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The Impact of Exchange Rate Depreciation on Economic and Business Growth in Pakistan

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Abstract

Depreciation remained a common factor in Pakistani economic history in different regimes, which affected different economic variables, especially the growth and business sector. We have linked depreciation with economic and business growth for Pakistan in this paper. Using time series data from 1976 to 2010 and employing cointegration followed by the Error Correction Model, we find that exchange rate depreciation has adversely affected growth in the business sector, notably Investment and FDI, while net export has a positive association with the exchange rate. All these findings reveal that depreciation is not a good practice because it has negative impact for growth in the business sector. The present scenario of the flexible exchange rate doesn't allow the corresponding authorities to set desirable exchange rates, however, the government must reinforce the real sector in order to ensure a stable exchange rate and hence macroeconomic stability.

Keywords: Foreign Exchange; General; Open Economy Macroeconomics; Economic Growth of Open Economies

I. Introduction:

The terms depreciation and devaluation[1,2] are used in floating and fixed exchange rate regimes respectively, when currency loses its value against foreign currency. There are different approaches which discussed devaluation, namely elasticity approach, monetary approach and absorption approach. Depreciation may affect different macroeconomic variables and can influence economic agent decision. According to the traditional theory devaluation stimulates the domestic production of exportable and importable substitutes (Afzal, 2011). Depreciation enhances exports, restores current account deficits, accelerating foreign direct investment (FDI) inflow and hence used as a policy tool in international trade. Moreover depreciation of domestic currency holds an attraction for foreign investors as generally foreign investors are often willing to buy the assets of counties whose currency is relatively weak (See Rhomberg ,1973, Wilson, Takacs 1979, -Oskooee & Kara ,2003).Several studies including Klein and Rosengern (1994); Froot and Stain (1991); Swenson (1994) and Goldberg & Kolstad (1995) find correlation between FDI inflow and exchange rate depreciations in USA.

Though depreciation has some economic yields, it has some flaws, notably contribution to inflation and devaluation, which increases the price of traded goods that feeds into the general price level (Upadhyaya and Upadhayay 1999, Afzal 2011). Depreciation of domestic currency may deteriorate growth through different channels like, investment, interest rate, and external debt. Depreciation, on one hand, stimulates the production of tradable items, on the other hand, it harms investment in non-tradable items since most of the developing countries import inputs for product industry and increases cost of production (see Branson, 1986; Buffie, 1986 and Van Wijnbergen, 1986).

Depreciation increases nominal interest rate (see Bruno, 1979, and Van Wijnbergen, 1986) because price increase, resulting from depreciation, will raise demands for nominal money and thus nominal interest rate. The increase in interest rate will tend to reduce investment and consumption expenditure through traditional mechanisms (Munir and Aslam 2007). Depreciation increases the volume of external debt since most developing countries pay this debt in the form of foreign currency, notably the US dollar, which obviously needs larger

[1] We are using both devaluation and depreciation terms synonymously in the entire study.
[2] See Muhammad Asif et (2011)

volume of domestic after depreciation (see Cooper, 1971; Gylfason and Risager, 1984 and Van Wijnbergen, 1986). Since depreciation increases cost of production, which also decreases the volume of imported goods used further in production (Krugman and Taylor, 1978; Bruno, 1979; Gylfason & Schmid, 1983; Hanson, 1983; Gylfason & Risager, 1984; Solimano, 1986; Edwards, 1986; VanWijnbergen, 1986 and Gylfason & Radetzki, 1991). Despite all these facts, the exchange rate holds importance in international trade policy, since most developing economies use it as a policy tool to restore the current account deficit, in which the government devalues the domestic currency in order to make imports expensive which decreases the demand for imported goods and stimulates exports. However the success of devaluation depends on the import and export demand elasticities. Marshal-Lerner condition states that the absolute sum of sum of these elasticities exceeds unity (Afzal, 2011). For example if the elasticities of the depreciation of a country is inelastic for imports, the higher price due to depreciation will not reduce import and vice versa.

Further, depreciation policy regarding regimes is also a debatable issue, since the desirable exchange rate in a fixed exchange rate regime can be attained as the fixed exchange rate is determined by mutual bargaining with international financial institutions and trading countries. The desirable exchange rate in a flexible exchange rate regime cannot be accomplished, because flexible exchange rate systems are based on self-adjustment, as the value of exchange rate is determined through the demand and supply of the dollar. The fixed exchange rate regime in Pakistan prevailed from its independence until 1981, the first time it devalued its domestic currency was by 30 percent in 1955 and the second time in 1972 by 56.8 percent. Floating and manageable floating regimes were in place until 2000 when it adopted a flexible exchange rate regime (Kemal and Haider(2005). During the flexible exchange rate regime, the Pakistan currency depressed from 56.8 percent to 60.6 per US in 2006. Correlation between the exchange rate and growth from 1976 to 2010 is illustrated in the appendix (see table-5).The correlation coefficient between the real exchange rate is positive and significant at a 0.01 percent level of significance. However this result doesn't provide a robust relation, likely due to spurious relation. Subsequent analysis in methodology and the estimation section will fix such flaws.

The objective of the research paper is to empirically analyze the exchange rate depreciation impact on economic growth and business growth integrally both in fixed and floating exchange rate regimes, since the fixed exchange rate is the most dominant factor in the Pakistan economy and depreciation remains a common phenomena in both fixed and floating exchange regimes.

The present study has impact because it covers the depreciation issue along with growth especially in the business sector, previous studies like Afzal(2011) , Munir & Chaudhry(2007) and Asif et al (2011) discuss the devaluation with special reference of policy issues, inflation and short run analysis for growth respectively. The reaming paper is organized as; section II and III comprises the purposed research methodology and empirical estimation respectively, section VII contains the conclusion of the study.

II. Econometric Methodology

Following Christopoluos (2004) model for empirical investigation, which contains real exchange rate as a single explanatory variable against GDP as a dependent variable, however to incorporate the business sector in the model, we added the Foreign Direct Investment (FDI), Investment (INV), and net export as independent variables along with the real exchange rate (EX) in the Chirstopolous (2004) model. Thus our model become

$$LogGDP = \beta_0 + Log\beta_1 FDI + Log\beta_2 INV + Log\beta_3 LNEX + Log\beta_4 LNXP + Ut \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

The delightful feature of Christopoluos (2004) model is assumption regarding the sign of real exchange rate with growth, as he stated, that if the coefficient of real exchange rate appears with negative and significant sign, it implies that depreciation is contractionary to growth. Conversely, significant positive signs will indicate that depreciation is expansionary to growth. The expected sign of all other variables is positive in association with growth, except net export, which is uncertain, because positive sign of XP will be the signal that export is the dominant element in net export, while, negative sign will show that import exceeds exports.

We are using are cointegration analysis suggested by Johanson (1991, 1995) followed by the Error Correction model for empirical investigation. Since we are using long period time series data, therefore, one must check the unit root properties of data. Augmented Dickey Fuller (1981), (ADF) unit root might be a good framework, in fact, ADF unit root test is the extension of Dickey Fuller (DF) (1979). The equation for ADF unit root test is

$$\Delta Yt = \beta_1 + \beta_2 + \beta_3 Y_{t-1} + \sum a\Delta Yt\text{-}1 + U_t$$

Parameter Yt-1 is tested in the ADF unit root test, using t(tau) statistics or Mackinnon(1999) critical T to test the coefficient (S)value, if 5 becomes zero, it would imply that the presence of unit root indicates non-stationary

property and vice versa.

In order to know the existence of long run relation, we may apply the Johanson (1991, 1995) cointegration test, this test has superiority over the Engle and Granger cointegration test due to several statistical features. Johanson (1991, 1995) is based on computed Eigenvalue values of maxima and trace statistics, which are tested against their respective critical values. If the computed values exceed beyond critical values one may reject the hypothesis of no cointegration and vice versa, since equilibrium is a long run phenomena which, doesn't appear at once. But because it comprises a large span of time, obviously, there is a possibility of deviation from equilibrium. In order to estimate such deviation, the most convenient approach would be the Error Correction Model (ECM) as

$Yt = b_0 + b_1Xt + b_2U_{t-1} + et$

Where Ut-1 is the error correction term, the model shows that Yt depends on both Xt and Ut-1. If Ut_{l-1} is non zero than our model will lose its equilibrium. Suppose the coefficient of Ut-1

is positive, it will show that b2 is diverging from equilibrium, the positive coefficient will restore the equilibrium but only after a long span of time. Conversely negative sign of b2 shows that the model is converging towards the equilibrium and will reach the equilibrium shortly.

The data for the relevant variables are obtained from the International Financial Statistics (IFS) database and various issues of Pakistan economic surveys.

III. Empirical findings:

Since we are using long period data therefore we must check the unit root property of time series data through the DF/ADF unit root test. We have used the ADF unit root test for this purpose, Table-2 contains the ADF test results.

Table-1

Variable	At level*	At First Difference*	conclusion	order of integration
LNGDP	46346	-5.5760	Non stationary at level	I(1)
	(-2.9528)	(-2.9558)	Stationary at first difference	
LNFDI	1.0990	-4.2321	Non stationary at level Stationary at first difference	I(1)
	(-2.9528)	(-2.9558)		
LNINV	2.3217	-5.0388	Non stationary at level Stationary at first difference	I(1)
	(-2.9528)	(-2.9558)		
LNNXP	2.9528	-5.7167	Non stationary at level Stationary at first difference	I(1)
	(-2.0909)	(-2.9558)		
LNEX	2.9528	-4.9997	Non stationary at level Stationary at first difference	I(1)
	(-2.0900)	(-2.9558)		

*ADF unit root is computed with constant and no trend.

"Parenthesis shows critical values of ADF unit root test for the relevant variable in both columns.

ADF Unite root test:*

ADF results show that all variable are integrated at first difference, and became stationary after first difference.

Now we may proceed and apply the Johanson (1991, 1995) cointegration test, seeTable-2.

Johanson (1991, 1995) Cointegration

Table-2

Cointegration LR Test Based on Maximal Eigenvalue

Variable	Eigenvalue	H0	H1 Statistics	95% Critical value	95% Critical Value
GDP	.82067	r = 0	r >= 158.4308*	34.4000	31.7300
FDI	.55768	r < =1	r >= 227.7342**	28.2700	25.8000
INV	.38009	r < =2	r >= 316.2582	22.0400	19.8600
NXP	.14468	r < =3	r >= 414.4682	15.8700	13.8100
EX	.34658	r < =4	r >= 55.3135	9.1600	7.5300

*Reject Null Hypothesis at 95% critical value **Reject Null Hypothesis at 90% critical value

The cointegration LR Test is based on Maximal Eigenvalue which identifies two cointegration vectors each at the 95 and 90 percent level of significance respectively. Next, table-3 holds cointegration results based on trace statistics.

Table-3

Cointegration Based on Trace Statistics

Variable	Eigenvalue	HO	H1	Statistics	95% critical value	95% critical value
GDP	.82067	r = 0	r >= 1	122.2048 *	75.9800	71.8100
FDI	.55768	r < =1	r >= 2	63.7741*	53.4800	49.9500
INV	.38009	r < =2	r >= 3	36.0399	34.8700	31.9300
NXP	.14468	r < =3	r >= 4	19.7817	20.1800	17.8800
EX	.34658	r < =4	r >= 5	5.3135	9.1600	7.5300

*Reject Null Hypothesis at 95% critical value **Reject Null Hypothesis at 90% critical value

The cointegration test based on stochastic trace statistics also reveals three co-integrating vectors at the 95 percent level of significance.

It is evident from Table 2 and table-3 that both Maximum Eigenvalue and Trace statistics reject the null hypothesis of no cointegration and that all variables are co-integrated, which demonstrates the existence of long run relationship between the variables. Long run equilibrium takes a long span of time, so there might be deviation from equilibrium, thus, the Error Correction Model (ECM) is an appropriate test to estimate such deviations. Table-4 shows ECM result.

Table -4

Error Correction Model (ECM):

Dependent variable is LNGDP

Variables	Coefficient	Standard Error	T-ratios [P-values
Con	-298615.6	65954.6	-4.5276[.000]
LNFD	1.3839	65954.6	4.5276[.000]
LNINV		.54022.50139	2.7601[.010]
LNEX	-.15555	.23795	-2.2703[.031]
LNXP		-.6165.03508	-2.6001[.008]
UTL	-.41104	.14632	-2.8091[.009]

R- Square 0.94 R (Bar) - Square 0.91

Table -4 contain the Error Correction Model (ECM) based on OLS. The ECM model specifies the short run behavior of the variables, and the empirical findings point out that the FDI and investment has a positive association with growth while exchange rate and net exports are negatively related with growth. All variables are found with significant sign, which, implies that depreciation results in slower growth rates, hence, a contractionary effect on growth. The negative signs of net export indicate that the current account remains as bad as before in the Pakistan economy, and the volume of imports often remain greater than exports due to stagnant export, which drain out domestic output in the form of high import bill. The exchange rate might be helpful in bridging the current account deficits via enlarging exports and contracting imports though depreciation .UTL is the Error Correction Term, which, if significant and negative, implies that the error term will converge to restore the long run equilibrium and holds desirable convergence property.

IV. Conclusion:

Exchange rate depreciation remains a common phenomenon in Pakistani economic history in both fixed and flexible exchange rate regimes. Although Pakistan adopted the flexible exchange rate from July, 2000, yet depreciation remains a common issue, which, has affected the economic and business sector in Pakistan. The present paper has, therefore, empirically analyzed relationship between exchange rate depreciation in association with its impact on growth and business sector for the period of 1976 to 2010. We employed the cointegration test followed by the Error Correction Model (ECM). Our empirical findings claim that the exchange rate has a negative implication for GDP and other variables like FDI and Investment, except net export which has negative association. These findings suggest that the exchange rate depreciation deteriorates economic growth and negatively affects the business sector, which claims that depreciation has a contractionary effect on economic growth, mainly, due to the fact that Pakistan, being a developing economy, imported most of its intermediate inputs, since depreciation increases the cost of production, which badly affected production and the business sector, notably, investment and foreign direct investment. Although net export is associated positively with exchange rate depreciation, it implies that depreciation stimulates net export via enlarging exports and contracting imports.

To sum up, depreciation is not a good practice to augment growth and stimulate business sector activities. In the presence of a flexible exchange regime, it is not possible to attain the desirable exchange rate. Similarly, trade liberalization also limited the role of trade policy. In this context, it is needed to uplift the structural status, like credit availability to the exporters, infrastructure improvement, and especially electricity[3]. A sufficient supply of electricity must be provided to the exportable product sector, as well as, export promotion incentives must be given. All of these efforts will be helpful in achieving the export target; stable exchange rate position and hence macroeconomic stability.

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[3] Since Pakistan is currently facing huge energy crises, insufficient energy to industrial sector, which resulted, lower level of production and losses competiveness in international markets.

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Appendix

Table-1

Correlation between GDP and Exchange rate

		GDP	EX
GDP	Pearson Correlation	1	0.916
EX	Pearson Correlation	0.916	1

GDP and real exchange rate movement through 1976 to2010