

# **A search for an optimum currency area partners for Pakistan**

Farooq Rasheed  
Javed A. Ansari  
College of Management Sciences  
PAF- Karachi Institute of Economics and Technology

## **Abstract**

This paper empirically examines the existence of a common trend between the exchange rates of Pakistan and five regional countries Bangladesh, India, Saudi Arabia, Sri Lanka and the UAE with two of their major trading partners, the United States and Japan as base countries. Results from Johansen co integrating analysis show that the strongest evidence points to the existence of common stochastic trends between the Pakistani rupees on the one hand and the Bangladeshi Taka and the Sri Lankan rupee on the other hand. There is no strong evidence for the existence of such a common stochastic trend between the Pakistani rupee and the currencies of India and the Gulf economies. Optimum Currency Area (OCA) theory seems to justify the formation of a currency union between Pakistan, Bangladesh and Sri Lanka. The case of a currency union between Bangladesh and Pakistan is strengthened by a shared political past and a shared history of financial institutional development. The immediate impact of the formation of a currency union on Pakistan's GDP growth will however be insignificant.

## **1. Introduction**

The Indian government has on several occasions advocated the idea that a common currency area be formed in the SAARC region. The response from other member countries has been somewhat lukewarm. They are unconvinced that the benefit of currency union establishment will outweigh the cost emanating from the abandonment of national monetary sovereignty. This paper seeks to empirically investigate the feasibility of a common currency area for Pakistan with each one of the following countries; India, Bangladesh, Saudi Arabia, Sri Lanka and UAE. This empirical investigation involves estimation of the co-variation of the bilateral real exchange rates using the Japanese Yen and the US dollar as base currencies.

Section II begins with an eclectic overview of the Optimum Currency Area (OCA) literature. Section III presents the estimation methodology, section IV discusses the findings and section V concludes the analysis

## **2. An Eclectic Overview of the OCA literature**

A currency area may be defined as a domain in which exchange rates of national currencies remain fixed, or else a currency area may have a single currency. In a currency area containing several currencies national central banks will have to co-ordinate their

policies to ensure that the buildup of the liabilities of a national central bank does not impair the convertibility of its national currency due to loss of reserves (Mundell 1961).

On the other hand if there is a single currency and a single central bank in a currency area the liabilities of the central bank can expand in a more elastic manner. As Mundell has shown adjustment to balance of payments disequilibria are different in the two cases, even though fixed exchange rates exist in the case of the currency area with several national currencies.

In a currency area with several national currencies, surplus countries may impose the burden of adjustment to balance of payments disequilibria on deficit countries by refusing to alter national prices (alter the terms of trade). In a currency area, with a single currency, the single monetary authority can (but need not) expand money supply to raise output and employment in the deficit countries at the cost of raising prices in the surplus countries (and in the currency area as a whole<sup>1</sup>). The unemployment-inflation trade off exists in both cases of adjustment<sup>2</sup>.

Exchange rate flexibility has been seen as a means for “painlessly” sustaining equilibrium but (again as Mundell (1961) has shown) it cannot correct inter-regional imbalances without imposing unemployment on the deficit region and inflation on the surplus region<sup>3</sup>. Mundell goes on to argue that avoiding painful adjustment requires the existence of regional currencies.

Other authors arguing against the adoption of a common currency by the European Common Market in the late 1950s based their case on the relative immobility of factors of production within the EEC (Meade 1957) Scitovsky (1958) on the other hand saw (and advocated) the adoption of a common currency by the EEC as a means for promoting capital mobility within the EEC region<sup>4</sup> and for the adoption of common employment policies.

Thus an essential feature of a common currency area (or region) is a high degree of factor mobility as a substitute for exchange rate flexibility among national currencies. The optimum currency area may thus be defined as a region with near perfect internal factor mobility and high external factor immobility. In the Mundell-Meade-Scitovsky view, determining the ‘optimality’ of a currency area is essentially a measure of estimating its internal and external factor mobility. It is as important to stress that this argument assumes that...

- Fully flexible exchange rate regimes can restore equilibrium without accelerating unemployment and inflation problems.
- Such stabilization should be the only objective pursued by economic policy makers

Other criteria for determining the size of a common currency area mentioned by Mundell (1961) include...

- Cost of money changing and valuation.
- The import from non-currency area sources to total consumption in the currency area. The higher this ratio is the less optimal a region is for the formation of a currency area<sup>5</sup>.
- Markets within the currency union are strong enough to absorb speculative attacks.

The savings of transaction costs have also been emphasized by several relatively recent studies, e.g. Feldstein 1997, Chang 1995)<sup>6</sup>. Other gains of currency area identified in the recent literature are enhanced price effectiveness and more integrated markets. It is evident that the traditional Mundell-McKinnon model fails to capture many of these dynamic effects<sup>7</sup>. Cooper et al (1998) extend this argument to show that welfare gains associated with reduced trade frictions created by the existence of multiple currencies also occur to individual consumers in the common currency area. They also stress the inflation reducing impact of a common currency union “through internalizing the external effects of national policies” (1998 p3). This also enhances consumer welfare, for agents are no longer hurt by the inflation policies of other (currency union member) governments. Thus the formation of a currency union can generate allocative efficiencies and reduce inflation related distortions.

Copper and Kempf (1998) do not estimate the relative significance of these gains or weigh them against the type of costs mentioned by Mundell or McKinnon and recognized implicitly in Sec IV of their own paper which shows that “acting independently governments will deviate from the monetary union outcome by imposing (national) currency requirements (formation of a currency union) is not a Nash equilibrium of our game” (1998 p4). There are real costs of abandoning national monetary sovereignty in a currency union (entailed in the loss of an instrument of stabilization in conditions of uncertainty) which may significantly outweigh welfare gains to consumers<sup>8</sup>.

Bayoumi and Eichengreen (1999) identify the following criteria for the existence of a successful common currency area.

- a. Symmetry of shocks across countries<sup>9</sup>
- b. Trade and investment integration and
- c. Labor mobility and wage flexibility.

The existence of common regional (as against global and country specific) shocks provides a strong case for a common currency<sup>10</sup>. Lee et al (2002) argue that increased integration with the world economy can also sometime strengthen the case for adopting a common currency. They decompose output variation in East Asia during 1978-1990 and 1991-1999 into a “regional common, a “world common” and a “country specific” component and find that the impact of the region common and global common factor increases significantly (relative to the country specific factor) during 1991-1999. The impact of the “region common factor” is more than that of the “global common factor” in the case of the East Asian region than it is for the EU during 1991-1999 according to Lee

et al's estimations<sup>11</sup>. Prima facie a currency union between Thailand, Indonesia, Malaysia and South Korea (but not for China and Singapore) can have a strong beneficial effect on output stabilization in the region.

Eichengreen and Bayoumi (1994) using an index developed earlier (Eichengreen and Bayoumi 1996) also find the East Asian region sufficiently integrated for the formation of a currency union. They note however that the region lacks effective institutions, sound financial systems, a history of integrationist policy and political net working which facilitated the establishment of a currency union in Europe.

Several studies have tried to identify the determinants of synchronization of business cycles among a group of countries. Trade has been identified as an important source of co-movements of output (Rose 1998, p200); Output movement synchronization can also be influenced by changes in relative prices of factors and products (Kraay and Ventura 2000). If trade leads to specialization, industry related shocks may reduce synchronization of output movement among the trading partners (Frankel and Rose 1998). Thus both the volume and the composition of trade is likely to effect output synchronization – bilateral intra industry trade may be expected to have greater impact on output synchronization than bilateral inter-industry trade. Higher co-movements of output are also stimulated by similarities of the structure of production (Imbs 2001). Lee et al find that in the case of European countries output co-movements are positively associated with the level of inter-regional trade and the similarity of trade structure. It is negatively associated with per capita GDP<sup>12</sup> and similarity of industrial structure. Given the higher level of inter regional trade and greater similarities of economic structure, relative to Europe, Lee et al (2002) argue that East Asian economies are likely to benefit more from the establishment of a currency union than the European countries<sup>13</sup>. Output co-variation is also likely to be positively effected by capital mobility for this enhances the speed of adjustment to shocks. But capital market integration induces greater specialization and therefore larger asymmetric shocks affecting the integrated countries. This reduces the attractiveness of forming a currency union by countries with high levels of capital mobility.

Financial integration is in the main a global (not a regional) phenomenon. Park and Song (2001) show that despite high levels of inter-regional trade there is little evidence of increased regional financial integration in Asia. Financial liberalization increases global not regional integration of national capital and money markets<sup>14</sup>. Regional financial integration in South Asia for example is also inhibited by the small size of banks and their absence in other countries of the region. Other financial institutions (and instruments) also lack a regional presence. Financial liberalization has increased the dominance of American banks in syndication and M&As transactions in the Indian financial markets (as also in South Korea, Thailand and Indonesia). Financial liberalization is thus unlikely to stimulate regional financial integration or the formation of a currency union. Financial liberalization does increase pressure for maintaining stable currency values vis-à-vis major hard currencies. Forming a currency union may be an instrument for reducing dependence on imperialist financial markets, but that is unlikely to an objective pursued by the incumbent policy makers of South Asia. The difference in

the impact of financial liberalization on global as against regional financial integration illustrates the dependence of the potential usefulness of the formation of a currency union on external factors (external that is to the region forming the currency union).

### **3. Methodology**

This paper is an attempt to study co-movements in the bilateral real exchange rates of Pakistan and five other countries (Bangladesh, India, Saudi Arabia, Sri Lanka and UAE) in the region with each of which, a currency union may be envisaged. The theoretical framework is provided by Generalized Purchasing Power Parity (GPPP) theory, which shows that when countries are highly integrated even though their bilateral exchange rates are non stationary, they can share a common stochastic trend and exhibit a long run integration relationship (Enders et al 1994).

GPPP theory can be interpreted in terms of an optimum currency area. If co movements of bilateral rates of Pakistan and any or all of the other five countries with their major trading partners (the US and Japan) are synchronized a common currency can be formed, since this synchronization reflects that Pakistan and some or all of the other five countries experience similar types of real disturbances. Forming a currency union in these circumstances can reduce money transaction costs, eliminate exchange rate uncertainty and generate the consumer welfare gains suggested by the literature. This investigation will be followed up by more detailed analysis of the determinants of synchronization of business cycles (as identified in the literature discussed above) of Pakistan and potential currency union partners in the future.

We begin by estimating the interrelationship of the following variables measuring economic activity in Pakistan, India, Sri Lanka, Saudi Arabia, UAE and Bangladesh.

- i. Real per capita GDP
- ii. Trade Balance
- iii. Terms of Trade
- iv. Volume of Trade
- v. Bilateral Real Exchange Rates with the US dollar and the Japan Yen as base currencies

Co-variations in the movements of these variables may be taken as signifying synchronization of the business cycles in the comparator countries. As Lee (2003) notes if these fundamental variables are significantly interrelated even though bilateral exchange rates are non stationary, they may share common stochastic trends and exhibit a long run co-integration relationship. We estimate the correlation between the bilateral exchange rates on the one hand and bilateral terms of trade and the relative per capita real GDP of each of the comparator countries.

Our argument is that a common currency area is justified in case of countries (a) whose fundamental variables are significantly integrated; (b) their bilateral exchange rates are positively correlated to movements in their relative real per capita GDP and relative terms of trade. Under these circumstances we expect the co-movement of bilateral real

exchange rate of such countries with their major trading partner, (US and Japan), should share a common stochastic trend.

Following Lee (2003) we estimate the real bilateral exchange rate of comparator countries using the US dollar and the Yen as the base currencies. We define the bilateral real exchange rates of all the countries in the group with Japan and USA as the base countries as follows.

$$R_t^{i/j} = E_t^{i/j} * (CPI_t^j / CPI_t^i) \quad (1)$$

Where  $R_t$  is Bilateral Real Exchange Rate,  $E_t^{i/j}$  is the nominal exchange rate between two countries  $i$  the foreign country and  $j$  the domestic country. In our model foreign countries are the base countries, i.e., Japan and the USA. CPI is consumer's price index for foreign and domestic countries (i.e., Pakistan, India, Bangladesh, Saudi Arabia, Sri Lanka and UAE). We will take natural log of all the bilateral real exchange rates to perform various tests.

We perform the Augmented Dickey-Fuller ADF test (1979, 1981) to determine the stationarity of each bilateral real exchange rate and test for the existence of a unit root in the bilateral real exchange rates. There have been several theoretical and empirical studies on the stationarity and determinants of the bilateral real exchange rates. Most empirical studies (e.g., Adler and Lehman, 1983; Corbae and Ouliaris, 1988; Enders, 1988; Patel, 1990; and Kim and Enders, 1991) fail to reject the null hypothesis of a unit root in the bilateral real exchange rate series they examine. If a unit root is present in a bilateral real exchange rate, then there exists real variables determining the real exchange rate. Real disturbances, including changes in terms of trade, tax system, or productivity can lead to a new equilibrium real exchange rate.

We test for the existence of a stationary equilibrium error. The existence of this test implies that non-stationary variables share a common stochastic trend.

We test the co-integration relationship between bilateral real exchange rate pairs, based on the maximal eigen values test using a two dimensional VAR (p) model. A co-integration rank test of the co-integrating space is performed on this basis. A normalized co-integrating vector and a speed of adjustment vector is estimated for the bilateral exchange rates.

VAR estimates are used to generate the responses of the real exchange rate to a positive one standard deviation shock in the residuals. We try to identify a common stochastic trend in the variation of the real exchange rates.

Finally we will estimate the model

$$Y_t = a + b*ER_t + c*Y_{t-1} + d*(X_R + M_R) \quad (2)$$

to estimate the relative importance of exchange rate (ER) stabilization and the growth of regional exports and imports ( $X_R + M_R$ ) in determining the growth of real per capita income ( $Y_t$ ) for Pakistan.

Estimation procedures and data used are presented along with the discussion of the results in the next section. All the data has been taken from various issues of International Financial Statistics on annual basis from 1973 to 2002.

## **4. Results**

### **A. Correlations of Movements in Fundamental Variables (1972-2000)**

Table 1: Correlation between Pakistan and comparator countries Macroeconomic Variables

	<b>BD</b>	<b>IND</b>	<b>SA</b>	<b>SL</b>	<b>UAE</b>
<b>Real per Cap</b>	0.8	0.92	0.86	0.96	0.08
<b>Trade Balance</b>	0.72	0.51	-0.28	0.23	-0.48
<b>Terms of Trade</b>	0.73	0.57	-0.13	0.27	-0.52
<b>Vol of Trade</b>	0.95	-0.96	-0.35	-0.87	0.81
<b>Ex Rate (base Yen)</b>	0.91	0.97	0.69	0.95	-0.08
<b>Ex Rate (base US \$)</b>	0.89	0.96	0.01	0.93	-0.43

The preliminary evidence presented in table 1 shows greatest synchronization between the business cycle of Pakistan and Bangladesh. Correlations are high in all variables with the right signs. Correlations are much lower in the case of India and Sri Lanka and have the “wrong” sign with respect to volume of trade. Similarly there is no evidence of a synchronization of the business cycles of Pakistan and the two gulf economies in our sample.

### **B. ADF Unit root tests on BRER with base US \$ and Japanese Yen.**

Table 2.A: ADF unit root tests on Bilateral Real Exchange Rates with base Japanese Yen

Lag 1	Statioarity at Difference	ADF Statistic
BD	1	-3.65
IND	2	-5.98
PK	1	-1.91
SA	1	-2.25
SL	1	-2.7
UAE	1	-3.48

(At 1% critical value is -2.65, at 5 % critical value is -1.96 and at 5% critical value is -1.6)

Table 2.B: ADF unit root tests on Bilateral Real Exchange Rates with base US \$

Lag 1	Statioarity at Difference	ADF Statistic
BD	1	-3.99
IND	2	-6.22
PK	1	-2.04
SA	1	-3.87
SL	1	-2.8
UAE	1	-4.07

(At 1% critical value is -2.65, at 5 % critical value is -1.96 and at 5% critical value is -1.6)

Tables 2.A and 2.B present the results of the ADF test to determine the stationarity of each bilateral real exchange rate series. As the literature notes the existence of the unit root in bilateral real exchange rate shows there exist real variables as its determinants (Enders and Hurn, 1994).

The Augmented Dicky Fuller Test tests the null hypothesis of a unit root, our results suggest that we cannot reject the null hypothesis of unit root in each series I (1) with the Japanese Yen and the US dollar as the base currency in the case of ADF statistic of Pakistan and four comparator countries. The exception is India and even in this case the I (1) series is very close to the critical value (base yen and \$) and we find the evidence of a unit root at the second difference level in the case of India.

### C. Speed of Adjustment

Estimates of the speed of adjustment “ $\beta$ ” with Japanese Yen and US Dollar as the base currencies.  $\alpha$  is the intercept of the equation

$$R_t^{i/j} = \alpha + \beta R_t^{i/k} + \varepsilon \quad (3)$$

Where R is real bilateral exchange rate, i is base currency, j and k are the two countries.

Table 3: Speed of Adjustment of Pakistan Rupee

Pair	Base Japan Yen		Base US \$	
	$\alpha$	<b>B</b>	$\alpha$	<b>B</b>
PK by BD	-11.5	1.1	-13.07	1.15
PK by IND	0.92	1.11	1.05	1.11
PK by SA	-129.72	43.4	25	0.4
PK by SL	-1.95	0.67	-1.6	0.7
PK by U	56.8	-8.07	90.5	-16.04

Estimates of “ $\beta$ ” in the equation represent the speed of adjustment in the dependant bilateral real exchange rate due to changes in various independent bilateral real exchange

rates. Speed of adjustment is particularly high among the bilateral real exchange rate of South Asian countries. The Pak Rupee reacts to the changes in bilateral real exchange rate of UAE and Saudi Arabia (with US \$ and Japanese Yen as base) significantly later than it does with respect to the changes in the bilateral real exchange rate of India, Sri Lanka and Bangladesh.

It is interesting to note that the shortest speed of adjustment of Pak rupee (in case of Japanese Yen as base) is with the Sri Lanka's rupee and the Bangladeshi Taka and the longest speed of adjustment is with respect to Saudi Arabia with base Yen. However when the US dollar is taken as the base currency the shortest speed of adjustment is with Saudi Arabia.

#### D. Co integration Test

We have derived the error correction term as follows.

$$\Delta r_t = \alpha + \beta r_{t-1} + \sum_{i=1}^p \phi_{t-i} \Delta r_{t-1} + \varepsilon_t \quad (4)$$

The error correction term as derived above is convenient because only 1 term in the integrated process is of order one i.e., I (1) under the unit root hypothesis, while the rest of the terms are stationary. We test the co integration relationship between two variables based on the eigen values. These results are presented in table 4.A and 4.B.

Table 4.A Pakistan's co integration relationship with base Japanese Yen

	BD	IND	SA	SL	UAE
Eigen Value (1)	0.46	0.37	0.31	0.34	0.61
Likelihood Ratio	20.4	14.1	12.2	16.1	34.5
5% critical value	15.41	15.41	15.41	15.41	15.41
Co integrating	Yes	No	No	Yes	Yes
Eigen Value (2)	0.095	0.03	0.05	0.14	0.23
Likelihood Ratio	2.81	1.14	1.6	4.3	7.5
5% critical value	3.76	3.76	3.76	3.76	3.76
Co integrating	No	No	No	Yes	Yes

Table 4.B Pakistan's co integration relationship with base US Dollar

	BD	IND	SA	SL	UAE
Eigen Value (1)	0.47	0.32	0.48	0.36	0.67
Likelihood Ratio	21.1	12.2	24.7	16.5	37.3
5% critical value	15.41	15.41	15.41	15.41	15.41
Co integrating	Yes	No	Yes	Yes	Yes
Eigen Value (2)	0.1	0.04	0.20	0.12	0.18
Likelihood Ratio	3.82	1.4	6.5	3.86	5.8
5% critical value	3.76	3.76	3.76	3.76	3.76
Co integrating	Yes	No	Yes	Yes	Yes

The evidence of co integration is highest in the case of Sri Lanka and the UAE (perversely) and also Bangladesh and weakest for India. The magnitude of the coefficients in the co integration vector is related to the aggregate demand parameters in such a way that the smaller the parameters of the co integrating vector the more similar will be the countries' aggregate demand parameters. The magnitude of the co integrating vector represents trade and investment flows between the two nations. According to our results presented in table 4, the lowest value of the magnitude of co integrating vector with both US dollar and Yen as the base is with Sri Lanka and Bangladesh showing that the aggregate demand parameters in the South Asian countries are similar, while Pakistan and the Gulf countries have different aggregate demand parameters.

We use the VAR estimates to generate the response of real exchange rate to a positive one SD shock in their residuals.

**Table 5: Standard Deviation of Bilateral Real Exchange rates**

Country	Base currency	Variance	Standard Deviation
BD	Yen	141.2	11.9
BD	US \$	118.4	10.9
IND	Yen	162.9	12.8
IND	US \$	149	12.2
Pak	Yen	215.1	14.7
Pak	US \$	197	14
SA	Yen	0.05	0.22
SA	US \$	0.052	0.23
SL	Yen	418.3	20.5
SL	US \$	381.4	19.5
UAE	Yen	0.02	0.14
UAE	US \$	0.142	0.38

Standard deviation of bilateral real exchange rate is presented in table 5. The values of standard deviation of the Pakistani bilateral real exchange rate with Japanese Yen as the base country is higher than that of Bangladesh, India, Saudi Arabia, and the UAE. Using the US dollar as the base currency the standard deviation of Pakistan's bilateral real

exchange rate is higher than the standard deviation of all other countries. The only country the standard deviation of whose exchange rate (using both Yen and US dollar as the base currencies) is higher than that of Pakistan is Sri Lanka.

### E. Impulse Response Function

The appendix A presents figures showing the impulse response function. They indicate the impact on the Pakistani bilateral real exchange rate of fluctuations in the bilateral real exchange rate of the other currencies, using both US dollar and Yen as the base currencies. We see that the greatest impact on Pakistan's bilateral real exchange rate is of the fluctuations of the currencies of India and Bangladesh. Results for the Gulf countries are inconclusive. The greatest impact of fluctuations in the Pakistan's bilateral real exchange rate is on the bilateral real exchange rate of Sri Lanka, Bangladesh, and India in that order whether we use Yen or US dollar as the base currency.

### F. Common Stochastic Trend

We have found the existence of a co-integrating vector using the Yen base for Pakistan & Bangladesh, Sri Lanka and the UAE and using the US dollar base for Pakistan & Bangladesh, Sri Lanka, Saudi Arabia and UAE. Interestingly India does not appear in either group. We would therefore expect the existence of a common stochastic trend between Pakistan and these countries.

There have been many empirical studies for identifying common stochastic trends. (Ahn,1997; Engle and Kozicki, 1993; Vahid and Engle, 1993). For an m-dimensional I(1) process of  $Y_t$ , if an  $m \times r$  matrix has  $r < m$  and  $\beta$  is such that  $\beta'Y_t$  is stationary, then for an  $m \times (m-r)$  matrix  $\beta_{\perp}$  such that  $\beta_{\perp}'\beta = 0$ , the  $(m-r)$  components of the vector  $\beta_{\perp}'Y_t$  are common trends, or linearly independent linear combinations of these components are common trends as well.

The common stochastic trend represents a weighted average of the Pakistan bilateral real exchange rate and the bilateral real exchange rate of the other countries. The ratio of the weights between the currencies of Pakistan and the other countries are given in table 6. The graphs showing common stochastic trends are with countries for which an integrating vector has been found is given in appendix B. It is interesting to note that the highest value of beta is once again obtained for Bangladesh and Sri Lanka, where as the beta value for UAE is negative

**Table 6.A Pakistan's Orthogonal Matrix with Base Japanese Yen**

<b>BD</b>		<b>SL</b>		<b>UAE</b>	
0.54	0.49	0.31	0.46	0.98	-0.11
0.49	0.46	0.46	0.69	-0.11	0.02
<b>Beta ratio</b>		<b>Beta ratio</b>		<b>Beta ratio</b>	
0.91		1.5		-0.11	

**Table 6.B Pakistan's Orthogonal Matrix with Base US Dollar**

<b>BD</b>		<b>SA</b>	
0.56	0.5	0.13	0.35
0.5	0.44	0.35	0.87
<b>Beta ratio</b>		<b>Beta ratio</b>	
0.89		0.2.69	
<b>SL</b>		<b>UAE</b>	
0.31	0.46	0.99	-0.06
0.46	0.69	-0.06	0.01
<b>Beta ratio</b>		<b>Beta ratio</b>	
1.48		-0.06	

**G. Exchange rate as determinant of real GDP growth.**

Finally we estimated the log version of the equation

$$\text{GDP} = a + b(\text{BRER}) + c(\text{GDP}_{t-1}) + d(\text{RVT}) \quad (5)$$

Where GDP = Real per Capita GDP

BRER = Pakistan's Bilateral Real Exchange Rate (in US \$ and Yen)

RVT = Pakistan's trade with the five comparator countries as a proportion of total Pakistan trade.

Table 7.A

Dependent Variable: RPCGDP\_PK

Method: Least Squares

Sample(adjusted): 1974 2002

Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.282467	0.089937	3.140710	0.0043
BRER_PK_BASEUS	-0.000680	0.000212	-3.208618	0.0036
RPCGDP_PK(-1)	0.627753	0.159876	3.926510	0.0006
RVT_PK	0.009623	0.015116	0.636566	0.5302
R-squared	0.979187	Mean dependent var		0.809614
Adjusted R-squared	0.976690	S.D. dependent var		0.035171

Table 7.B

Dependent Variable: RPCGDP\_PK

Method: Least Squares

Sample(adjusted): 1974 2002

Included observations: 29 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.297451	0.093196	3.191677	0.0038
BRER_PK_BASEJP	-0.000702	0.000216	-3.249197	0.0033
RPCGDP_PK(-1)	0.614659	0.161637	3.802712	0.0008
RVT_PK	0.008472	0.014842	0.570813	0.5732
R-squared	0.979341	Mean dependent var		0.809614
Adjusted R-squared	0.976862	S.D. dependent var		0.035171

Results presented in table 7A and 7B show that variations in Pakistan real exchange rate and in the proportion of Pakistan's trade with the comparator countries in our sample are not significant determinants of per capita GDP growth. The stabilization of Pakistan's real exchange rate -through a formation of a currency union- is unlikely to have a significant impact on economic growth of Pakistan.

## 8. Conclusions

Our major conclusions are ...

- Preliminary analysis shows greatest synchronization in the business cycles of Pakistan and Bangladesh. Synchronization is much weaker with respect to India and absent in the case of the Gulf countries.
- The existence of a unit root is found at the first difference level for all currencies except India.
- Speed of adjustment of Pakistan's bilateral exchange rate (using both US dollar and Japanese Yen as the base currencies) is quicker for South Asian than the Gulf currencies.
- A co integration relationship is most pronounced between the Pakistani rupee, the Bangladeshi Taka and the Sri Lankan rupee. There is no evidence for the existence of such co integration with the Indian rupee. The values of the co integrating coefficients suggest a similarity of the demand structure of Pakistan, Bangladesh and Sri Lanka.
- The strongest impact on Pakistan's exchange rate is that of variations in the Bangladeshi Taka and the Indian rupee.
- The greatest impact of the fluctuations of the Pakistan rupee is on the Bangladeshi Taka and the Sri Lankan rupee.
- A common stochastic trend has been identified in the case of Pakistan, Bangladesh and Sri Lanka.

- However stabilizing the exchange rate is unlikely to have a significant impact on GDP growth in Pakistan. The formation of a currency union cannot be a high policy concern.

These results suggest that some grounds exist for considering the possibilities of establishing a currency union between Pakistan, Bangladesh and Sri Lanka. Clearly India is too large an economy and its business cycle is weakly synchronized with that of Pakistan. Its demand structure is significantly different and a long-term co-integration relationship has not been found between the Pakistani and Indian rupee.

This preliminary investigation has not touched upon many other relevant questions (briefly outlined in section II). Assessment of factor mobility (within the proposed currency area and between it and the rest of the world), list of money exchange and valuation, ratio of imports from the non currency area to total consumption of the area members, trade and investment structures, inflation proneness etc is required before a currency union can be advocated. Similarly levels of integration of countries forming a proposed currency union with the world economy and within their region should be assessed. Determinants of synchronization of business cycles of proposed currency member union member countries should be identified. Trade structures and productive structures of the proposed currency union member countries are particularly impatient in this context.

As Eichengreen (2004) has pointed out the single most important determinant of the success of a common currency area is political will. It is because of this that the prospects of a currency union are particularly bright for Pakistan and Bangladesh. This proposal for a currency area including East and West Pakistan (each region being otherwise autonomous in its macroeconomic policies) was first put forward by Shiakh Mujibd (who interpreted the 1940-Pakistan resolution as envisaging this idea). East and West Pakistan had a common central bank, a common parliament and a common supreme court, which functioned for a quarter of a century. Creating a single monetary authority with equal national representation is feasible as unlike in the case of India; the population of Pakistan and Bangladesh are not vastly unequal. Given this common historical background transparency could be built into the monetary management process (broadly along the lines proposed by the Awami League economists in PIDE during the 1960s). Creating open capital accounts is also not difficult as such as more (unlike capital account liberalization vis-à-vis India) is unlikely to be significantly de-stabilizing for either Pakistan or Bangladesh. Both countries have during the past decade been re-capitalizing their commercial banks, strengthening prudential regulations and strengthening corporate governance procedures. A gradual convergence of financial structures and monetary transmission mechanisms is more feasible for Pakistan and Bangladesh than it is for a currency union containing the giant Indian economy and the other South Asian pygmies.

In conclusion we would like to stress that establishing a common fiscal system is not a pre-requisite and may not be a consequence of creating a currency union. Eichengreen (2004) and several other authors support this view and the Awami League PIDE economists were also of this view. That is why they advocated the abandonment of fiscal

federalism while remaining supporters of a common monetary policy for East and West Pakistan (one currency, one State Bank and a common transmission mechanism). Despite monetary union a common fiscal system has not been created in the EU. The EU budget is in a typical year less than 1 percent of EU GDP illustrating the triviality of the loudly trumpeted stabilization measures. Counter cyclical stabilization is the responsibility of national governments, which collect taxes and undertake public spending. Deficit ceilings set by the EU growth and stabilization pact are routinely ignored and large deficits in Germany and Italy have not driven EU wide real interest rates, for real interest rates are determined by global capital markets, not the capital markets of the EU region.

Eichengreen (2004) has also argued that there is no need for instituting a lengthy pre qualification period; (as was the case in the EU), during which Bangladesh and Pakistan are expected to satisfy convergence criteria with respect to budget deficits, inflation, interest rates and exchange rates. There is no need to monitor compliance with strict numerical targets for these macro aggregates: de Grauwe (2004) shows that interest and exchange rates variations are endogenous. They will converge as expectation of the formation of the currency union increase. Exchange rates targets are unachievable if capital account liberalization is also mandated. Moreover meeting the targets during the qualifying periods is no guaranteeing that they will be sustainable after the currency union has been formed. Several EU members have significantly exceeded deficits targets after 2001. The real pre conditions for the formation of a currency union are financial institutional convergence and political will. There is of course a twin causal relations between them hence the formation of a currency union is the both the cause and the effect of an enhanced political empathy and greater convergence of financial and monetary institutions and mechanisms. Policy makers in Bangladesh and Pakistan should keep this in mind when addressing these questions.

## Notes

1. Keynesian assumptions underlying this analysis and that of Mundell (1961) are obvious
2. i.e., Phillips curve
3. Or sharing the burden of adjustment between the deficit region
4. Which then comprised of only six countries, Belgium, France, W. Germany, Italy, Luxemburg and the Netherlands.
5. Mundell (1961, p-663) argues that a crucial assumption of the pro flexible exchange rate lobby is that trade unions are not willing to accept nominal wage adjustments but are willing to accept real wage adjustment required by fluctuations in the exchange rate. This assumption is likely to become increasingly unrealistic as the share of imports in consumption rises.
6. In 1990 the European Commission estimated that gains of about 0.5 percent of community GDP would result from the adaptation of a single currency (cited in Emerson (1992)).
7. As Wyplisz (1997) argues this traditional model provides very little support for the establishment of a monetary union in Europe.
8. Cooper and Kempf recognize that gains to monetary union may perhaps be modest and “our paper avoided some potential cost of monetary union” (1998, p-27)
9. The cost of loss of national control over monetary policy can be reduced if the countries adopting a common currency have synchronized business cycles for then a common monetary policy can serve all countries in the region.
10. It is on this basis that Bayoumi and Eichengreen (1991) advocated a common currency for East Asia.
11. This is also accepted by Eichengreen (2004)
12. The poorer EU countries being less integrated
13. “Other things remaining constant”
14. Global financial shocks may have different on regional partners

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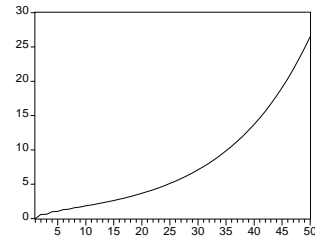
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## **Appendix A.1**

Impulse Response Function of Pakistan's Bilateral Real Exchange Rates (Base Japanese Yen)

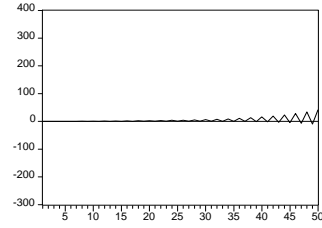
Response to One S.D. Innovations

Response of BRER\_PK\_BASEJP to BRER\_IND\_BASEJP

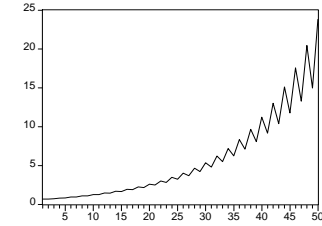


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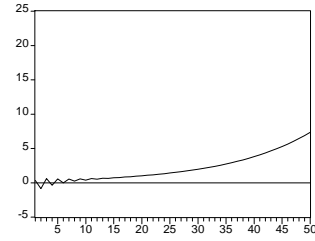
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Response of BRER\_BD\_BASEJP to BRER\_PK\_BASEJP

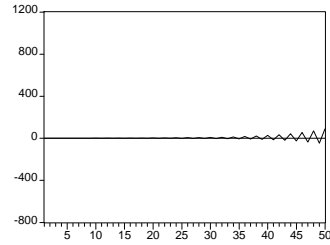


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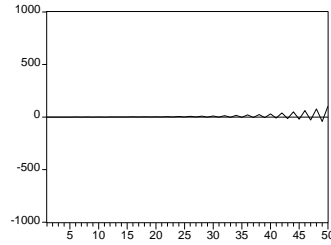
Response to One S.D. Innovations

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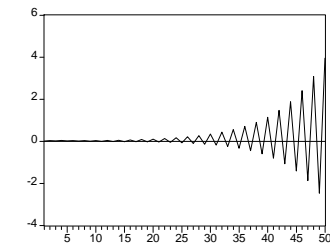


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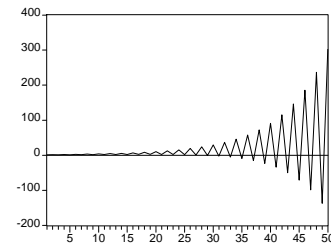
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Response of BRER\_SA\_BASEJP to BRER\_PK\_BASEJP

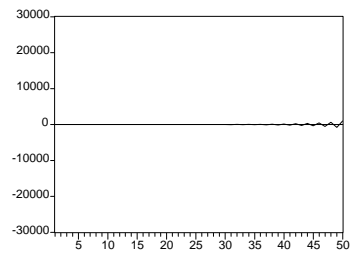


Response of BRER\_SL\_BASEJP to BRER\_PK\_BASEJP

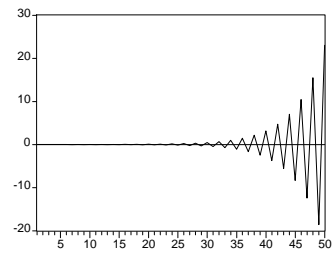


Response to One S.D. Innovations

Response of BRER\_PK\_BASEJP to BRER\_U\_BASEJP



Response of BRER\_U\_BASEJP to BRER\_PK\_BASEJP

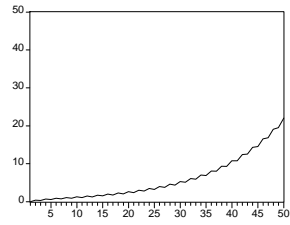


- **Appendix A.2**

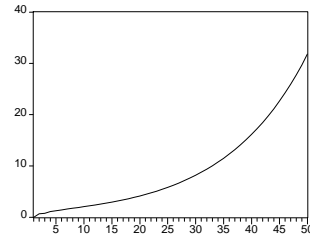
Impulse Response Function of Pakistan's Bilateral Real Exchange Rates (Base US Dollar)

Response to One S.D. Innovations

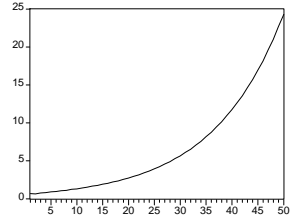
Response of BRER\_PK\_BASEUS to BRER\_BD\_BASEUS



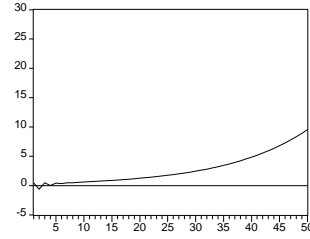
Response of BRER\_PK\_BASEUS to BRER\_IND\_BASEUS



Response of BRER\_BD\_BASEUS to BRER\_PK\_BASEUS

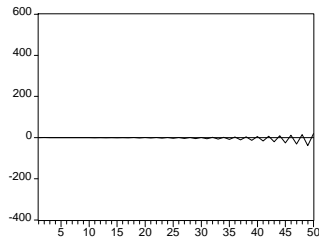


Response of BRER\_IND\_BASEUS to BRER\_PK\_BASEUS



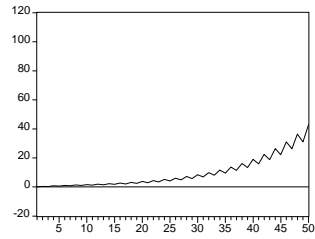
Response to One S.D. Innovations

Response of BRER\_PK\_BASEUS to BRER\_SA\_BASEUS

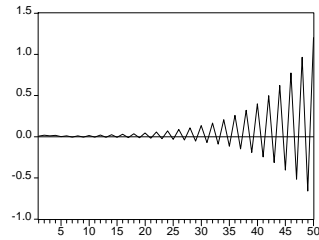


Response to One S.D. Innovations

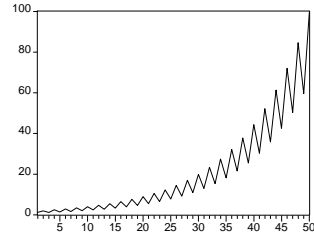
Response of BRER\_PK\_BASEUS to BRER\_SL\_BASEUS



Response of BRER\_SA\_BASEUS to BRER\_PK\_BASEUS

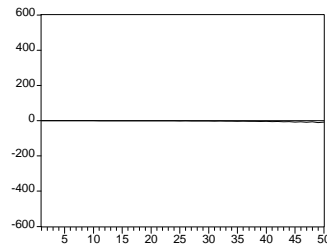


Response of BRER\_SL\_BASEUS to BRER\_PK\_BASEUS

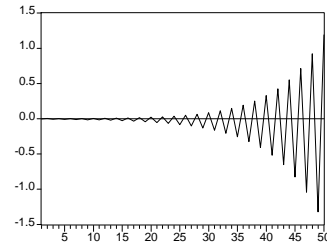


Response to One S.D. Innovations

Response of BRER\_PK\_BASEUS to BRER\_U\_BASEUS

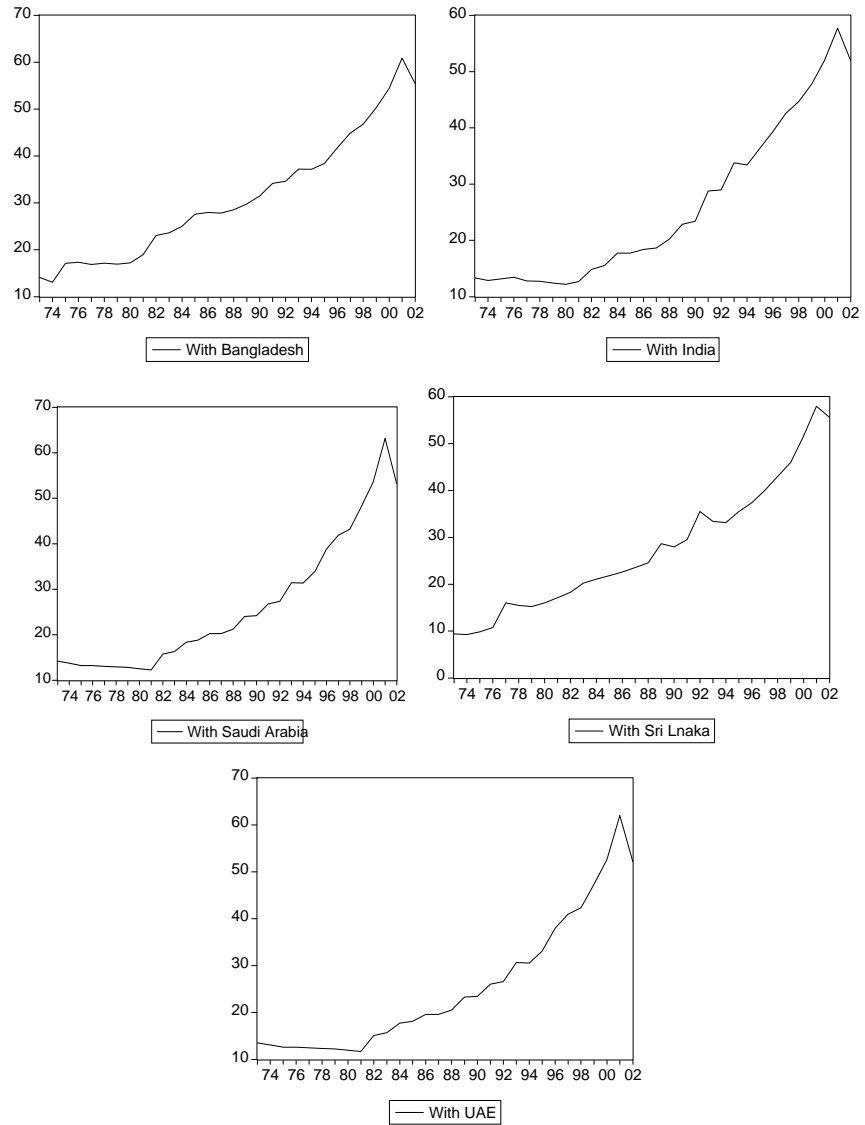


Response of BRER\_U\_BASEUS to BRER\_PK\_BASEUS



## • Appendix B

### Common Stochastic Trends of Bilateral Exchange Rate (Base Yen)



### Common Stochastic Trends of Bilateral Exchange Rate (Base US Dollar)

