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THE IMPACT OF DOMESTIC CREDIT, DEFICIT AND CHANGING EXCHANGE RATE REGIMES ON FOREIGN RESERVES OF PAKISTAN

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Abstract. Using monetary approach to the balance of payments, this study examines impacts of credit creation, deficit, dis-equilibrium between money supply and money demand and exchange rate regimes on international reserves. The empirical evidences indicate that moving from fixed to manage exchange rate system has not affected reserve flows in any appreciable way. During the fixed exchange rate period, the money demand was greater than its supply, as a result reserves grew. Moreover, the impact of real income and price level on foreign reserves is more during the fixed exchange rate system, disregarding price effect due to its insignificance, the money demand less than money supply resulted in reserves outflow. The most striking finding of the study is that acceleration in the growth rate of domestic credit, due to deficit financing, lead to approximately equal worsening in the balance of payments. In other words, no sterilization takes place to affect the reserves movement through domestic credit. It appears that excess credit creation, money supply and demand are basic sources, which bring changes in the variation of international reserves. However, the real income and prices are important in explaining changes in money demand. Thus, in Pakistan, the movements in the foreign reserves are the results of changes in monetary policy instruments like credit creation and money supply. The behaviour of international reserves and balance of payments is dominated by the factors like changes in income, exchange rate, interest rate and other monetary instruments. In the long run, the monetary authorities did not sterilize the changes in foreign exchange reserve through domestic credit creation. Moreover, the monetary policy has significant effect on balance of payments and international reserves.

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I. INTRODUCTION

In developing countries like Pakistan, the foreign reserves are one of the important determinants of its balance of payments and creditworthiness. They also play a dominant role in the adjustment of exchange rate. Pakistan's balance of payments has mostly remained in deficit for the last fifty years.[1] The monetary authorities have been making considerable efforts to boost the foreign reserves through managing the exchange rates. Pakistan devalued her currency over hundred percent, *i.e.* 131% in 1972. After the devaluation of 1972, the rupee remained pegged with US dollar at Rs. 9.9 per dollar. During 1981, Pakistan's rupee depreciated steadily against other currencies due to appreciation of US dollar. As a result, Pakistan's exports became excessively non-competitive because these were already facing tough competition in the international market. On 8th January 1982, the Pakistan Government de-linked the rupee from the US dollar by introducing a managed floating exchange rate system, whereby the Rs./$ is fixed with reference to a trade weighted basket of currencies of its major trading partners. Thus, the period prior to 1982 was under fixed exchange rate. The period thereafter is considered as flexible exchange rate regime. We will analyze the impact of these regimes on foreign reserves of Pakistan.

The stocks of foreign reserves were $ 185 million, $ 431 million and $ 2784 million on 30th June 1958, 1977 and 1987, respectively. The fluctuations in the reserves continued and these reserves were as low as $ 529 million on 30th June 1990. The reserves declined to $ 1219 million (1997) and further reduced to $ 930 million on 30th June 1998. But the situation slightly improved due to foreign borrowing to $ 1730 million by end of June 1999, it again reduced to $ 1439 million on 29th April 2000, indicating a decline of 16.8% over the level of the end of June 1999.[2] It may be noted that these reserves were not enough for two week's imports.

The main reasons of Pakistan's balance of payments deficit are the export instability, insufficient foreign receipts and ever-increasing burden of external debt (Chaudhary and Abe, 1999; Chaudhary and Ahmed, 1995 and Chaudhary and Saleem, 2001). Another problem faced by Pakistan is the

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[1]It is an exception that during 2001-02, the balance of payments is positive, mainly due to September 11 incidence. There is significant increase in remittances and foreign aid during this period. During 2004, foreign reserves jumped to over $ 11 billion.

[2]*See Pakistan Economic Survey* for long run fluctuation in the reserves.

excessive credit expansion due to steady rise in budget deficit.[3] The excessive credit expansion creates excess money supply over money demand, which leads to reserve outflows and deteriorates the balance of payments (Chaudhary and Shabbir, 2002).

The monetary approach to balance of payments is often presented as superior to alternatives traditional one's because under this approach, money market is stable and if there is any dis-equilibrium in the money market, it will initiate an automatic adjustment process, which brings equilibrium in the long-run. According to this approach, any dis-equilibrium in the money market is expected to be adjusted through changes in the internal reserve flows under fixed exchange rate system and changes in the exchange rate when economy is operating under flexible exchange rate regime because the balance of payments situation puts pressure on balance of payments and exchange rate system.[4] Under a managed floating exchange rate system (presently in action), any dis-equilibrium in the money market is adjusted through changes in both exchange rates and foreign exchange reserves.

The research studies conducted by Zecher (1972), Aghelvi and Khan (1977), Wildford and Zecher (1979) and Bhatia (1982) using monetary approach to the balance of payments concluded that excessive credit expansion and money multiplier are the major causes of the dis-equilibrium in the balance of payments. Pertaining to Pakistan, Uddin (1985), Bilquees (1989) and Khan (1996) partially focused on the issue but these studies have limitations. These studies did not consider testing the basic assumption of monetary approach, *i.e.* the exogeneity of money demand determinants and domestic credit with respect to foreign reserves. Besides, these studies did not relate different exchange rate regimes and deficit to the domestic credit creation. Moreover, their sample size was also small. Thus, their results were not very reliable. Given this background, this study is undertaken to improve upon the earlier findings and highlight impacts of changing regimes of exchange rates and of excessive credit expansion. The study is organized as follows. Methodology is discussed in section II. Section III consists upon the discussion of empirical results. Conclusion and policy implications are provided in section IV.

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[3] *See* for details *Economic Survey 2001-02* and Chaudhary and Shabbir (2002).

[4] *See* Hossain (1988), p. 86.

II. METHODOLOGY

The monetary approach to the balance of payments relates the balance of payments directly to the demand for and supply of money. Main interest is to analyze the effects of variations in the nominal stock of money (monetary base) on interest rate, output and domestic price level. However, in a small open economy operating under fixed exchange rate regime, the money supply can no longer be considered as exogenous instrument because it can be changed through surpluses and deficits in the balance of payments. Therefore, it can be said that monetary approach to the balance of payments is concerned with the relationship between the domestic component of money stock, prices, output, interest rate and the balance of payments.

There will be a change in money demand and supply due to variations in economic activities. Thus, it is necessary to watch these changes. The money demand shows the economy's capacity to absorb the increased money supply. The temporal stability of the money demand functions is crucial for the monetary policy to have predictable effects on the economic variables. The formal monetary model of the balance of payments consists of the money demand function, a money supply function and their equilibrium condition.

Three basic issues in specifying the money demand function are (*i*) the definition of money, (*ii*) the variables to be used in money demand function and (*iii*) the stability of money demand function.[5] The specific features of underdeveloped economies, like Pakistan, in terms of an impact of different monetary variables are different from the case of developed countries. In less developed economies, interest rate is included in money demand function as an opportunity cost variable which remains one of the most controversial issues because in such economies, interest rate is not determined by market forces due to the existence of dual money market (organized and unorganized) and frequent interference of government. In LDCs where the range of alternative assets is limited, substitution may take place between goods and money. Therefore, it is more appropriate to represent the opportunity cost by both the interest rate and the implicit return on goods, the rate of inflation. Thus, demand for real money balances can be written as:

$$M^d / P = a\, y^{b1}\, i^{b2}\, \pi^{b3} \qquad (1)$$

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[5] *See* Ahmed (2000).

Where M^d is the demand for nominal money balances, P is the domestic price level, y is the level of domestic real income, i is the domestic interest rate and π is the rate of inflation. Equation (1) can be written in log form as:

$$m^d - p = a + b_1 y + b_2 i + b_3 \pi \quad (2)$$

$$m^d = a + p + b_1 y + b_2 i + b_3 \pi \quad (3)$$

Taking derivative with respect to time and denoting it by (g), equation (3) becomes as:

$$g\, m^d = \alpha_0 + \alpha_1 g\, p + \alpha_2 g\, y + \alpha_3 g\, i + \alpha_4 g\, \pi + u \quad (4)$$

Where $g\, x = (1 / x)\,(dx / dt)$, $x = p, y, i, \pi$ and u is the stochastic disturbance. The parameters α_1, α_2, α_3 and α_4 are the elasticities of price, real income, interest rate and rate of inflation with respect to nominal money balances, respectively, and are expected to have the following signs:

$$\alpha_2 > 0, \quad \alpha_3 > 0, \quad \alpha_4 > 0$$

Since the demand for money is assumed to be homogeneous of degree one in price level, so the expected sign of $\alpha_1 = 1$.

As the rate of growth in real income (gy) increases, more nominal money balances will be demanded while the similar increase in the rate of growth in interest rate (gi) and inflation ($g\pi$) will lower the demand for nominal money balances (Aghevli and Khan, 1976).

The money supply is defined as equal to the product of money multiplier and the high-powered money.

$$M^s = Km \quad (5)$$

Where M^s is the supply of money, K is the money multiplier and m is the monetary base (volume of high-powered money).

By definition the stock of high-powered money or the liabilities of the monetary authorities (m) is equal to the stock of international reserves (R) and domestic assets (net of liabilities) holding of the monetary authorities (DC).

$$m = R + DC \quad (6)$$

Putting it in equation (5)

$$M^s = K\,(R + DC) \quad (7)$$

Writing equation (7) in logarithmic form we get:

$$m^s = k + \log\,(R + DC) \quad (8)$$

Where m^s is the log of money supply (M^s) and k is the log of money multiplier (K). Taking derivative with respect to time and denoting it by (g) and re-arranging we get:

$$g\,m^s = g\,k + (R/m)\,g\,R + (DC/m)\,g\,DC \quad (9)$$

Where $g\,x = (1/x)\,(dx/dt)$, $x = k$, R and DC.

Equation (9) can be written as:

$$g\,m^s = g\,k + g\,r + g\,dc \quad (10)$$

Where:

$g\,m^s$ = Growth rate of money supply

$g\,k$ = Growth rate of money multiplier

$g\,r$ = Growth rate of international reserves, weighted by its share in monetary base

$g\,dc$ = Growth rate of domestic credit, weighted by its share in monetary base

With the help of monetary equilibrium, we can derive the international reserves flows equations.

$$g\,m^s = g\,m^d \quad (11)$$

The complete model is as given below:

$$g\,k + g\,r + g\,dc = a + b_0\,g\,p + b_1\,g\,y + b_2\,g\,i + b_3\,g\,\pi + u, \quad (12)$$

Bringing the dependent variable on the left hand side, we get:

$$g\,r = \beta_0 + \beta_1\,g\,p + \beta_2\,g\,y + \beta_3\,g\,i + \beta_4\,g\,\pi - \beta_5\,g\,k - \beta_6\,g\,dc + u \quad (12.1)$$

Equation (12.1) represents the key relationship in the monetary theory of the balance of payments. The expected signs and expected magnitudes of the parameters of equation (12.1) are as follows:

$$\beta_1 = 1,\ \beta_2 > 0,\ \beta_3 < 0,\ \beta_4 < 0,\ \beta_5 = \beta_6 = -1$$

The expected sign of β_1 implies that an increase in the rate of growth in price level ($g\,p$) improves international reserve position because of devaluation. Mundal and Dornbush (1973) emphasized that devaluation is purely a monetary phenomenon. Since devaluation raises the domestic price level leading to reduction in domestic expenditures on goods and services via reduction in residents purchasing power. This leads to increase in the production of exportable goods. As a result, the level of income and employment goes up. An increase in income and employment increases the

nominal money demand over money supply. If domestic credit is constant, the increased money demand generates capital and foreign exchange reserves inflows and as a result the balance of payments becomes surplus. The reserve increases by β_1 times the devaluation because of an increase in the domestic price level. As a result, domestic currency appreciates. On the other hand, an increase in the growth rates of interest rate ($g\,i$), inflation ($g\,\pi$), the money multiplier ($g\,k$) and the domestic assets of central bank ($g\,dc$) will lead to reserve losses (Frekal *et al.*, 1980).

The coefficient β_2 is the income elasticity of demand for nominal money balances and therefore is positive and is the neighbourhood of unity. In particular, a one-percent increase in income generates β_2 percent increase in the demand for money and consequently a reserve inflow just sufficient to result in β_2 percent increase in nominal and real stock of money.[6] Increase in interest rate is associated with reserve outflows. Other things being equal, a given increase in the interest rate would depress the demand for money, creating an excess supply of money and consequently would result in the reserve outflows. Hence, the interest rate and changes in this rate are assumed to reflect similar movements in interest rates all over the world.[7] However, if changes in Pakistan's interest rate are dominated by changes relative to the rest of the world, the estimates of β_3 are likely to be positive, *i.e.* increase in Pakistan's interest rate relative to the rest of the world would attract capital and generate reserve inflows and *vice versa*.

For a given no money illusion,[8] the price coefficient (β_1) should be positive and equal to one. The coefficients of growth rates of money multiplier ($g\,k$) and domestic credit ($g\,dc$) should be negative ones ($\beta_5 = \beta_6 = = -1$). However, it is important to note that where demand for money is

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[6]This result may appear to be different with the absorption theory in which rising income increases imports and generates reserve outflows. However, the absorption theory is concerned with the balance of trade rather than balance of payments (Zecher, 1974, p. 290).

[7]Under the current international monetary system in which the financial markets have become more integrated, the domestic and foreign interest rates move together (Oskooee and Pourheyarian, 1990). Hamburger (1977) argued that the domestic and foreign interest rates generally move together and when they do, it is the domestic interest rate that determines the amount of money held by the public.

[8]People fail to increase their money expenditures in proportion to the rise in prices; hence, balance of trade improves (Yousaf, 1990).

unrelated to income and interest rate, the estimated coefficients of ($g\,p$), ($g\,k$) and ($g\,dc$) can assume any value, positive or negative.[9] The coefficient (β_6) on domestic assets (net) called the offset coefficient and expected to have a value of minus unity (Uddin, 1985). The offset coefficient indicates the degree to which changes in domestic component of money supply are offset by the changes in international reserves (Bhatia, 1982). The empirical studies by Hyginus (1988) and Uddin (1985) showed that the offset coefficient does not take the value exactly equal to one. They postulate that the OLS estimates of reserves flow equation may give biased results. It is because of sterilization assumption, which does not prove true in most of the developing countries. OLS method is commonly used for such estimations (Aghevli and Khan, 1976; Bhatia, 1982; Zecher, 1974 and Bilquees, 1989). Thus, OLS method is used to draw empirical results.

The growth rates of money multiplier ($g\,k$) and the domestic credit ($g\,dc$) both are the policy variables and are responsive to policy actions taken by the monetary authorities (McGreger, Burrows and Zecher, 1972).[10] An increase in either variable tends to increase the money supply and, *ceteris paribus*, leads to an outflow of reserves to restore money supply to its equilibrium level.

III. EMPIRICAL RESULTS

The foreign reserve equation (12.1) is estimated for the period 1965-99 using broad (M2) definition of money.[11] The OLS method is used for estimation. The Chow Breakpoint test is carried out to investigate whether there is any change or shift in the reserves flow equation between the periods of fixed exchange rate and managed floating exchange rate system.

The estimated results are reported in Table 1. The results show that F-statistics for the Chow test is 1.60, which is insignificant. Thus, we accept the hypothesis that the structure of foreign exchange reserves relationship remained stable over the estimation period. It indicates that both intercept

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[9]For instance, if $g\,p$ and $g\,k$ were always zero and total money flows at 5% per year, then the half of this growth was due to $g\,r$ and half to $g\,d$. Therefore, the estimated coefficients of $g\,p$ and $g\,k$ could be zero and for $g\,d$ plus one.

[10]*See* Frenkel and Johnson (1976).

[11]For the stability of money demand function and exogeneity assumption *see* Appendix Tables 1 and 2.

and slope coefficients are not affected by the new system of managed floating exchange rate. It means that there is no evidence of a significant difference in the regression slopes and intercepts in the two periods (1965-81 and 1982-99).

TABLE 1

Results of Foreign Exchange Reserve Flows Equation for Pakistan (1965-99)

Variables	Coefficients		
	(1)	(2)	(3)
Constant	–1.238 (–2.33)**	–0.321 (–3.36)*	–2.09 (–4.34)*
Price level	0.001 (1.64)***	0.0002 (0.98)	0.001 (2.41)**
Real income	1.19 (5.99)*	0.835 (26.14)*	1.480 (8.047)*
Interest rate	–0.15 (–2.70)*	–0.236 (–4.92)*	— —
Inflation rate	–0.62 (–1.84)***	— —	–1.166 (–3.80)*
Money multiplier	–0.213 (–3.26)*	–0.145 (–1.98)**	–0.244 (–3.38)*
Domestic credit	–0.822 (–35.16)*	–0.811 (–29.55)*	–0.823 (–32.08)*
MA	0.941 (16.28)*	1.39 (5.69)*	0.989 (1652.02)*
R-squared Adjusted R-squared SE of Regression Durbin-Watson Stat. F-statistics	0.987 0.984 0.017 1.98 311.57*	0.991 0.989 0.014 1.40 530.65*	0.984 0.981 0.019 2.33 302.87*
Chow Breakpoint Test F-statistics	1.60	0.281	1.34

* Significant at 1% level

** Significant at 5% level

*** Significant at 10% level

Thus, the regression results of equation (12.1) are true for the data of 1965-99. It implies that the new system introduced in 1982 has not affected the channel of reserve movements of the fixed exchange rate period. It means that moving from fixed exchange rate system to a managed floating exchange rate system has not affected reserve flows in any appreciable way either in average or at the margin. It is concluded that the hypothesis of no structural change in intercepts and slope is accepted. Thus, the reserve flows equation (12.1) is the true model and results are reported in Table 1.

The theory clearly provides prior predictions about the signs of the coefficients in the estimated equation (12.1). The results show that all the explanatory variables underlying the equation have the expected signs. We also estimated different regressions by using the growth rates of interest rate and inflation alternatively and collectively as a measure of opportunity cost of holding money.

The regression results, without inflation variable, shows that the price coefficient is insignificant but without interest rates, all coefficients are significant. The results indicate that the positive signs of the growth rate of price and real income confirm the proposition of the monetary approach. These results indicate that, other things being equal, a rise in growth rate of the prices and real income will lead the reserve inflows and thus improve the balance of payments. The most striking finding of this study is that the domestic credit coefficient (offset coefficient) is not statistically different from minus one, the value predicted by the monetary model. It means that acceleration in the growth rate of domestic credit appears to cause an approximately equal worsening in the balance of payments, as a proportion of money stock in Pakistan. In other words, no sterilization takes place to affect the reserve movements through domestic credit. This would imply that all increases in this variable would totally leak out through the balance of payments. The offset coefficient has very interesting implications for LDCs like Pakistan where it is assumed that the government sterilizes the international reserve movement through domestic credit and hence the coefficient of domestic credit should not be close to unity in Pakistan.

The same monetary model is estimated for sub-periods (1965-81 and 1982-99). The purpose of this division is to examine the impact of managed floating exchange rate system introduced in 1982, on international reserve flows. As already mentioned that prior to 1982 there was fixed exchange rate system. The results of estimated equation (12.1) are reported in Table 2 for fixed exchange rate and in Table 3 for managed floating exchange rate system.

TABLE 2

Estimates of Foreign Exchange Reserve Flows Equation for Pakistan (1965-81)

Variables	Coefficients		
	(1)	(2)	(3)
Constant	–2.038 (–2.82)*	–0.320 (–0.41)	–2.588 (–4.30)*
Price level	1.297 (3.01)*	0.178 (0.423)	1.488 (3.56)*
Real income	1.380 (5.43)*	0.868 (2.82)*	1.552 (6.92)*
Interest rate	–0.128 (–1.28)	–0.371 (–3.45)*	— —
Inflation rate	–2.094 (–3.45)*	— —	–2.636 (–5.87)*
Money multiplier	–0.275 (–0.55)	0.316 (0.66)	–0.624 (–1.43)
Domestic credit	–0.765 (–15.86)*	–0.842 (–12.94)*	–0.950 (–15.48)*
R-squared	0.988	0.985	0.984
Adjusted R-squared	0.982	0.979	0.977
SE of Regression	0.017	0.018	0.019
Durbin-Watson Stat.	2.08	1.90	2.21
F-statistics	147.52*	154.63*	141.16*

* Significant at 1% level

During fixed exchange rate regime, the results indicate that all coefficients bear the signs as predicted by the monetary theory. The results show that the impact of real income on reserve flows is positive and the effect of domestic credit on reserve flows is negative. The total share of real income and prices in the reserve inflows is 2.677% whereas the total share of domestic credit and money multiplier in reserve outflows is –1.030%. It indicates that during fixed exchange rate period, the money demand was greater than money supply, as a result reserves increased around 1.647% and

we disregard money multiplier due to its insignificance then its impact is 1.912, indicating the improvement in the balance of payments.[12]

TABLE 3

Estimates of Foreign Exchange Reserve Flows Equation for Pakistan (1982-99)

Variables	Coefficients		
	(1)	(2)	(3)
Constant	–0.900 (–1.03)	–1.685 (–1.58)	–1.576 (–2.43)**
Price level	0.770 (1.21)	–0.552 (–0.98)	0.312 (0.63)
Real income	0.969 (3.13)*	1.243 (3.28)*	1.211 (5.32)*
Interest rate	–0.069 (–1.13)	–0.029 (–0.39)	— —
Inflation rate	–0.827 (–2.85)*	— —	–0.780 (–2.63)**
Money multiplier	–0.569 (–2.63)**	–0.774 (–2.96)*	–0.519 (–2.42)**
Domestic credit	–0.847 (–35.46)*	–0.848 (–27.63)*	–0.855 (–36.65)*
R-squared Adjusted R-squared SE of Regression Durbin-Watson Stat. F-statistics	0.994 0.990 0.014 1.81 312.64*	0.993 0.990 0.014 1.83 372.88*	0.994 0.990 0.013 1.87 403.72*

* Significant at 1% level

** Significant at 5% level

[12]We assume that the sum of the growth rates of real income and price level constitute the money demand. The sum of growth rates of money multiplier and domestic credit represent the money supply. Our basic hypothesis is that if money demand is greater than money supply, it will lead to the reserve inflows, improve the balance of payments and if money supply is greater than money demand, it will lead to reserve outflows, deteriorating the balance of payments.

During the managed floating exchange rate system, the results indicate that the coefficients of price level and interest rate are insignificant. The coefficients of real income, inflation rate, domestic credit and money multiplier are significant. The total share of income and prices in reserve inflow is 1.739 whereas the total share of money multiplier and domestic credit in reserve outflows is –1.416. It indicates that during managed floating exchange rate system money demand is greater than money supply which leads to reserve inflows (0.323) and if we disregard prices due to its insignificance then money demand is less than money supply which leads to reserve outflows by –0.447 (*See* Khan, 1996, p. 89).

During the period of fixed exchange rate system, the impact of real income and price level on foreign reserve is more than during the managed floating exchange rate system. This is due to high degree of money illusion. Thus, the managed floating exchange rate system failed to reduce the money illusion. Moreover, the managed floating exchange rate system also failed to prevent the depreciation of domestic currency. Due to this, the exports though increased but at slower rate. Besides, the coefficient of domestic credit is almost the same during the both periods. The value of coefficient of domestic credit is –0.84, which is less than unity. This shows partial sterilization policy adopted by the government which affects the movements of reserves during the both periods. During managed floating exchange rate system, all variables are producing significant impact on the growth rate of reserves except prices and interest rate. It means that managed floating exchange rate system has affected the reserve flows and may have a significant impact on the economy.

These results may be expected due to liberalization of exchange controls and relaxation in various trade restrictions. The most interesting finding is that the new system (managed floating) has significantly affected the reserves because 99% variations in reserves are explained by the reserve flows equation (12.1) under the managed floating exchange rate system.

During the entire sample period (1965-99), different commercial policy instruments like tariff, quota, exchange controls, export subsidies, devaluation, rupee de-linking and liberalization of exchange control etc. are used to generate the foreign exchange reserves or attempted not let them diminish. However, the impact of these policies can be viewed from the perspective of the monetary approach to the balance of payments. The key objective of these policies is to restrict the foreign currency allocation for imports. As a result, the import volume will be reduced from its free market level. This reduction in imports raises the prices of importable goods and

through substitution, raises the general price level. This rise in price level will lead to increase in money demand. In the absence of rapid increase in domestic credit, this increased money demand will be satisfied from abroad, resulting in the balance of payments to become surplus or deficit is reduced.

The above analysis reveals that money demand and money supply are the basic sources which bring changes in foreign reserves. The variations in real income and price level are important in explaining the changes in money demand. In Pakistan, the movements in foreign reserves (inflow or outflow) are the result of changes in monetary policy's instruments like changes in domestic credit etc. This implies that the behaviour of the overall balance of payments is dominated by those factors which influence the foreign reserves such as changes in income, price level, interest rate and other monetary instruments.

Our results indicate that the monetary policy has significant impact on the foreign reserves and therefore on overall balance of payments. The most important and interesting finding of this study is that acceleration in the credit creation, as a result of deficit, appears to have significant impact on reserves to deplete. Moreover, the study also shows a stable relationship among the international reserve flows, real income, price level, interest rate and domestic component of money supply.

IV. CONCLUSION AND POLICY IMPLICATIONS

The findings of this study reveal the key hypothesis of monetary model that excess demand for money leads to inflow of reserves and excess money supply leads the reserves outflow. On the other hand, the government budget deficit leads to excessive credit expansion. As a result, there will be equal loss in foreign exchange reserves in the long run. For rectification, it is suggested that government should reduce the size of its growing budget deficit. The increase in government budget deficit partially due to an income inelastic revenue structure, financed through credit creation, leads to excessive expansion in domestic credit which creates excessive supply of money over demand and, therefore, it leads to foreign reserves outflows. The impact of real income and price level on foreign reserves was more during the fixed exchange rate regime than that of during the managed exchange rate regime. However, money illusion continued throughout the both regimes. Moreover, the imbalance between money demand and money supply had significantly affected international reserves. In order to achieve internal and external balance, monetary policy could play important role.

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APPENDIX

TABLE 1

Estimates of Nominal Money Demand Function 1965-1999 (M2 Definition)

Variables	Coefficients		
	(1)	(2)	(3)
Constant	–0.840 (–0.94)	0.115 (0.77)	–1.380 (–2.38)**
Price level	0.001 (3.43)*	0.001 (3.34)*	0.001 (4.11)*
Real income	1.210 (4.83)*	0.920 (29.81)*	1.25 (6.75)*
Interest rate	–0.134 (–1.81)***	–0.183 (–3.04)*	— —
Inflation rate	–0.480 (–1.13)	— —	–0.93 (–2.58)*
MA (1)	0.941 (31.58)	0.940 (27.57)	0.950 (43.59)*
R-squared	0.998	0.998	0.998
Adjusted R-squared	0.997	0.997	0.998
SE of Regression	0.027	0.023	0.023
Durbin-Watson Stat.	1.94	1.78	2.33
F-statistics	5299.68*	8554.83*	6159.6*
Chow Breakpoint Test F-statistics	1.86	1.54	0.13

* Significant at 1% level

** Significant at 5% level

*** Significant at 10% level

TABLE 2

Regression Results for Testing Exogeneity of the Monetary Model

Test Statistics for Null Hypothesis
Gs = 0, for all s > 0
Wald Statistics

Regression	Model	F-statistics	Chi square	R2	DW-stat.
g p	General model Linear model	0.459 (0.511) 0.244 (0.631)	0.459 (0.497) 0.244 (0.620)	0.99 0.85	2.06 1.67
g y	General model Linear model	0.929 (0.355) 0.078 (0.785)	0.929 (0.335) 0.078 (0.779)	0.76 0.61	2.05 2.14
g i	General model Linear model	0.634 (0.227) 0.500 (0.495)	1.634 (0.201) 0.500 (0.479)	0.76 0.61	2.05 2.14
g π	General model Linear model	0.391 (0.544) 0.154 (0.702)	0.391 (0.531) 0.154 (0.694)	0.99 0.73	2.42 1.69
g dc	General model Linear model	8.558**(0.03) 1.037 (0.365)	8.558**(0.03) 1.037 (0.308)	0.98 0.76	2.05 1.61

Where:

g p = Growth rate of domestic price level

g y = Growth rate of real income

g i = Growth rate of domestic interest rate

g π = Growth rate of inflation

g dc = Growth rate of domestic credit

** Significant at 5% level

( ) Value shows the probability