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June 2013

Online at <https://mpra.ub.uni-muenchen.de/49395/>
MPRA Paper No. 49395, posted 01 Sep 2013 06:26 UTC

Exchange Rate and Economic Growth in Pakistan (1975-2011)

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ABSTRACT

This paper investigates the impact of inflation, nominal exchange rate, FDI and capital stock on economic growth of Pakistan by using time series data for the period of 1975-2011. Augmented Dickey Fuller (ADF) test is applied to check the stationarity of variables. All variables found stationary at level. So Ordinary Least Squares method is applied to check the relation between dependent variable (GDP) and independent variables (Exchange rate, FDI, capital stock). The results of OLS show that inflation and exchange rate has negative and significant affect economic growth of Pakistan. One percent increase in inflation will decrease GDP by 0.29 percent. Exchange rate coefficient is -0.5504 that means one percent increase in exchange rate will reduce GDP by 0.55 percent. Capital stock (GFCF) does not significantly affect economic growth. Foreign direct investment has positive and significant effect on economic growth of Pakistan. The results show that one percent increase in FDI will raise GDP by 0.37%. Our model is free from hetroskedasticity and autocorrelation with satisfactory functional form that suggests the stability of the model. The CUSUM and CUSUMSQ are showing that the model is structurally stable within the 5% of critical bounds. Government should take significant steps to increase the standard of exporting goods to make smooth balance of trade.

KEYWORDS: Economic Growth, FDI, Inflation, Pakistan

INTRODUCTION

The relationship between exchange rate and economic growth has been an important subject in economics. Exchange rate means how many units of one nation's currency can be purchased with one unit of domestic currency. Exchange rate can be called the conversion factor that determines the rate of change of currencies. There is a difference between real and nominal exchange rate. If we exclude the inflation influence then it is real exchange rate and if we include the inflation influence then it is nominal exchange rate. The nominal exchange rate can be expressed in bilateral and multilateral term. Real exchange rate volatility means the short term fluctuation of the real exchange rate. Different patterns of exchange rate behaviour into catagories is known as exchange rate regime. A regime in which exchange rate remains fixed is called fix exchange rate regime and in which exchange rate fluctuates is known as floating exchange rate regime. The middle of fix and floating exchange rate is called managed float regime.

The main objective of this paper is to investigate the relation between exchange rate and economic growth of Pakistan. Theoretically speaking, there exists a positive relationship between high exchange rate and economic growth, which suggest that devaluation/ depreciation enhance economic growth. But Pakistan largely exports raw materials and agriculture based commodities, while import expensive goods like oil, machinery and high-tech goods. Moreover, demands of Pakistani products in foreign markets are less; because exporting products have not met the required international standards. In the light of given facts, trade balance of Pakistan mostly remains negative, hence leads to less economic growth.

Pakistan adopted floating exchange rate system. By currency devaluation, the foreign goods become expensive; therefore, people switch from the consumption of foreign goods to the domestic goods. Similarly, the local goods will become cheaper for the foreigners and the export will rise. Pakistan nominal exchange rate is increasing day by day this clearly indicates that more Pakistani currency is required to buy one dollar. Hence Pakistani rupee experiences deprecation against dollar. Moreover, Pakistani currency faces devaluation and depreciation over different periods of time depending upon official and unofficial increase in the exchange rate. Economic growth results in the currency appreciation and improves the living standard while failure the economic growth leads to the depreciation of the currency. Official exchange rate of PKR declined from PKR 10/\$ in 1980 to PKR 90/\$ in 2011. The exchange rate regime in Pakistan can be seen from the table 1 clearly.

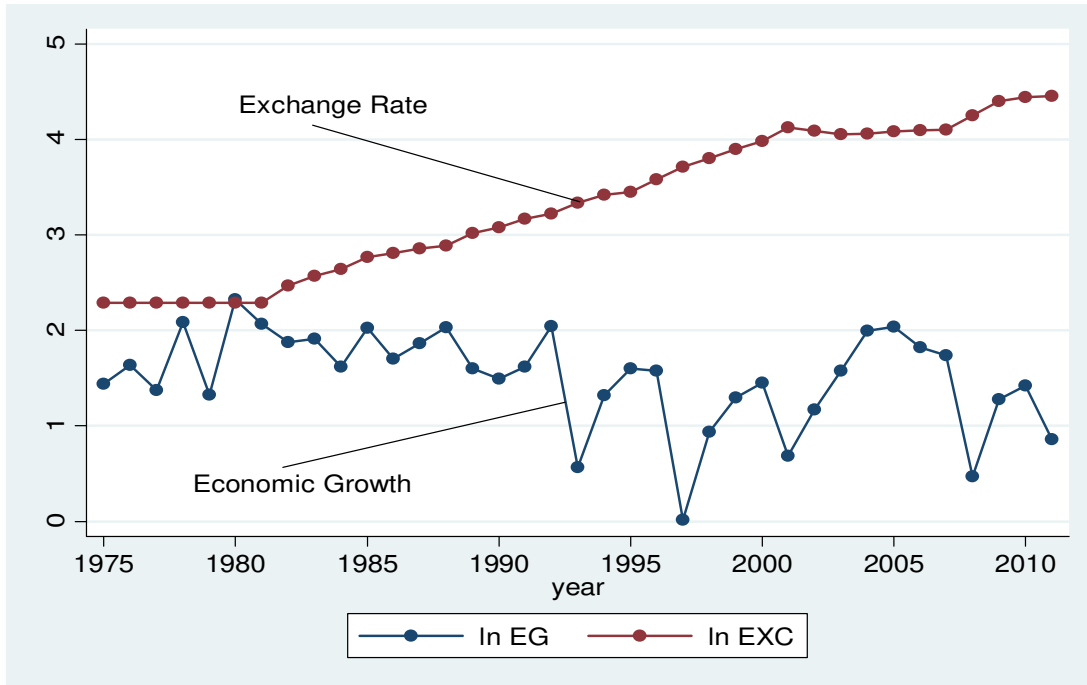
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Table 1

Exchange Rate	Period	Rupee
Fixed	1971-81	Devalued
Managed Floating	1982-1999	Devalued
Flexible	2000-2006	Depreciated

Source: Economic Survey of Pakistan

Fig 1: Economic Growth VS Exchange Rate in Pakistan



Source: Author

The figure 1 clearly shows the negative relationship between nominal exchange rate and economic growth of Pakistan.

LITERATURE REVIEW

In this section we will see the previous studies related to our paper. If we talk about the economic growth and development here is Najid Ahmad (2012) who investigates the relation between GDP and total investment in the country by using time series data for the period of 1971-2011. He suggests that investment is necessary for the economic growth of Pakistan. Author uses ordinary least squares method for his study. He finds positive and significant relation between them. He views that foreign investors are the major source of the prosperity of Pakistan. At another place Najid Ahmad (2012) explores the relationship between energy consumption and economic growth of Pakistan. He treats GDP as dependent variable and energy usage as independent variable. The author finds positive relation between GDP and energy usage in Pakistan. He views that one percent increase in energy usage will raise GDP by 1.23%. Pakistan is facing energy crisis that is a big hindrance in the achievement of development and growth. He suggests alternative sources to meet the needs of energy like by constructing biogas.

Najid Ahmad (2012) finds economic growth in educational sectors. He uses different variables of primary schooling and tests their relation in Pakistan. A time series data is used for the period of 1971-2009. GDP is treated as dependent variable and primary schools, number of teachers and enrollment as independent variables. He says that primary enrollment is the major key for the progress and prosperity of Pakistan. At another place the writer uses the same variables for secondary schooling and suggests to control the size of the class and addition of number of schools will be beneficial for the development of Pakistan. Najid Ahmad (2012) seeks economic growth and development in exports. He uses time series data for the period of 1971-2011. He says one percent increase in exports will raise GDP by 0.81 percent. Exported goods reduce the burden of balance of payment.

There are controversial views of the economists about the relation between exchange rate and economic growth. Exchange rate means how much unit of other currency you are getting with one unit of your national currency while exchange rate volatility shows how demand and supply of one nation's currency settled exchange rate. There exists positive relation between exchange rate volatility and economic growth in the long run (Zahoor Hussain, 2009). Here is Qichun He (2010) who explores the relationship between exchange rate and economic growth in China. He views that China adopted fixed exchange rate policy and made rapid economic growth. He further adds that fix exchange rate cause the promotion of long run productivity.

Abu Bakaar (2010) examines the real effect of exchange rate on economic growth of Sierra Leone. He uses quarterly data for the period of 1990-2006 for his analysis to investigate the relation with the help of Granger causality tests. He finds positive correlation between real effective exchange rate and economic growth of Sierra while Yin-Wong (1998) explores the relationship between exchange rate and growth in five Asian countries. Jinzhao (2012) points out the role of exchange rate and economic growth using 28 Chinese provinces data for the period of 1992-2008. The author confirms the positive effects of real exchange rate on economic growth of China and Danson Musyoki (2012) finds negative impact of real exchange rate volatility on economic growth.

If we try to explore the relationship between inflation and economic growth we come to the conclusion that there are different economists whose views differ from each other. Some says that there exists no relation between inflation and growth. Some are in a view that there is a positive and significant relation and some think that there is an inverse relation between inflation and economic growth. Najid Ahmad (2012) finds the relation between inflation and gross domestic product of Pakistan. He uses time series data for the period of 1971-2011. He finds positive relation of inflation with GDP of Pakistan. Inflation encourages productivity as well as the output level. But inflation must be moderate otherwise results can be worse. At another place Najid Ahmad (2012) uses time series data for the period of 1971-2011 for his analysis. He takes GDP as dependent variable and inflation, exports, investment and population growth as independent variables. He finds negative and insignificant relation between inflation and economic growth of Pakistan. Shazad Hussain (2011), Nasir Iqbal (2009), Naseer (2012) and Mubarik (2005) find positive relation between inflation and economic growth in their studies. Some economists find negative and significant relation between inflation and economic growth like Bruno and Easterly (1998), Huybens (1999), Quartey (2010), Atish Gosh (1998) and Barro (1995). Here is Farhan Ahmad (2012) who did not find any relation between inflation and economic growth.

Foreign direct investment is another important variable that can affect the economic growth. Most of the researchers are agree with the point that FDI is working as an engine for economic growth of the country. They are in a view that without the sufficient amount of FDI it is quite impossible to make sustainable growth. Najid Ahmad (2012) sheds light on the importance of foreign direct investment for the development. He takes the example of Pakistan as a developing country. For his study he uses GDP as a dependent variable and foreign direct investment, domestic capital and labor force as independent variables. He finds positive and significant relation between economic growth and FDI in Pakistan. He suggests that for the development of Pakistan there is need to attract foreign investors. Iqbal Mahmood (2011), Abdul Khaliq (2007) and Niazi (2011) also consider FDI as an important tool for economic growth.

DATA COLLECTION AND METHODOLOGY

Multiple regression analysis is used to find the relationship between the variables. We used secondary data that is collected from the official economic survey of Pakistan and WDI. Economic growth is taken as dependent variable. Inflation, FDI, nominal exchange rate and Gross fixed capital formation (GFCF) are use as independent variables for the period of 1975 to 2011. Econometric model is given below:

$$\ln(EG_t) = \beta_0 + \beta_1 \ln(INF_t) + \beta_2 \ln(FDI_t) + \beta_3 \ln(EXC_t) + \beta_4 \ln(CS_t) + \varepsilon_t$$

Where

EG=Economic Growth

INF=Inflation

FDI=Foreign Direct Investment

EXC= Nominal Exchange Rate

CS=Capital stock proxies by gross fixed capital formation (GFCF)

ε_t =Stochastic Error Term

Where, β_0 , β_1 , β_2 , β_3 , β_4 are the respective parameters.

Augmented Dickey Fuller test is used to check the unit root properties of the variables so that it can be estimated what technique is appropriate for our model. The results of unit roots test is given in table 2

Table: 2 Null Hypothesis: There is unit root; Alternative Hypothesis: There is no unit root

Variables	Trend	Drift	Conclusion
Ln (EG)	-3.605*	-2.936*	I(0)
Ln (INF)	-3.454**	-2.089*	I(0)
Ln (FDI)	-3.398**	-2.218*	I(0)
Ln (EXC)	-2.407	-1.533**	I(0)
Ln (GFCF)	-2.083	-1.703*	I(0)

Source: Author

Note: * denote significance at 5% and ** denote significance at 10%.

All variables are integrated of order zero [I (0)], so we can use Ordinary Least Square (OLS). The results of OLS are given in table 3:

Table 3: Results of Ordinary Least Squares Method

Dependent Variable: LnGDP Method: Least Squares Sample:1975-2011 Included Observations: 37						
Variables	Coefficient	Std. Error	T-Statistics	PValues	R ²	DW
constant	23.72	19.65	1.21	0.236	0.3382	2.001
Ln(INF)	-0.2907	0.1597	-1.82**	0.078		
Ln(FDI)	0.3735	0.1660	2.25*	0.031		
Ln(EXC)	-0.5504	0.2893	-1.90**	0.066		
Ln(GFCF)	-1.003	0.8396	-1.19	0.241		

Note: * denote significance at 5% and ** denote significance at 10%
Source: Author

The results of OLS show that inflation has negative relation with the GDP of Pakistan. One percent increase in inflation will decrease GDP by 0.29%. Foreign direct investment has positive and significant relation with the GDP of Pakistan. It shows that one percent increase in FDI will raise GDP by 0.37 percent. Both exchange rate and gross fixed capital formation has negative affect on economic growth of Pakistan. The elasticity of exchange rate and gross fixed capital formation is 0.55 and 1.00 respectively. But here capital stock has insignificant affect on economic growth of Pakistan. The value of R² (coefficient of determination) in our model represents that 33.8% of the variations in the dependent variable (Ln EG) is due to independent variables included in the model. The model is free from the problem of autocorrelations (DW value=2).

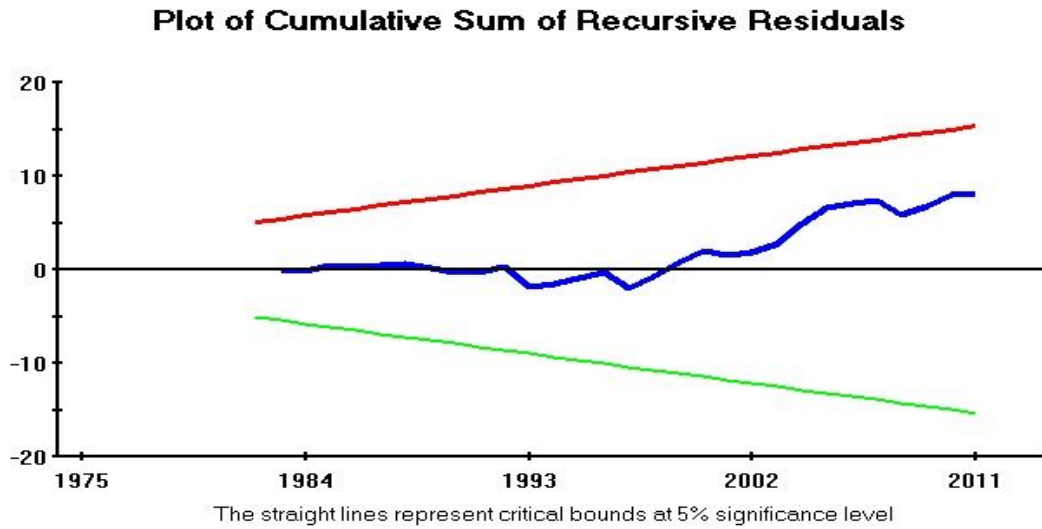
Table 4: Diagnostic Tests

Item	Test Applied	CHSQ (χ^2)	Probability value
Serial correlation	Lagrange Multiplier Test	5143E-4	0.994
Functional Form	Ramsey's reset test	27334	0.601
Heteroscedasticity	White Test	61890	0.431

Source: Author

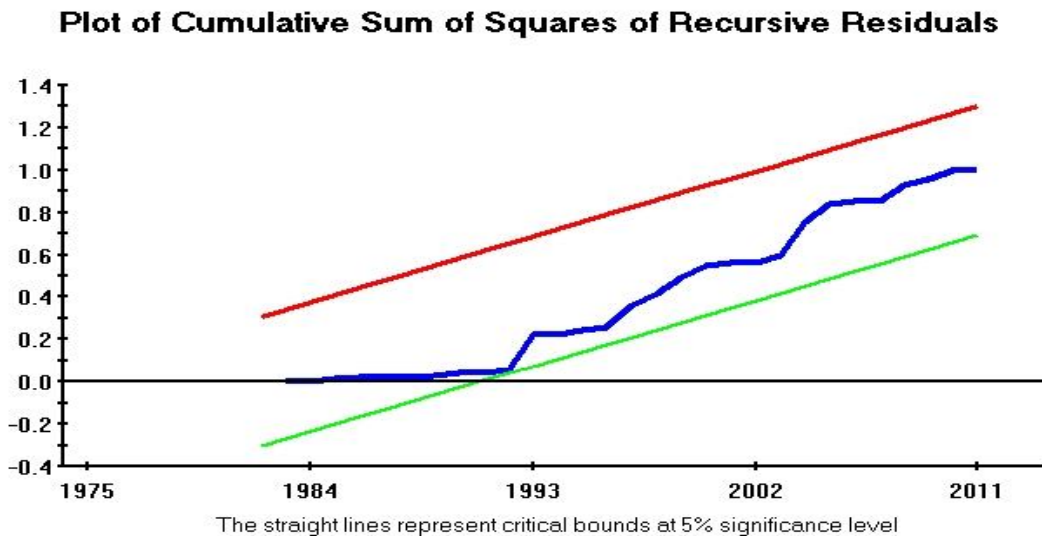
Table 4 shows various diagnostic tests. The results of diagnostic tests demonstrate that our model is free from serial correlation and hetroscedasticity. Moreover, Functional from is up to the mark.

Figure 2: Plot of Cumulative Sum of Recursive Residuals



Source: Author

Figure 3: Plot of Cumulative Sum of Squares of Recursive Residuals



Source: Author

The above graphs show that both CUSUM and CUSUMQ are lying within the critical bounds so our model is structurally stable.

Conclusion and policy implication

This study examines the impact of inflation, foreign direct investment, exchange rate and capital stock on the economic growth of Pakistan by using the yearly data for the period of 1975–2011. Multiple regression technique is used to analyze the relationship between dependent variable (Economic growth) and independent variables (inflation FDI, exchange rate and Capital stock). Results indicate that inflation, foreign direct investment and exchange rate significantly affect economic growth, whereas capital stock (GFCF) does not significantly affect economic growth. Foreign direct investment has positive relation with gross domestic product of Pakistan as it is considered as an

engine for the economic growth of the country. There is need to attract investors by creating peaceful environment in the country. Moderate inflation is necessary for the growth but above the specific level it can lead to the depreciation of the growth. Nominal exchange rate has negative relation with economic growth of Pakistan. Our model is free from heteroskedasticity, autocorrelation, and functional is up to the mark which suggests the stability of the model. Moreover, both CUSUM and CUSUMQ are lying within the critical bounds. It shows that our model is structurally stable.

If a country is developing, it needs to import large quantities of raw materials and capital goods for its development. But naturally its capacity to exports will be low. Therefore, its demand for foreign exchange is more that leads to depreciation of its exchange rate and in this way economic growth will be affected. If a country (having no debt burden) currency depreciates its export will become cheaper and hence export will increase. In the short run inflation will increase and the whole society will have to bear the social cost of inflation but in the long run output will increase that is the aim of every country. Pakistan is facing severe crisis and threats. Balance of trade is the most important problem. Following measure should be taken to minimize trade deficit, which in turn guarantees economic growth. Pakistan should export finished goods rather than raw materials. To meet the challenges of present world it should follow the model of unbalance growth. Industrial based agriculture production should be encouraged. Textile sector is earning huge amount of foreign reserves. Other sectors can make effective contribution to increase the volume of trade. Pakistani products are less demanded in the rest of the world, government should take significant steps to increase the standard of exporting products.

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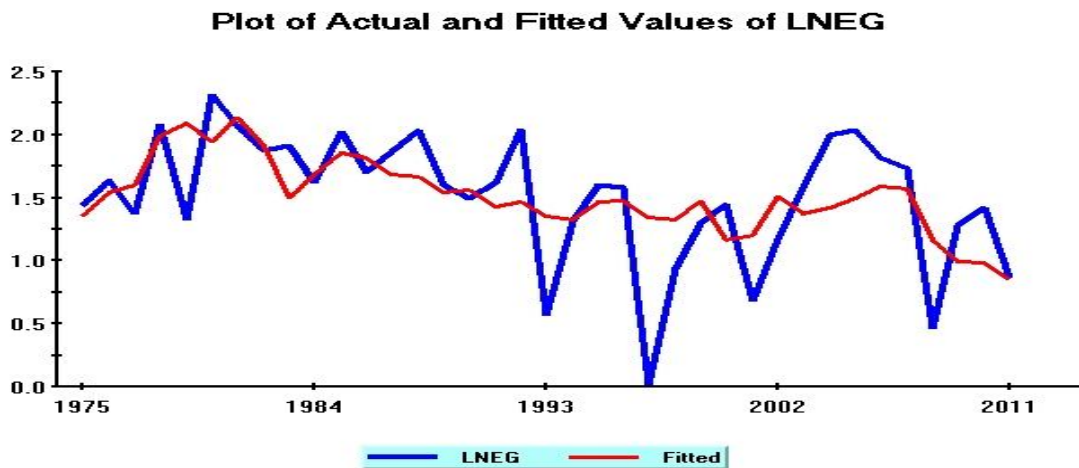
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APPENDIX

Figure 4: Actual VS Fitted Plot



Source: Author

Table 5: Correlation Matrix

Variables	Ln(EG)	Ln(INF)	Ln(FDI)	Ln(EXC)	Ln(CS)
Ln(EG)	1				
Ln(INF)	-0.1265	1			
Ln(FDI)	-0.2948	0.1058	1		
Ln(EXC)	-0.4425	-0.0463	0.8988	1	
Ln(GFCF)	-0.3822	0.0183	0.9616	0.9395	1

Source: Author