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Exchange Rate Dynamics and Monetary Fundamentals: Evidence from South Asian Countries

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Abstract

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Keywords: Exchange Rate, Money Supply, Inflation Rate, Monetary Fundamental and Income

Authors:

Palwasha: (Corresponding Author)
Faculty Member, Department of Economics, Women University Mardan, KP, Pakistan.
Email: (palwashaz1234@gmail.com)

Nadeem Iqbal: Assistant Professor, Department of Economics, University of Peshawar, KP, Pakistan.

Aisha Rehman: PhD Scholar, Department of Economics, University of Peshawar, KP, Pakistan.

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Title

Exchange Rate Dynamics and Monetary Fundamentals: Evidence from South Asian Countries

Abstract

This paper examined the role of monetary fundamentals in determining nominal exchange rate changes in South Asian countries. The Vector Autoregressive (VAR) technique and Autoregressive Distribution Lag (ARDL) were used. Results from the VAR indicate that the exchange rate responds to shock originating from differences in money supply, inflation differential, interest rate, and real income differential and are consistent with the short-run predictions of the monetary model of the exchange rate. The results show that inflation and interest rate differentials are responsible for the majority of changes in exchange rates in the short run. The conclusion from the result is that, particularly in the short run, monetary fundamentals are the primary causes of exchange rate fluctuations in South Asian countries.

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Authors:

Palwasha: (Corresponding Author)
Faculty Member, Department of Economics, Women University Mardan, KP, Pakistan.
Email: (palwashaz1234@gmail.com)

Nadeem Iqbal: Assistant Professor, Department of Economics, University of Peshawar, KP, Pakistan.

Aisha Rehman: PhD Scholar, Department of Economics, University of Peshawar, KP, Pakistan.

Introduction

The correlation between economic growth and exchange rate is considered one of the main subjects in economics. The rate of exchange in an open economy remains an important variable that has direct consequences on macroeconomic factors like gross domestic product. Policymakers, investors, and economists focused on the exchange rate of the country, so they made the investors invest their money in that country because they believed that the high exchange rate of a country creates competitive advantages in international trade. Due to the increased exchange rate the domestic export of goods of a country becomes cheaper which also raises the export demand, which means imports decrease and exports increase which all of these affect the gross domestic product of the country (Bilawal et al., 2014).

After the Financial crisis of 2008, Pakistan faced a decline in some parameters which are external capital inflows, exports, equity flows, and a significant depreciation of the rate of exchange due to which

debt was more expensive and led to adverse implications for the corporate sector. This situation causes uncertainty in the long run which affects society's welfare. A progressive strategy outward-oriented and a development strategy export-based is needed which is only possible when there is a stable exchange rate, while on the other side instability in the exchange rate with economic fundamentals, such as high interest rates, low real income, high money supply, all these can lead to severe instability in financial systems especially in developing countries. (Dumrongrittikul & Anderson, 2015).

Pakistan had a fixed-rate regime from 1947 to 1981. Afterward, in 1982, Pakistan managed a floating exchange rate shifting from a fixed exchange rate regime in 1982, which was then in 2000 shifted to a floating exchange rate. Even after this regime change in the exchange rate the problem of balance still remained there (Khan & Qayyum, 2008). Further, over the last two decades, Pakistan has introduced many reforms from time to time in the trade sector and financial sectors as well, which further experienced changes in the exchange rate market for better economic growth with macroeconomic stability. After the financial crisis of 2008, Pakistan faced a deterioration in exports, external capital inflows, equity movements, and depreciation in the rate of exchange (Amjad & Din, 2010).

Till 1970, the Pakistani rupee was associated with the British sterling pound, and from 1971 it was then associated with the US dollar because of the growing power of the US in the world. The Pakistani rupee was aligned with the US Dollar in 1982. When the government of General Zia-Ul-Haq came into power they changed the exchange rate status from fixed to managed float, from the period 1982-88 the currency devalued by 38.5% and again depreciated because of the 1998 nuclear test (Khan et al., 2012).

The traditional monetary models of exchange rate can be used to analyze the macroeconomic consequence of exchange rate variance, according to the literature (Groen 2000; Rapach & Wohar 2004). The model of the monetary rate of exchange demonstrates that the monetary phenomenon is one of the basic reasons for depreciation in the rate of exchange, the basic reason for the rate of exchange dynamics increase in money supply, inequality in income levels, inflation, and fluctuations in interest rate. Despite this in the long-run macroeconomic policy debate, Kim et al. (2010) and Meese and Rogoff (1983) investigate to examine the behavior of the model of the traditional rate of exchange that has failed, particularly in short-run dynamics. Inflation, interest rates, and economic development are all significant influences on the rate of exchange of Dollar/Euro. Despite the importance of monetary fundamentals in calculating the exchange rates, the short-run coexistent linkages of exchange rates and monetary parameters have been always neglected. In Pakistan, there is a need to look at the dynamics of short-term and long-run rates of exchange.

There remains a lack of empirical literature that shows a significant relationship between exchange rates and the fundamentals of monetary systems in a developing nation like Pakistan. The explanation for this could be that until recently, most of these developing countries have used a regime of floating exchange rates. The effect of these policies in developing nations can be better understood if such models are empirically tested in countries with binding capital flow limits and underdeveloped domestic financial sectors (Kletzer & Kohli, 2000).

In Pakistan, empirical literature for exchange rate determination by using the monetary approach is limited, and the literature that is available is not sufficient enough to address the current exchange rate changes or their connection with monetary fundamentals. In examining exchange rate behavior, the current literature mostly focused on the effect of outside factors such as remittances and terms of trade (Haque & Montiel, 1992). Only a few studies are available that have looked at the behavior of the exchange rate (nominal) using the approach of the Purchasing Power Parity (PPP) hypothesis or using a version of the monetary approach and few have available using Keynesian exchange rate models (Khan & Qayyum 2011). Most of these studies, however, did not examine the dynamic interactions of these monetary fundamentals and exchange rate dynamics, which have considerable implications for policy formulation to determine the exchange rate's sensitivity to major monetary fundamentals.

The nominal rate of exchange and straightforward set of monetary fundamentals are strongly correlated, according to the monetary model of rate of exchange determination. The monetary approach is an appealing theoretical tool for comprehending changes in the rate of exchange over time because of its obvious intuition—that a country's price level is calculated by its supply and demand for money and that the price level in different countries should be the same when expressed in the same currency. Additionally, it offers a long-term reference point for the nominal rate of exchange between two currencies, serving as a precise test for whether a currency is significantly "overvalued" or "undervalued."

Up until the early 1980s, In Pakistan, the regime of fixed exchange rate was there. After that the State Bank of Pakistan (SBP) in the late 1980s started to frame detailed and result-oriented reforms in the financial sector, it intended to replace the pegged exchange rate regime. The consequences were that the approach of de jure exchange rate transitioned from multiple exchange rates to a controlled floated exchange rate until 2000, and then after a gap of about two years converted to a free float exchange rate. Deviation from parity conditions is expected to be eliminated as the exchange rate regime changes (Khan & Nawaz, 2018). Furthermore, over the last two decades, trade and financial sector liberalization, as well as the relaxing of capital flow limitations, have decreased many distortions. The floating exchange rate regime in Pakistan motivates researchers to investigate the influence of monetary instruments which bring a possible change in the process of exchange rate. The objective of the study is to examine the short-run plus long-run correlation between the rate of exchange and monetary factors in Pakistan, using panel data for the time period 1990-2020. And to observe how the nominal rate has changed in response to changes in monetary fundamentals. Furthermore, it examines the dynamic response of the rate of exchange to monetary policy shock.

Theoretical Framework

The monetary model of rate of exchange purpose is still a popular theoretical instrument for comprehending changes in exchange rates over time and is frequently cited in the literature to explain exchange rate changes in both developed and developing market economies. The absolute purchasing power parity, the uncovered interest rate parity, and money market equilibrium in domestic and international markets serve as the foundation of the monetary model (Dabrowski et al. 2014, Moazzam, 2022 and Siddharth, Alexiou, & Vogiazas 2024).

The quantity theory of money is extended by the monetary model of exchange rates. According to this theory, the rates of exchange are mainly affected by the demand and supply of home currency as well as external currencies. The primary premise of the monetary rate of exchange approaches is, that the key driver of the exchange rate is national monetary policy. The purchasing power parity (PPP) theory and the quantity theory of money are combined in the monetary exchange rate model, which is its main feature. According to theoretical literature the relative supply of money, relative real income differentials, rate of interest differentials, and rate of inflation differentials determine the exchange rate. The approach predicts that there is a stable demand for money functions for both the home countries and overseas countries, allowing for the determination of equilibrium conditions both in the money market at home and abroad. It also supposes that clear products, money, and foreign exchange markets alter prices, nominal rate of interest, and rate of exchange instantly. It is also supposed that by using the quantity theory of money we can determine the aggregate price level, and in the long run, it holds the purchasing power parity (PPP) theory. The models of the monetary rate of exchange further suggest that home assets are the perfect alternates for foreign capitals both at home and abroad and that the Fisher parity condition embraces both at domestic and overseas. Moreover, the real rates of interest are considered to stay persistent in the long run across countries (Khan & Nawaz, 2018).

According to the monetary approach, the exchange rates of each country's national currency are determined by their equilibrium in the total demand and supply of that country. According to this theory, the demand for money is obtained by the rate of interest, income level, and general price level. There is a direct relationship between demand for money and real income and price levels. On the other hand, there is an indirect relationship with the interest rate. The monetary authorities of various countries independently measure the supply of money. The foreign exchange market is in equilibrium or at interest parity at the outset. It is also assumed that the home country increases the supply of money by its monetary authority. Which will lead to inflation in the home country in the long run. According to the PPP hypothesis, this will also lead depreciation of the home currency.

According to purchasing power parity states that home prices "P" must equal overseas prices "P*" multiplied by the rate of exchange "e" then the domestic currency price of foreign currency:

$$P=e\ P^*$$

$$M^s = M^d$$

$$M^d = L(y, r, \pi, k)$$

Where y= domestic real income, r= domestic interest rate, π= domestic inflation, and where the "*" indicates the foreign factors.

Econometric Model and Methodology

The current study will be a considerable addition of knowledge especially for Pakistan by examining the correlations of exchange rates and instruments of monetary system, utilizing panel data from 1990 to

2022. Second, for empirical analysis, this work will use the cointegration and Vector Autoregressive (VAR) techniques. These methods are valuable because they allow for the estimation of short-run correlation between determinates of the monetary system and the nominal rate of exchange (Loria et al., 2010). Third, by using the technique of Impulse response function (IRF) and forecast error variance decomposition (FEVD) technique we will examine the response of the nominal rate of exchange when there is a change in monetary fundamentals. Fourth, based on economic theory, this paper will apply Impulse Response Functions (IRFs) to trace out important policy shocks.

The first step of empirical analysis is to use the Johansen (1995) cointegration test to look at the long-term connection among all the variables. However, the study employs the VAR modeling paradigm to investigate the dynamic interplay among the rate of exchange and monetary determinates. Impulse response functions (IRFs) would be used to analyze the short-run dynamics of the rate of exchange based on structural identification and forecast error variance decomposition (FEVD). The study has used the Autoregressive distributed lag method to generate the short-run and long-run estimations of the monetary model of the exchange rate in light of the cointegration between the rate of exchange and monetary fundamentals.

In our study, the monetary exchange rate is a dependent variable while the money supply differential, real income differential, interest rate spread, and inflation rate differential are the independent variables. In order to analyze "Exchange Rate Dynamics And Monetary Fundamentals: Evidence From A Panel Approach, the following model of Heinlein and Krolzig (2012).

$$S_{it} = \beta_o + \beta_1 m_{it}^d + \beta_2 y_{it}^d + \beta_3 I_{it}^d + \beta_4 \pi_{it}^d + u_{it} \quad 1$$

Where S_{it} is the long-run equilibrium exchange rate where negative values in the above model indicate the obligation of the exchange rate while the positive values indicate the depreciation, $m_{it}^d = m_t - m_t^*$ represents money supply differential, $y_{it}^d = y_t - y_t^*$ denotes real income differentials, $I_{it}^d = I_t - I_t^*$ is spread of interest rate in the short-run, and $\pi_{it}^d = \pi_t - \pi_t^*$ is inflation rate differential and i is used for cross-sectional and t is for time.

Differences are determined using the South Asian countries as a reference point (*). Equation (1) illustrates that whenever depreciation occurs in the exchange rate this will be because of an increase in the relative money supply, but on the other hand if appreciation occurs in the exchange rate it will be because of an increase in the relative real income [Hallwood and MacDonald (2000); Hunter and Ali (2014); Katusiime, et al. (2014)]. According to the model, depreciation occurs in the exchange rate whenever there is a rise in the relative short-run rate of interest and rate of inflation.

For empirical analysis, this work uses cointegration and Vector Autoregressive (VAR) techniques. These methods are valuable because they allow for the estimation of short-run simultaneous correlations between monetary factors and the nominal rate of exchange while taking the cointegration between the exchange rate and monetary components into account. Impulse Response Functions (IRFs) and Forecast Error Variance Decomposition (FEVD) are considered. Based on economic theory, this article applies sign limitations and a zero restriction on Impulse Response Functions (IRFs) to trace out important policy shocks. This study will be useful for developing countries to understand the difference between exchange rates and monetary.

Data Source

To analyze Exchange Rate Dynamics and Monetary Fundamentals: Evidence from a Panel Approach (a case study of South Asian countries 1990-2022). We used panel data which has been taken from International Financial Statistics (IFS) as a branch of IMF for the Years 1990-2022 which is published by International Monetary Fund (IMF) and from world development indicator.

Construction of Variables

In equation 1, an exchange rate (S_{it}) is the dependent variable, money supply differential (m_{it}^d), real income differentials(y_{it}^d), interest rate (I_{it}^d), and inflation rate differential (π_{it}^d) is the vector of independent variables and u_{it} is the error term that comprises the impact of all excluded variables where I am used for crossed sectional and t is used for the time period.

The rate of exchange is known as the trade of a nation's currency for another nation's currency or we can say that it is the worth of one currency in terms of another currency. The rate of exchange can be the direct or indirect exchange rate. The indirect exchange rate is to exchange of the home/domestic currency in terms of foreign currency while the direct exchange rate is the exchange of external currency in terms of home currency. The direct exchange rate can be a real or nominal exchange rate. The nominal exchange rate tells us how much one country's goods

and services can be traded or exchanged for another country's goods and services while the real exchange rate is the worth of one currency in terms of another country's currency. Here in this study nominal exchange rate will be used. Supply of Money is defined as M2 which is the addition of currency, demand deposit, time deposit, and other deposits like Treasury bill rate for six months, and consumer price index (2015=100). The data for all these variables will be obtained from International Financial Statistics and world development indicators. A relative supply of money will be obtained by making the difference between Pakistan and the South Asian countries board money. Relative income will be calculated, by taking the real gross domestic product differences of Pakistan and South Asian countries. Likewise, interest rate differential will be obtained by taking the difference of nominal interest rates between Pakistan and the South Asian countries. The rate of inflation (π_{it}) is calculated as $\pi_{it} = (lnP_t - lnP_t) \times 100$, where the consumer price index is denoted by P_t. Except for the interest rate, all the other variables are taken in logarithmic form.

Results And Discussion

Descriptive statistics describe the general properties that are mean, median, maximum, minimum, standard deviation, and normality. With the help of it, we may use the features of the data. The basic information of the descriptive is given in the following Table 01:

Table 1

Descriptive Statistics

	Erd	Gdpcd	Infd	Msd
Mean	-0.31	2.07	-0.09	-0.06
Median	-0.37	5.23	-0.44	0.35
Maximum	15.84	980.52	14.09	21.07
Minimum	-16.47	-2622.79	-22.80	-11.90
Std. dev	4.85	275.29	3.73	4.92
Skewness	-0.50	-4.72	-0.57	0.56

Where Erd=exchange rate differentials, Gdpcd=real income differentials, Infd=inflation rate differentials and Msd=money supply differentials

It is possible to determine the order of integration of macroeconomic variables using the Augmented Dicky-Fuller (ADF) unit test. Table 2 presents the results that were obtained. The variables being non-stationary or having a unit root is the null hypothesis. The Mackinnon crucial Values are the basis for the rejection region of an ADF null hypothesis. The null hypothesis is rejected since it is discovered that all of the variables are stationary at the level and that the likelihood is less than 5%. (khattak et al., 2012).

Table 2

Unit root test

Variables	Probability at level
Exchange rate	0.01***
Money supply	0.00
Real income	0.00
Interest rate	0.05**
Inflation rate	0.00

**** and ** mean significance levels at 1% and 5% respectively.*

Here in table 3 shows the result for lag selection. The rule of thumb is to select the criteria that give the minimized figure so here the study chooses AIC. Here lag structure from lag 0 to lag 4 is shown and in Table 3 lag 1 has the minimum value that is 34.85 as compared to others. So the AIC value shows optimal lag for my model. So for model exchange rate, supply of money, real income differentials, rate of interest, and rate of inflation, and study is going to use lag 1 for empirical analysis as indicated by AIC criteria.

Table 3

Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2101.91	NA	4.11e+09	36.32	36.44	36.37
1	-1991.57	209.26	9.44e+08*	34.85*	35.56*	35.14*
2	-1976.60	27.10	1.13e+09	35.02	36.33	35.55
3	-1963.88	21.92	1.14e+09	35.23	37.13	36.01
4	-1936.59	44.70*	1.36e+09	35.19	37.69	36.21

**indicates lag order selected by the criteria LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion*

The nominal exchange rate, real income, money supply, interest rate, and inflation rate are examined over the long term using the Johansen co-integration technique. Based on the Forecast Error Variance Decomposition, the impulse response function can be used to analyze the short-run dynamics of the exchange rate. Table 4 provides the trace statistic and maximum Eigen statistics for the co-integration rank in order to calculate the number of stable long-run co-integrating correlations. The results show that the exchange rate and the monetary fundamentals have a single co-integration relationship for panel analysis. The maximum eigenvalue test statistics and trace test statistics, both of which are statistically significant at the 1% level, indicate the existence of a single co-integrating vector, suggesting that the nominal exchange rate and monetary fundamentals are integrated. In other words, the nominal exchange rate and monetary fundamentals have a long-run equilibrium connection.

Table 4

Trace test and max. eigen test

Null Hypotheses	Alternative Hypotheses	R	Probb. of trace test	Probb. Of eigen test
$H_0=0$	$H_1>0$	0	0.00	0.00
$H_0=1$	$H_1>1$	1	0.00	0.00
$H_0=2$	$H_1>2$	2	0.00	0.00
$H_0=3$	$H_1>3$	3	0.00	0.06*
$H_0=4$	$H_1>4$	4	0.01***	0.01***

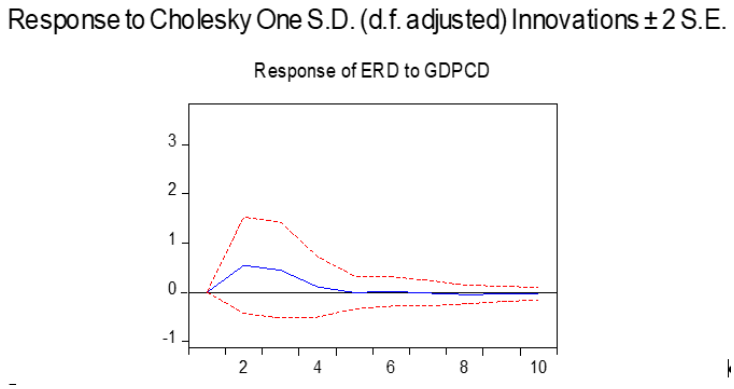
*"R" indicates the number of co-integrating vectors & *** means significance level at 1%.*

The coefficients derived from the VAR model's estimation may not be suitable for direct interpretation. As a result, both the variance decomposition and impulse response functions are employed. It is possible to identify the dynamic interaction between variables by using impulse response functions. It demonstrates how much each variable in the system reacts dynamically to shocks or innovation in another variable. In other words, rather than emphasizing the variable's actual value, it emphasizes more on the trend's upward or downward movement. Adversely, variance decomposition is employed to identify the causal connections between the variables. It demonstrates the degree to which changes or shocks in one variable may be attributed to changes in all other variables in the system.

The study computes impulse response functions to ascertain how quickly and how significantly real rates of exchange and other variables are impacted by shocks to these fundamentals. The research mainly focuses on how the real exchange rate responds to four variables: real income in terms of GDP per capita, inflation rate, money supply, and inflationary interest rate. The impulse response results are reported in Figure 1.

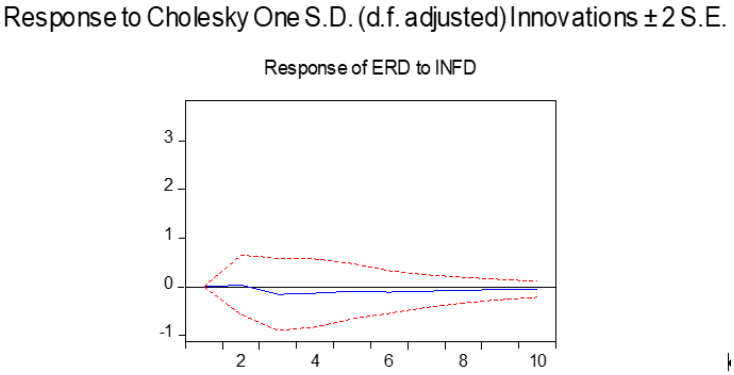
The nominal exchange rate's reactions to shocks to itself, to income, to inflation, to the money supply, and to differences in interest rates are denoted by the abbreviations ERD to GDPCD, ERD to INFD, ERD to MSD, and ERS to RD, respectively. According to the monetary exchange rate model's transmission mechanism, a positive shock (including an increase) to the money supply, interest rates, and income differentials should cause a depreciation of the nominal exchange rate whereas the latter should result in an appreciation.

Figure 1



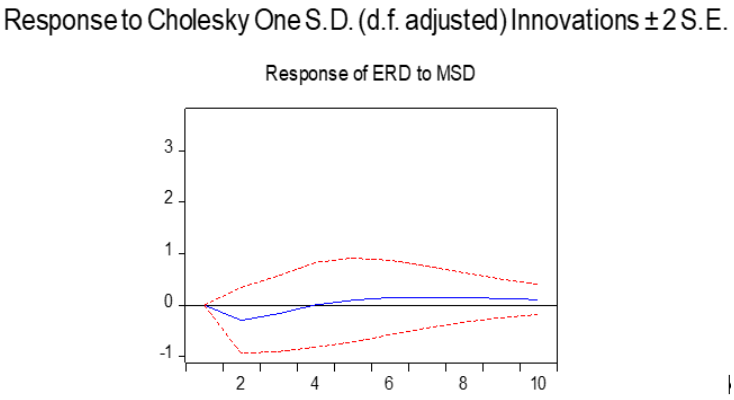
Income shocks have a direct, large, and positive effect on the exchange rate, which causes it to increase. A shock to the income gap causes the nominal exchange rate to gradually increase.

Figure 2



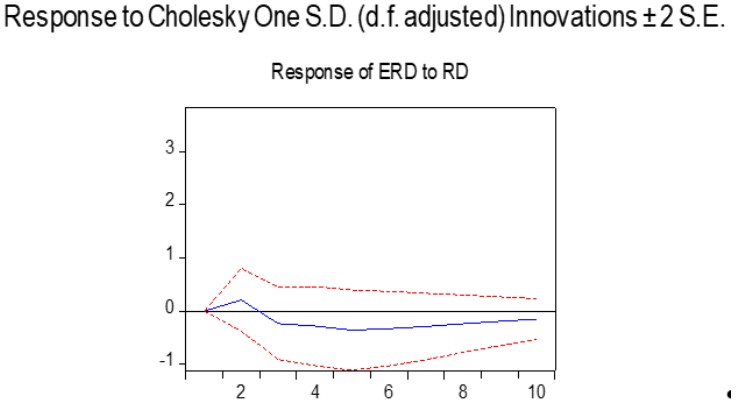
During the first two quarters, a shock to the inflation gap resulted in no adjustment in the exchange rate. This response is transient, though, since the exchange rate continues to decline after the second quarter throughout the duration of the time horizon. To put it in another way, a shock to inflation has a negative net effect on exchange rates, suggesting a decline in the value of the domestic currency.

Figure 3



In the first two quarters, a shock to the money supply gap triggers a negative reaction from the exchange rate. This response, however, is temporary because the exchange rate has been rising ever since the second quarter over the entire time horizon. In other words, a shock to the money supply has an overall positive impact on exchange rates, indicating a strengthening of the home currency.

Figure 4



Within the first two-quarters of an interest difference shock, the exchange rates depreciate immediately before gradually rising after that. It does, however, have a net negative impact on the exchange rate, signaling devaluation in the absence of the money supply shock.

In general, the nominal exchange rates' impulse responses to shocks to the underlying monetary framework are in line with the monetary exchange rate model's hypotheses and support the short-run predictions of Loria et al. (2010) for the monetary exchange rate model for Mexico.

We have computed general forecast error variance decomposition of the rate of exchange and the outcomes are described in Table 5. The rate of exchange itself explains a 100 percent variation in the effect period, but then it reduced to 94.93 percent in the tenth quarter. The role of the relative money supply to nominal exchange rate movements is 00 percent on the impact and on average the contribution remains the same in the last quarters. After that, the impact of relative money supply increased by 0.00 percent in the first quarter to 0.76 percent in the tenth quarter. This resulted in the relative supply of money differentials shock insignificantly describing short-run variations in the nominal rate of exchange; however, the influence slowly increases over the longer horizon. Likewise, the share of real income shock also started from 0.00 percent in the first quarter and slowly increased to 1.79 percent in the tenth quarter. From 0.00 percent in the first quarter, it rose to 2.21 percent in the tenth quarter; afterward, the influence of the rate of interest differential slowly increased. Lastly, the influence of rate of inflation differentials the rate of exchange difference was 0.00 percent in the influence period which is also again 0.00 percent in the second quarter. Afterward, the impact slowly increased and touched 0.29 percent in the tenth quarter. The situation suggests that inflationary expectations play an important role in clarifying the nominal rate of exchange in the short run. This implies that money supply differentials, real income differentials, rate of interest differentials, and rate of inflation differentials are vital factors that affect the nominal rate of exchange fluctuation in South Asian countries in the short run (Khan and Nawaz 2018, Moazzam, 2022 and Siddharth, Alexiou, & Vogiazas 2024).

Table 5

Forecast Error Variance Decomposition

Variance Decomposition on ERD	ERD	MSD	RID	RD	INFD
1	100.00	0.00	0.00	0.00	0.00
2	97.83	0.45	1.48	0.21	0.00
3	96.95	0.49	2.04	0.40	0.10
4	96.75	0.45	1.92	0.69	0.16
5	96.33	0.46	1.85	1.14	0.19
6	95.89	0.53	1.81	1.52	0.23
7	95.52	0.60	1.79	1.81	0.25
8	95.24	0.67	1.79	2.00	0.27
9	95.05	0.72	1.79	2.13	0.28
10	94.93	0.76	1.79	2.21	0.29

The study is going to use the ARDL method to generate the short and long-run estimations of the monetary rate of exchange model in consideration of the cointegration test between exchange rate and monetary determinates. The following provides the monetary exchange rate model's long-run estimates:

Table 6 shows that real income and money supply have the largest long-term effects on exchange rates. The positive indicator of the money supply indicates that a gain in home currency relative to foreign money results in a long-term drop in the exchange rate. This demonstrates how rising domestic prices decrease the competitiveness of domestic goods and affect the trade balance when the home money supply increases. The outcomes are in line with prior studies (Kletzer and Kohli 2000; Khan and Qayyum 2011). The projected elasticity of the supply of money difference is 0.14, which means that a long-term rate of exchange rate depreciation of 0.14 percent occurs for every one percent rise in home-relative money to overseas money. Possible explanation: Over the past 20 years, South Asian countries' currency rates have been under pressure to depreciate as a result of an excessive money expansion brought on by budget deficits.

The calculated real income coefficient is significant and negative (-0.009), and is inconsistent with what the monetary model of the forex rate predicts. This implies that a rise in relative real income raises the need for actual money balances, which eventually results in a valuation of the rate in South Asian countries. Bilson (1978) emphasized that only export-led growth will result in a valuation of the currency after a rise in real income. Our results, however, are in line with the Monetarist hypothesis that rising domestic output would lead to higher exports and a better trade balance. The estimated coefficient of real income is fairly reliable with the past results of Kletzer and Kohli (2000) and Khan and Qayyum (2011).

The findings show that the differential of inflation rates has favorable long-term effects on currency rates. This shows that a long-term increase in domestic interest rates for a given international rate of interest of 0.36 percent results from a one percentage rise in the national rate of inflation compared to the overseas rate of inflation.

Table 6

Results of Long-run Coefficients

Variables	Coefficients	std.error	t.stats	P_value
MSD	0.143850	0.033040	4.353809	0.0000
RID	-0.009324	0.001827	-5.104439	0.0000
INFD	0.364601	0.071513	5.098389	0.0000

The findings of the short-term effects of the variables on the dependent variable are shown in Table 7. The currency rate will depreciate by 0.02 percent for every percent rise in actual income. Similarly, if the difference between inflation rates rises by 1%, the exchange rate will decline by roughly 0.22 % (Khan & Nawaz, 2018). The exchange rate will decrease by around 0.12% if the money supply rises by about 1%. (Jimoh, Dr. Ayodele, 2004). It doesn't matter if all of the estimates in Table 7 are unremarkable at the 5% level and inversely correlated with the exchange rate.

Table 7

Results of Short-run Coefficients

variables	coefficients	std.error	t.stats	P_value
COINTEQ01	-0.84	0.49	-1.70	0.09
D(ERD(-1))	-0.03	0.32	-0.11	0.90
D(ERD(-2))	0.34	0.26	1.28	0.20
D(ERD(-3))	0.26	0.28	0.95	0.34
D(GDPCD)	-0.02	0.04	-0.48	0.63
D(GDPCD(-1))	-0.02	0.03	-0.64	0.52
D(GDPCD(-2))	0.01	0.03**	0.41	0.68
D(GDPCD(-3))	-0.04	0.04	-1.16	0.24
D(INFD)	-0.22	0.24	-0.93	0.35
D(INFD(-1))	-0.15	0.18	-0.86	0.39

variables	coefficients	std.error	t.stats	P_value
D(INFD(-2))	-0.11	0.11	-0.97	0.33
D(INFD(-3))	0.01	0.13	0.10	0.91
D(MSD)	-0.12	0.14	-0.85	0.39
D(MSD(-1))	-0.02	0.10	-0.21	0.8
D(MSD(-2))	0.08	0.05	1.40	0.16
D(MSD(-3))	-0.17	0.24	-0.71	0.47
C	-0.73	0.38	-1.90	0.06

Conclusion

Using cointegration and VAR modeling approaches, the research examines the role of monetary fundamentals in determining exchange rates for South Asian countries between 1990 and 2020. The first step of empirical analysis is to use the Johansen (1995) cointegration test to take a look at the long-term connection among all the variables. However, we adopt the VAR modeling technique to investigate the dynamic interactions among the rate of exchange and monetary determinates. The primary benefit of the VAR modeling is that it makes it possible to identify shocks in terms of economic theory (Khan & Ahmed, 2014). It offers a chance to determine the overall impact of unexpected variations in system variables. The VAR technique is more data-driven as it is only constrained through the number of parameters, delays, and previous constraints used to recognize the important shock (Bhornland and Halvorsen 2014).

The findings show that in the long run, the supply of money differentials and real income are the main factors influencing forex rates, whereas, in the short run, money supply differentials, real income differentials, and rate of interest differentials are the main factors influencing nominal forex rates. The supply of money differentials, income, interest rates, and inflation differentials are the primary elements responsible for short-run fluctuations in the nominal rate of exchange in South Asian nations, according to IRFs and FEVD research. The positive indicator of the money supply indicates that a gain in home currency relative to foreign money results in a long-term drop in the exchange rate. This demonstrates how rising domestic prices decrease the competitiveness of domestic goods and affect the trade balance when the home money supply increases. South Asian countries' currency rates have been under pressure to depreciate as a result of an excessive money expansion brought on by budget deficits.

The calculated real income coefficient, which is negative and significant, is consistent with what the monetary model of the rate of exchange predicts. That implies that a rise in relative income raises the need for actual money equilibriums that eventually result in a valuation of the rate of exchange for South Asian countries. Bilson (1978) emphasized that only export-led growth will result in a valuation of the currency after a rise in real income. Our results, however, are in line with the Monetarist hypothesis that rising domestic output would lead to higher exports and a better trade balance. The findings show that the differential of inflation rates has favorable long-term effects on currency rates. This shows that a long-term increase in the national rate of interest for the specified international rate of interest of 0.36 percent results from a one percent rise in home inflation relative to overseas inflation.

Following are the economic consequences of this analysis: The significance of monetary fundamentals in describing exchange rate fluctuation in South Asian countries is indicated by the presence of significant long-run and short-run correlations between the rate of exchange and monetary fundamentals. Therefore, these fundamental factors can be used by policymakers as a stabilizing tool for the short- and long-term forecasting of exchange rates. By influencing exchange rates, policymakers can particularly employ monetary policy to bring about changes in global competitiveness. In reality, the exchange rate has a big impact on how much and where international trade and financial flows are going. The results of this study provided informative information for interpreting South Asian exchange rate fluctuations. Since the bulk of South Asian nations have many same characteristics, including being emerging nations from the same region and subject to identical foreign influences, they are often similar. Particularly, the development methods of these nations are similar, and they share the same problems with monetary and forex rate strategies. The county economies are having difficulty creating a macroeconomic climate that is stable, which is required to improve their capacity to draw external direct assets and foster trade and monetary ties in the Asian area. In order to understand the development of exchange rate fluctuations, investors would utilize the monetary model of the exchange rate as a valuable target. As many Asian nations use the US dollar as their base currency, the study's findings do encourage regional trade and financial integration as well as the

coordination of monetary and exchange rate policies in South Asia.

The findings of this research will also be useful for financial managers and investors in considering the links between exchange rates and monetary determinates and in developing investing, risk management, and trading plans.

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