Empirical Analysis of Determinants of Economic Growth: Evidence from SAARC Countries

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Abstract: This study investigates the factors that determine and enhance economic growth. The factors to determine the economic growth of South Asian Association for Regional Cooperation (SAARC) countries are foreign direct investment, total debt, gross domestic investment and inflation. Simple ordinary least square is applied to analyze the determinates of economic growth with the help of panel data for 39 years with annual frequency from 1971 to 2009. The economic growth may gain boost by the factors not only by these but also many others. In this study foreign direct investment and inflation are found having inverse relationship with economic growth while gross domestic investment and total debt are found positively associated with economic growth. This study may prove useful contribution for policy making for South Asian countries.

Keywords: *Economic growth, SAARC, Inflation, Domestic investment, Total debt*

1. Introduction

Economy is a backbone of any country. The paradigm shifts in economies, as they move from static to dynamic and are getting the attention of the economists from last do decades. The development of the country is associated with its economy, as changing in economy directly affects the development of the country and living standard of the people. So, the Economic Growth and Its factors that lead the growth are an area of study for economists. Asia, especially East Asia and South Asia have experienced the growth at a level higher than remaining world. East Asia has over 5% growth per capita from mid to the last of the previous century (Kowalski, 2000). South Asia is a region that not only is affected from its own crises but also responds to the external crises also. So, its growth is always dynamic, and factor of growth also change over time.

In the previous literature of economic a wide debate has been take place. Different Researcher used different factors. Factors may vary because of level of development of economy, region, researcher own interest etc. Previous studies Amjad and Khan (2004); Andres and Hernando (1999); Fosu (1996); Jong & Kiseok, (2010); Kogid, Mulok, Beatrice and Mansur (2010); Tsai (1994); Kowalski (2000) used Foreign Direct Investment, Domestics Saving, Employment Level, Level Export, Physical Capital, Human Capital and Labor, Technological Change, Consumer Price Index, Exchange Rate, Trade Balance, Domestic Credit and Inflation in the cross country and panel of regions and also on individual country. These are the some variables out of many that have been used in literature.

The objective of the paper is to access the factors of economic growth like Foreign Direct Investment, Total Debt, Gross Domestics Investment and Inflation and analyze their relationship with economic growth in a panel of five Asian countries; Bangladesh, India, Nepal, Pakistan and Sri Lanka for a period of 39 years from 1971 to 2009. Remaining part of the paper consists of the follows: in section 2 we provide a brief review of literature regarding our variables, in section 3, labeled as Data and Methodology, the variables are defined and the data source is stated. In section 4, econometric model and results are elaborated, in section 5 a conclusion of the paper is derived, and at the end of the paper a section is included for references.

2. Review of Literature

The area of economic growth has always been in the eyes of researchers to work on it. Different researchers have carried out an empirical work on economic growth (Tsai, 1994; Permani, 2008; Amjad and Khan, 2004; Andres and Hernando, 1999; Fosu, 1996; Soderbom and Teal, 2001; Baroo, 1996; Kogid, Mulok, Beatrice and Mansur, 2010; Kowalski, 2000; Barro, 1995; Alfaroa, et al. 2004; Anaman, 2004; Antonio and Marek, 2008;

Vaithilingam, Guru, and Shanmugam, 2003; Chen and Feng, 2000; Anaman, 2004 and Mallick, 2008). Different researchers use different theories of growth by time to time. The major theories carried out by different authors over the passage of time were neo classical theory of economic growth, structuralist theory and market friendly theory. In this study the factors of the economic growth has been taken from above mention theories like foreign direct investment from neoclassical growth theory, investment from structuralist theory and debt and inflation from market friendly theory.

Foreign direct investment has always been seen as an important contributor for economic growth. It is an important predictor of economic growth. In the previous studies of economic growth foreign direct investment has been found by negatively associating the economic growth in long run. According to Anwar and Nguyen (2010), foreign direct investment (FDI) always contributes impressively towards the economic growth of the developing countries. Huge Multinational Corporations (MNCs), by their major contribution in foreign direct investment, provide a positive impact on development of human capital, skills of employees, research and development and technology of host country. Higher economic growth results in higher inwards FDI. Kogid et al, (2010) describes that stable economy has always enough attraction for investors to invest, hence factors that determine the growth of economy, out of which one is foreign direct investment may become a threat for the stability of economy if it is not well managed. The study found foreign direct investment as complement factor for economic growth as it proves itself as less important. Kowalski (2000) finds that increase level of FDI will help to support the increased level of economic growth. He carried out a study of sixteen East Asian countries for a period of 1983 to 1997f. Tsai (1994) take two panels in first one he take a panel of 62 countries for a period of 4 years from 1975 to 1978 and in second panel he take 51 countries for a time period of 4 years from 1983 to 1986. He also finds the negative association of foreign direct investment with economic growth. In the literature above mention, foreign direct investment has found negatively affecting the economic growth, so we are also predicting that in this study it also will affect the economic growth negatively.

Debt is considered as burden for the economy. It is assumed that the country having a high level of debt is facing low level of growth. Kowalski (2000) says that high level of debt is seen as trouble for the economy. Debt has been used in literature, many researchers like Piazolo and Bank (1995), Jayaraman and Lau (2009), Fosu (1996), Kowalski (2000), Amjad and Khan (2004) take it into account for their growth modeling and determinants. Fosu (1996) carried out a study in Sub-Saharan Africa and concluded that debt is negatively influenced the growth of GDP as it reduced the marginal productivity of capital. He says that on average a high-debt country faced a 1 percent reduction in GDP growth annually. Piazolo and Bank (1995) estimates the factors of economic growth in South Korea from 1955 to 1990. They find the debt effecting significantly and negatively towards the economic growth. Kowalski (2000) conduct a study on East Asian countries. Based on theory he predict a negative association of debt with economic growth but his study proves that debt has boost the economic growth positively and proves itself a significant determinant of East Asian economic growth. Jayaraman and Lau (2009) finds in their study on Pacific Island Countries that (i) in a long run there is not a relationship in debt and economic growth (ii) in short run there is a bi-directional relationship between economic growth and external debt. They concluded that external borrowings enhance the economic growth in PICs in the short run. Domestic Credit found insignificant predictor of economic growth in SAARC and Pakistan (Amjad and Khan, 2004). We also perceive a negative association between economic growth and debt.

In 1995, Piazolo and Bank conduct a study in South Korea for accessing the determinants of economic growth. Piazolo and Bank (1995) find in there study that investment is positively affecting the growth of economy. Baroo (1996) says that in the neoclassical growth model domestic investment is equal to the saving of the country. A higher saving rate raises the higher level of domestic investment and it ultimately leads to a steady state level of output per worker and it enhanced the growth rate. He found a positive relationship of domestic investment with economic growth but it was not statistically significant. However, he says that investment is likely to be important for some extent for economic growth. Amjad and Khan (2004) for their study for SAARC and Pakistan also used the domestic investment as a predictor of economic growth. They found that domestic investment is not only contributing to the economic growth but it was also statistically significant. In a study for East Asia from 1983 to 1997 Kowalski (2000) also finds the domestic investment a fruitful indicator for economic growth. His prediction for domestic investment was positive. Based on theory

we are expecting that the domestic investment is an important predictor for economic growth. We are expecting a positive relationship between economic growth and domestic investment.

Inflation is the rapid upward change in the prices of the goods and services. Its consequences are not very good. It leads to decrease in purchasing power of people, resulting low consumption of goods and services. It will decrease the production and ultimately a decrease in growth. In literature it is found that inflation is affecting the economic growth negatively. Piazolo and Bank (1995) conduct a study for South Korea for the determinants of growth for 1955 to 1990. They said that in a clearly way inflation effects the growth negatively and significantly. They did not support a growth motivated inflation policy for the developing countries. Kowalski (2000) for East Asia finds that inflation is affecting the economy negatively and significantly. Baroo (1996) says that by using some plausible instruments in statistical procedure the relationship between inflation and economic growth has found negative. For long period this causes for reduction in stander of living. He says that lower inflation leads to enhanced growth. Andres and Hernando (1999) says in their study that there is a significant negative correlation between economic growth and inflation in the long run. Inflation not only effects the growth and investment but also efficiency of the productive factors by which they are used. They say that inflation has temporary impact on growth rate that brings a fall in per capita income. Mallick (2008) conduct a study from 1960 to 2005 for India by using the cointegration procedure. In his study he concluded that inflation has an adverse impact on the growth of economy. In all the previous studies inflation has found negatively effecting the growth. So we are also projecting that in our study inflation has an adverse association with economic growth.

From all the discussion conducted above, we see that these factors may prove useful predictors of economic growth. So we are going to study these factors for their contribution for economic growth in the context of South Asia. This study will be for a period of about four decades, so it may presents true picture for economic growth and may also be helpful for making the policies relating to the economic growth.

3. Data and Methodology

Data: The data for this study was taken from the World Development Indicators and Penn World Table (PWT). A sample of five major countries out of eight has been selected from SAARC countries to investigate the empirical relationship. Panel of five Asian countries Bangladesh, India, Nepal, Pakistan and Sri Lanka is taken into account for this study. The panel data is for 39 years, from 1971 to 2009, as in this period major changes relating to South Asia have occurred, like the separation of East Pakistan and becoming a new country named Bangladesh, two countries India and Pakistan become atomic power in this period and etc. Annual frequency has been used for the data as it was available annually. In literature these four explanatory variables foreign direct investment, total debt, gross domestics investment and inflation are found as important predictor for economic growth, so we are also using these variables in our study to predict the economic growth of South Asia.

Variables: Four variables are used in this study Foreign Direct Investment (FDI), Total Debt (TD), Gross Domestics Investment (GDI) and Inflation (INF). Theoretical and empirical aspects of the explanatory variables are given below:

Foreign Direct Investment: Foreign Direct Investment is important and significant predictor of the Economic Growth (Kowalski, 2000). FDI in long run has negative association with Economic Growth because foreign works take holds in economy (Kogid et al, 2010; Tsai, 1994). FDI is an engine for economic growth in low developing countries (Tsai, 1994). He also says that Foreign Direct Investment provides external capital and advance technology to the economy and provides benefits to whole economy. The proxy used for FDI is the Net Inflow (BOP, Current US$). Data for this variable is taken from the World Development Indicators. The expected sign for foreign direct investment is negative.

Total Debt: It is assumed in the literature that high level of Debt is the sign of the trouble in the economy (Kowalski, 2000). It is said that the external debt is burden for the economy (Fosu, 1996). Debt is an important determinant of macroeconomic (Kowalski, 2000). Relationship between economic growth and

Total Debt is perceived negative (Amjad & Khan, 2004; Kowalski, 2000). The proxy used for Total Debt is Total Debt and Services (US $). The data for the Debt is taken from the World Development Indicators.

Gross Domestics Investment: Kowalski (2000) said that Gross Domestics Investment is the involvement of the Government of the country towards its economy. In theory a positive effect is found between Gross Domestics Investment and the Economic Growth (Kogid et al, 2010; Amjad & Khan, 2004; Baroo, 1996). The Gross Domestics Investment has significant effect on Economic Growth (Amjad & Khan, 2004). The proxy used for this explanatory variable is Investment share of PPP converted GDP Per Capita at Current Prices. The data for this variable is extracted from Penn World Table (PWT)

Inflation: To complete our model we include the Inflation as an explanatory variable. Market Friendly Theory says that inflation is macroeconomic indicator. (Kowalski, 2000) says that inflation determine the stability of the economy of the country. A high level of inflation represents a high level of problem associated with the economy. In literature the relationship between economic growth and the inflation is found negative. We use the proxy for inflation is Inflation, GDP deflator (annual %).   Data for this variable is derived from World Development Indicators. Our expected correlation is negative.
Table 1 shows the explanatory variables and their expected signs along with the proxy used and the source of the data:

Table 1: Determinants of Economic Growth, panel data of Asia

	Variables	Expected Sign	Proxy	Data Source
Dependent Variable	Growth		Growth Rate of Total PPP converted GDP Laspeyres2	Penn World Table
	Foreign Direct Investment	—	Net Inflow (BOP, Current US$)	World Development Indicator
Independent Variables	Total debt	—	Total Debt and Services (US $)	World Development Indicator
	Gross Domestic Investment	+	Investment share of PPP converted GDP Per Capita at Current Prices	Penn World Table
	Inflation	—	Inflation, GDP deflator (annual %)	World Development Indictor

Econometrics Model: The model used for this study is the simple regression model in OLS. This is the model which is used most for this type of data analysis. Many researchers like (Tsai, 1994; Amjad and Khan, 2004; Soderbom and Teal, 2001; Kowalski, 2000; Anwar and Nguyen, 2010) are different authors who used the regression analysis by using the ordinary least square model. In this model we regress the economic growth on the foreign direct investment, debt, domestic investment and inflation with a panel of five Asian countries data from year 1971 to 2009. The model and variables are given below:

$$G = \beta_0 + \beta_1 (FDI) + \beta_2 (D) + \beta_3 (INV) + \beta_4 (INF) + e_t \qquad (3.1)$$

Here in our above mentioned model G denotes the level of economic growth, FDI means foreign direct investment, total debt is denoted as D while INV means domestics investment and INF stands for inflation. e is the error term and β (1…4) are coefficients of the variables. In table 2 and 3 descriptive statistics and results of the model are given respectively.

4. Empirical Findings

The results of the study are explained in detail below.

Table 2: Descriptive statistics

Variables	Observations	Means	Standard deviation	Minimum value	Maximum value
Growth	195	4.53	2.93	-13.97	10.22
FDI	195	1.27	5.15	-3.61	4.13
Inflation	195	9.69	8.87	-17.63	80.57
Investment	195	22.06	6.04	3.96	42.04
Total debt	194	2.34	3.85	8298000	23873961

Through descriptive statistics we can take many observations, in this data set the average of growth is 4.53 with a standard deviation of 2.93 and the minimum value in our observation of growth is -13.97 and the maximum growth in our observation is 10.22 with a total number of observation is 195.The average of foreign direct investment is 1.27 with a standard deviation of 5.15 and the minimum value in our observation of foreign direct investment is-3.61 and the maximum foreign direct investment in our observation is 4.13with a total number of observation is 195.The average of inflation is 9.69 with a standard deviation of 8.87 and the minimum value in our observation of inflation is -17.63 and the maximum inflation in our observation is 80.57 with a total number of observation is 195.The average of investment is 22.06with a standard deviation of 6.04and the minimum value in our observation of investment is 3.96 and the maximum investment in our observation is 42.04 with a total number of observation is 195.The average of total debt is 2.34with a standard deviation of 3.85and the minimum value in our observation of total debt is 8298000 and the maximum total debt in our observation is 2.38e+11 with a total number of observation is 195

Table 3: Empirical Results

Variables	Co-efficient	Standard Error	P-value
Growth	-------	---------	----------
FDI	-9.7611***	1.2311	0.000
Inflation	-0.0236442*	0.0140127	0.092
Investment	0.1273836***	0.0414947	0.002
Total debt	2.5811***	3.3212	0.000
Intercept	1.519051	0.8862766	0.087
R-square			
Within	0.1603		
Between	0.7790		
Overall	0.1751		

***significant at 1%, **significant at 5%, *significant at 10%

The results of our model are significant and in the support of our expectations. Different diagnostics test were also taken to our panel data like Breusch-Pagan and Durbin-Watson test. Resulting the panel data free from heteroskedasticity and autocorrelation. Multicollinearity up to some extent is bearable. The first variable of the model is foreign direct investment which is negatively correlated with our explained variable as we were expecting in the section of data and methodology. The change in economic growth will be downwards 9.76 points as one point increase in the level of foreign direct investment. As the foreign direct investment was seen in the theory by negatively affecting the growth our study also finds that FDI is also inversely affecting the economic growth. Like foreign direct investment inflation is also finds in theory with a negative relationship with economic growth. In our study it is also proves that inflation is negatively associated with the growth of economy. The relationship is significant at 10 percent level of significance. The change in the economic growth will be minus 0.023 as one unit increase in the level of inflation. The remaining two variables domestic investment and total debt are found as positively correlated with the growth of economy. The debt was found in theory negatively correlated with economic growth while our study found the positive relationship between economic growth and debt. No reason is found for this contradiction. The one unit increase in the debt will increase the 2.58 units of the level of economic growth. This relationship of debt and economic growth is significant on 1 percent. Domestic investment is found positively relationship with economic growth in our study, this relationship is found as well as in the theory. The change in the economic growth is positive as the level of domestic investment increases.

These results lead to the conclusion that the foreign direct investment, inflation, domestic investment and total debt are important predictor of the economic growth. They contribute much to the growth of economy. The contribution of foreign direct investment and inflation is negative while the contribution of domestic investment and total debt is positive.

5. Discussion and Conclusions

Policy making for any country is not possible without studying the previous trends of the economy and important predictors of its growth. It is because to enhance the growth of economy and making policies and plans for economy in future you should be able to having knowledge of country's previous growth track. This study was conducted for the countries of South Asia, by using simple ordinary least square model and data for previous 39 years from 1971 to 2009. The growth determinants in this study were used are, foreign direct investment, inflation, domestic investment and total debt. In this study we find that inflation and foreign direct investment are negatively affecting the economic growth while on the other hand domestic investment and total debt are positively affecting the growth of economy. The model suggests that if foreign direct investment will increase as by one unit the growth of the economy will be declined by 9.7 units. As the level of foreign direct investment will increases the level of growth will decline. By increasing inflation the growth of economy is also affected but at a very small level, one unit uplift in inflation level will cause 0.02 units downwards in economic growth. Domestic Investment is positively correlated with growth and growth will increase by 0.127 units as the domestic investment will increase by one unit. Like domestic investment total debt is also having positive association with economic growth. One unit increase in total debt will increase 2.58 units increase in level of economic growth.

This study has very useful implication of policy making for the SAARC. The countries of the region of SAARC should focus more on domestic investment and debt to boost their economic growth. On the other side foreign direct investment and inflation are negatively correlated with economic growth of south Asian countries, so policy makers should develop polices and plans to control the inflation and limit the foreign direct investment. Many questions are arising here that either these above discussed determinants are only the determinants of economic growth or there are more? In future up to how many years these variables may proves that they are still significant? Up to how much extent this study can be generalized over the other regions of the world? These questions are still answerable and needs further investigations.

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