TÍTULO: Impacto de las variables macroeconómicas en el tipo de cambio: una evidencia de Pakistán.

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RESUMEN: El propósito de esta investigación es proporcionar la evidencia sobre la relación entre el tipo de cambio real frente al dólar estadounidense y las variables macroeconómicas en Pakistán. Para examinar esta relación, se utiliza la técnica ordinaria de regresión de mínimos cuadrados. El saldo actual es negativamente significativo al 10%; la inflación y la inversión extranjera directa también son negativamente significativas al 5%, 1%, respectivamente, pero el Producto Interno Bruto per cápita es positivamente significativo al nivel del 5%. La apertura comercial no muestra una relación importante con el tipo de cambio real. Este estudio es útil para los inversores internacionales y también para aumentar las exportaciones de un país.

PALABRAS CLAVES: OLS, REXR, variables macroeconómicas, prueba ARCH-LM, prueba blanca.

TITLE: Impact of macroeconomic variables on Exchange rate: an evidence from Pakistan.

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ABSTRACT: The purpose of this research is to provide the evidence on the relationship between Real Exchange Rate against US dollar and macroeconomic variables in Pakistan. To examine this relationship, the ordinary least square regression technique is used. The current balance is negatively significant at 10% level; the inflation and foreign direct investment is also negatively significant at 5%, 1% respectively, But the Gross Domestic Product per capita is positively significant at 5% level. The Trade openness shows no important relation with Real Exchange Rate. This study is helpful for international investor, and also to increase export for a country.

KEY WORDS: OLS, REXR, macroeconomic variables, ARCH-LM test, White Test.

INTRODUCTION.

In the era of globalization and financial liberalization, exchange rate plays an important role in international trade and finance for a small open economy like Pakistan. This is because movements in exchange rates affect the profitability of multinationals and increase exchange exposure to enterprises and financial institutions.

A stable exchange rate may help enterprise and financial institutions in evaluating the performance of investments, financing and hedging and thus reducing their operational risks. Fluctuations in the exchange rate may have a significant impact on the macroeconomic fundamentals such as interest rates, prices, wages, unemployment, and the level of output.

Volatility of exchange rates put in plain words the uncertainty in international transactions both in goods and in financial assets. Exchange rates are modeled as forward-looking relative asset prices that reflect unexpected variations in relative demand and supply of domestic and foreign currencies, so exchange rate volatility replicate agents' expectations of changes in factors of money supplies, interest rates and incomes (Rehman, 2014).

Exchange rate management has been a topical issue among academics and policy makers for a very long time. This started predominantly when the gold standard collapsed in the 1930's and subsequent emergence of the britton wood system of adjustment peg from the 1940's, through the espousal of flexible exchange rate given by the developing nation in 1970 and those carrying out structure reforms in the 1980's as well as in the wake of the currency crises in developing economies in the 1990's.

Flexible exchange rate is accompanied by the fluctuation of exchange rate making it the major focus in the debate due to its impact on business outcome as nations' business partners would prefer a stable exchange rate to a volatile one. It has been recognized in previous studies that maintaining a relatively stable exchange rate is important in boosting economic growth.

Volatility of exchange rate induces uncertainty and risk in investment decision with destabilizing impact on the macroeconomic performance (Mahmood, Ehsanullah, & Habib, 2011; Rehman, 2014). Mordi, (2006) studied about the concern of private sectors about the volatility of exchange rate, because the fluctuations in exchange rate affect the investments or interest of investors which become the cause of capital gain or losses.

Macroeconomic variables symmetrically affect exchange rate volatility; Azid, Jamil, & Kousar (2005)'s investigations are indicated that appreciations in exchange rate increase import and decrease export and viceversa. Appreciation and depreciation of exchange rate highly affected trade and economic growth of the exporting and importing countries.

Exchange rate deprecation has a negative effect on developing countries (Azid et al., 2005; Shaheen, 2013). In this paper, researcher will explore the relationship between macro-economic variables and exchange rate fluctuations in response to these variables. I will find out which macro-economic variables are more closely correlated with exchange rate fluctuations. Theoretically, there are preplanned relationship between macro-economic variables and exchange rate fluctuations. In this paper, I will find out whether these relationships hold true in practical sense or not. Apart from this, the introduction, the rest of this paper is organized as follows: section two focuses on the literature and empirical review while section three relates to the methodology employed. Section four dwells extensively on analysis and discussion of findings. The last section presents the summary, conclusion and recommendations.

Significance of study.

It is important to know the impact of macroeconomic variables on real exchange rate for the forecasting of exchange rate. This study will help Pakistani as well as foreign companies, banks, individuals, foreign currency dealers, and investment management firms etc., to forecast the exchange rate by using macroeconomic variables.

Objective of study.

To check the relationship of macroeconomic variables with real exchange rates against us dollar of Pakistan.

Literature review.

The review of literature plays a significant role in identifying the backdrop of the study being conducted. It also gives direction about the problem and eradicates the possibility of needless repetition of the efforts. In addition, precious information on research skill is obtained from the previous research description. The main purpose of this section is to assess the related literature review.

(chinn & wei, 2008) reported that interest rate and inflation rate has high effect on the fluctuation of exchange rate while gross domestic product and current account has low impact on exchange fluctuation. Bacchetta & Van Wincoop (2013) found that there is no clear evidence of the relationship between exchange rate and economic growth because it varies from country to country.

This paper determined the relationship between exchange rate and economic growth and according to the results this paper concludes that there is positive and significant relationship between exchange rate and economic growth of Pakistan in long term. According to this research impact of exchange rate in terms of real exchange rate on economic growth is significant and the relationship is positive with the economic growth therefore high exchange rate should be maintained in order to boost the economic growth.

Hakkio (1982) indicate that fisher relationship showed changes in real interest rates are caused due to the change in nominal interest rates. Changes in real interest rates attract domestic and foreign investment opportunities. If U.S. real interest rate is higher than the foreign real interest rate, the market must be expecting the real exchange rate to depreciate. Changes in real interest rates were the dominant influence on nominal interest rates and the dollar. Ebiringa & Anyaogu, 2014; Honohan & Lane (2004) indicate that the presence of positive impact of exchange rate volatility on GDP growth rate and trade openness.

While negative impact of exchange rate volatility on foreign direct investment is found. Dallas S. define that the expectation of future appreciation or depreciation of a currency is linked closely to the expectation of future inflation in one country relative to another country. Mahmood et al. (2011) define that the exchange rate is a dynamic variable, the main factors influencing its formation being the following: GDP, inflation rate, money supply, interest rate and balance of payments. Analysis of the factors influencing the exchange rate must take into account their interdependence, the connection between them, which ultimately leads to currency appreciation or depreciation.

Mordi (2006) found that exchange rate depreciation passes through into inflation more quickly than does exchange rate appreciation. Adeniran, Yusuf, & Adeyemi (2014) reported that exchange rate fluctuation is helpful in future economic variables such as money, income, prices and interest rates. The exchange rates can help forecast fundamental macroeconomic indicators. Jillani & Asim (2010) investigate about the impact of exchange rate fluctuation on the volume and trade flow's variability. Expansion of trade is discouraged by volatility of exchange rate and minimizing its incentives.

Jillani & Asim (2010) carried out a comparative study and found that appreciation of exchange rate increases GDP in Russia while it reduces GDP in Japan and China.

H0= there is no significant relationship between macroeconomic variables (CB, INR, FDI, GDP and OP) and real exchange rate.

H1= there is a significant relationship between macroeconomic variables (CB, INR, FDI, GDP and OP) and real exchange rate.

Data description.

For this research, the time series secondary data from 1980 to 2017 was used. The date is obtained from state bank of Pakistan, world bank development indicator, business recorder and also some findings and the information about data was gathered previous report, research paper and official websites.

Data analysis tool.

E-views 7 statistics application software was used for the empirical analysis of the data and hypothesis testing.

Methodology.

To find the impact of macroeconomic variables on exchange rate, the multiple econometric regressions is used. This model is also used by Barkoulas, Baum, & Caglayan (2002) and Zamir, Amin, Ullah, & Khan (2017). The model is constructed as follows.

$$REXR = f(CB, INR, FDI, GDP, OP)$$

$$REXRt = f(CBt, INRt, FDIt, GDPt, OPt)$$

The regression equation model and natural logarithm is as follows.

$$LREXRt = \beta0 + \beta1 LCBt + \beta2 LINRt + \beta3 FDIt + \beta4 LGDPt + \beta5 OPt$$

Where,

L denotes log and t denotes time period.

Rexr = real exchange rate.

Cb = current balance account.

Inr = inflation.

Fdi = foreign direct investment.

Gdp = gdp per capita.

Op = trade openness.

μi = error term.

Empirical findings.

Table 1 represents the outline of descriptive statistics of all variables. The results of the descriptive statistics show the number of observations; mean, maximum, minimum values; stander deviation, kurtosis and jarque-bera test.

H0= the data is normally distributed.

H1= the is not normally distributed.

In case of CB, INF and FDI, the jarque-bera insignificant the null hypothesis is not rejected mean that the date is normally distributed. In case of REXR, GDP and op are significant shows the date data is not normally distrusted. The result of kurtosis and skewness shows that distributions are symmetry.

Table-1 Descriptive Statistics of Real Exchange rate (REXR)						
	REXR	**CB**	**INF**	**FDI**	**GDP**	**OP**
Mean	4.79738	-2.45096	1.96877	20.0927	0.79334	3.15389
Median	4.72685	-2.66393	2.04982	20.094	0.92107	1.92571
Maximum	5.42273	5.33006	3.00994	22.4443	1.89995	32.5613
Minimum	4.53785	-9.20432	0.93197	17.1984	-2.35306	-64.8513
Std. Dev.	0.25901	2.72586	0.53072	1.34671	0.80796	18.1201
Skewness	1.20074	0.5843	-0.40392	-0.18793	-1.86141	-1.21963
Kurtosis	3.20955	4.69226	2.2705	2.25088	5.09463	6.5294
Jarque-Bera	9.20075	6.6965	1.87588	1.11221	54.745	29.1439
Probability	0.01005	0.03515	0.39143	0.57344	0.0000	0.0000
Sum	182.3	-93.1365	74.8134	763.524	26.1801	119.848
Sum Sq. Dev.	2.48223	274.921	10.4217	67.1044	20.8894	12148.5
Observations	38	38	38	38	38	38

Graphically representation of data.
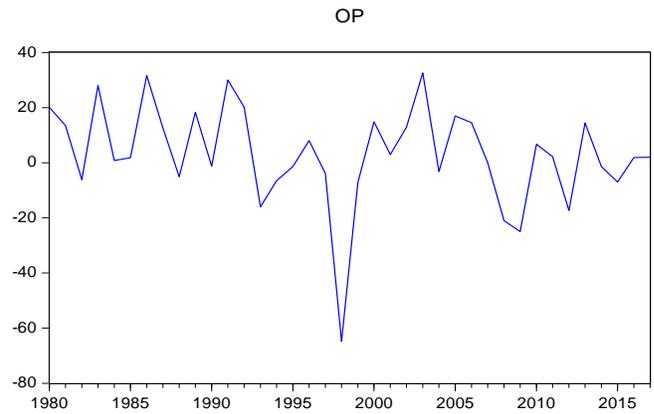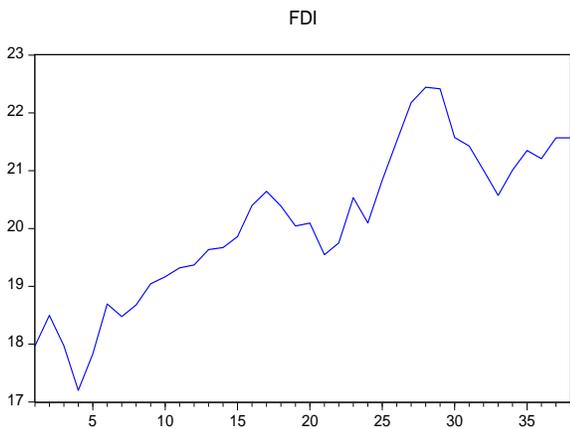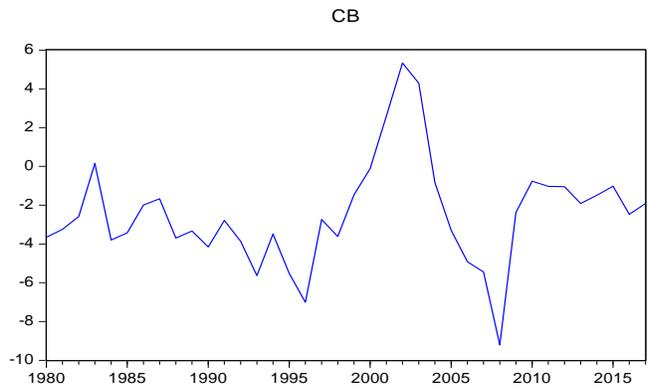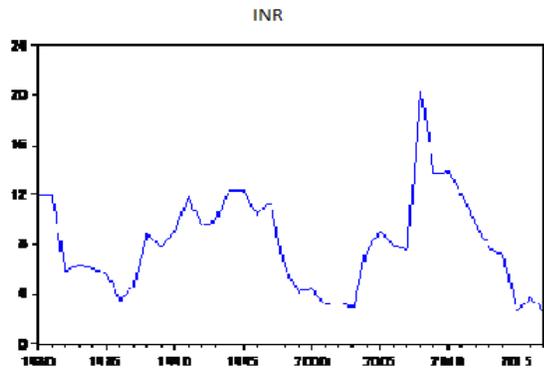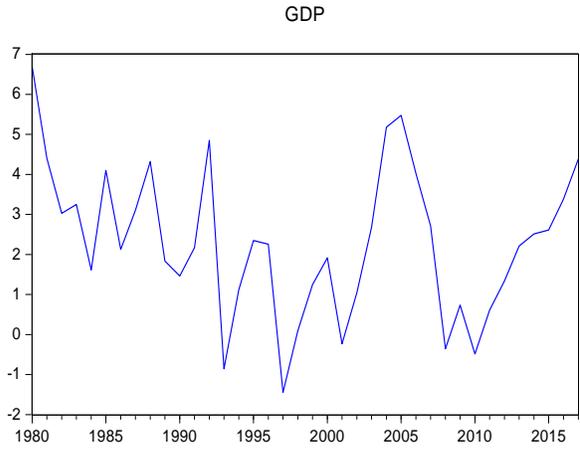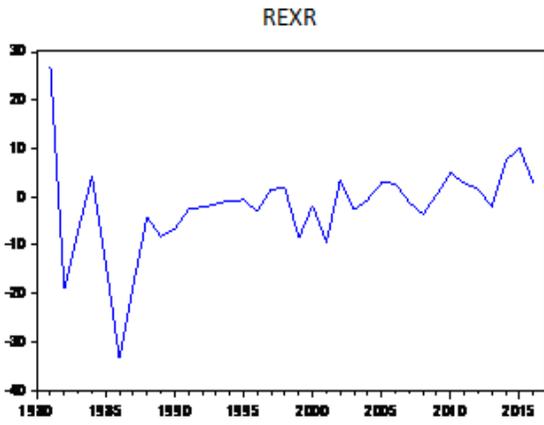
Multiple Regression Models.

Table-2 Regression equation (OLS)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.189618	0.391267	20.93101	0.1869
CB	-0.023416	0.013213	-1.772224	0.0876***
INR	-0.081716	0.060339	-1.354279	0.0469**
FDI	-0.16669	0.018503	-9.008985	0.0000*
GDP	0.104587	0.043248	2.418314	0.0226**
OP	-0.00321	0.001949	-1.646741	0.1112
R-squared	0.779223	Mean dependent var.		4.82294
Adjusted R-squared	0.738338	S.D. dependent var.		0.26717
S.E. of regression	0.136667	Akaike info criterion		-0.97957
Sum squared resid	0.504305	Schwarz criterion		-0.70748
Log likelihood	22.16287	Hannan-Quinn criteria		-0.88802
F-statistic	19.05904	Durbin-Watson stat		1.85742
Prob(F-statistic)	0.00000*			

*1% level of significant** 5% level of significant *** 10% level of significant.

In above table, it was found the relationship between macroeconomic variables and exchange rate.

The result shows that current balance account (CB) is negatively significant at 10% level, the inflation rate (INR) is negatively significant at 5% level, Gross domestic product per capita (GDP) is positively significant at level 5% and foreign direct investment (FDI) is negatively significant at 1% level, but the trade openness is insignificant.

The value of Coefficient of determination (R-squared) is 77.92 % mean that 77.92% of the variation dependent variables with the regression equation. The value of F-statistics is 19.05904 is significant at the level of 1% means that the model is good fit.

The ARCH LM test.

The result of ARCH LM shows that's the value of R-squared is insignificant means that there is no serial correlation. So, we are not able to reject the null hypothesis.

Table-3 Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.569606	Prob. F	0.5722
Obs*R-squared	1.407437	Prob. Chi-Square (2)	0.4947

H0= There is no serial correlation.

H1=There is serial correlation.

Heteroskedasticity Test: White.

Table-4 Heteroskedasticity Test: White Noise			
F-statistic	1.359442	Prob. F	0.275
Obs*R-squared	23.20041	Prob. Chi-Square	0.2791
Scaled explained SS	27.48754	Prob. Chi-Square	0.1221

H0=There is Homoscedasticity.

H1=There is Heteroskedasticity.

In the above Table, it was found that the value of R-squared is insignificant, it means that there is homoscedasticity. So, we are not able to reject the null hypothesis.

CONCLUSIONS.

The exchange rate is the one of the most important determinates of a country relative level of economic growth. Exchange rate plays a vital role for a country to level the trade which is the critical for every market economy in the world.

Pakistan is a developing country and exchange rate with US dollar is important for trade with other countries. To check the relationship between exchange rate and macroeconomic variables the OLS model is used. The current balance (CB) is negatively significant at 10%, the inflation (INR) and Foreign

direct investment (FDI) is also negatively significant at 5%,1% level, but the Gross Domestic Product per capita (GDP) is positively significant at 5% level.

The Trade openness (OP) shows no important relation with real exchange rate (REXR). The CB, INF, FDI negatively forced the exchange rate mean that when the values of these variable is decreased, the value of exchange is up but in case of GDP is viceversa. To control exchange rate volatility for the boost of economy must be look and valuate the importance of macroeconomic variables.

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