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Foreign Aid and Economic Growth: A Case of South Asian Countries

*Khim Lal Devkota**

Abstract

Foreign aid for any developing country is inseparable entity from its economic growth. Thus the relationship between economic growth and foreign aid is investigated from a panel data set of developing south Asian countries over the period 1980-2006. I have estimated the responsiveness of aid to these countries' economic, demographic and political needs and use fixed effects to control unobserved country specific effects of donors. I found that per capita income and foreign aid have been negatively related, while aid has been positively related to population and external debt. The negative coefficients on per capita GDP suggests that Donor aid favors south Asian countries in allocating aid, supporting the hypothesis that recipient needs do have an effect on foreign aid allocation. Also, the hypothesis that countries with a higher score receive more foreign aid as a reward for their democratic orientation is tested and, quite surprisingly rejected.

Introduction

Aid and economic growth has been the subject of extensive investigation, which is hardly surprising given the importance of the topic. There is a large literature that attempts to measure, using cross-country regressions, the aid effects on growth or poverty in the receiving countries. Many of those attempts did not find a clear influence of foreign aid—positive or negative—when the amount of aid, or some proxy for it, was entered as a separate explanatory variable in the regressions.

Official development assistance, in the form of foreign aid, represents an important channel through which wealth is transferred from rich, developed nations to poorer, underdeveloped economies. Both the magnitude and the scope of these international transfers have increased significantly over the last four decades. For example, total flows of official development assistance from members of the OECD and OPEC countries have increased from about $6 million in 1965 to over $59 billion in 2002. By that time these funds had come to represent between 3% and 5% of the Gross National Income of the recipient low

* Mr Devkota is Revenue and Account Expert, Ministry of Local Development, Local Bodies Fiscal Commission.

and middle income countries, and to finance between 10% and 20% of their gross capital formation (World Bank, 1994, 2004).

Three of every four poor people in developing countries live in rural areas—2.1 billion living on less than $2 a day and 880 million on less than $1 a day—and most depend on agriculture for their livelihoods(World Bank 2008). There are still around 1 billion people living at the margins of survival on less than US$1 a day, with 2.6 billion—40 percent of the world's population—living on less than US$2 a day(Human Development Report 2007/8).

In 1970 UN Resolution has set a target for developed countries to commit 0.7% of their gross national income (GNI) as ODA), the target of 0.7% is still a distant goal. The average ODA/GDI ratio for DAC countries was only 0.31% in 2006 (http://siteresources.worldbank.org). Only a handful of small donors have achieved this level of aid.

The largest donors in 2007, by volume, were the United States, followed by Germany, France, the United Kingdom and Japan. The only countries to exceed the United Nations target of 0.7% of GNI were Denmark, Luxembourg, the Netherlands, Norway and Sweden (http://www.finfacts.ie/irishfinancenews/article).

Feyzioglu (1998) has found that aid to 14 countries from 1971 to 1990 showed that a dollar increase in foreign aid leads to an increase of $ 0.95 in total government spending. The link between aid and growth in receiving countries has been controversial for many years; specifically, the effectiveness of aid in promoting growth remains highly contested. It was assumed that donors can simply calculate the financing gap - that is to say, the difference between domestic saving and the levels of investment required for a targeted rate of economic growth - and fill it with assistance. A more complex, 'two-gap' model was subsequently developed by economists Hollis Chenery and Alan Strout. This model directed attention to two gaps in developing economies: the aforementioned financing gap, and the gap between import requirements for a targeted level of production and foreign-exchange earnings.

Aid was perceived to fill gaps that were the most pressing. The currently popular view is that developing countries suffer more from an "institution gap and a" policy gap" than a financing gap (Alvi, Debasri and Elias, 2008).

The main objective of foreign aid is to promote economic growth in poor countries and thereby lift people out of poverty. (In this sense, foreign aid is distinguished from emergency relief such as medical supplies, food, water and other items that might be supplied in the event of a disaster.) The idea dates back to economist John Maynard Keynes who in the 1930s argued that government could stimulate development by financing investments. Keynes' ideas for the domestic economy were taken up by a new breed of development economists who argued that investment in less developed countries (LDCs) could be stimulated by injections of cash from overseas.

In general, donors have not discriminated effectively among different countries and

different phases of the reform process. Donors tend to provide the same package of assistance everywhere at all times (Aid and Reform in Africa, World Bank 2001). The clause that has introduced some heterogeneity to the aid contracts as implemented is tied versus untied aid: whether the recipient is free to decide the use of the funds received or must use the funds to buy goods and services from the donor country. Traditionally, aid effectiveness literature considers aid as an aggregate. In their influential paper, Burnside and Dollar (2000) claim that aid has a positive impact on growth in countries with good policies. This result, quite controversial and starting point of much debate, leaves policy makers with an open question: What can be done in countries with bad policies? How should aid contracts offerings adapt to individual country characteristics to maximize their effectiveness?

Barro and Lee(2002) measured political proximity by voting patterns in the United Nations and economic proximity by bilateral trading volumes and found that there is negative but significant relationship between lending and growth. Bandyopadhyay and Wall (2007), estimate the responsiveness of aid to recipient countries' economic and physical needs, civil/political rights, and government effectiveness. They look exclusively at the post-Cold War era and use fixed effects to control for the political, strategic, and other considerations of donors. They find that aid and per capita income have been negatively related. Ali and Isse (2005) and Amanja and Morrissey (N0 06/05) have also found non linear relationship between foreign aid and growth.

Historically most aid has been given as bilateral assistance directly from one country to another. Donors also provide aid indirectly as multilateral assistance, which pools resources together from many donors. The major multilateral institutions include the World Bank; the International Monetary Fund; the African, Asian, and Inter-American Development Banks, and various United Nations agencies such as the United Nations Development Programme. In terms of total dollars, the United States has consistently been the world's largest donor (except in the mid-1990s when Japan briefly topped the list).

In 2005, official development assistance (ODA) reached a record USD 106.8 billion, boosted by unprecedented debt relief operations. In 2005, the top ten ODA recipients received 42% of total net ODA (Table 1). Six of the top ten recipients were in Asia, the remaining four in Africa. Africa received the highest regional share of ODA, although this fell from 44% in 1990 to 33% in 2005.

The history of foreign aid in south Asian region dates back to many years ago. Although the pattern of foreign aid has changed with loans outweighing grants, aid flow is continuing as yet. Poverty is a major problem in most South Asian countries. It affects the majority of the people, especially in rural areas. That's why; foreign aid is indispensable for most South Asian Countries for many years to come.

The World Bank Group extended loans, credits, grants, equity investments, and guarantees totalling nearly US$6.9 billion to South Asia in fiscal year 2007. This is an increase of US$2.3 billion over the previous year, demonstrating the institution's continuing role in fighting poverty as South Asian countries look for ways to tackle their social challenges even while most of their economies grew aggressively. As of March 24 in fiscal year 2008,

IBRD/IDA lending to South Asia totalled more than US$2, 4 billion(World Bank, South Asia web page).

This paper addresses foreign aid allocation and development effectiveness: the case of south Asian countries. Besides it tries to seek the answer, how donors allocated the aid and how should its effectiveness be measured? This is an important issue as each year donors transfer tens of billions of dollars in foreign aid to developing countries. The 22 member countries of the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC), the world's major donors, provided USD 103.7 billion in aid in 2007 to the developing world (http://www.oecd.org/document). Rich countries have given an enormous $2.6 trillion dollars in aid since 1960, amounts to $3.6 trillion at 2008 prices (http://www.globalissues.org/TradeRelated/Development/). In the last 50-60 years, over 1 trillion dollar has been given in foreign aid. However, millions in third world countries still live in abject poverty. Today more than one billion people live on less than $ 1 per day (World Bank 1998).

How that aid was allocated and how should its effectiveness be measured? Perhaps surprisingly—given the cost and range of foreign aid programs the donor administers—there have been few comprehensive attempts to answer these questions.

Model

First, I propose a linear regression model of the form,

$$y_{it} = \alpha_i + X_{it}\beta + \varepsilon_{it} \qquad (1)$$

Together with the following assumptions is imposed,

- The ε_{it} are iid, normally distributed and serially uncorrelated.
- $E[\varepsilon_{it}(X, a_i)] = 0$
- $E[\varepsilon_{it} a_i] = 0$
- $Var(\varepsilon_{it}) = \sigma_\varepsilon^2$
- $Var(a_i) = \sigma_a^2$

The variable y_{it} denotes aid from donor country i at time t and is modeled to depend on explanatory variable denoted by X_{it}, an error term ε_{it} and a_i which is an unobserved country specific characteristic. For the purpose of this model, such an unobserved country specific characteristic could be interpreted as the strategic position of country i from the point view of the assistance countries. Considering the realities of international politics, we might suspect that the strategic position of a country plays a dominant role in aid allocation and as a result, a specification like (1) which includes both a cross section and a time dimension

and allows for unobserved effects has considerable benefits over a pure cross sectional formulation.

The set of explanatory variables will be divided into those that reflect the needs of the recipients and those that reflect the political and economic interest of the donor counties.

To measure explanatory variables I use:

- Per Capita GDP, the hypothesis being that countries with lower per capita GDP receive more foreign aid.
- An index of democracy the hypothesis being that countries with a higher score receive more foreign aid as a reward for their democratic orientation.

The factors that should not, but do affect foreign aid will be measure by:

- The country's public investment, where the hypothesis is that as government investment decreases the proportion of foreign aid increases.
- The country' external debt, where the hypothesis is that as external debt decreases foreign aid increases.
- Finally population will also be an explanatory variable. This is needed given that none of the independent variables are expressed in per capita terms. Hence I will test the hypothesis that as a population of a country increases, the aid increases.

The main assumptions of the model are as follows: donor country may expect that (i) the recipient country will behave more favorably toward donor country by supporting donor's national political interests, (ii) the recipient country will confer economic benefits towards the donor (eg, by buying more of the products from the donor country), and (iii) the lives of people in the recipient country will be better because of donor's assistance (altruistic vision). While the first two assumptions refer to donor interests, the third assumption refers to recipient needs.

The Data

A panel dataset covering both bilateral and multilateral donors, and six aid recipient south Asian countries (Bangladesh, Bhutan, India, Nepal, Pakistan & Srilanka) from 1980 to 2006 was compiled for the purposes of this research paper. I utilize data from various sources. The official foreign aid data are derived from OECD and World Bank. The data cover all major bilateral and multilateral donors.

The time series of my sample is chosen to cover the years 1980 to 2006 because the political situation of most countries in the sample during this period started to stabilize and once it stabilized, remained more or less unchanged. If the period was extended to cover earlier years, the assumption that the country specific effects are constant over time might no longer apply. I exclude Afghanistan and Maldives due to unavailability of the homogeneous data and political factors as well.

I took the six countries and make 156 observations that satisfied all of the following criteria:

- They are classified as either low or lower middle income countries by the World Bank development report 2008.
- They have full members of the United Nations during 1980-2006(UN membership acts like a measure of political stability).
- Data were available for the entire span between 1980-2006.

For the relevant data, I converted in 2007 USD by inflation calculator (http://www,bls,gov/CPI/#data). Due to differences in scope ODA data from OECD and World Bank are not same. However, the correlation between these two variables is 0.93.

Population, investment and external debt were collected from World Bank's quick query data system. For GDP Per Capita (in PPP) I used IMF online data system.

The index of democracy for each recipient was taken from the Freedom House (http://www.freedomhouse.org/template.cfm?page=2), which includes score of Political Rights and Civil Liberties. They are measured on a one-to-seven scale, with one representing the highest degree of Freedom and seven the lowest for all countries. I find the average of two variables; the highest score shows presence of autocracy and lowest democracy.

Naturally, decision on foreign aid allocation depends on recipient data of earlier years. Thus foreign aid at time t was assumed to depend on the average value of the explanatory variables at time t-1 and t-2.

Finally, following Trumbull and Wall (1994), each variable was measured relative to its sample mean for the relative year. This accounts for the fact that some variables tend to decrease, whereas others tend to increase over time.

Thus the final formulation of the above model is given by

$$FA_{it} = a_i + \beta_0 + \beta_1 GDP_{it} + \beta_2 EXD_{it} + \beta_3 POP_{it} + \beta_4 DEM_{it} + \beta_5 INV_{it} + \varepsilon_{it} \quad (2)$$

Where,

FA_{it} = (i's per capita foreign aid in year)/ (sample average at time t)

Pop_{it} = (Country i's population, at time t)

DEM_{it} = (Country i's democracy/autocracy score, at time t), which is quality of governance as well. For this purposes, I use institutional quality and democratic quality of governance.

INV_{it} = (Country i's investment at percent of GDP at time t)

GDP_{it} = (Country i's Gross domestic product based on purchasing power parity (PPP) per capita GDP, in 2007 USD at time t)

EXD_{it} = (Country i's external debt, 2007 USD million at time t)

I further expanded the (2) in the following 4 different models,

Model 1:

$$LogAID_{it} = \alpha_i + \beta_0 + \beta_1 \log GDP_{it}lag + \beta_2 \log EXD_{it}lag + \beta_3 \log pop_{it}lag + \varepsilon_{it}$$

Model 2

$$\log AID_{it} = \alpha_i + \beta_0 + \beta_1 \log GDP_{it} + \beta_2 \log EXD_{it} + \beta_3 \log pop_{it} + \beta_4 \log DEM_{it} + \varepsilon_{it}$$

Model 3

$$\log AID_{it} = \alpha_i + \beta_0 + \beta_1 \log GDP_{it}lag + \beta_2 \log EX_{it}Dlag + \beta_3 \log pop_{it}lag + \beta_4 \log DEM_{it}lag + \varepsilon_{it}$$

Model 4

$$\log AID_{it} = \alpha_i + \beta_0 + \beta_1 \log GD_{it}Plag + \beta_2 \log EXD_{it}lag + \beta_3 \log poplag_{it} + \beta_4 \log DEMlag_{it} + \beta_5 \log INV_{it}lag + \varepsilon_{it}$$

Table 2 summarizes the means and standard deviations of all variables. Also some interesting preliminary observations can be found in table 3.

Estimation

Ordinary Least Square (OLS)

The OLS estimator of (1) is,

$$\hat{\beta} = \left[\sum_i^n x_i x_i'\right]^{-1}\left[\sum_i^n x_i y_i\right]$$
$$= (X'X)^{-1}X'y$$

We may use $\hat{\beta}$ to calculate the regression residuals:

$$\hat{\varepsilon} = y - X\hat{\beta}$$

The error variance σ_ε^2 measures the variation in the unexplained part of the regression. Its method of moments estimator is the sample average of the squared residuals $\hat{\sigma}_\varepsilon^2 = \frac{1}{n}\sum_{i=1}^n \hat{\varepsilon}_i^2$

An alternative estimator uses the formula

$$s^2 = \frac{1}{n-k}\sum_{i=1}^n \hat{\varepsilon}_i^2$$

A measure of the explained variation relative to the total variation is the coefficient of determination or R-squared.

$$R^2 = \frac{\sum_{i=1}^{n}(\hat{y}_i - \bar{y})^2}{\sum_{i=1}^{n}(y_i - \bar{y})^2} = 1 - \frac{\hat{\sigma}^2}{\hat{\sigma}_y^2}$$

Where $\hat{\sigma}_y^2 = \frac{1}{n}\sum_{i=1}^{n}(y_i - \bar{y})^2$ is the sample variance of y_i. The R^2 is frequently mislabeled as a measure of "fit". Instead we use "R-bar-squared".

$$\bar{R}^2 = 1 - \frac{s^2}{\hat{\sigma}_y^2} \quad \text{where}$$

$$\hat{\sigma}_y^2 = \frac{1}{n-k}\sum_{i=1}^{n}(y_i - \bar{y})^2$$

The OLS estimation is given in table (6.1).

Fixed and Random Effects

The estimation of the model is sensitive to whether the assumption

$$E[a_i \mid X_1 \ldots . X_{iT}] = 0$$

holds or not. Under above, the model is random effects and consistent estimator of β is obtained by feasible generalized least square estimation (FGLS). However, this estimator is no longer be consistent if above fails, ie the model is fixed effects. Fortunately, the null hypothesis that holds can be tested directly

One-way Fixed Effects (FE)

The fixed effects model modestly relaxes the assumption that the regression function is constant over time and space. A one way FE model permits each cross-sectional unit to have its own constant term while the slope estimates (β) are constrained across units as is the σ_ε^2. This estimator is often termed the least-square dummy variable (LSDV) model. Since it is equivalent to including N-1 dummy variables in the OLS regression of y on x (including a unit vector). However, the LSDV is fraught with problems because it implies an infinite number of parameters in estimator. A better way to understand the FE estimator is to see the removing the panel- level average from each side of (1) removes the fixed effects from the model.

$$\overline{y}_i = (1/T)\sum_{t=1}^{T} y_{it},\ \overline{X}_i = (1/T)\sum_{t=1}^{T} X_{it}$$

and $\overline{\varepsilon}_i = (1/T)\sum_{t=1}^{T} \varepsilon_{it}$ .Also note that a_i is panel-level average. Then simple algebra on (5.1) implies,

$y_{it} - \overline{y}_i = (X_{it} - \overline{X}_i)\beta + a_i - a_i + \varepsilon_{it} - \overline{\varepsilon}_i$ this implies that

$\ddot{y}_{it} = (\ddot{X}_{it})\beta + \ddot{\varepsilon}_{it}$ (3)

Equation (3) implies that OLS on the within-transformed data will produce consistent estimates of β.We call this estimator $\hat{\beta}_{FE}$. The estimation is presented in Table (6.2)

One-way Random Effects (RE)

To implement the one-way RE formulation of (1), we assume that both α and ε are mean zero process, uncorrelated with the regressors, that they are each homoskedastic; that they are uncorrelated with each other, and that there is no correlation over individuals or time. For the T observations belonging to the ith unit of the panel, the composite error process

$$\eta_{it} = \alpha_i + \varepsilon_{it}$$

Gives rise to the error-components model with conditional variance

$$E[\eta_{it}^2 / x^*] = \sigma_a^2 + \sigma_\varepsilon^2$$

And conditional covariance within a unit of

$$E[\eta_{it}\eta_{is} / x^*] = \sigma_a^2, t \neq s$$

The covariance matrix of these T errors can then be written as

$$\Sigma = \sigma_\varepsilon^2 I_T + \sigma_a^2 \tau_T \tau_T'$$

Since observations i and j are uncorrelated, the full covariance matrix of η across the sample is block diagonal in $\Sigma : \Omega = I_n \otimes \Sigma$

The GLS estimator for the slope parameters of this model is,

$$\hat{\beta}_{RE} = (x^{*\prime}\ \Omega^{-1} x^*)^{-1}(x^{*\prime}\ \Omega y)$$

$$= (\Sigma_i x^{*\prime}\ \Sigma^{-1} x_i^*)^{-1}(\Sigma_i x^{*\prime}\ \Sigma^{-1} y_i)$$

To compute this estimator, we require $\Omega^{-1/2} = (I_n \otimes \Sigma)^{-1/2}$, which involves

$$\Sigma^{-1/2} = \sigma_{\varepsilon}^{-1}(I - T^{-1}\theta\tau_T\tau_T')$$

Where

$$\theta = 1 - \frac{\sigma_{\varepsilon}}{\sqrt{\sigma_{\varepsilon}^2 + T\sigma_{\alpha}^2}}$$

The one way RE estimation is given in table (6.3)

Testing the appropriateness of RE

We can use a Hausman test to test the null hypothesis that the extra orthogonally conditions imposed by the RE estimator are valid. If the regressors are correlated with the α_i, the FE estimator is consistent but the RE estimator is not consistent. If the regressors are uncorrelated with the α_i, the FE estimator is still consistent, albeit inefficient, whereas the RE estimator is consistent and efficient.

Denote $\hat{\beta}^c$ by the estimator that is consistent under both the null and the alternative hypothesis, and by $\hat{\beta}^{\varepsilon}$ the estimator that is fully efficient under the null but inconsistent if the null is not true. The Hausman specification test takes the form,

$$H = (\hat{\beta}_c - \hat{\beta}_{\varepsilon})' D^{-}(\hat{\beta}_c - \hat{\beta}_{\varepsilon})$$

Where $D = Var(\hat{\beta}_c) - Var(\hat{\beta}_{\varepsilon})$

$Var(\hat{\beta}_c)$ denotes a consistent estimate of the asymptotic variance of β, and the operator $^{-}$ denotes a generalized inverse.

A Hausman static for a test of endogeneity in an IV regression is formed by choosing OLS as the efficient estimator $\hat{\beta}_{\varepsilon}$ and IV as the inefficient but consistent estimator $\hat{\beta}_c$. Alternatively,

Under the random effects null hypothesis of $E[a_i | X_{i1} \ldots . X_{iT}] = 0$,

$$(\beta^w - \beta^{GLS})'(Var(\beta^w) - Var(\beta^{GLS}))(\beta^w - \beta^{GLS})$$

follows a $X^2(k)$. If I fail to reject, β^{GLS} is consistent. Otherwise, a consistent estimator is given by $\hat{\beta}_{FE}$. The Hausman specification test is given in table (4.2).

Tables 2, 3 and 4 summarize the results. Note that in all my 4 models χ^2 test statistics reject comfortably the null hypothesis, so the correct specification of the model is provided by fixed effects formulation.

Results

Model with Fixed Effects

When we do not impose the restrictions that the fixed effects are all zero (i.e., the intercepts are the same for all recipients), we will find that all five explanatory variables are statistically significant in explaining levels of aid. Further, Hausman test Statistic easily rejects the null hypothesis that the fixed effects are all zero, meaning that this is the statistically preferred model. Because there are no theory-based reasons to impose these restrictions, it is also the preferred model in terms of theory. The rejection of these restrictions on the fixed effects has important implications for our interpretation of the relationships between aid and the explanatory variables, and highlights the importance of controlling for donor interests.

Having rejected the null that holds using the Hausman test statistic , we know that the correct formulation treats the unobserved a_i as fixed effects and a consistent is given by FE in table 4.2. GDP and external debts are significant in all 4 models.

In all models the GDP and debt are significant and their's coefficient are negative and positive respectively. Population is insignificant in all models. So far democracy is concerned it is included from model 2 but it is significant only model 2. However coefficient is positive.

I have included investment in model 4. But it is not significant. The negative coefficients on per capita GDP suggests that Donor AID favors south Asian countries in allocating ODA, supporting the hypothesis that recipient needs do have an effect on foreign aid allocation. However, the same is not true for democracy and population which have absolutely no effects on aid. Debt has positive affect in aid allocation.

Model with Random Effects and OLS

If we see carefully, in the estimation with random effects and OLS of all 4 models, the effects of all my explanatory variables except for the democracy variable are statistically significant. Thus, according to these models, the level of aid is responsive to recipient needs (as measured by per capita GDP), the effectiveness of debt, population and investment but not democracy.

The coefficient of GDP Capita is negative in all models. The coefficient of debt and populations are positive in all models. From these models we can say that population has significant positive role in aid allocation.

The democracy is significant only in model 2 in RE and model 3 in OLS. So democracy does not affect on the amount of foreign aid determination. So far investment is concerned in model 4, it is significant and the coefficient is negative in both RE and OLS.

Results from descriptive tables and diagrams

The descriptive statistics are presented in figure 1 and Tables 2 and 3. The average GDP Per Capita (in PPP) to the south Asian countries is $1707. The lowest value is $763(Nepal) and highest $4280(Bhutan). Annually the South Asian countries are getting $1319.25(in million) foreign aid i.e. $1101 in per capita terms. The India is getting highest foreign aid and Bhutan the lowest (in million). In per capita terms, the result is just reversed.

The average score of government investment in this region is 25.42 (percentage of country GDP). The Bhutan has highest score (61 %) and Bangladesh lowest (14 %). Likewise, the average value of external debt is 28879.8 $ million. The Bhutan has lowest foreign loan and the India highest.

The index of democracy ie sums of civil liberties and political rights indices for these South Asian countries is below the average level (4.14). In my democracy data, 1 indicate the best (most free) and 7 the worst (most restrictive). The only India has above the average level. The Bhutan has the lowest score comparing to the other countries.

If I compare these descriptive results in my regression estimation the result is quite impressive and interesting. The Bhutan is getting highest per capita foreign aid but its democracy score is very bad. India has highest democracy score and population but it is getting lowest per capita aid.

My descriptive and estimation results are consistent with; what is happening in south Asian countries?

Conclusions

As mentioned earlier, the empirical approach in this study is based on panel data regressions in a system of four equations. The estimation results are presented in tables 4. The result for alternative specifications, used for robustness check is also reported in the table. In most cases the coefficients are statistically significant, and all equations have a good fit. As mentioned earlier this paper is an empirical investigation of the effect of growth on aid. I have used the most available data and incorporate some of the important features of the empirical literature on growth and aid. The paper shows that the effect growth on aid is negative means that the negative coefficient on per capita GDP has favored south Asian countries in allocating aid to the donor countries. The hypothesis is that donors will give higher aid if the index of democracy score is high but the finding is that there is no significant role of democracy for aid determination. Besides Bhutan is getting higher per capita foreign aid even its democratic index is very bad.

Most of the approaches demonstrate a negative and statistically significant effect of GDP on aid. In the analysis of debt and population – is shown to be positive and significant regardless of the method of estimation. These findings suggest that the true appreciation of the economic and demographic effect of foreign aid can have important implications for policies designed to promote economic growth.

The conclusion is that recipient needs reflected in per capita GDP, external debt, population and investment but the democracy score does not has a significant effect on foreign aid decisions.

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Figure: 1- Aid and other explanatory variables to the south Asian countries
Figure: 1.1- Foreign Aid

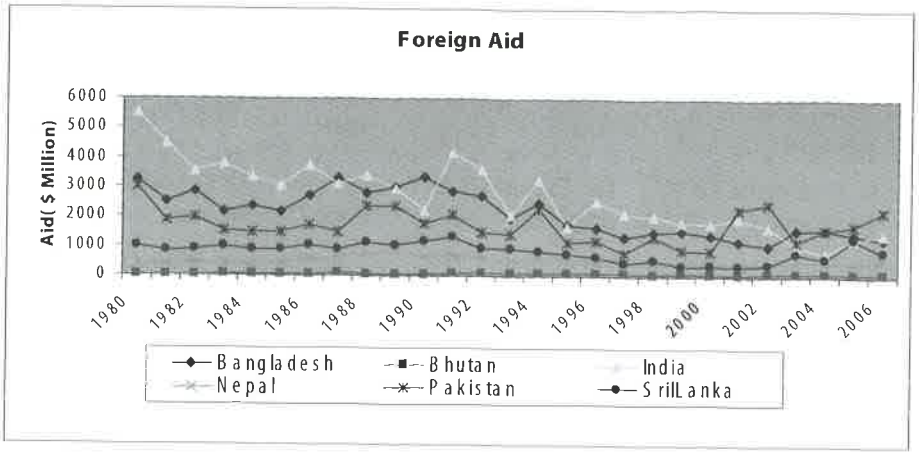

Figure: 1.2- Per Capita Foreign Aid

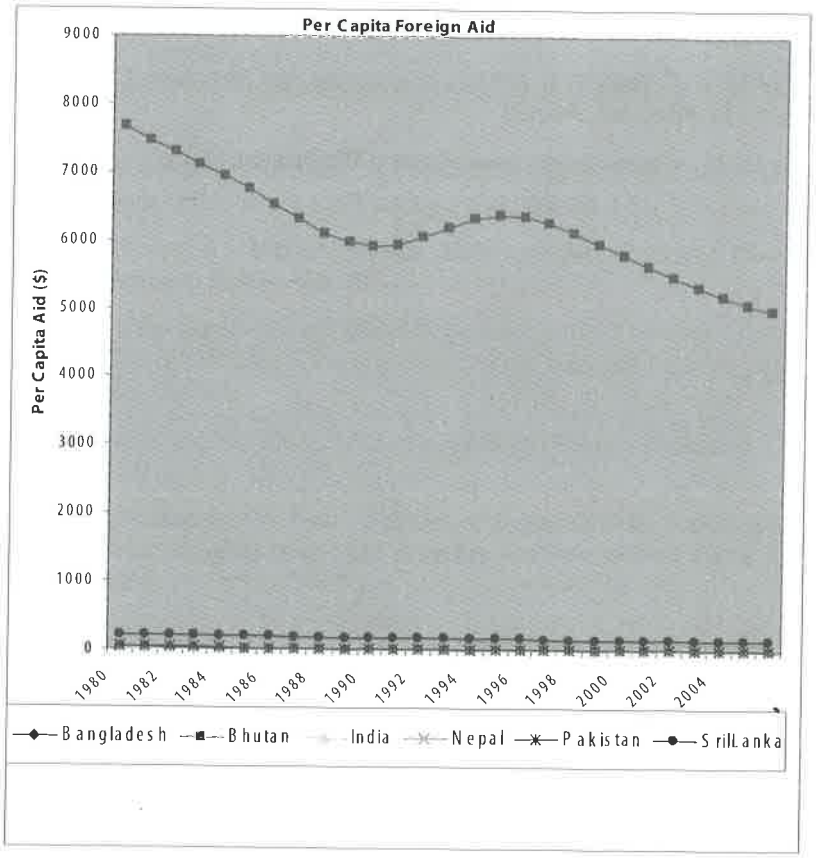

Figure: 1.3- GDP Per Capita

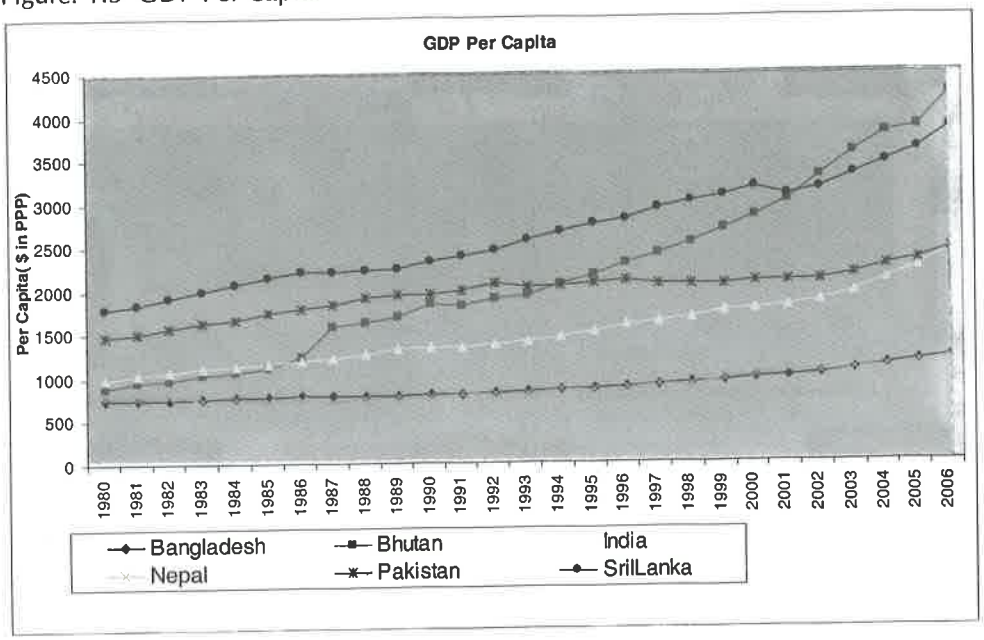

Figure: 1.4- External Debt

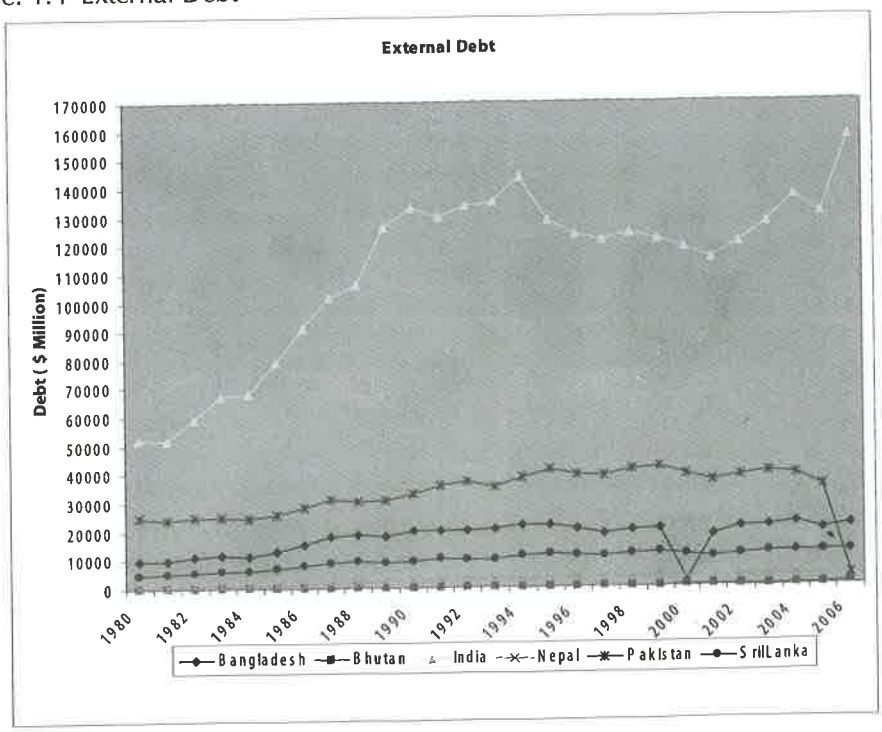

Figure: 1.5- Democracy

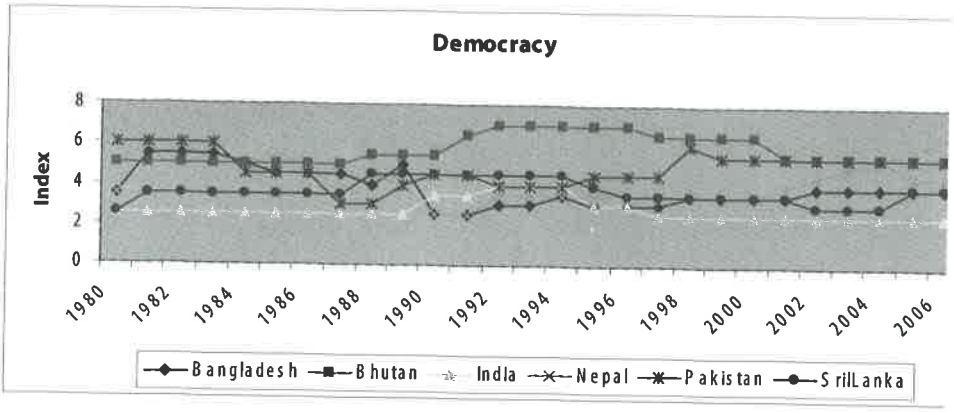

Figure: 1.6- Investment

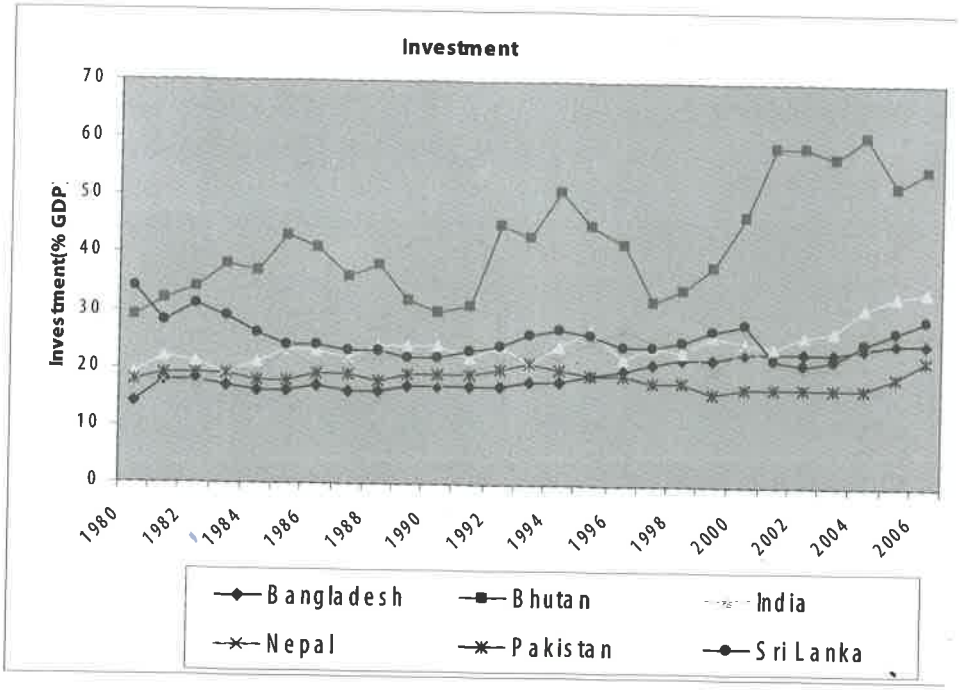

Table1: Top 10 ODA receipts and Donors ($ million, 2005, net disbursements)

receipts by recipient			ODA donors		
Country	Amount	%	Country	Amount	%
Iraq	21654	20	United States	25279	24
Nigeria	6437	6	Japan	10406	10
Afghanistan	2775	3	EC	8687	8
Indonesia	2524	2	United Kingdom	8164	8
Ethiopia	1937	2	Germany	7447	7
Viet Nam	1905	2	France	7239	7
Sudan	1829	2	IDA	6611	6
Congo Dem. Rep	1828	2	Netherlands	3683	3
China	1757	2	Canada	2833	3
India	1724		Italy	2270	2
Other recipients	62003	58	Other donors	3753	22
Total	106372	100	Total	106372	100

Source: Development Aid at a glance 2007, OECD

Table 2: Descriptive Statistics

Variables	Observation	Mean	Std. Dev	Min	Max
Investment (% GDP)	162	25.42	9.30	14	61
GDP Per Capita (USD PPP)	162	1707	819.57	763	4280
DEM	162	4.14	1.21	2.5	7
POP(,000)	162	196243.1	323480.6	423	1109811
External Debt (USD million)	162	28879.8	40474.08	0.6	157667.6
ODA (USD million)	162	1319.25	1102.60	20.3	5508.6
Per Capita Aid	162	1101.161	2305.571	2.922335	7675.036

Table 3: Foreign aid recipients and their relative average in all six variables

Country	Aid	Investment	GDP	DEM	POP	Debt	Per Capita Aid
Bangladesh	2129.68	19.33	919.93	3.89	121399.9	17179.11	27.49
Bhutan	70.26	42.26	2194.85	5.81	529.33	206.32	6200.40
India	2678.23	24.26	1545.00	2.78	899006.7	111228.5	3.68
Nepal	526.67	21.85	913.19	3.74	20927.52	2497.57	160.29
Pakistan	1696.00	18.56	1997.00	4.89	118068.9	32725.36	28.54
SrilLanka	814.64	26.22	2672.48	3.72	17526.19	3.94	186.56

3.1 Bangladesh

Variables	Observation	Mean	Std. Dev	Min	Max
Investment (% GDP)	27	19.33	3.23	14	25
GDP Per Capita (USD PPP)	27	919.93	138.22	771	1258
DEM	27	3.89	0.881	2.5	5.5
POP (,000)	27	121399.9	20629	88855	155991
External Debt (USD million)	27	17179.11	5034.63	1820.8	22141.9
ODA (USD million)	27	2129.68	724.85	1045.3	3327.9
Per Capita Aid USD	27	27.49	4.78	20.79	36.50

3.2 Bhutan

Variables	Observation	Mean	Std. Dev	Min	Max
Investment (% GDP)	27	42.26	9.86	29	61
GDP Per Capita (USD PPP)	27	2194.85	980	914	4280
DEM	27	5.82	0.77	5	7
POP (,000)	27	529.33	58.92	423	649
External Debt (USD million)	27	206.32	217.6	0.6	734.6
ODA (USD million)	27	70.26	24.93	20.3	102.3
Per Capita Aid USD	27	6200.4	694.23	4999	7675

3.3 India

Variables	Observation	Mean	Std. Dev	Min	Max
Investment (% GDP)	27	24.26	3.68	19	34
GDP Per Capita (USD PPP)	27	1545	388.29	1016	2478
DEM	27	2.78	0.52	2.5	4
POP (,000)	27	899006.7	130680.1	687332	1109811
External Debt (USD million)	27	111228.5	29554.66	51777.5	157667.6
ODA (USD million)	27	2678.23	1151.70	763.3	5508.6
Per Capita Aid USD	27	3.68	0.55	2.92	4.72

n	Max
14	25
771	1258
2.5	5.5
3855	155991
20.8	22141.9
45.3	3327.9
0.79	36.50

n	Max
29	61
14	4280
5	7
23	649
0.6	734.6
0.3	102.3
99	7675

n	Max
19	34
16	2478
2.5	4
32	1109811
7.5	157667.6
3.3	5508.6
92	4.72

3.4 Nepal

Variables	Observation	Mean	Std. Dev	Min	Max
Investment (% GDP)	27	21.85	2.8	17	27
GDP Per Capita (USD PPP)	27	913.19	139.43	763	1205
DEM	27	3.74	0.65	2.5	5.5
POP (,000)	27	20927.52	3896.68	15159	27641
External Debt (USD million)	27	2497.57	1079.54	515.4	3746
ODA (USD million)	27	526.67	112.87	387.9	831.5
Per Capita Aid USD	27	160.29	30	117.33	213.95

3.5 Pakistan

Variables	Observation	Mean	Std. Dev	Min	Max
Investment (% GDP)	27	18.56	1.31	16	22
GDP Per Capita (USD PPP)	27	1997	244.57	1502	2488
DEM	27	4.89	0.89	3	6
POP (,000)	27	118068.9	23291.13	82730	159002
External Debt (USD million)	27	32725.36	8350.47	3698.2	42023.1
ODA (USD million)	27	1696	546.94	768.6	2975.8
Per Capita Aid USD	27	28.54	5.7	20.4	39.20

3.6 Sri Lanka

Variables	Observation	Mean	Std. Dev	Min	Max
Investment (% GDP)	27	26.22	2.85	22	34
GDP Per Capita (USD PPP)	27	2672.48	567.53	1816	3880
DEM	27	3.72	0.56	2.5	4.5
POP (,000)	27	17526.19	1586.72	14746	19886
External Debt (USD million)	27	9441.9	2357.96	4639.8	12193.6
ODA (USD million)	27	814.64	282.48	325.6	1351.4
Per Capita Aid USD	27	186.56	17.39	163	219.94

Table 4: Regression Results: Dependent Variable Log Aid

Table 4.1: Estimates of $\hat{\beta}_{OLS}$

Variables	Model 1			Variables	Model 2		
	Coefficient	Standard error	t-statistic		Coefficient	Standard error	t-statistic
Log GDPlag	-0.743*	0.092	-8.04	Log GDP	-0.709*	0.091	-7.81
Log EXDlag	0.441*	0.042	10.55	Log EXD	0.421*	0.041	10.17
Log POPlag	0.762*	0.068	11.18	Log POP	0.794*	0.071	11.16
DEM	-	-	-	Log DEM	0.355*	0.141	2.52
INV	-	-	-	INV	-	-	-
	R^2 =0.8298, $\overline{R}^2$ =0.8275				=0.9048, =0.9024		
Variables	Model 3			Variables	Model 4		
	Coefficient	Standard error	t-statistic		Coefficient	Standard error	t-statistic
Log GDPlag	-0.753*	0.092	-8.18	Log GDPlag	-0.463*	0.101	-4.59
Log EXDlag	0.434*	0.042	10.4	Log EXDlag	0.382*	0.040	9.63
Log POPlag	0.797*	0.071	11.27	Log POPlag	0.484*	0.088	5.5
Log DEMlag	0.237**	0.137	1.73	Log DEMlag	0.014	0.133	0.1
INV	-	-	-	Log INVlag	-0.837*	0.158	-5.29
	=0.9095, =0.9071				=0.9237, =0.9237		

* &** indicate statistical significance at the 5 & 10 percent levels respectively.

Table 4.2: Estimates of

Variables	Model 1			Variables	Model 2		
	Coefficient	Standard error	t-statistic		Coefficient	Standard error	t-statistic
Log GDPlag	-0.980*	0.193	-5.08	Log GDP	-0.670*	0.195	-3.44
Log EXDlag	0.410*	0.039	10.48	Log EXD	0.346*	0.039	8.8
Log POPlag	0.100	0.363	0.28	Log POP	-0.270	0.381	-0.71
DEM	-	-	-	Log DEM	0.299*	0.135	2.23
INV	-	-	-	INV	-	-	-
	Hausman test Statisticp-value=0.000				Hausman test Statisticp-value=0.000		
Variables	Model 3			Variables	Model 4		
	Coefficient	Standard error	t-statistic		Coefficient	Standard error	t-statistic
Log GDPlag	-0.969*	0.193	-5.01	Log GDPlag	-0.938*	0.202	-4.65
Log EXDlag	0.404*	0.040	10.18	Log EXDlag	0.404*	0.040	10.16
Log POPlag	0.087	0.363	0.24	Log POPlag	0.069	0.365	0.19
Log DEMlag	0.124	0.125	0.99	Log DEMlag	0.113	0.127	0.89
INV	-	-	-	Log INVlag	-0.104	0.190	-0.55
	Hausman test Statisticp-value=0.000				Hausman test Statisticp-value=0.000		

* &** indicate statistical significance at the 5 & 10 percent levels respectively.

Table 4.3: Estimates of

Variables	Model 1			Variables	Model 2		
	Coefficient	Standard error	z-statistic		Coefficient	Standard error	z-statistic
Log GDPlag	-1.310*	0.132	-9.92	Log GDP	-1.143*	0.128	-8.93
Log EXDlag	0.436*	0.039	11.04	Log EXD	0.393*	0.039	10.01
Log POPlag	2.270*	0.115	11.06	Log POP	1.190*	0.115	10.33
DEM	-	-	-	Log DEM	0.254**	0.144	1.77
INV	-	-	-	INV	-	-	-
Variables	Model 3			Variables	Model 4		
	Coefficient	Standard error	z-statistic		Coefficient	Standard error	z-
statistic							
Log GDPlag	-1.342*	0.134	-10.04	Log GDPlag	-0.463*	0.101	-4.59
Log EXDlag	0.435*	0.040	10.93	Log EXDlag	0.382*	0.040	9.63
Log POPlag	1.303*	0.120	10.86	Log POPlag	0.484*	0.088	5.5
Log DEMlag	0.103	0.134	0.77	Log DEMlag	0.014	0.133	0.1
INV	-	-	-	Log INVlag	-0.837*	0.158	-5.29

* &** indicate statistical significance at the 5 & 10 percent levels respectively.