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# MACROECONOMIC IMPACTS OF BUDGET DEFICIT ON PAKISTAN'S FOREIGN SECTOR

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**Abstract**. The purpose of this study is to investigate impact of government budget deficit on money supply, domestic price level, out put, balance of payments and international reserves. A model was developed to draw empirical evidences this regards. The empirical evidences lead to a conclusion that fiscal and monetary variables are important to determine economic stability in the foreign sector of Pakistan. Money supply is positively related to foreign reserves, bank credit and borrowing 'of the public sector to finance deficit. It is negatively related to interest rate. The money demand is also negatively related to interest rate but positively related to income. The output is positively affected to credit extended to the private sector, international reserves and real expenditures of the public sector for the development of social sectors. The increase in money supply due to excessive credit, affects trade balance through output, which resultantly brings changes in foreign reserves. The increase in government budget deficit, financed through excessive expansion in domestic credit, created excessive supply of money over demand, and therefore, led to foreign reserve outflows. To control the sharp swings in money supply, prices and reserves, the government should avoid the short-run devaluation and stabilize the external value of its currency. The credit obtained by the public sector from the banking system and utilized for current expenditures leads private credit to crowd out. The export supply function indicated that exports are positively related to real income, relative prices and nominal exchange rate. The elasticity of exports with respect to income was greater than one, which means an increase in income enhances exports more than the growth of income. The imports are also positively related to income, and foreign reserves, and negatively to relative prices of imports and foreign exchange rate. The monetary policy actions are heavily dependent on the fiscal. Therefore, a close link between monetary and fiscal policies is necessary. In order to achieve the internal and external balance, the implication of monetary

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and fiscal policies must be consistent. To reduce the balance of payments deficit and to restore stability, the monetary authorities should control the excessive domestic credit expansion. This is only possible when government reduces the size of its budget deficit.

## I. INTRODUCTION

In developing countries monetary expansion, associated with heavy government borrowing from banking system as well as from international sources to finance large budget deficits, is one of the key factors contributing to balance of payments disequilibria.[1] In such countries, the government depends upon deficit financing due to its inability to mobilize domestic resources, relatively narrow tax base, and inflexible tax structure (Tanzi, 1982). The capital markets of these countries are also underdeveloped and institutionally determined interest rates (in most developing countries) often create a financial environment that has a built-in-bias towards the expansion in money supply. So in the presence of supply constraints, an excess of money supply contributes to increase in general price level and imports (Yousaf, 1988).

Like most developing countries, a large and growing budget deficit in Pakistan is one of the major outstanding economic problems. It is held responsible' for high inflation, low growth, a current account deficit and crowding out of private investment and consumption (Chudhary and Abe, 1999). Budget deficit in Pakistan has varied between 5.4 to 8.7% of GDP during last two decades. On average, it was 6% of GDP during the decade of 1970s. It was 7.6% of GDP in 1980s. During the year 2001-02, it has again surpassed 7% of GDP. For the sustainability of deficit several revenue measures were introduced in the successive budgets, along with reduction in development expenditures, however, all in vain.

In the second half of the 1990s, deficit declined to 6.4% of the GDP through reductions in development expenditures. In other words, this reduction was not achieved by enhancing tax efforts (Tax-to-GDP ratio) but mainly at the cost of loosing future growth potential, *i.e.* reduction in development expenditures. This reduction was also not sustainable and it again increased in the current fiscal year. Pakistan's tax system is still characterized by a narrow and punctured base. Its reliance on distortionary

[1]See Aghevli (1975), Aghevli and Khan (1976) and Otani and Park (1976).

import-related taxes, high tax rates on one hand and tax concessions, exemptions and weak tax administration on the other hand has become a continuous phenomenon.[2] The deficit, resultantly, is not sustainable (Chaudhary and Ahmed, 1996). Moreover the balance of payments deficit has become a permanent economic problem. In the last fifty years, Pakistan has continuously suffering from current account deficit.[3] This deficit is financed through international loans. As a result international debt has reached beyond sustainability. Debt service alone has been washing away more than 5% of the country's GDP growth (Chaudhary, 1888, 2002).

Such a large budget deficit necessitates rapid expansion of domestic credit. The change in domestic credit would cause foreign reserves to approach a new equilibrium level (Khan and Knight, 1981). Moreover, in underdeveloped countries, free capital market interaction is limited and it is also underdeveloped. The main source of financing the government budget deficit remains the banking system, which crowds out private credit. De Silva (1977), Aghevli (1977), Dunn (1986), Dalamagas (1990) and Chaudhary and Ahmed (1995, 1996) analyzed the fiscal aspects of inflation but they did not pay much attention to balance of payment deficit and to the monetary mechanism which could generate the problem. The purpose of this analysis is to estimate the monetary model (mentioned above) in order to investigate the channels through which the government budget deficit affects the money supply, domestic price level, out put, balance of trade and international reserve flows (balance of payments).

The study is organized as follows. Part II focuses on methodology. In part III empirical findings are discussed. Part IV consists upon conclusion and policy implications.

## II. METHODOLOGY

To analyze the impact of budget deficit on the balance of payments, fiscal and monetary variables are linked to observe the process and their role in the

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[2]See, Economic Survey 1999-2000.

[3]Current year is an exception. After fifty years, there is surplus in the balance of payment, not due to increase in exports. It is a result of an increase in remittances, rescheduling and increase in aid from the international community. However, the change in the BOP is not sustainable.

economy of Pakistan. The Quantity Theory of Money implies that when money supply expands more rapidly than real output, it creates inflation. However, there are structural variables, which also generate this problem in developing countries. Thus, monetary or fiscal models need to incorporate such variables in order to fully explain the phenomenon (Yousaf, 1988).

De Silva (1977) developed a simultaneous equation model and estimated the key equations separately with OLS method. In Pakistan, Chaudhary and Ahmed (1995, 1996) also estimated this model with the same estimation method as De Silva. OLS method gives biased results for simultaneous equation model, therefore, the estimates of these studies are not reliable. Besides, the above study also used a very small sample size to explain short run impacts. So this study is undertaken to improve upon the shortcoming in the literature and provide reliable results. First, structural variables are incorporated in the model; second, 2SLS method is utilized for estimation. Moreover, the basic model does not capture the affects of external sector. For this purpose, we have extended the model by incorporating the exports and imports equations in order to obtain better results, for the economy of Pakistan. The objective of this exercise is to investigate the mechanism through which the monetary impulses are channeled and then their affects are transmitted to other macroeconomic variables, *i.e.* domestic price level, output, level of exports and imports and balance of payments.

The money supply function is given as follows.

$$M^s = f(R, GBD, BCP) \tag{1}$$

Where $M^s$ is the money supply; $R$ is the international reserves; GBD is the government borrowing from the banking system (to finance the budget deficit) and BCP is the commercial banks credit provided to the private sector.

Demand for real money balances is the function of real income and interest rate.

$$(M^d / P) = f(y, i) \tag{2}$$

Where $M^d$ is the demand for nominal cash balances; $P$ is the domestic price level; $y$ = real income and $i$ is the rate of interest.

The price level is determined by the monetary equilibrium that varies with the changes in money supply and demand for real money balances. If $\Delta M^s > \Delta M^d \Rightarrow P$ will rise, if $\Delta M^d > \Delta M^s \Rightarrow P$ will fall and if $\Delta M^s = \Delta M^d$, there will be no change in price level.

The real output is the function of real government expenditures (consumption plus investment), credit of banking system to the private sector, balance of trade and real interest rate.

$$y = f(GE, BCP, BT, r) \tag{3}$$

Where $GE$ is the real government expenditure (investment plus consumption), $r$ is real interest rate and $BT$ is the balance of trade (export minus import).

The supply of real exports depends on real income, relative prices of exports and nominal exchange rate.

$$x = f(y, RPx, E) \tag{4}$$

Where $y$ is the level of real income, $RPx$ is the relative prices of exports ($px / p$), and $ER$ is the nominal exchange rate.

Finally the demand for real imports depends on real income, relative prices of imports, international reserves and nominal exchange rate.

$$m = f(y, RPm, R, ER) \tag{5}$$

Where $RPm$ is the relative prices of import and $R$ are the international reserves.

The trade balance and foreign exchange reserve (balance of payments) equations are defined as:

$$BT = x - m \tag{6}$$

$$R = R(-1) + BT + Bf \tag{7}$$

Where $BT$ is the balance of trade and $Bf$ is the net foreign borrowing.

The complete model in log form can be written as:

$$\ln(M^s) = a_0 + a_1 \ln(R) + a_2 \ln(GBD) + a_3 \ln(BCP) \tag{8}$$

$$\ln(M^d / p) = b_0 + b_1 \ln(y) + b_2 \ln(i) \tag{9}$$

$$\ln(y) = c_0 + c_1 \ln(GE) + c_2 \ln(BCP) + c_3 \ln(BT) + c_4 \ln(r) \tag{10}$$

$$\ln(x) = d_0 + d_1 \ln(y) + d_2 \ln(RPx) + d_3 \ln(ER) \tag{11}$$

$$\ln(m) = e_0 + e_1 \ln(y) + e_2 \ln(RPm) + e_3 \ln(R) + e_4 \ln(ER) \tag{12}$$

$$BT = x - m \quad (13)$$

$$R = R(-1) + BT + Bf \quad (14)$$

Endogenous variables are: $M^s$, $M^d$, $p$, $y$, $m$, $R$ and $x$.

Exogenous variables are: *GBD*, *BCP*, *GE*, *RPx*, *RPm*, *ER*, $y$, *Bf* and $i$.

The working of the model is as follows: The increase in money supply ($M^s$) take place due to, say, an increase in government borrowing from the banking system to finance the budget deficit (*GBD*). When the government spends this borrowing (increase in government expenditure), means increase in output $y$ (Equation 10) that in turn raises the public's demand for, real money balances (Equation 9). Other things remaining the same, the change in domestic price level depends on change in money supply and money demand, if $\Delta M^s > \Delta M^d \Rightarrow \Delta P > 0$, if $\Delta M^d > \Delta M^s \Rightarrow \Delta P < 0$ and $\Delta M^s = \Delta M^d \Rightarrow \Delta P = 0$. Other things remaining constant, the change in price affects the supply of exports and demand for imports through relative prices of exports and imports (Equations 11 and 12). Changes in exports ($x$) and imports ($m$) affect the balance of trade (Equation 13), thus resulting in changes in reserves ($R$) due to changes in balance of trade (Equation 14), which will lead to a corresponding change in $M^s$ (Equation 8) unless the monetary authorities undertake offsetting actions. Thus, the system is inter-dependent.

## III. EMPIRICAL RESULTS

A simultaneous equation model is estimated to examine the impacts of budget deficit on money supply, foreign reserves and balance of payments. For this purpose annual data for the period 1965-99 is compiled and 2SLS technique is utilized for estimation. The results of 2SLS regression model are reported in the table. In general, the results are reasonable because the explanatory power, R2 for each equation is fairly high except export supply function and there is no serious auto correlation problem for each equation as shown by DW and H Statistic.[4] The linkages are discussed below:

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[4]When lagged value of dependent variable is used as independent variable in the regression equation then estimated DW statistic has no importance regarding the existence of auto-correlation. Thus, H test is used to check the presence of auto-correlation. If the DH statistic is significant, then we reject the hypothesis that there is no serial auto correlation other wise accept it. For further detail see J. Durbin (1970).

TABLE

Regression Results

**Money supply equation**

$M^s = 0.49 + 0.15\,R + 0.77\,BCP + 0.09\,GBD + 0.36\,AR$

(3.88)* (2.02)** (9.56)* (1.99)** (2.01)**

| | | | |
|---|---|---|---|
| R-Squared | 0.995 | Adjusted R-Squared | 0.994 |
| S.E. of Regression | 0.046 | Durbin-Watson Stat | 1.84 |

**Money demand equation**

$M^d = -0.27 + 1.01\,Y - 0.21\,i + 0.74\,AR(1)$

(–1.48) (31.17)* (–2.85)* (5.98)*

| | | | |
|---|---|---|---|
| R-Squared | 0.998 | Adjusted R-Squared | 0.997 |
| S.E. of Regression | 0.029 | Durbin-Watson Stat | 1.31 |

**Output supply equation**

$y = 0.45 + 0.05\,BCP + 0.03\,TB + 0.06\,GER - 0.025\,r + 0.87\,y(-1)$

(1.68)*** (2.60)* (2.17)** (2.54)* (–0.548) (8.66)*

| | | | |
|---|---|---|---|
| R-Squared | 0.998 | Adjusted R-Squared | 0.997 |
| S.E. of Regression | 0.008 | H. Statistic | –0.44 |

**Export supply function**

$x = -2.83 + 1.06\,y + 0.20\,RPx + 1.04\,ER + 1.15\,x(-1)$

(–1.82)*** (2.01)** (0.41) (2.37)* (4.35)*

| | | | |
|---|---|---|---|
| R-Squared | 0.54 | Adjusted R-Squared | 0.47 |
| S.E. of Regression | 0.18 | H. Statistic | 0.481 |

**Import demand function**

$m = -0.60 + 0.41\,y + 0.11\,R - 0.01\,ER - 0.08\,RPm + 1.22\,m(-1)$

(–1.87)*** (1.91)** (1.72)*** (–1.90)** (–0.78) (5.54)*

| | | | |
|---|---|---|---|
| R-Squared | 0.921 | Adjusted R-Squared | 0.907 |
| S.E. of Regression | 0.04 | H. Statistic | 0.60 |

Foreign Reserve Identity $R = R(-1) + BT + Bf$

Trade Balance Identity $BT = x - m$

*Significant at 1% level
**Significant at 5% level
***Significant at 10% level

2SLS is used for estimation

## MONEY SUPPLY EQUATION

The estimates of money supply indicate that money supply is positively related to foreign reserves (*R*), bank credit to private sector (*BCP*) and domestic source of financing the budget deficit *i.e.* borrowing from banking sector (*GBD*). The results indicate that around 10% increase in money supply is triggered due to 1.5% by foreign re/serves (*R*), 7.7% by bank credit expansion (*BCP*) and 0.9% by domestic financing of government budget deficit (*GBD*).

## MONEY DEMAND EQUATION

The estimates indicate that the demand for nominal money balances is positively related to nominal income and negatively to interest rate (opportunity cost of holding money). It means that an increase in income will lead to increase in money balances by the same amount of 1.01%[5] and increase in interest will lead to decrease in money balances.

In developing countries like Pakistan, the public holds most of its saving in the form of money due to insufficient existence of other financial assets. Moreover, the results show that the monetary sector of the economy is expanding rapidly. In the absence of independent proxy to capture the magnetization effect, the income elasticity of money balances will be biased upwards. The interest rate puts negative pressure on money demand, indicating that as interest rate goes up, people get rid off their money holdings in preference for goods and real assets.

## OUTPUT SUPPLY EQUATION

The estimates show that real output is positively related to bank credit (*BCP*), trade balance (*BT*), real government expenditure, lagged value of real output and negatively related to real interest rate, as shown in the table. A one percent increase in output is explained by an increase of (*BCP*), (*BT*) and (*GE*) by the amount of 0.05%, 0.03% and 0.06%, respectively. The interest rate is negatively related to output but is insignificant. The result of the output equation, suggests that bank credit to private sector and government expenditures play a key role in determining the level of output in the Pakistan's economy. The increase in bank credit to private sector will lead to

[5]These results are consistent with those obtained by Zecher (1974).

rise in investment level, which enhances the productive capacity of the economy and employment opportunities.

## EXPORT SUPPLY FUNCTION

The estimates of export supply equation indicate that the Pakistan's exports are positively related to real income, relative prices of exports[6] and nominal exchange rate. The income elasticity of exports could be positive or negative depending on the elasticity of demand for exportable goods. If the domestic demand for exportable goods rises more (or less) than proportionate increase in income then the income coefficient could be negative (positive) and less (more) of the output will be exported.[7] The supply elasticity of exports with respect to income is greater than unity (1.06), which implies that export sector is growing with greater proportion than the rest of economy.[8] The positive sign of *RPx* indicates that as the export price rises relative to domestic price level, the production for exports becomes more profitable and hence, exporter will expand rapidly.[9] The positive sign of exchange rate (*ER*) implies that a deprecation of currency has a positive impact on exports. 10% depreciation in exchange rate will lead to increase in exports by 10.4%.

## IMPORT DEMAND FUNCTION

The results of imports demand equation show that Pakistan's imports are positively related to real income and foreign exchange reserves, and negatively related to exchange rate and relative prices of imports. The income elasticity of imports is well below the unity, indicating that the demand for imports rises less than proportionate increase in output. The coefficient of foreign reserves shows a positive relationship between imports and reserves. A 10% increase in reserves will lead to increase in imports by 1.1%.

The estimated coefficient of exchange rate is negative and significant, implying that the depreciation of the domestic currency (devaluation) may have a dampening impact on imports. The negative effect of devaluation on

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[6]In order to capture the effect of devaluation on exports and imports we introduce nominal exchange rate in both functions. For further detail see Aynul and Khan (1994).

[7]For further detail see, Gold, Sterin M. and Mohsin H. Khan (1978).

[8]*Ibid*, p. 2.

[9]For further detail see, Aghevli (1977).

imports is, however, equal to 0.01. This implies that imports are largely influenced by factors other than exchange rate, *viz.* level of investment, the desire to maintain full capacity utilization, fluctuations in availability of food grains, availability of foreign aid and the stringency of commercial policies. Thus, devaluation is not expected to have very substantial effect on the imports.[10]

The study was aimed at investigating the effects of macroeconomic variables on major aggregates such as inflation, real output and balance of payments. The major conclusion drawn from this study is that the government budget deficit has significant impact on money supply and this in turn has exerted a significant influence on the inflation and balance of payments. In other words, the government has forced the central bank to print more money to finance the growing budget deficit. This in turn has exerted upward pressure on prices. On the other hand, changes in money supply have affected the trade balance through exports and imports, which in. turn influenced the foreign exchange reserves. These results suggest that in order to reduce inflation and balance of payments deficit there is a need to manage monetary, fiscal and exchange rate policies simultaneously.

Presently, Pakistan is facing a dilemma with regards to its foreign sector. The depreciation of domestic currency may raise exports but the imports may not fall significantly. The previous record of devaluation indicates that the rupee was devalued several times. Then it was delinked from the dollar and placed under managed floating exchange rate system in January 1982. The track-record shows that the rupee continued to depreciate by 13.8% per annum on an average since its delinking from dollar but failed to achieve the desired results.[11] The negative impacts of devaluation on imports are not encouraging for Pakistan, being an import-oriented country. Our major imports consist of not only consumption items like wheat, edible oil, tea and powder milk etc but also machinery, raw material, chemicals and other capital equipment. These items are imported to meet the country's development requirements. The empirical finding of this study indicates that

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[10]See, Kemal and Alvie (1975), p. 16.

[11]It is first time that during the current year rupee has appreciated, which .is a result of better balance of payment. This change is not durable either, since there is no sound change in the foreign exchange earnings, rather export fell during this period. The improvement in reserves is due to a significant increase in remittance. The Pakistanis abroad shifted their assets from abroad, due fear of their taken over, after September 11 incidence.

devaluation will not improve the trade balance but it would actually increase the cost of production.

In most developing countries like Pakistan, the excess demand for foreign reserves is the result of technologically imposed lags in the development of exports and substitutes for imports. Growth requirements are proportionate to output and the exports earnings cannot meet the demand for imports. In addition, the sectoral bottlenecks and under-utilization of resources are factors of tremendous importance and deserve special attention. In short, it may be suggested that government must reduce the budget deficit in order to contain optional inflation and stable balance of payments. Moreover, government should match monetary growth with economic growth for stability of the economy.

## V. CONCLUSION AND POLICY IMPLICATIONS

The empirical evidence leads to the conclusion that fiscal and monetary variables are important to determine economic stability in the foreign sector of Pakistan. The "changes in money supply affect trade balance through output which resultantly brings changes in foreign reserves. The increase in government budget deficit, partially due to an income inelastic revenue structure, leads to excessive expansion in domestic credit, which creates excessive supply of money over demand, and therefore leads to foreign reserves outflows.

The important implications based upon these empirical findings call for reduction in budget deficit, which will help to improve balance of payments deficit. It would also tend to halt the excessive growth of domestic credit and hence restore the reserve position. To control the sharp swings in money supply, prices and reserves, the government should avoid the short-run devaluation and stabilize the external value of its currency. To improve the trade balance, the commercial policy must be reconsidered. The credit obtained by the public sector from the banking system and utilized for current expenditures leads private credit to crowd out. Thus, it not only affects growth but also put pressure on balance of payment. Therefore, it is suggested that the government should reduce the size of budget deficit by cutting down its current and unnecessary expenditure. The monetary policy actions are heavily dependent on the fiscal decisions made by the government. Therefore, a close link between monetary and fiscal policies is necessary. In order to achieve the internal and external balance, the implication of monetary and fiscal policies must be consistent. To reduce the

balance of payments deficit and to restore the price stability, the monetary authorities should control the domestic credit expansion. This is only possible when government reduces the size of its budget deficit and restores the autonomy of the central bank. Besides, financial and fiscal constraints should be minimized through reforms in order to generate more revenue.

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