

Relationship Between Exchange Rate and Budgetary Deficit Empirical Evidence from Pakistan

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Abstract: The present study is concerned with the direct relation between exchange rate and budget deficit under the managed floating exchange system. The study is based on the data for 1982-1998 from Pakistan. It is estimated that budget deficit has both direct and indirect effects on the real exchange rate so a relationship between budget deficit and real exchange rate exist. The exchange rate changes depend on whether the fiscal deficit is reduced by increasing taxes or by lowering Government expenditures. The devaluation will be smaller if the cut in Government expenditure falls on traded rather than non-traded goods.

Key Words: Exchange Rate, Budget Deficit, Empirical Evidence

Introduction

Exchange rate policy has significant implications for developing countries. From early 1950 to 1982 Pakistan followed fixed exchange rate policy. In the period the Rupee was devalued against US Dollar once in May 1972. There is substantial literature on this devaluation and its related aspects. After the success of floating exchange rate policy in majority of the developed countries, many developing countries followed the practice in 1980s. Pakistan adopted the managed floating exchange rate policy in 1982. The literature on the exchange rate under this system confirms the indirect relation between exchange rate and budget deficit, i.e. through the channel of interest rate, price level and growth of money supply.

Exchange rate measures the price of a country's currency expressed in terms of one unit of another country's currency. After World War II a system of adjustable peg known as Britton Woods system was introduced. Under the system United State's dollar was pegged to gold at fixed parity of US\$35 per ounce of gold. The monetary authorities in United States (US) were prepared to buy and sell unlimited amounts of gold at the official rate. Other currencies of all the countries were pegged against the dollar.

Since the first oil price shock in 1973, many developed countries adopted the floating exchange rate policy, which showed a good impact on these economies. In 1980s Pakistan, Philippines Uruguay and many other developing countries followed the developed countries and adopted the floating exchange rate system.

Generally, the exchange rates are relative prices of the national currencies under floating exchange rate system. In the system they are determined by demand and supply in markets of foreign exchange. Two types of floating exchange rate system are prevalent globally. They are freely floating and managed floating exchange rate systems. In the freely floating exchange rate

structure the forces of demand and supply of foreign exchange determine the exchange rate. In the system the monetary authorities do not interfere in the foreign exchange market and its outcomes. But in the managed floating exchange rate system monetary authorities interfere to stabilize the volatile changes in the exchange rates.

Exchange rate exerts a strong influence on the balance of trade, the structure and level of production, and the allocation of resources. The real exchange rate is a dependent variable, which is responsive to some exogenous factors, and the shocks induced by policies. The policy makers usually take nominal exchange rate as an instrument for the policies. As the nominal exchange rate and real exchange rate are interrelated to each other so it is critical for policy makers to have comprehension of the magnitude and time path of the likely response of real exchange rate to the nominal exchange rate action. It is however accepted that nominal devaluation has temporary effects on real exchange rate. As wages and prices in the long run rise to the full amount of devaluation, that is action of nominal exchange rate, the real exchange rate returns to its original position. To change the real exchange rate permanent basis, devaluation has to be supplemented by policies that restrict the increase in prices resulted by devaluation. For the policy makers it is better to have an idea of the factors that influence the real exchange rate.

The effects of the various exogenous factors are broadly incorporated to the real exchange rate by the channel, i.e. absolute prices, relative prices, income and interest rates. The relative importance of these channels depends upon how the monetary and fiscal policies perform in the economy. A transitory depreciation of the real exchange rate results in transitory improvement in the Balance Of Payments (BOP). As the deficit in BOP is part of the public sector deficit so the elimination of budget deficit has important implication on the real exchange rate.

(Evans,1985) analyzed the relation between budget deficit and interest rate and found that larger budget

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deficit leads to increase in demand for loanable funds, which results in shoot up of interest rate. There has been an unprecedented growth in the budget deficits in recent three decades in Pakistan. The larger budget deficit is accompanied by higher interest rate, massive increase in the growth of money supply and higher prices.

As the real exchange rate is related to BOP, which is a crucial policy variable, so budget deficit can have impact on BOP. Due to volatility of the stock market and sluggishness of trade deficit improvement the reduction of budget will restore the order of the economy.

There is considerable debate in the literature on implications of budget deficit on interest rate, rate of growth of money supply and price level. As the budget deficit increases interest rates increases, money supply grows excessively and price level increase. (Abel, 1990) related exchange rate and budget deficit, and demonstrated that in US deficit is likely to have an indirect effect on exchange rate.

(Burney and Yasmeen, 1989) revealed that overall Government deficit has no relation with nominal interest rate. But there is a weak relationship between overall budget deficit and nominal interest rate. In Pakistan, the government deficit financed through borrowing from the banking system is associated with high nominal interest rates.

Empirical studies of Pakistan, and other developing and developed countries show that real and monetary variable play an important role in the determination of real exchange rate. (Afridi, 1995) in his research shows some important variable to determine the equilibrium path of the real exchange rate. He concluded that excess domestic credit creation, ratio of the capital inflow to Gross Domestic Product (GDP) and openness of the economy determine the path of the real exchange rates. He also found that Terms Of Trade (TOT) and technological change affect the real exchange rate but these two variables are found not to be significantly important.

In a study about Pakistan, (Chistie and Hassan, 1993) found that domestic credit creation and the level of credit financing are important variables to determine the path of real exchange rate. They described that normally deficit is financed by three sources, i.e. cash balances, domestic borrowing and foreign commercial borrowing. The deficit finance creates temporary surplus in capital account and thereby exerts upward pressure on the value of domestic currency. Domestic borrowing to finance deficit creates pressure on rate of return on long term saving instruments.

Since sustainable change in real exchange rate requires policies that bring a change in real macroeconomic aggregate. Over valuation of the exchange rate and BOP problem can be traced back to imbalance in the Government budget. The measure to reduce fiscal deficit is the policies that have a long run effect on the real exchange rate. (Montely, 1983)

(Khan and Lizondo, 1987) found that devaluation produces only transitory improvement in BOP. An improvement in the public sector deficit is necessary for improvement in BOP. They showed that long run BOP equilibrium is attained with the elimination of fiscal

deficit. Fiscal policy instruments are important determinants of the long run behavior of the real exchange rate.

(Khan, 1988) has expressed a link between budget deficit and interest rates through an empirical study in Pakistan. He found a positive relation between budget deficit and interest rate. He further stated that Government budget deficit reflect the excess of demand for funds from the non-Government budget deficit reflects the excess of demand for funds from the non-Government sector. Some other studies have also shown the relationship between exchange rate and budget deficit from different perspectives. (Evans, 1985) has shown the same results for US economy.

Objective of The Study: Despite the importance of real exchange rate as a key relative price, only a few studies have tried to analyze the various factors influencing real exchange rate in Pakistan. The objective of the present study is to find relationship between the real exchange rate and budget deficit. The analysis of the study tresses upon two points.

- i. The indirect relation between the budget deficit and real exchange rate through the price level. As the inflation represents the growth rate of prices, the domestic and foreign inflation differential (Pakistan and US) are used to see the indirect effect of the budget deficit.
- ii. The direct relation between budget deficit and the real exchange rate, i.e. as the authorities in the developing countries do not effect the foreign exchange market, the budget deficit can directly influence the real exchange rate.

The purpose of the present study is to test the null hypothesis that no relationship exists between exchange rate and budgetary deficit. The hypothesis is analyzed and checked with reference to Pakistan for the period of 1982-98. In the period Pakistan followed the policy of managed float.

Materials and Methods

The data is obtained from (International Financial Statistics, 1999) of IMF publications. To analyze the relationship between real exchange rate and budget deficit Ordinary Least Square (OLS) regression method is applied by the computer software TSP, moreover some simple mathematical techniques and calculation are used. The real exchange rate is the dependent variable and regressors are domestic and foreign inflation differentials, interest rate differentials, TOT, GDP, and budget deficit as percent of GDP.

Model: The asset market does not fully explain the change in the exchange rates, because assets are a stock and a flow is necessary to dispose them off. The value of exchange rate influences the commodity market where prices adjust slowly. The phenomenon affects the balance of trade, the level of national income and the rate of price change.

The real exchange rate may be expressed in the following two equations.

Equation. No. 1

$$\begin{aligned} \text{PER} &= f(\text{GDF}, \text{Y}, \text{IDF}, \text{TOT}) \\ \text{PER} &= C + B_1 \text{GDF} + B_2 \text{Y} + B_3 \text{IDF} + B_4 \text{TOT} \end{aligned}$$

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Where

PER	=	Real Exchange Rate
GDF	=	Differential of the domestic and Foreign (US) inflation rates.
Y	=	Gross domestic product.
IDF	=	Differential of domestic and foreign interest rates.
TOT	=	Terms of Trade.

It is observed that there is excess of domestic inflation over the foreign inflation, which depreciates the domestic currency. If the domestic prices rise faster than the foreign prices, then the foreign goods demand increase. Assuming free capital flows it results in improvement in TOT as well as depreciation of domestic country.

If the domestic interest rate exceeds the foreign interest rate then depending upon the change (increase or decrease) in demand for bonds will lead to appreciation or depreciation of the domestic currency. Budget deficit mostly have indirect effect on the rate of exchange through the price.

The Government can finance the budget deficit by using the given five options:

- Augmenting the supply of money.
- Borrowing from abroad.
- Borrowing from the domestic residents.
- Reducing the reserves of the country.
- Blend of the above four criteria.

Due to scarce resources, much Government of developing countries does not interfere in the foreign exchange market. Thus budget deficit has an influence on exchange rate directly, which can be expressed as:

Equation No. 2:

$$PER = f(GDF, Y, IDF, TOT, BD)$$

$$PER = C + B_1GDF + B_2Y + B_3IDF + B_4TOT + B_5BD$$

Where

PER	=	Real Exchange Rate
GDF	=	Differential of the Domestic and Foreign (US) Inflation rates.
Y	=	Gross Domestic Products.
IDF	=	Differential of Domestic and Foreign interest rates
TOT	=	Terms of trade.
BD	=	Budget Deficit as Percentage of GDP.

The equation shows that budget deficit can influence exchange rate directly. Higher budget deficit lead to depreciation of the domestic currency directly as well as indirectly.

Results and Discussion

The empirical analysis of the study is based on Pakistan's experience in the period of 1982-98, due to the fact that during this period Pakistan has followed the policy of

managed float. The data on the nominal exchange rate and other variables has been taken from international Finance statistics [1999]. Both of the equations in the model are estimated by using OLS technique. Results of Equation No. 1 for dependent variable PER

Table 1: The Estimates of Equation No. 1

Regressions	Estimated Coefficients	T Value
C	17.6200	6.02900
GDF	0.51124	2.06170
Y	0.000003	1.64280
IDF	-0.020521	-0.63665
TOT	11.8968	2.22009
R-Squared	=	0.891819
Adjusted R-Squared	=	0.855576
Durbin-Watson Statistic	=	2.173190
F-Statistic	=	24.731300

In the equation the channels through which exchange rate can be affected are shown. The coefficient of the inflation differential and TOT are significant at 10 percent and 5 percent level of significant respectively. But interest differential is insignificant because interest rate do not reflect market conditions. The explanatory variables in the regression explain 89 percent of the variation. The estimates do not suffer from serial correlation.

Results of equation No. 2 for dependent variable PER

Table No 2: The Estimates of the equation No. 2

Regressors	Estimated Coefficient	Tvalues
C	12.16350	4.06936
GDF	0.495007	2.52814
Y	0.000006	3.43345
IDF	-0.552359	-1.75590
TOT	8.902810	2.04380
BD	-1.011190	-2.87451
R-Squared	=	0.938223
Adjusted R-Squared	=	0.910143
Durbin-Watson Statistic	=	1.89281
F-Statistic	=	33.4121

The results from the table shows that the explanatory variables in this regression explain 94 percent of the variation. The estimates of regression do not suffer from any serial correlation, which is clear from Durbin-Watson statistic. The equation is actually the real exchange rate equation. All the coefficients have approximately expected signs. But they are not necessarily statistically significant.

To the perception, the coefficient of interest rate is not statistically significant. It means the interest rate influences the real exchange in Pakistan, that is due to the following certain reasons:

- The money market is not put to market conditions but monetary authorities in Pakistan control it.
- Recently people are given the right to own the bonds of the foreign countries. So the capital inflows have forced the domestic currency to devalue.

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The Terms Of Trade coefficient is positive and is not significant at 5 percent level of significance so the Terms Of Trade have no impact on the real exchange rate.

The estimated coefficient of the budget deficit have revealed the fact that budget deficit has significant direct effect on the real exchange rate as the coefficient of the budget deficit is significant at 5 percent level of significance. It means the budget deficit has strong effect on the real exchange rate. Overall budget deficit has no relation with the nominal exchange rate. But the budget deficit financed by banking systems leads to higher nominal interest rate. This was shown by (Burney and Yasmeen, 1989). Above analysis depicts the fact that budget deficit in Pakistan have influence on the exchange rate directly as well as indirectly through price level.

The equation further depicts that when the budget deficit is increased by 1 percent, the real exchange rate decreases by 1.01 percent. It means the domestic currency devalues so the budget deficit has negative relationship with the real exchange rate. So, to make the real exchange rate stable budget deficit must be reduced. The policies to reduced the budget deficit may also be appropriate to make the domestic currency stable.

Conclusion

The objective of the present study was to examine the relationship between the real exchange rate and the Government budgetary deficit. The main concern is that in addition to indirect effect, the budgetary deficit has a direct effect on the real exchange rate in Pakistan. To prove the hypothesis it has been tried to regress the real exchange rates on all the channels, which affect the real exchange rate.

Differentials of interest rate, inflation rates for Pakistan and US, TOT, and GDP product have been inducted into the regressors line. The results rejected the hypothesis that there is no relationship between budgetary deficit and exchange rate. The analysis further highlights a specific aspect of policy domain that is not well appreciated in the literature. That is the options to finance budgetary deficit from external borrowing and drawing on foreign exchange reserves are influenced by prevailing exchange rate. It would lead to conclusion that

budget deficit could possible have direct effect on real exchange rate.

The exchange rate changes depend on the fact that fiscal deficit is reduced by increasing taxes and by lowering Government expenditures. Required devaluation will be smaller if the cut in government expenditures falls on traded rather than non-traded goods.

The conclusion of the paper is that budget deficit has both direct and indirect effects on the real exchange rate. The estimates from Pakistan have been presented for the empirical support and it is proved that there exists a relationship between budget deficit and real exchange rate.

References

- Abel, John D. 1990. "The Role of Budget Deficit During the Rise in Dollar Exchange Rate from 1979-85". Southern Economic J.
- Afridi, U. 1995. "Determining the Exchange Rate". The Pakistan Development Review 34.
- Burney, Nadeem A. and Attiya Yasmeen 1989. "Govt. Budget Deficit and Interest Rates-An Empirical Analysis of Pakistan". The Pakistan Development Review 28.
- Chistie and Hasan 1993. "What Determines the Real Exchange Rate in Pakistan?" The Pakistan Development Review 32.
- Cottani, J., D. Cavallo and M.S. Khan 1990. "Real Exchange Rate Behavior and Economic performance in LDCs". Economic Development and Cultural Change 39.
- Evans, P. 1985. "Do Large Deficits Produce High Interest Rates?" American Economic Review 75.
- IMF 1999 "International Financial Statistics" International Monetary Fund, Washington D.C.
- Khan, Zahid, H. 1988. "Govt. Budget Deficits and Interest Rates-The Evidence since 1971 using Alternative Deficit Measures". Southern Economic J. 54.
- Khan, Mohsin and J. Saul Lizondo 1987. "Devaluation, Fiscal Deficit and the Real Exchange Rate". The World Bank Economic Review 1.
- Montely, B. 1983. "Real Interest Rates, Money and Govt. Deficits" Economic Review. Federal Reserve Bank of San Francisco.