describes the outcome of Hausman test and provides evidence against the null hypothesis i.e. random effects are consistent and efficient.

Table 6

Empirical Findings Dependent Variable (Y)

Variable	Fixed Effect		Random Effect	System GMM
	I	II	III	IV
GOV	0.1396	0.1647	0.1888	0.6580
	(2.1139)*	(2.903)*	(3.8008)*	(2.0866)*
ODA(-1)	0.0640	0.0612	0.0356	0.0804
	(3.6180)*	(3.6709)*	(2.7284)*	(2.4624)*
ED	−0.0644	−0.0656	−0.0786	−0.0870
	(−2.7321)*	(−2.9116)*	(−3.8863)*	(−1.9243)**
INV	0.1729	0.1778	0.1591	0.4309
	(7.2136)*	(8.0980)*	(8.6121)*	(6.4593)*
LF	0.2886	0.2631	0.0786	0.3252
	(5.3878)*	(5.7704)*	(3.2310)*	(4.2038)*
M2	−0.0546	−0.0505	−0.0073	−0.0823
	(−5.2490)*	(−5.4175)*	(−1.2215)	(−5.3295)*
C	−12.3470	−11.8083	−5.7582	−21.9748
	(−5.4708)*	(−6.1849)*	(−5.1727)*	(−4.6133)*
AR(1)	0.1310			
	(5.0221)*			
R-squared	0.2304	0.2105	0.0774	0.1750
Adjusted R-squared	0.1950	0.1762	0.0738	0.1376
Durbin-Watson stat	2.0177	1.7345	1.6318	1.5425
F-statistic	6.5003	6.1314	21.7224	
Prob(F-statistic)	0.0000	0.0000	0.0000	
J-statistic				2.079
No. of Observations	1560	1560	1560	1500

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

Table 7

Hausman Test

Test Cross-section Random Effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section Random	57.996	6.000	0.000

4.2. Model Estimation and Interpretation of Results

As the Hausman test is in favour of fixed effect method, so the empirical model has been estimated using this technique, in order to tackle the issue of endogeneity GMM has been applied. Per capita income has been taken as the dependent variable; governance, foreign aid and external debt are the main variables of concern while investment, labour force and M2 are taken as control variables. Results are described in Table 6. The R-square value shows the regression fit and its value is 0.23 and 0.21 in Model (I) and Model (II) 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, 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 favourable environment for investment.

The second variable of main concern is aid/GNI; lagged variable of aid/GNI has been used that is significant at the level of 1 percent. 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 utilisation 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. Whenever there is 1 percent increase in aid/GNI, it will spur per capita growth rate by 0.064 percent and 0.0804 percent according to the results estimated through OLS and GMM respectively (See, model I and IV).

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. If debt burden increases by 1 percent it will adversely affect economic growth by 0.0644 percent and it is significant at 1 percent using fixed effect model. The coefficient estimated through GMM also indicates that the external debt has an adverse effect on economic growth and it is also highly significant. 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 labour force/population are taken here as control variables that are significant at the level of 1 percent, both have positive coefficients, implying any increase in investment activity or labour force will boost up economic growth. The results point out that if investment/GNI and labour force increase by 1 percent it will amplify economic growth by 0.17 percent and 0.29 percent respectively using fixed effect model. The results shown by the GMM are also in line with OLS and are highly significant. In the next step, we carried out further estimations while augmenting possible interactive terms of governance along with key candidate

variables, foreign aid and external debt. Results are reported in Table 8 (Model A and Model B). These results signify our key belief that if we control governance level, then foreign aid appear to be positively correlated with economic growth, whereas, external debt relationship remains negative for the longer term horizon.

Table 8

Empirical Findings with Governance as Interactive Variables
Dependent Variable (Y)

Variable	Model A	Model B
C	−13.2735	−11.2059
	(−6.0678)*	(−5.2666)*
GOV	0.1087	0.2382
	(1.5972).	(3.4807)*
GOV(−1)*ODA(−1)	0.0050	
	(1.9039)***	
GOV*DEBT		−0.0106
		(−3.0774)*
INV	0.1816	0.1847
	(7.5753)*	(7.7964)*
LF	0.3113	0.2502
	(5.8750)*	(4.8233)*
M2	−0.0563	−0.0562
	(−5.3842)*	(−5.5100)*
AR(1)	0.1331	0.1385
	(5.0951)*	(5.4369)*
R-squared	0.2224	0.2210
Adjusted R-squared	0.1872	0.1871
Durbin-Watson stat	2.0174	2.0161
F-statistic	6.3098	6.5204
Prob(F-statistic)	0.0000	0.0000
No. of Observations	1500	1560

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

4.3. 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

Table 9

Robustness Check and Sensitivity Analysis

Variable	1	2	3	4	5	6	7	8	9	10
C	0.2728	–2.7274	–10.6444	–12.3470	–10.9403	–2.2382	–8.9625	–1.4400	–3.3434	–2.2008
	(0.4528).	(–4.4936)*	(–5.5585)*	(–5.4708)*	(–5.6695)*	(–3.1969)*	(–3.9402)*	(–2.1162)**	(–5.0884)*	(–3.1518)*
GOV	0.1618	0.1236	0.1456	0.1396	0.1676	0.1418	0.2052	0.1233	0.1206	0.1337
	(2.3357)**	(2.1571)**	(2.5466)*	(2.1139)**	(2.9592)*	(2.4971)**	(3.0831)*	(2.1635)**	(2.1155)**	(2.3578)*
ODA(-1)	0.0808	0.0665	0.0715	0.0644	0.0559	0.0509	0.0688	0.0600	0.0646	0.0527
	(4.4030)*	(3.9615)*	(4.2767)*	(3.6178)*	(3.3353)*	(3.0205)*	(3.8114)*	(3.5660)*	(3.8674)*	(3.1349)*
ED	–0.0862	–0.0882	–0.0673	–0.0644	–0.0622	–0.0822	–0.0622	–0.0949	–0.0833	–0.0845
	(–3.5810)*	(–3.9436)*	(–2.9592)*	(–2.7321)**	(–3.3353)*	(–3.6860)*	(–2.6065)*	(–4.2644)*	(–3.7193)*	(–3.7981)*
INV	–	0.1666	0.1643	0.1729	0.1539	0.1420		0.1711	0.1329	0.1346
		(7.5223)*	(7.4597)*	(7.2136)*	(6,5445)*	(6.0267)*		(7.6982)*	(5.5936)*	(5.7022)*
LF	–	–	0.1920	0.2886	0.2280	–	0.2242	–	–	–
			(4.3561)*	(5.3878)*	(4.8339)*		(4.0037)*			
M2	–	–	–	–0.0546	–0.0562	–0.0462	–0.0587	–0.0319	–	–0.0432
				(–5.2490)*	(–5.8992)*	(–4.9364)*	(–5.4394)*	(–3.5094)*		(–4.6036)*
TO	–	–	–	–	0.0179	0.0260	0.0326	–	0.0192	0.0270
					(2.8104)*	(4.2092)*	(4.7912)*		(3.2175)*	(4.3840)*
INF	–	–	–	–	–	–	–	–0.0001	–0.0002	–0.0001
								(–2.8260)*	(3.5536)*	(3.0799)*
AR(1)	0.1666	–	–	0.1310	–	–	0.1390	–	–	–
	(6.4452)*			(5.0221)*			(5.3774)*			
R-squared	0.1825	0.1849	0.1951	0.2304	0.2147	0.2025	0.2148	0.1973	0.1962	0.2075
D-W. stat	2.0206	1.6990	1.7208	2.0177	1.7438	1.7199	2.0180	1.7016	1.7154	1.7224
F-statistic	5.0894	5.3853	5.6613	6.5003	6.1861	5.8344	5.9398	5.6489	5.6116	5.9224
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
No. of Obs.	1500	1560	1560	1500	1560	1560	1500	1560	1560	1560

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

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.

5. CONCLUSION

This study investigates empirically the impact of foreign aid, external debt and governance on economic growth. Empirical model has been estimated using the fixed effect method for the data set of 60 developing countries (1984–2010), all the results are significant and according to expectations. 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. Developing countries are not only suffering from the poor quality governance, the scarcity of resources is another curse that is pushing the economy back into the pool of intricacy and obscurity. In order to finance the different development projects as well as the budget deficit, government of developing nations has to look for foreign aid and external debt. The results point out the hidden actualities of foreign aid and external debt very magnificently and it might not be wrong to say that external debt is a burden what put an economy into trouble. Foreign aid is playing a constructive job in spurring the economic activity of an economy. It is recommended to finance the development projects through earned revenues but if there is a need of more funding then government should go for foreign aid financing and must try to reduce the debt burden that is spoiling the whole economic activity. Developing countries should try to pay more attention to the issue of poor quality of governance and side by side they must indulge in those activities that augment the earned revenues.

REFERENCES

Abu Bakar, N., and S. Hassan (2008) Empirical Evaluation on External Debt of Malaysia. *International Business and Economics Research Journal* 7:2, 95–108.

Acemoglu, D., and J. Robinson (2008) The Role of Institutions in Growth and Development. Commission on Growth and Development. (Working Paper No.10).

Agnor, P. and P. J. Montiel (2010) *Development Macroeconomics*. 3rd Edition. Princeton University Press.

Ahmad, E. (1996) Capital Inflows and National Debt. *The Pakistan Development Review* 35:4, 943–960.

Ahmad, E. (2011) A Qualitative Analysis of Pakistan's External and Internal Debt. *The Lahore Journal of Economics* 123–157.

Alesina, A. A. (2000) Who Gives Foreign Aid to Whom and Why? *Journal of Economic Growth* 5:1, 33–63.

Arellano, M. and O. Bover (1995) Another Look at the Instrumental Variable Estimation of Error Component Models. *Journal of Econometrica* 68:1, 29–51.

Boone, P. (1996) Politics and the Effectiveness of Foreign Aid. *European Economic Review* 40, 289–329.

Brautidam, D. (n.d.) *Aid Dependence and Governance*. Stockholm: Almqvist and Wiksell International.

Brautigam, D. A., and S. Knack (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. and A. Hamann (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 Stabilisation. National Bureau of Economic Reseacrh (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.

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* 36, 603–619.

Decker, J. H. and J. J. Lim (2008) What Fundamentally Drives Growth? Revisiting the Institutions and Economic Performance Debate. *Journal of International Development*, 698–725.

Djankov, S., R. La Porta, S. Lopez-de, and A. Shleifer (2002) The Regulation of Entry. *Quarterly Journal of Economics* 117:1, 1–37.

Dollar, D. and L. Pritchett (1998) *Assessing Aid: What Works, What Does Not and Why*. New York: Oxford University Press.

Easterly, W. (1999) The Ghost of Financing Gap: Testing the Growth Model Used in the International Financial Institutions. *Journal of Development Economics* 60:2, 423–438.

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.

Ekanayake, E. M. and D. Chatrna (n.d.) The Effect of Foreign Aid on Economic Growth in Developing Countries. *Journal of International Business and Cultural Studies*.

Ezeabasili, V. N., H. O. Isu, and J. N. Mojekwu (2011) Nigeria's External Debt and Economic Growth: An Error Correction Approach. *International Journal of Business and Management* 6:5, 156–170.

Feeny, S. (2005) The Impact of Foreign Aid in Economic Growth in Papua New Guinea. *Journal of Development Studies* 41:6, 1095–1117.

Feeny, S. (2006) Economic Impact of Foreign Aid to Melanesia. *Journal of the Asia Pacific Economy* 12:1, 34–60.

Feld, L. P., and G. Kirchgassner (2008) Institutions and Economic Growth: A Survey of the Recent Empirical Evidence. (SCALA Discussion Paper No. 11/2008).

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. and R. Mash (1998) Fiscal Implications of Debt and Debt Relief: Issues Paper. (Mimeographed).

Hall, J. C., R. S. Sobel, and G. R. Crowley (2010) Institutions, Capital and Growth. *Southern Economic Journal* 77:2, 385–405.

Hameed, A., H. Ashraf, and M. A. Chaudhary (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. (2002) The Impact of Aid and External Debt on Growth and Investment. *CREDIT Research Paper* 26:2.

Hansen, H. A. (2000) Aid Effectiveness Disputed. *Journal of International Development* 12:3, 66–87.

Hansen, H. A. (2001) Aid and Growth Regressions. *Journal of development Economics* 64:2, 547–570.

Hansen, H., and D. Heady (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. *Weltwirschaftliches Archiv* 127:2, 280–297.

Islam, M. (2003) Political Regime and the Effect of Foreign Aid on Economic Growth. *Journal of Developing Areas* 37, 35–53.

Islam, M. (2005) Regime Changes, Economic Policies and the Effect of Aid on Growth. *Journal of Development Studies* 41:8, 1467–1492.

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. (2001) Aid Dependence and the Quality of Governance: Cross-country Empirical Tests. *Southern Economic Journal*, 310–329.

Knack, S. A. (1995) Institutions and Economic Performance: Cross Country Tests Using Alternative Institutional Measure. *Economics and Politics* 7, 207–227.

Krugman, P. (1988) Financing vs. Forgiving a Debt Overhang: Some Analytical Notes. *Journal of Development Economics* 29, 253–268.

La Porta, R., S. F. Lopez-de, and R. Vishny (1998) Law and Finance. *Journal of Political Economy* 106:6, 1113–1155.

Lensink, R., and O. Morrissey (n.d.) 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 H. White (2001) Are There Negative Returns to Aid? *Journal of Development Studies* 37:6, 42–64.

Levy, V. (1987) Anticipated Development Assistance and Temporary Relief Aid. *Quarterly Journal of Economics* 97, 446–58.

Levy, V. (1988) Aid and Growth in Sub-Saharan Africa: The Recent Experience. *European Economic Review* 32:9, 1777–95.

Maizels, A. A. (1984) Motivations for Aid to Developing Countries. *World Development* 12:9, 879–900.

Malik, S., M. K. Hayat and M. U. Hayat (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.

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 Does not; It Can, but That Depends. *Journal of International Development* 18:7, 1031–1050.

McKinlay, R. A. (1978a) Foreign Policy Model of the Distribution of British Bilateral Aid: 1960–70. *British Journal of Political Science* 8, 313–322.

Mosley, P. and H. J. John (1991) Aid and Power: The World Bank and Policy Based Lending 1, 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. Centre for Global Development, Washington, DC.

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.

Rajan, R. and S. A. (2007) Does Aid Effect Governance? *American Economic Review* 97, 322–327.

Rajan, R. and S. A. (n.d.) Aid and Growth: What Does the Cross-country Evidence Really Show? (NBER Working Paper 11513).

Rodrik, D., A. Subramanian, and F. Trebbi (2004) Institutions Rule: The Primacy of Institution over Geography and Integration in Economic Development. *Journal of Economic Growth* 9:2, 131–150.

Sachs, J. D. (1989) The Debt Overhang of Developing Countries. In Guillermo A. Calvo, Ronald Findlay, PenttiKouri, and Jorge Braga de Macedo (eds.) *Debt, Stabilisation and Development*. Oxford: Basil Blackwell.

Savvides, A. (1992) Investment Slowdown in Developing Countries During the 1980s: Debt Overhang or Foreign Capital Inflows. *Kyldos* 45:3, 363–378.

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).