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Impact Of Macro Economic Factor (Interest Rate, Inflation Rate, Gdp Per Capita Growth, Fdi) On Exchange Rate

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Abstract

Among the developing countries, Pakistan experienced a unique downward trend in rupee value and frequent transitions in the exchange rate systems. Exchange rate is one of the most important indicator of economic growth of a country and its instability has major impact on international trade. These distinctive features make Pakistan economy an interesting case study for the empirical examination of the rupee exchange rate and its role in the monetary policy and macroeconomic performance. The purpose of the present study is to find out which of the macroeconomic indicators has managed the Pak-rupee exchange rate uncertainty during the study period. Furthermore, the effect of the exchange rate instability on selected macroeconomic variables has also been studied in the framework of a correlation and regression approach. The Time series annual data covering the period of 2001 to 2023 has been used for the empirical analysis.The Ordinary Least Squares method is used for the estimation of regression equations. For avoiding the problems of spurious relationship between the variables and series implications for the standard errors, various diagnostic tests have been applied. Study has taken exchange rate as dependent variable and selected macroeconomic variables as independent variables. In the current era is studying of investigates impact of interest rate, foreign direct investment, gross domestic product per capita and inflation rate on uncertainty of exchange rate in Pakistan.The result show that exchange rate has negative relationship with the variables such as interest rate (INT), foreign direct investment (FDI) and positive with GDP per capita (PCGDP) and inflation (INF), which is also supported by the theory and results. On the basis of the findings, it has been recommended that foreign factors in factors should also be taken into account for the stability of exchange rate.

Keywords: GDP Growth Per Capita, Inflation Rate, Exchange Rate and FDI (foreign direct investment)

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Introduction

Monetary policy aims to reduce unemployment and regulate prices by using policy variables like interest rate, inflation rate, foreign direct investment and gross domestic product per capita to boost economic growth.Increased interest rates prevent capital outflows and delay economic growth. In the global network age, Real Exchange Rate (ER) plays a crucial role in free market economies. Pakistan's economy is open to foreign trade, making domestic inflation exposed to external price shocks. Exchange rate is closely monitored and handled by the government.

The rate at which one currency is exchanged for another is known as the exchange rate. Stated differently, the exchange rate represents the cost of a country's currency in relation to another country. It is also understood to represent the value of a country's currency in terms of another currency, as well as the quantity of one currency that may be exchanged for a quantity of another currency. The relative prices of the two moneys or currencies are measured at the nominal exchange rate, such as the Rupee in respect to the US Dollar. Therefore, real exchange rate is definitely observed as a real term, but nominal exchange rate is a monetary concept. The comparative cost of two tradable items (exports and imports) using the real exchange rate.

The nominal exchange rate for the years 1980–2014 will be considered.Simply put, exchange rates fluctuate frequently because they float widely against one another. The movements of currency within and between nations affect money, and more especially, currency assessments. The value of a currency rises in response to increased demand for that particular currency and vice versa. In other words, a market-based exchange rate fluctuates in response to shifts in currency prices. A currency tends to appreciate in value whenever there is a greater demand for it than there is supply. When demand is much lower than supply, it will lose value since people can prefer to store their wealth in different forms, like another currency. Apart from this, alterations in a wide range of factors cause swings in exchange rates.Because investors typically seek out secure investments with the highest yields, changes in exchange rates in a number of nations have the biggest impact on the value of money. Similarly, when imports exceed exports, trade balances shift, demand for foreign currency increases, and the country’s currency depreciates. Reduced actual home currency depreciation results from increasing gross domestic output. As a result, just as the other variables affect the fluctuation of the exchange rate, so does the GDP. Furthermore, a variety of macroeconomic indicators are significantly impacted by exchange rate fluctuations. (1)

In the era of financial liberalization and globalization, exchange rates play a significant role. Because fluctuations in exchange rates affect multinational corporations' performance and strengthen their relationships with businesses and investment firms. A stable exchange rate can help businesses and financial institutions analyze the effectiveness of their funding, procurement, and avoidance strategies, so reducing all of the risks and hazards they face. Exchange rate variations may have an impact on macroeconomic factors such as the interest rate, wages, unemployment rate, and production quality. This could ultimately result in a macroeconomic disequilibrium, which could then prompt an exchange rate devaluation to lessen the economy's external instability. (2)

Monetary policy in Pakistan has gone through several phases. First, from 1973 to January 7, 1982, the State Bank of Pakistan maintained a fixed exchange rate regime, with the rupee exchange rate fixed at 9.9 to the US dollar. The rupee continued its declining trend even after the State Bank of Pakistan implemented a managed float exchange rate mechanism on January 8, 1982. It further decreased in value from 12.71 to 51.77 US dollars between 1982 and 1999. Following that, on May 19, 1999, the State Bank of Pakistan implemented a full float market- based system that was based on supply and demand in the foreign exchange market. However, between 2000 and 2008, the value of the rupee fell even further, falling from 58.03 to 62.55 per US dollar (State Bank of Pakistan, 2005). In terms of growth performance, the GDP grew at a 6.80% annual rate in 1973, a 1.70 percent annual rate in 1997, and a 4.10 percent annual rate in 2008. Similar to this, the country's inflation rate peaked in 1975 at 26.71%, dropped to 3.59% in 1987, and then increased to 12% in 2008.Only in 1973, when it was worth 153 million rupees, did the nation's trade balance remain positive. Then, it began to decline and in 1985, it reached a deficit of 51,799 million rupees. From there, the situation got worse, and in 2008, the deficit reached 1,315,454 million rupees. Although they displayed a growing trend, the foreign exchange reserves grew slowly. From 3920.4 million in 1973 to 78,386 million in 1994 and 592,723.8 million in 2008, it had significant growth. (3&4)

Countries often restrict domestic currency, leading to significant fluctuations in exchange rates due to monetary shocks. Policy makers aim for growth and price stability, as exchange rate volatility is linked to impulsive movements in comparative price economies. In Pakistan, monetary policy aims to achieve price stability and stabilize currency value. This study investigates the causes of exchange rate instability in Pakistan, focusing on the International effects, which suggests future spot exchange rates are determined by nominal interest rate differentials.

1.1 Brief Background

Emil Sundqvist worked on the empirical investigation of the International Fisher Effect. Social Science and Business Administration Programmers (2002) in Sweden, and Mussa Michael investigated on Nominal exchange rate regimes and the behavior of real exchange rates: Evidence and implications (1986) in United States of America.. After the Bretton Wood system failed in 1971, A significant amount of volatility was observed in both real and nominal exchange rates as a result of the majority of industrial economies switching from fixed to floating exchange rates after the Bretton Woods system collapsed in 1971 [5] and [6]. The impact of exchange rate volatility on both local price stability and foreign trade was then the subject of discussion. The majority of economists believe that the real exchange rate's significant volatility in the 1970s was caused by monetary authorities. (5&6)

Alan .C. Stockman (1983) investigated on Real exchange rates under alternative nominal exchange-rate systems in United States of America. Economic managers nationalized all private sector institutions in Pakistan during the 1970s, marking a significant shift in the country's policies. The policies of liberalization, deregulation, and decentralization were implemented in place of

those earlier decisions in the 1980s. During that period, the exchange rate policy was also amended, and in 1982, Pakistan implemented a managed float exchange rate system, leading to a 20% depreciation of the Pakistani rupee. The "Medium Term Standby Extended Fund Facility (EFF)" was signed in 1988 with the IMF. Devaluation, import liberalization, tariff reduction, and financial sector changes, including deregulation of interest rate structure, were all included by the agreement's terms. (7)

Pakistan had to go through a number of stabilization and adjustment restructurings throughout the 1990s. In terms of GDP growth, it was also the least developed country in South Asia during that time. By the end of the 1990s, macroeconomic indicators had shown some improvement, but exchange rate volatility and instability remained

extremely high. Following the 1998 nuclear disaster, trade deficits worsened as a result of economic sanctions, and exports declined, resulting in a negative current account deficit. "Foreign exchange reserves have never remained sufficient and hardly covered six weeks of imports during the 1990s," according to the State Bank of Pakistan.(8) Pakistan's per capita income increased from $897 in 2005–06 to $1,368 in 2012–13 in US dollars. The acceleration of real GDP growth, the steady exchange rate, and the comparatively slower rate of population growth are the primary causes of this increase. In 2013, the government did, however, continue to control the level of prices by printing fresh notes. As a result of the inflation, the price level increased steadily, the exchange rate displayed significant instability and volatility, and it reached its peak when the Pakistani rupee fell to its all-time low of 113 versus the US dollar.

This equation may be used to aid with the following research questions:

1. How does inflation affect exchange rates?
2. How do fluctuations in interest rates impact currency rates?
3. What connection exists between exchange rates and foreign direct investment?
4. How do exchange rates get influenced by GDP per capita?

You may learn more about the dynamics of exchange rates and guide economic policy decisions by examining the correlations between these variables.

2 2 Literature review

A thorough explanation of the earlier theoretical and empirical topics that are extremely pertinent to the chapter on the object. A thorough literature evaluation is an essential component of any quality study. The following is an arrangement of the literature reviewed for this study.

Christian Broda (2016) came up with a theory of Exchange Rate Regimes and National Price Levels in America from university of Chicago. Analyzed yearly data for over 100 worldwide sites from 1980 to 1998 to investigate the connection between exchange rate systems and pricing levels. After applying the fixed exchange rate technique, the study came to the conclusion that the inflation rate in emerging nations appeared to be 20% greater than in countries with flexible exchange rate regimes. Similar results were also reported for industrialized nations, albeit at a much lesser correlation. (9)

Douglason.G Motor (2008) investigated on Exchange Rate Reforms and Its Inflationary Consequences: The case of Nigeria in Nigeria. Examined the impact of exchange rates on price distortion in Nigeria empirically using yearly data from 1970 to 2003. Exchange rates, money supply, nominal GDP, and price level were all used in the study. The government determined the economic and statistical relevance of exchange rate variation in relation to inflation by using both the Slope-dummy methodology and Vector Error Correction (VEC). The impulse response function demonstrated that the Naira's depreciation increased inflation and decreased output. According to the error variance decomposition, changes in the money supply and exchange rate had a significant impact on Nigerian inflation. The results from the slope-dummy likewise supported the earlier findings. Overall, the findings demonstrated that exchange rate volatility in Nigeria was a significant factor in determining the inflation rate in the United Kingdom (UK).(10)

Toufiq Choudhry and Mohammed Hassan worked on Exchange Rate and Regime and demand for Reserves (2007) Evidence from Kenya, Mexico and Philippines. Evaluated the need for foreign exchange reserves under fixed and floating exchange rate regimes for three developing countries: Mexico, Kenya, and the Philippines. Quarterly data from 1986 to 2000 were used in this analysis (QIV). The primary factors influencing these countries' foreign exchange reserves throughout the course of the sample period were assessed to be the volume of imports, average propensity to import, and reserve variability. The study's subsample results, however, demonstrated that the behavior of foreign exchange reserves stayed constant across both regime periods. (11)

Adnan Kasman and Duygu Ayhan (2008) investigated about the Exchange Reserves and Exchange Rates in Turkey: Structural Breaks, Unit Roots and Cointegration in Turkey. The utilized monthly data for the years 1982: M1 to 2005: M11 to examine the relationship between Turkey's currency rate and foreign exchange reserves. The research determined that there was a correlation between foreign exchange reserves and exchange rate by using unit root and cointegration tests. According to the study, there is a simple causal relationship between nominal effective exchange rate and foreign exchange reserves over the short and long terms. However, regarding the relationship between nominal exchange rate and foreign exchange reserves, the research came to the conclusion that nominal exchange rate eventually had an impact on foreign exchange reserves. Reserves of foreign currency were restricted under the flexible exchange rate system.According to the report, foreign exchange reserves could be a crucial instrument for reducing the detrimental effects of exchange rate volatility and averting any potential financial crises in the future. (12)

Lahiri, A., Hantrovaska, V. and Vegh, A.C. (2008) worked on Interest Rates and the Exchange Rate: A Non-Monotonic Tale in Pakistan. Has come to the conclusion that variations in inflation and exchange rate volatility are typically correlated. The daily volatility of the exchange rate versus the US dollar, according to them, is influenced by macroeconomic factors. By examining a global panel of 43 stock markets between 1990 and 2001, we were able to determine that while a country's economic wealth reduces exchange rate volatility, exchange rate regime flexibility, central bank intervention, and the unpredictability of the specific domestic economy all increase exchange rate volatility. Exchange rate volatility is generally unaffected by restrictions on capital movements. (13) Ahmad H Ahmad, E J Pentecost (2009) investigated about Exchange Rates and International Reserves: A Threshold Cointegration Analysis in London. Investigated the association between currency rates and foreign reserves in a few African nations using quarterly data from 1980: QI to 2004: QIV by doing a threshold Co-integration analysis. In many nations, it had been determined that there was a correlation of some kind between foreign exchange reserves and the exchange rate. Also, it was shown that during the floating system as opposed to the peg regime, these nations' holdings of foreign exchange reserves were larger.(14)

.Siti Rahmi Utami , E. L inanga (2009) Exchange Rates, Interest Rates, and Inflation Rates in Indonesia: The International Fisher Effect Theory in Indonesia. The studied, using the framework of an international Fisher Effect approach, the effects of interest rate differentials on the exchange rate of Indonesia relative to four industrialized nations, namely Japan, Singapore, the United Kingdom, and the United States. The study demonstrated that interest rate differentials, when compared to Japan, had a significant but unfavorable effect on the Indonesian currency rate. Nonetheless, it was discovered that there was a positive but negligible correlation between the interest rate differentials and the exchange rates for the other three countries—Singapore, the UK, and the USA. (15)

K. P. Prabheesh, D. Malathy and R. Madhumathi (2021) worked on Precautionary and mercantilist approaches to demand for international reserves: an empirical investigation in the Indian context in India. The examined monthly data from 1993 to 2007 with the goal of analyzing how mercantilist and preventive policies affected India's need for foreign exchange reserves. They included the nominal exchange rate, opportunity cost measure, imports, and foreign institutional spending as factors. Assuming that the nominal exchange rate is used as a stand-in for the mercantilist motivation, the co-integration results demonstrated a long-term relationship between the foreign exchange reserves and its variables. Additionally, every variable was discovered to be significant in the FOREX holdings in India. However, it was discovered that the specific mercantilist approach's measures were more important in comparison. (16)

Samuel Antwi, Mohammed Issah, Aboagyewaa Patience & Solomon Antwi, David McMillan, (2020) The effect of macroeconomic variables on exchange rate: Evidence from Ghana Using a multivariate modeling technique called Vector Auto regression (VAR), the study looked at how macroeconomic variables affected the exchange rate in Ghana for 76 quarterly observations between 2000 and 2019. It focused on the impact of the lending rate, inflation, real GDP, and broad money supply (M2) on the exchange rate. The goal was to determine how effective these variables were at managing the country's exchange rate. The Ghana Statistical Service, World Development Indicators, and the Bank of Ghana were the only secondary data sources considered in the study. The real GDP granger was discovered to be the cause of Ghana's exchange rate. The money supply, lending rate, and inflation, however, have an indirect impact on Ghana's exchange rate rather than being the primary cause. It was suggested that certain factors should be taken into account for a sound exchange rate policy. (17)

In summary, there is a strong relationship between the exchange rate and a number of other macroeconomic variables, including foreign exchange reserve, output level, inflation, and currency devaluation. When emerging nations employ fixed exchange rate techniques, their inflation rates appear to be higher than those of those with flexible exchange rate regimes. Additionally, a decline in value of the currency increased inflation and lowered output. The fluctuation of exchange rates was a major factor in determining the rate of inflation. The material that is now available leads one to the conclusion that foreign currency reserves could be used as a crucial instrument to reduce the negative effects of fluctuating exchange rates and prevent any potential financial catastrophe in the future.

3. Research Methodology

The analysis was carried out to explain the methodological framework of this study. As a regression method least square, variables were tested regard unit root to examine stationarity and the order of integration. And in point econometric techniques are put on to test hypotheses with the study. A comprehensive explanation is given in the following paragraphs.

2.1 Objective of the study

The following are the main goals that the study hopes to accomplish:

1. Modeling:
To compute the relationship in mathematics between the chosen macroeconomic variables and the exchange rate.

2. Prediction:
Based on anticipated values for the independent variables, apply the model to forecast future exchange rates.

3. Analysis:
To look at the direction and strength of the correlations between each independent variable and the exchange rate.

4. Policy-making:
To assist in the formulation of economic policies pertaining to trade, investment, and monetary policy.

The paper is divided into five sections: introduction, literature review, data sources and methodology, results, conclusions, and policy guidelines, covering background information, literature review, data sources, methodology, results, and policy guidelines.

2.2 Academic Model:

The model combines of four variables which represent the exchange rate is the function of foreign direct investment, gross domestic product per capita, interest rate and inflation rate.

EXR = FDI, GDPPC, INT, INF

Where,

EXR	=	Exchange Rate
FDI	=	Foreign Direct Investment
GDPPC	=	Gross Domestic Product Per Capita
INF	=	Inflation Rate
INT	=	Interest Rate

Following hypothesis has been estimated to be evaluated against above equation.
H1. There is a dependent variable of exchange rate and inflation rate independent and exchange rate dependent on inflation rate.
H2.The rate of exchange dependent on interest rate. That means interest rate is independent variable.
H3.The foreign direct investment is independent variable and the exchange rate have a dependent on foreign direct investment.
H4. The exchange rate is dependent variable and the gross domestic product per capita have independent variable and exchange rate dependent on it.

2.3 Data Collection

The yearly data of all variables from 2001 to 2023 have been recovered fromState bank of Pakistan (SBP), World Bank Development Indicator and Economic surveys, and the sample involved of 23 observations. The all variables of data using without transforms into log from the variance to reduce, so that the coefficient can be read as no resistance. Although some of the judgment and material is also collected from previous report, research papers, academic journals and official websites.

2.4 Data Analyze

E-Views (Version 10), statistical and econometric presentation software were used for the empirical analysis of the data and hypothesis testing. By estimating the parameters of this equation using regression analysis in E-Views, you can:

1. Identify the most significant factors influencing exchange rates.
2. Quantify the impact of each variable on exchange rates.

3. Forecast exchange rates based on expected changes in the independent variables.
4. Evaluate the effects of policy interventions on exchange rates.

To investigate the data and make useful judgments on the basis of such evaluation, inferential statistics procedures are applied where inferences are made on the basis of sample data to conclude valid judgments about the population structured on such samples. Inferential statistics procedures are ways of analyzing data in such a way that they provide useful guidelines to the researcher in drawing findings about whether or not a hypothesis was sustained by the results. Right now many ways are used to inference the results. Since the key purpose of this study is to discover the impact of independent specifics on dependent variables, therefore, the study has used regression analysis. Regression evaluation (t-ratios, f-statistics, p-ideals, r-squared) allows to create a conclusion related to the speculation made under this study.

4. Results and Discussions

2.5 Empirical results

The model of regression explaining the macroeconomic variables of selected on exchange rate growth is based on the functional from given mathematically, model can be write as:

Where, EXR = F (FDI, GDPPC, INF, INT

EXR	=	Exchange Rate
FDI	=	Foreign Direct Investment
GDPPC	=	Gross Domestic Product Per Capita
INF	=	Inflation Rate
INT	=	Interest Rate

2.6 Correlation Analysis

This appears to be a correlation matrix generated by E-Views, a statistical software program. The matrix displays the correlation coefficients between five variables:

1. EXR (Exchange Rate)
2. INF (Inflation)
3. INT (Interest Rate)
4. FDI (Foreign Direct Investment)
5. GDPPC (Gross Domestic Product per Capita)

The numbers in the matrix represent the correlation coefficients (r) between each pair of variables, ranging from -1 (perfect negative correlation) to 1 (perfect positive correlation).

2.6.1 Figure 1.

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	EXR	INF	INT	FDI	GDPPC
EXR	1.000000	0.645449	0.495957	-0.455288	0.064069
INF	0.645449	1.000000	0.744420	0.077823	-0.073876
INT	0.495957	0.744420	1.000000	-0.070314	-0.272576
FDI	-0.455288	0.077823	-0.070314	1.000000	-0.033975
GDPPC	0.064069	-0.073876	-0.272576	-0.033975	1.000000

Here's a brief explanation of the correlations:
EXR and INF have a moderate positive correlation (0.645). EXR and INT have a moderate negative correlation (-0.455). EXR and FDI have a weak positive correlation (0.064).
EXR and GDPPC have a weak positive correlation (0.064). INF and INT have a strong positive correlation (0.744).
INF and FDI have a weak positive correlation (0.077).

INF and GDPPC have a weak negative correlation (-0.073). INT and FDI have a weak negative correlation (-0.070).
INT and GDPPC have a moderate negative correlation (-0.272). FDI and GDPPC have a weak negative correlation (-0.033).
In summary, this correlation matrix suggests that:

- Exchange rates are positively related to inflation and GDP per capita, but negatively related to interest rates.
- Inflation is positively related to interest rates and negatively related to GDP per capita.
- Interest rates are negatively related to foreign direct investment and GDP per capita.
- Foreign direct investment is negatively related to GDP per capita.

Keep in mind that correlation does not imply causation, and further analysis is necessary to understand the underlying relationships between these variables.

2.7 Regression Analysis

When the running of regression the following outcomes are generated, in this coefficient of all variables along with their t-statistics and p value are observed. Also R – Squared and Durbin Watson statistics is calculated. R-Squared is also known as the coefficient of resolve. Which is considered to find the number of times real and likely values are same. Durbin Watson (DW) test is carried out to check for auto correlation in the model. Different problem-solving checks have also been carried out for the model to settle its stability which is providing in the continuing clauses.

2.7.1 Figure 2.

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Dependent Variable: EXR
Method: Least Squares
Date: 03/24/24 Time: 03:46
Sample: 2001 2023
Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	83.22346	42.93833	1.938209	0.0684
INF	6.341658	1.756561	3.610269	0.0020
INT	-1.246473	3.619261	-0.344400	0.7345
FDI	-29.72686	7.827028	-3.797976	0.0013
GDPPC	2.161447	3.735508	0.578622	0.5700

R-squared	0.685329	Mean dependent var	105.7375
Adjusted R-squared	0.615403	S.D. dependent var	54.90220
S.E. of regression	34.04810	Akaike info criterion	10.08309
Sum squared resid	20866.91	Schwarz criterion	10.32993
Log likelihood	-110.9555	Hannan-Quinn criter.	10.14517
F-statistic	9.800673	Durbin-Watson stat	0.676213
Prob(F-statistic)	0.000217		

Performance metrics for the model include both Multiple R-Squared and Adjusted R- Squared values. Their potential values fall between 0.0 and 1.0. The value of Adjusted R-Squared is always somewhat lower than the value of Multiple R-Squared due to the complexity of the model; as a result, model performance is more effectively achieved. Growth in imports, exports, foreign direct investment, per capita GDP, and inflation account for 68.5% of the variation in the dependent variable (EXR), according to the R-squared of 0.685. Additionally, the F-statistics, which have a probability of 0.000217 to validate the model's joint significance and overall significance, demonstrate that all of the explanatory factors have a substantial combined influence on the dependent variable. Also, the outcome clearly shows that the model is not a false one and can be used for economic analysis (R-Squared value is more than of D-statistics, i.e. 0.68 > 0.67 and the residuals are fixed when tested for unit root).

The Durbin-Watson (DW) test value in the table is 0.67, falling between 0.60 and 0.90, indicating that the model has no autocorrelation. Two of the four explanatory variables are statistically significant on their own, and the standard errors' too-small values give sufficient proof that two is no multicollinearity in the clarifying variables.

The coefficients of each clarifying variable indicate the strength and nature of the relationship each one has with the dependent variable. But a negative coefficient denotes a negative link, a positive coefficient indicates a positive relationship between the clarifyingvariable and the dependent variable. With all other variables held constant, the coefficient shows how the dependent variable is expected to change for each unit change in the corresponding regressed.(The same effect this paper reference 20)

The coefficient values for every series are listed in Figure 2. To evaluate the unique statistical significance of each explanatory variable, Figure 2. Also provides the t-statistics for each series. According to the figure 2 foreign direct investment (FDI), and interest rate (INT) have negative coefficients, while Inflation rate (INF) and per capita GDP (PCGDP) have positive coefficients. It is also clear the figure 2 shows that while inflation and per capita GDP are individually statistically insignificant, interest rate and foreign direct investment are all individually statistically significant. Generally speaking, the coefficient signals connected to practically every variable match theoretical expectations. According to the results, the model is accurate and well-fitting.

The expression for the estimated model is given as under.

EXR= 83.22346 + 6.341658 INF - 1.246473 INT - 29.72686 FDI + 2.161447GDPPC

Interpretation of the effect is particular step by step.

Findings from the growth in foreign direct investment (FDI) indicate that there is a negative correlation between FDI and EXR; that is, for every unit increase in FDI, there will be a

29.72 unit decrease in the dependent variable EXR, all other things being held constant. In light of economic theory, the outcome is justifiable in that FDI may rise in response to a decline in exchange rates, which could enhance overall demand for particular products and services. This increase in demand strengthaccordingly lead to higher pricing for those products and services, which would then immediately impact inflation and cause a decline in the value of foreign money in local currency, or a decline in the exchange rate. The same result in this reference, Madeeha zamir, Amjad amin , Sami Ullah, Salim ullah Khan, (2017) Exchange Rate Volatility in Pakistan and Its Impact on Selected Macro Economic Variables (1980-2014), (18)

It is determined that there is a negative relationship between interest rate and the dependent variable EXR, meaning that for every unit rise in interest rate , there will be a 1.246 unit drop in EXR when all other variables remain constant. This implies that the value of foreign currency relative to home currency will rise as interest rate rise. To have one unit of foreign money, an increasing amount of domestic currency will be required as more and more interest are more liabilities. The statistical significance of the link supports the idea that interest rate weaken the economic stimulus intended to support a stronger domestic currency. A rise in interest rate strengthens the expansion of international payments and loans and others deficit raises the value of foreign currency relative to the home currency. The same result of below reference, Tariq Mahmood Ali,

Muhammad Tariq Mahmood, Tariq Bashir, (2015) Impact of Interest Rate, Inflation and Money Supply on Exchange Rate Volatility in Pakistan and the data uses of monthly data for the period ranging from July-2000 to June-2009. (19)

The dependent variable EXR is positively but not significantly impacted by per capita GDP (PCGDP). The findings indicate that preserving every other variable as continuous a one unit increase in GDPPC can result in 2.16 units increase in the dependent variable; this effect is not significant sufficient in the time period engaged under this study as evident from the results presented in above figure 2. The same result in this reference, Madeeha zamir, Amjad amin , Sami Ullah, Salim ullah Khan, (2017) Exchange Rate Volatility in Pakistan and Its Impact on Selected Macro Economic Variables (1980-2014), (18)

The development in inflation (INF) has a positive but significant effect on the dependent variable EXR. Observance all the other variables as constant a one unit increase in inflation growth will lead to 6.34 unit fall in the dependent variable EXR still, this impact is significant sufficient as observable from the results specified figure 2. Generally, a high level of inflation poorly affect GDP per capita concerned with of the economy while FDI focused on may benefit from it and this strength be the reason that inflation has not been one of the significant elements of EXR. There are similar result of both references, Tariq Mahmood Ali, Muhammad Tariq Mahmood, Tariq Bashir, (2015) Impact of Interest Rate, Inflation and Money Supply on Exchange Rate Volatility in Pakistan and the data uses of monthly data for the period ranging from July-2000 to June-2009 and Madeeha zamir, Amjad amin , Sami Ullah, Salim ullah Khan, (2017) Exchange Rate Volatility in Pakistan and Its Impact on Selected Macro Economic Variables (1980-2014). (18 & 19)

5. Conclusion

The Based on empirical data, it is determined that exchange rate instability is positively correlated with GDP per capita and inflation and negatively correlated with interest rates and foreign direct investment. There are both short- and long-term correlations between GDP per capita, inflation and currency rate volatility.

According to economic theory, rising interest rates cause output, investment, and surplus supply in the products market, which raises prices. That is to say, interest rates disclose information about the possibility of inflation. Through the indirect process of GDP per capita inflation, interest

rates can effectively reduce exchange rate instability. Also, it has been discovered that the foreign direct investment, a policy variable, and exchange rate volatility are inversely related. As a result, controlling the interest rate could be an effective way to reduce exchange rate volatility. The government might increase the interest rate by up to 15% depending on Pakistan's size of economy. A rise in interest levels causes prices to fall, which may limit the volatility of the exchange rate.

The State Bank of Pakistan implemented measures under the Foreign Exchange Regulation Act, 1947 to maintain a stable exchange rate of the Pakistani rupee. These included lowering discount rates, lowering yield on T. bills, restricting foreign exchange dealing, and restricting payments to or for the credit of outside Pakistani residents. Additionally, restrictions were imposed on the import and export of certain currency and bullion, the regulation of the uses of imported gold and silver, regulation of the export and transfer of securities, and the custody of securities.

Empirical evidence suggests a positive relationship between inflation, GDP per capita and exchange rate volatility, with interest rates and foreign direct investment showing inverse relationships in both short and long run. Economic theories suggest that increasing interest rates leads to increased output, investment, and excess supply in the goods market, resulting in higher prices. This information can indirectly limit exchange rate volatility. Raising foreign direct investment could help restrain exchange rate volatility in Pakistan.

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