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Determining Pak Rupee Exchange Rates *vis-à-vis* Six Currencies of the Industrial World: Some Evidence Based on the Traditional Flow Model

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I. INTRODUCTION

Pak-rupee exchange rates *vis-à-vis* many currencies of the industrial world have weakened continuously and persistently since Pakistan abandoned fixed exchange rates in April 1982. This proposition is strongly supported by descriptive test statistics, as shown in Table 1, such as mean, standard deviation and coefficient of variation of six Pak rupee exchange rates—against the U.S. dollar, British pound, German mark, Japanese yen, Swiss franc and French franc—over the period 1982q1-2000q4. Based on these descriptive statistics, it is evident that Pak rupee has depreciated persistently against all currencies of the industrial countries in question over the period under investigation; for example, it has depreciated by 324.05 percent against the British pound, 406.360 percent against the U.S. dollar, 344.53 percent against the French franc, 498.48 percent against the Swiss franc, 477.78 percent against the German mark and 986.25 percent against the Japanese yen since April 1982. As evidenced by coefficient of variation, Pak rupee has weakened enormously against all currencies of the industrial world, while it has weakened relatively more alarmingly against the Japanese yen, Swiss franc and German mark.

Under a system of managed floating exchange-rate,[1] the persistent loss in the strength of Pak rupee *vis-à-vis* these and other world currencies has been a matter of great concern to our country's policy-makers and economic managers on the

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[1]If a country opts for a managed exchange rate policy, its central bank intervenes in the foreign exchange market when a movement in its exchange rate is deemed undesirable. Unlike fixed exchange rates, however, there is no formal commitment to defend a specific exchange rate. Under a managed floating exchange rate policy, the effect of shift in demand for and supply of foreign exchange is uncertain. If the central bank wants the exchange rate change that would result from the shift, it takes no action and the exchange rate is allowed to move to its equilibrium value. On the other hand, if it does not want the change in the exchange rate, it intervenes in foreign exchange market to keep the rate constant. If the central bank merely wants to smooth the movement in the exchange rate, as is often the case, it buys or sells just enough currency for the exchange rate to adjust slowly to its new equilibrium value.

Table 1

Basic Statistics on Pak Rupee Exchange Rates

Exchange Rate	Rate of Change	Mean	Standard Deviation	Coefficient of Variation
Rs/B£	324.05%	20.56	0.60	0.47
Rs/FFr	344.53%	4.18	2.05	0.49
Rs/GM	477.78%	14.10	7.19	0.51
Rs/J¥	986.25%	0.22	0.14	0.62
Rs/SFr	498.48%	18.19	9.50	0.52
Rs/U$	406.36%	27.31	12.66	0.46

following grounds. First, the persistent loss in the strength of Pak rupee may cause a balance of payments crisis because of a resultant depletion in foreign exchange reserves, forcing the authorities to intervene in the foreign exchange market to stabilise the home currency. Second, the depletion of foreign exchange reserves may also result in speculative attacks against the home currency, weakening further the external value of the home currency. Third, the persistent depreciation of the home currency results in a continuing private-sector capital outflow. Finally, faced with this reserve haemorrhage, the authorities are forced to withdraw from the foreign exchange market and allow the exchange rate to float, at least temporarily.[2]

While enormous work has been carried out accounting for movements in exchange rates, no single theoretical model has emerged predominant. There are a wide variety of exchange rate models, including purchasing power parity (PPP), traditional flow, monetary and portfolio balance models of exchange rates. Purchasing power parity, an earliest view of exchange rate determination which was developed by Cassel (1916, 1918), postulates that the nominal exchange rate tends to be in line with the ratio of the domestic to foreign price index and the real exchange rate to be constant over time. This model posits that the exchange rate is determined by demand and supply flows that originate from current account transactions.[3]

[2]See Obstfeld (1984, p. 208). Indeed, the move towards floating exchange rates in countries around the world is indicative of this situation.

[3]This view of the exchange rate determination also implies that the exchange rate moves to equilibrate the current account.

One snag is that PPP ignores capital flows that play a key role in determining the behaviour of the exchange rate.[4] PPP can only lead to a sustainable equilibrium exchange rate if current and capital accounts are simultaneously in balance. If, however, a country has a persistent current account deficit, its foreign debt will rise and therefore it will need to run a trade surplus to cover its growing debt interest payments. This will require the exchange rate to remain below its PPP level.

Another model of exchange rate determination that also assigns a key role to demand for and supply of flows in determining the exchange rate is known as the traditional flow model, which was developed by Mundell (1962) and Fleming (1962). However, unlike PPP that neglects the role of capital flows emanating from capital account of the balance of payments, the traditional flow model presumes that flows originating both from current and capital accounts play a key role in determination of the exchange rate. This model posits that the exchange rate is determined by demand and supply flows of foreign exchange emanating from transactions arising out of both current and capital account flows. It is argued that balance in the former account is determined independently of the balance in the latter; therefore, adjustment in the domestic economy is required to maintain overall balance in the balance of payments. However, the overall balance in the balance of payments requires capital flows to be sufficient to finance deficit in the current account or to absorb surplus in the current account. The Mundell-Fleming model was designed for a small open economy, with unemployed resources, facing a given world interest rate and perfectly elastic supply of imports at a given price in terms of foreign currency. Given such assumptions, it can be demonstrated that with flexible exchange rates, monetary policy is extremely powerful in altering real output.

[4]MacDonald (1995, pp. 446-447) argues that the balance of payments view of the exchange rate determination suggests that under floating exchange rate regime, the exchange rate moves to equilibrate the sum of the current and capital accounts of the balance of payments, i.e. changes in official reserves are assumed to be zero under a pure float. This is given as follows

$$(current\ account)_t + (capital\ account)_t = \Delta R_t = 0$$

The current account is determined by net flow of exports, which is in turn determined by the real exchange rate and exogenous factors such as productivity differences in the manufacture of traded goods between home and abroad and changes in government expenditures, and the stock of net foreign assets. This is given as

$$(current\ account)_t = \alpha(s + p^* - p)_t + \beta z_t + i_t^* A_t \quad \alpha > 0, \beta = ?$$

Substituting this equation into the one representing equilibrium in the balance of payments and then solving for the nominal exchange rate, s_t , we obtain

$$s_t = (p - p^*)_t - (\beta/\alpha)z_t - (i_t^*/\alpha)A_t - (1/\alpha)[capital\ account]_t$$

The validity of PPP requires z_t and A_t to be zero and one way of obtaining this would be to assume that α, relative price elasticity of the net of exports, is infinitely large. However, if the net of exports is not infinitely price elastic, then the exchange rate will not be determined exclusively by relative prices and as such there will arise a bias in the PPP relationship. Moreover, even if α were high, as long as the degree of capital mobility is also high, capital flows would an important reason for the violation of PPP.

The monetary model of exchange rates postulates that exchange rates are determined by the supply and demand for national monetary stocks.[5] The major contention underlying the monetary model is that national monetary policies are the primary factors influencing the path of exchange rates. This does not imply, however, that real factors, such as real output, do not affect exchange rates. Real factors do affect exchange rates only indirectly but to the extent they first affect the demand for money. Moreover, expectations also play a key role in determining the future path of the exchange rate, but, as one would expect, these expectations are assumed to be largely monetary induced.

The portfolio balance model of exchange rate determination[6] views that both exchange and interest rates are determined simultaneously by the portfolio equilibrium conditions for wealthholders in each country. This model posits that current account imbalances as well as portfolio diversification play a predominant role in the determination of the exchange rate. In essence, it is postulated that the exchange rate is simply determined by relative bond supplies and the interest rate differential.

The object of this paper is to examine if the movement in Pak-rupee exchange rates *vis-à-vis* six currencies of the industrial world—the U.S. dollar, British pound, German mark, Japanese yen, French franc and Swiss franc—can be explained by the traditional flow model of exchange rate over the period 1982Q1-2000Q4. One reason for testing this model is that it is expected to better explain movements in Pak rupee exchange rates because Pakistan is a small open economy, with unemployed resources, that faces a given world interest rate and perfectly elastic supply of imports. As for the monetary model, we do not expect it to explain movements in Pak rupee exchange rates because it is usually derived from stable commodity, money and financial market conditions that are unlikely to hold in Pakistan relative to the rest of the world. As for the portfolio balance model, it cannot be tested because the relevant data are not available on the underlying variables. Section II gives a brief account of the traditional model of exchange rate, while Section III gives a description of the data and the econometric methodology used in testing the empirical relevance of this model for Pakistan. Section IV presents empirical results and the final section concludes.

[5]There are several variations of the monetary model—the Frenkel (1976) and Bilson (1978) flexible price monetary model, the Dornbusch (1976) sticky price monetary model, the Frankel (1979) real interest differential monetary model, the Hooper and Morton (1982) equilibrium real exchange rate monetary model and Griton and Roper (1977) exchange-market-pressure monetary model—but they all share the same premise that movements in the exchange rate can be explained by changes in the demand for and supply of monetary stocks across countries.

[6]The portfolio balance model was developed, inter alia, by Branson (1983); Branson and Halttunen (1979) and Frankel (1983).

II. THE TRADITIONAL FLOW MODEL OF EXCHANGE RATE DETERMINATION

The traditional flow model, as developed by Mundell (1962) and Fleming (1962), adheres primarily to Keynesian tradition, emphasising that it is aggregate supply that takes the passive role in fixing the price level, while aggregate demand variations determine the level of economic activity. This model focuses on demand and supply flows in the foreign exchange market emanating from both current and capital accounts that play a key role in determining the exchange rate.[7] The exchange rate is just in equilibrium when supply is just equal to demand and when any current account imbalance is just matched by a net flow of capital in the opposite direction. It is assumed that balance of payments equilibrium obtains when capital flows across exchanges are just sufficient to finance the current account deficit or absorb the surplus.[8] The model posits that purchasing power parity does not hold at all even in the long run and therefore the current account is determined not only by relative prices and but also by relative incomes across countries. Increases in domestic prices relative to foreign prices are predicted to have a negative effect on the current account and hence, all else constant, to cause a depreciation in the home currency. Goods prices are assumed to move sluggishly, allowing exchange rate changes originating from other sources to change the relative prices of domestic and foreign goods. An increase in domestic real income is thought, all else being equal, to cause the exchange rate to fall. This is because an increase in income tends to increase imports, deteriorating the current account, with no offsetting effect on capital flows. The relationship between current account and relative prices and incomes can be represented by the following equation:

$$ca_t = a(s + p^* - p)_t - b(y - y^*)_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

where ca_t is the net flow from current account, $p(p^*)$ is the price of domestic (foreign) goods, s is the exchange rate defined as the domestic currency price of a unit of the foreign currency, $y(y^*)$ is the domestic (foreign) real income level, α and b

[7]The Mundell-Fleming model neglects the role of demand for and supply of monetary stocks in the determination of the current and future of path of the exchange rate. On the contrary, the monetary model places main emphasis on the demand for and supply of monetary stocks in determining the current and future path of the exchange rate. However, there is ample evidence today to suggest that neither demand and supply flows of foreign exchange alone nor demand and supply of monetary stocks alone can play a key role in the determination of exchange rate.

[8]An implicit prediction underlying this model is that exchange rates of a country's currency *vis-à-vis* other currencies around the world could be in equilibrium when the country is running a current-account deficit if the domestic interest rate is high enough to maintain an offsetting net capital inflow. This implies that at a constant interest differential, there is a steady, potentially infinite, accumulation of domestic assets by foreigners. However, the model gives no account of how the portfolios of foreigners are brought into equilibrium.

represent price and income elasticities of exports and imports respectively. In Equation (1) the lower case letters represent logarithmic values of the underlying variables.

The traditional flow model presumes that foreign and domestic assets are not perfect substitutes and consequently the international interest differentials are thought to provoke finite capital flows into or out of a country. More plausibly, it is argued that, given risk aversion, investors around the world require risk premium to move their capital funds from one financial centre to the others. In a special case of perfect capital mobility, even the smallest deviation of the domestic interest rate from the foreign interest rate is predicted to provoke infinite flows into or out of domestic money markets. Thus capital account, *K*, is determined by interest differential and is given as follows:[9]

$$K = c(r - r^*)_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

If we add Equations (1) and (2) for current and capital accounts respectively, a pure float requires the following conditions to hold at all times.

$$a(s + p^* - p) - b(y - y^*) + c(r - r^*) = 0 \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Rearranging Equation (3) and solving for s, we obtain the following equation

$$s = (p - p^*) + \frac{b}{a}(y - y^*) - \frac{c}{a}(r - r^*) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

which can in turn be rewritten in stochastic regression form as follows[10]

$$s_t = \beta_0 + \beta_1(p - p^*)_t + \beta_2(y - y^*)_t - \beta_3(r - r^*)_t + \varepsilon_t \quad \ldots \quad (5)$$

Equation (5) shows that the exchange rate tends to depreciate when domestic price and income levels are relatively higher than those of foreign countries, while it tends to appreciate when domestic interest rates are higher than those of foreign countries.

III. DATA DESCRIPTION AND ECONOMETRIC METHODOLOGY

The empirical validity of the Mundell-Fleming model of exchange rate will be examined for Pak rupee exchange rates *vis-à-vis* six currencies of the industrial world – the British pound, French franc, German mark, Japanese yen, Swiss franc and the US

[9]In the Mundell-Fleming model, exchange rate expectations are assumed to be static, i.e. $\Delta s^e_{t+1} = 0$. But in today's world markets for goods, capital and foreign exchange, which have become increasingly and highly integrated, exchange rates tend to be invariably affected by market's expectations. It is, therefore, needed to carry out work allowing for the role of expectations in the model to investigate the process of exchange rate determination.

[10]Thus, according to this model, if a country wants to strengthen its exchange rate it must adopt policies to lower prices, raise interest rates and reduce real growth.

dollar—using quarterly data over the period $1982\,Q_1$ –$2000\,Q_4$. The data on exchange rates, industrial production,[11] the market interest rates, the bond yield and the consumer prices were collected from different issues of International Financial Statistics.

The econometric methodology employed in testing the traditional flow model will the multivariate maximum likelihood method of cointegration, which was initially developed by Johansen (1988, 1991) and further extended by Johansen and Jusilius (1990). One reason for employing this technique is that it has especially been developed to estimate a long-run relationship between more than two nonstationary variables involving all the cointegrating vectors. Other reason is that it produces results that remain robust irrespective of the direction of normalisation. The other reason is that it provides a maximum likelihood test statistic to test a priori restrictions imposed on the coefficients of the cointegrating vectors.

IV. EMPIRICAL RESULTS

Before testing the traditional flow model of exchange rate, as represented by Equation (5), for cointegration, unit root tests are first carried out to examine if the variables underlying the model are integrated of the same order. To this end, the Johansen test statistic is applied, where 'cointegration in one variable' simply implies that the variable is $I(0)$.[12] Results, as given in Table 2, clearly indicate that all the variables underlying Equation (5) are $I(1)$ in levels and $I(0)$ in first differences.

Results based on the Johansen multivariate maximum likelihood technique of cointegration, as shown in Table 3, using the market interest rate shows that the null of no cointegration is strongly rejected in all cases, indicating that there exists a long run relationship between exchange rates and relative prices, incomes and interest rates. However, the results do not lend strong support to a priori restrictions imposed on the coefficients of the cointegrating vectors by the traditional flow model of exchange rate in all cases but Pak rupee exchange rate *vis-à-vis* the British pound. While the coefficients on relative prices and interest differentials are correctly signed in cases of Pak rupee exchange rates relative to the French franc, German mark, Japanese yen and Swiss franc, the coefficients on the relative incomes are not. On the other hand, while the coefficients on relative prices and relative incomes are correctly signed in case of Pak rupee exchange rate *vis-à-vis* the U.S. dollar, the coefficient on the interest differentials is not. Our results regarding the French franc, German mark, Japanese yen and Swiss franc are consistent with those obtained by Pearce (1983) who tested the traditional flow model for the Canadian dollar exchange rate *vis-à-vis* the US dollar over the period 1971:I-1982:I.

[11]Data on industrial production are used because quarterly data on real GDP are not available for Pakistan. However, the results are not expected to differ significantly even if quarterly data are used on GDP by interpolating them from the annual series.

[12]See Cuthberston, *et al.* (1992) for the use of the Johansen test statistic for unit root testing.

Table 2

Testing for Unit Root

Variable	Level	First Difference
Pakistan-France		
S_t	0.42	10.03*
$(p-p^*)_t$	0.56	11.18*
$(y-y^*)_t$	1.40	16.89*
$(r-r^*)_t^{CMR}$	0.36	21.83*
$(r-r^*)_t^{BY}$	4.12	14.13*
Pakistan-Germany		
S_t	0.55	9.51*
$(p-p^*)_t$	0.56	11.18*
$(y-y^*)_t$	1.02	16.15*
$(r-r^*)_t^{CMR}$	0.85	22.68*
$(r-r^*)_t^{BY}$	4.29	14.26*
Pakistan-Japan		
S_t	1.53	12.74*
$(p-p^*)_t$	0.62	24.72*
$(y-y^*)_t$	1.32	17.06*
$(r-r^*)_t^{CMR}$	0.68	25.38*
$(r-r^*)_t^{BY}$	3.15	11.77*
Pakistan-Switzerland		
S_t	1.25	11.05*
$(p-p^*)_t$	1.26	16.93*
$(y-y^*)_t$	2.42	17.95*
$(r-r^*)_t^{CMR}$	2.42	23.61*
$(r-r^*)_t^{BY}$	2.18	16.75*
Pakistan-U.K.		
S_t	0.10	17.22*
$(p-p^*)_t$	0.42	20.78*
$(y-y^*)_t$	1.83	16.24*
$(r-r^*)_t^{CMR}$	1.08	21.11*
$(r-r^*)_t^{BY}$	2.73	17.44*
Pakistan-U.S.		
S_t	1.00	28.27*
$(p-p^*)_t$	0.41	14.09*
$(y-y^*)_t$	2.03	16.66*
$(r-r^*)_t^{CMR}$	2.28	29.38*
$(r-r^*)_t^{BY}$	2.37	13.85*

* Significant at the 5 percent level.

Table 3

Testing for Cointegration Using Data on Market Interest Rates

$$\left(s_t = \beta_0 + \beta_1 (p - p^*)_t + \beta_2 (y - y^*)_t - \beta_3 (r - r^*)_t^{CMR} + \varepsilon_t\right)$$

Coefficients	Rs/B£	Rs/FFr	Rs/GM	Rs/J¥	Rs/SFr	Rs/U$
β_0	3.10	0.57	2.12	–2.59	2.35	3.67
β_1	2.32	2.99	1.95	2.16	1.87	1.13
β_2	0.17	–1.12	–0.35	–0.17	–0.28	0.69
β_3	–0.06	–0.07	–0.04	–0.03	–0.04	0.05
Max						
$r = 0$	28.22*	42.27*	45.62*	37.50*	52.86*	41.62*
$r < 1$	13.91	19.06	15.34	10.34	10.88	15.33
Trace						
$r = 0$	54.51*	75.78*	70.30*	60.16*	77.65*	67.56*
$r < 1$	26.30	33.50	24.08	22.66	25.94	25.94

* Significant at the 5 percent level.

It is, however, interesting to note that when the traditional flow model was tested again for six Pak rupee exchange rates using the data on (bond yields) long term interest rates, as shown in Table 4, the results turn out to be supportive in almost all cases, except two Pak rupee rates against the French franc and the U.S. dollar. While the sign on coefficients of the relative income is not in line with the expectations of the model in the former case, the sign on interest differential is against expectations of the model in the later.

Table 4

Testing for Cointegration Using Data on Bond Yield

$$\left(s_t = \beta_0 + \beta_1 (p - p^*)_t + \beta_2 (y - y^*)_t - \beta_3 (r - r^*)_t^{BY} + \varepsilon_t\right)$$

Coefficients	Rs/B£	Rs/FFr	Rs/GM	Rs/J¥	Rs/SFr	Rs/U$
β_0	2.75	0.63	1.72	–3.38	2.26	3.40
β_1	0.63	1.68	1.34	1.05	1.66	1.16
β_2	2.64	–0.26	0.95	1.44	0.38	0.83
β_3	–0.28	–0.04	–0.11	–0.15	–0.09	0.02
Max						
$r = 0$	36.07*	39.54*	31.37*	47.97*	55.41*	53.52*
$r < 1$	11.30	11.62	9.32	8.85	20.06	24.34
Trace						
$r = 0$	60.27*	63.76*	51.17*	63.27*	87.29*	88.65*
$r < 1$	24.21	24.23	19.81	15.90	31.88*	35.13

* Significant at the 5 percent level.

V. CONCLUSION

This paper aims to test the empirical validity of the traditional flow model of exchange rate for six Pak rupee exchange rates relative to the British pound, French franc, German mark, Swiss franc and the U.S. dollar by using quarterly data over the period 1982 Q_1 –2000 Q_4 . The results obtained by employing the Johansen maximum likelihood technique of cointegration are supportive of the model in almost all cases except two Pak rupee exchange rates against the French franc and the U.S. dollar when the data on long-term interest rates were used rather than when the data on short-term interest rates were used.

One conclusion that emerges from these results is that Pak rupee exchange rates *vis-à-vis* the currencies of the industrial world are determined by differences in prices, income and interest between Pakistan and the countries in question. This implies that if the monetary authorities wish to strengthen Pak rupee against the currencies of the industrial countries, then they must adopt the policies aimed at lowering prices and real growth and raising interest rates relative to those the industrial countries under consideration. Moreover, the authorities can relay on the monetary policy in altering real output and balance of payments position.

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Comments

The paper is a useful addition to the literature on the determinants of exchange rates in Pakistan. Based on the traditional flow model (M-F model), the author uses time series econometric techniques to study movements in Pak rupee exchange rates against the currencies of 6 industrial countries. The main finding is that the Pak rupee exchange rates are significantly affected by relative prices, incomes and interest rates. The author concludes that strengthening Pak rupee would involve policies aimed at lowering prices and output growth and raising interest rates relative to those of foreign countries.

The issue of whether the traditional flow model is capable of explaining movements in exchange rates has been critically examined in the literature (for example Obstfeld, Obstfeld and Rogoff, and Purvis), and this literature has been ignored in the present paper. At least three fundamental weaknesses of the model have been highlighted in the literature.

The first problem relates to the modelling of capital flows (Eq. 2). It is assumed that a rise in the domestic interest rate leads to a continuous capital inflow from abroad. However, to expect such inflows to continue indefinitely is unrealistic because after a point international investors will have re-arranged the stocks of their international portfolios to their desired levels and once this happens the net capital inflows into the country will cease. The only way that the country could then continue to attract capital inflows would be a further rise in its interest rate until once again international portfolios are restored to their desired levels. Thus, in fact, a country that needs a continuous capital inflow to finance its current account deficit has to continuously raise its interest rate, whereas the model predicts, implausibly, that capital could flow continuously even in the face of a constant domestic-foreign interest rate differential.

The second problem with the model is its treatment of exchange rate expectations. The model implicitly assumes static exchange rate expectations, which is an implausible assumption under a floating exchange rate regime. For example, according to the model, an increase in the domestic price level leads to a depreciation of the currency. In this scenario, it is unreasonable to assume that economic agents do not expect a depreciation as well. If agents expect depreciation, this may require a rise in the domestic interest rate to encourage them to continue to hold the domestic currency.

Third, the model ignores the interaction between stocks and flows. According to the model, a current account deficit can be financed by a capital inflow. While such a policy is feasible in the short run, persistent capital inflow over time increases

the stock of foreign liabilities owed by the country to the rest of world and this means a worsening of current account as debt-servicing payments increase. Clearly, a country can not go on financing a current account deficit indefinitely as it becomes an ever-increasing debtor to the rest of the world.

Other criticisms arise from the Keynesian nature of the model, with its focus on short run demand issues, and absence of supply side structure. Furthermore, with increasingly integrated financial markets, movements in exchange rates are largely driven by speculative flows, expectations and uncertainty. Non of these factors has been explicitly incorporated in the model.

Turning now to the empirical issues:

The author uses industrial production instead of GDP as a measure of national income. This is presumably because of non-availability of quarterly data on GDP. But this may distort the results especially in the context of Pakistan's economy where a substantial proportion of GDP orginates in the agriculture sector.

Second, the author has not estimated the Error Correction Models, despite the fact that the variables have been found to be co-integrated. According to the Granger Representation Theorem, an Error Correction representation exists for any set of co-integrated variables. I think estimation of the Error Correction Models would provide further insight into the short-run dynamics of the variables of interest.

Third, the empirical results need a bit more explanation. For instance, why is it the case that the results differ markedly when market interest rates are used than when bond yields are used. Furthermore, how do we interpret cases where parameters of interest have turned out to be wrongly signed, or where *a priori* restrictions have not been supported by the data. Do these results amount to the rejection of the Tradition Flow model? I think the paper needs to be explicit on these issues.

And finally, the author argues that if the monetary authorities wish to strengthen Pak rupee against the industrial currencies, then policies must be adopted that lower prices and output growth, and raise interest rates. But one must be mindful of the adverse consequences of these policies. For example, lower growth would result in unemployment and poverty. On the other hand, higher interest rate would crowd out domestic investment and lead to an ongoing buildup of external debt that would eventually require a sharp drop in consumption. So in essence, according to the paper, we can have a strong currency at the expense of high unemployment and poverty and/or fall in domestic investment and mounting external debt. These are tradeoffs that the Pakistan's economy can ill afford.

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