

## COMOVEMENT BETWEEN EXCHANGE RATE FLUCTUATIONS AND ECONOMIC FACTORS IN PAKISTAN'S ECONOMY (1990-2013)

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***Abstract.** Prior to 1976, business community of the world followed gold as a stable standard exchange rate for international business. After flexible exchange rate system implemented in the world in 1976, different solutions for stabilizing the exchange rate system were introduced to reduce the effects of exchange rate fluctuations on business. Pakistan and US Economy relies on trade for improving its GDP, lowering inflation rate and enhancing the economy of the Country. However if the trade balance is sufficient but the exchange rate fluctuation is significant then GDP would decrease instead of increasing and the economy might be negatively affected. It is understandable that imports of Pakistan are more than its exports and if exchange rate also fluctuates between Pakistan and the imported country then the country economy would disturb. Due to this imbalance in import/export, Pakistan relies on different institutions like IMF, World Bank, etc. These loans many help in balance of payment, partial stability but on the same time depreciate the economy if Pakistan. These loans are in the form of US dollars and Pakistani rupees are mostly associated with US dollars. Pakistan economy suffers a setback when these loans are returned. This paper looks as to how exchange rate fluctuations between Pakistan and USA and affects Pakistan's economy and what are the factors which are disturbed due to exchange rate fluctuations between the two countries.*

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**Key words:** Exchange rate, gross domestic product, imports, exports

### **Importance of Research**

This research will help in determining how GDP, imports, exports and inflation rate of Pakistan is affected due to the exchange rate fluctuations between Pakistan and USA. Similarly in case of exchange rate fluctuations what steps should be adopted in adjusting the exchange rate fluctuations.

## **Limitations of the Research**

Since this research basically focus on Pakistan and US exchange rate fluctuations and its impact on different factors of economy of Pakistan. There are still different economies in the world with whom Pakistan is interacting and these economies also has some effects on Pakistan's economy, but in this research data from 1990 to 2013 is considered only for Pakistan and US exchange rate fluctuations which cover necessary cause and effect situation and economy of Pakistan is understandable in a good environment. Due to limitation of journal pages requirement, author could not include all the graphs and tables but necessary one's have been interpreted and discussed in this paper.

## **Literature Review**

Bleaney, (2000) found that inflation was mostly related to floating exchange rates and found that they are persistent with the floating exchange rates .Furthermore, he concluded that countries with floating exchange rates experienced high inflation rate than those whose exchange rate is fixed.

Francisco (2005) deduced difference between hard pegs and soft pegs and found that pegs can reduced the inflation rate and money growth rate but have not control over monetary discipline. Hegii (1995) explained the relationship between effects of exchange rate on fluctuations of prices of commodity and its impact on market dynamics.

Jing Di and Mustafa (2010) investigated the impact of real exchange rate fluctuations on the trade flows between the United States of America and its top 13 trading partners.

Kandilov (2008) explained that the exchange rate fluctuations had a great negative impact on the agricultural trade between the countries of G 10 and when the agricultural export subsidies were controlled then the original impact was declined by 50% because the agricultural export subsidies were correlated with the exchange rate fluctuations.

Khan (2012) is of the opinion that exchange rate fluctuations could bring a substantial effect on GDP and inflation of any country but the most important one was that of GDP as exchange rate directly affected the economy of any country however there should be a negative impact on the economy of Pakistan by comparing exchange rate of USA and Pakistan.

Lee (2013) explained the affects of information regarded monetary exchange rates and its implications on the international exchange rate scenarios. Authors suggested that the world's largest economies showed volatility regarded the real

and nominal exchange rates but this article showed a significant relationship between the real and nominal exchange rate of the country.

Nishat (2004) examined the impact of fluctuations of exchange rate and its relation with exports of Pakistan. They concluded that fluctuations of exchange rate had significant and insignificant impact on exports of Pakistan both in long run as well as in the short run.

Prasad (1997) deduced that the determinants for the real exchange rates changes were due to the relative nominal and real demand shocks.

Peridy (2003) explored the impact of exchange rate volatility on the exports of Great seven (G-7) countries. He concluded that there was a lot of variations in the exports of G7 countries because of exchange rate volatility as it mostly depended on which industry it covered and which exports market it focused.

Peerman and Farrant (2006) found that exchange rate fluctuation was considered as a source of shock for the economy of different countries and not as an absorber of shock for different countries.

## **Methodology**

The main methodology which is taken in to consideration is ordinary least square method with simple regression model, Auto regressive model, cointegration test, unit root test followed by T test, P test which are conducted for significance of the data through accepting or rejecting null or alternate hypothesis and analyze stationary and non stationary nature of the analyzed data.

In OLS (ordinary least square) method simple regression model is applied. Auto regressive model is also applied to see the long term affect of the variables with different tests like unit root (Dickey, 1979) applied for non-stationary of the data, cointegration test (Johenson approach) is applied to see the degree of integration between the variables which are stationary at level.

The research undertaken is quantitative in nature because quantitative data allows to study the exchange rate fluctuations more precisely and its impact on economy through quantitative analysis would allow to the understand results drawn more accurately. This research is fundamentally casual and hypothesis in nature.

The data for this research is primarily taken from the official website of Federal Bureau of Statistics of Pakistan for imports, exports, inflation and GDP of Pakistan for about nine years from 1990 to 2013. The exchange rate data

between Pakistan and USA is taken from the official website of State bank of Pakistan from 1990 to 2013.

This research has taken data from the official website of state bank of Pakistan and from the official website of federal bureau of statistics of Pakistan for nine years from 1990 to 2013.

The variables used in this research for analysis of the data are inflation, imports, exports and gross domestic product (GDP) as dependent variable and exchange rate as independent variable. These variables are studied separately for finding exchange rate effects.

### Theoretical Framework

Figure 1 of the research shows that exchange rate fluctuation has strong impact on inflation, imports, exports and Gross domestic product of Pakistan which means that with strong or weak fluctuations in exchange rate would cause inflation, imports, exports and Gross domestic product of Pakistan to fluctuate beyond its boundaries bringing the economy of Pakistan in good or bad position.

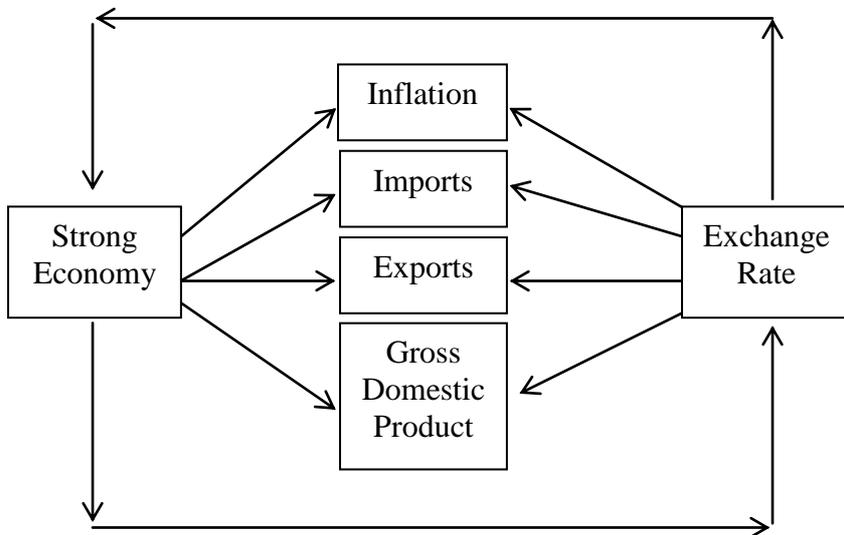


Figure 1 Theoretical framework

## Analytical and Statistical Techniques

### Simple Regression Analysis

This model is useful to detect the effect of independent variable on dependent variable. The slope of the line represents the correlation between the variables. The intercept shows that when there is no value of explanatory variable then there must be some value of explained variable. The model is specified below

Table 1 *Summary Statistics*

Multiple R	R Square	Adjusted R Square	Standard Error	Observations
0.950	0.902	0.897	231619	24

Table 2 *ANOVA*

	<i>Df</i>	<i>Sum of Square</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
Regression	1	1.1E+13	1.1E+13	201.80	1.5E-12
Residual	22	1.2E+12	5.4E+10		
Total	23	1.2E+13			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-875137.4	130870.6	-6.69	0.00	-1146546.3	-603728.4
exchange rate	31625.8	2226.3	14.21	0.00	27008.73	36242.9

$$\text{IMP} = \alpha + \beta (\text{Exc})$$

$$\text{EXP} = \alpha + \beta (\text{Exc})$$

$$\text{GDP} = \alpha + \beta (\text{Exc})$$

$$\text{INF} = \alpha + \beta (\text{Exc})$$

Where,

IMP= imports of Pakistan

EXP= exports of Pakistan

GDP= gross domestic product

INF= inflation rate

Exc= exchange rate between Pakistan and USA

## Hypothesis

Ho = Exchange rate fluctuation has no effect on exports, imports, GDP and inflation.

H1= Exchange rate fluctuation has effect on exports.

H2 = Exchange rate fluctuation has effect on imports.

H3= Exchange rate fluctuation has effect on GDP.

H4= Exchange rate fluctuation has effect on inflation.

## Simple Regression Model

### 1. Exports

After applying simple regression model in ms excel different results were obtained for the relationship between exchange rate of Pakistan and US and exports of Pakistan from 1990 to 2013. The regression analysis shows positive relationship by accepting alternate hypothesis and rejecting alternate one.

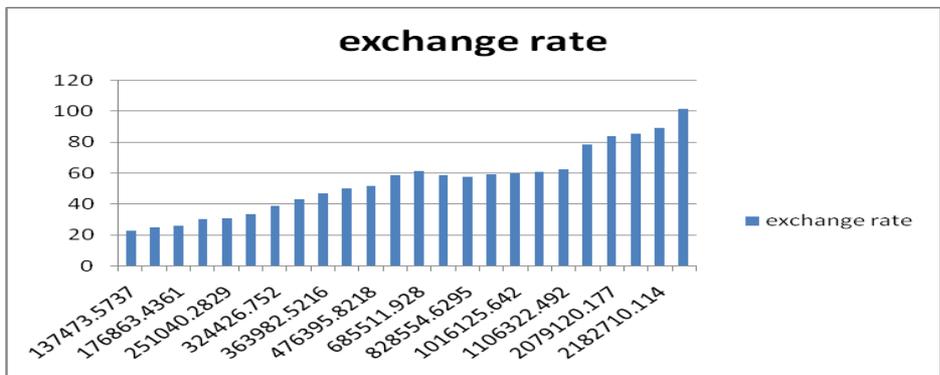


Figure 1 Exchange Rate

The graph shows that with increase in exchange rate fluctuations exports of Pakistan are also disturbed continuously which means that with increase in exchange rate fluctuations the exports of Pakistan are also increased.

### 2. Imports

Simple regression analysis indicates that if there is no issue of exchange rate then Pakistan would have less import as was expected.

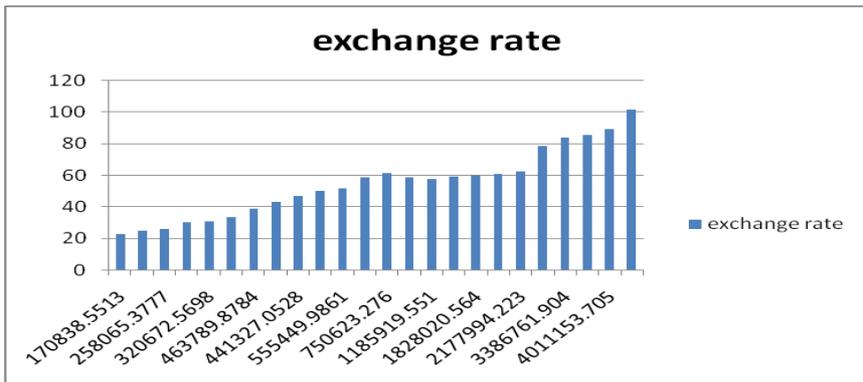


Figure 2 Exchange Rate

The graph between imports and exchange rate fluctuations shows that with increased fluctuations in exchange rate between Pakistan and US then imports are also disturbed with same fluctuations as in case of exchange rate.

### 3. GDP

The results obtained from simple Regression analysis explains that when there is no exchange rate problem between Pakistan and US then GDP of Pakistan have negative value which will result in declining of its economy.

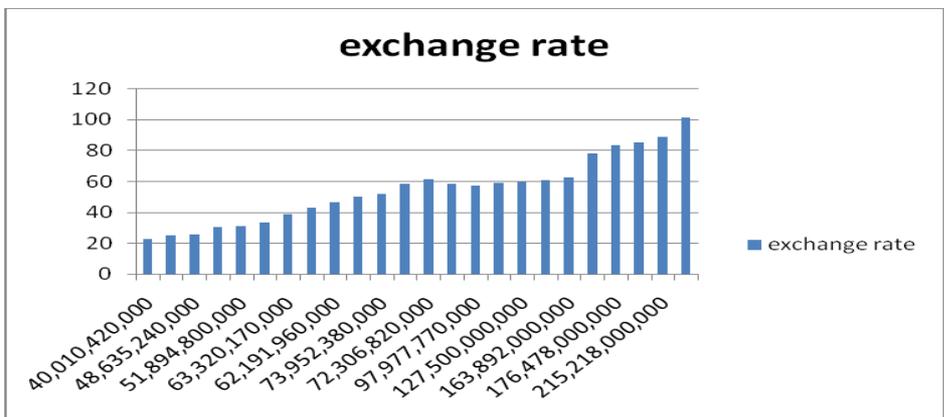


Figure 3 Exchange Rate

The above graph shows that exchange rate fluctuations bring variations in GDP of Pakistan consistently making the economy of Pakistan in stable or instable state.

#### 4. Inflation

The regression model gives different results for inflation and exchange rate fluctuations. The graph shows that exchange rate fluctuations does not move inflation rate of Pakistan consistently because exchange rate is associated with inflation rate of Pakistan in long run. If exchange rate fluctuates more than expected then inflation rate is also disturbed in long run.

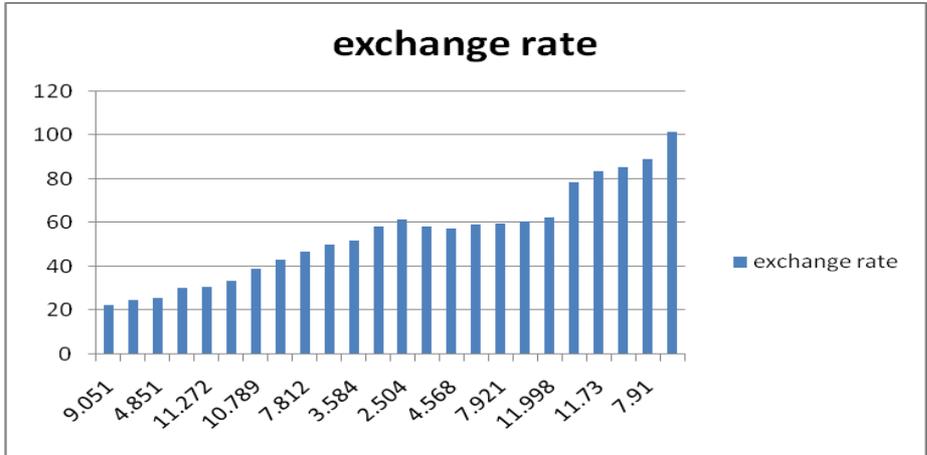


Figure 4 Exchange Rate

#### Unit Root Test

In this study unit root test is applied for time series data in order to investigate the non stationary or stationary nature of the data. In order to test whether the variable is non stationary or stationary augmented dickey- Fuller test is applied. Here in unit root test null hypothesis indicates that variable is not stationary or got unit root while alternate hypothesis indicates that variable is stationary. Unit root have three equations to test for stationary or non stationary nature of variables.

The results of unit root tests for all the dependent variables are given in table 1 which shows that except inflation all the three variables i-e exports imports and GDP are not stationary at level because ADF statistics shows that the values for exports, imports and GDP are smaller than their respective critical values at 5% level of significance and their probabilities are also greater than 0.05.

#### Auto Regressive Model

The auto regressive approach is used for time series data where a current value of the dependent or explained variable is observed through the lagged and the

current values of independent or explanatory variables. Here null hypothesis is that there is no serial correlation while alternate hypothesis indicate that there is serial correlation between the variables.

Table 1 *Unit Root Tests*

	Exports		Imports		GDP		Inflation	
	Expt (-1)	Exc	Im (-1)	Exc	GDP (-1)	Exc	Inf (-1)	Exc
t- statistic	7.31	2.66	5.23	5.66	5.87	1.72	2.67	0.20
Probability	0.00	0.02	0.00	0.00	0.00	0.10	0.01	0.84
r-square	0.98	0.98	0.99	0.99	0.99	0.99	0.28	0.28

After analyzing Auto regressive model different values are generated for exports, imports, GDP and inflation. The results shows that t- statistic values for exports lag 1, imports lag 1, GDP lag1 and exchange rate fluctuation are significant at 5% level of significance while P- statistic also indicates significant relationship because value greater than 0.05 for exports lag 1, imports lag 1, GDP lag1 and exchange rate fluctuation.

### Cointegration Test

Cointegration test is necessary in time series data to see the degree of integration in the integrated variables. Cointegration test is used after the variables became stationary to give robust results. Johenson test is used in this study to observe cointegration between the variables under study. Null hypothesis indicates that there is no cointegration while alternate hypothesis indicates that there is cointegration between the variables.

Johenson cointegration test suggests that for Unrestricted Cointegration Rank Test (Trace) the value of none and at most 1 at 5% level of significance is 69.82 and 47.86 which is greater than 1.97 and there P- statistic value is also less than 0.05 which shows that exchange rate have long term relationship with imports exports GDP and inflation. Similarly for Unrestricted Cointegration Rank Test (Maximum Eigen value) the value of T- statistic and P- statistic for none and at the most 1 shows that exchange rate have a long term relationship with exports imports GDP and inflation or all the variables are cointegrated with each other. In this case null hypothesis is rejected and alternate hypothesis is accepted.

### Findings

- Exchange rate fluctuations between Pakistan and US have strong impact on exports of Pakistan. If exchange rate fluctuates abnormally then exports also

fluctuates with same frequency and causes the economy of Pakistan to become strengthen or weaken.

- Exchange rate fluctuations also have strong and long term impact on imports of Pakistan which causes to move imports up and down by bringing the economy of Pakistan in good or bad situation.
- Gross domestic product of Pakistan is also affected positively by exchange rate fluctuation between Pakistan and US which indicates that when exchange rate value is disturbed then GDP of Pakistan is also affected causing the economy of Pakistan to become weaker or stronger.
- Inflation in Pakistan is negatively related with exchange rate fluctuations between Pakistan and US which indicates that exchange rate does not affect the inflation rate in Pakistan but in long run it have some association with inflation rate in Pakistan.

### **Discussion**

My findings of the study were in line with Peerman and Farrant (2006), Peridy (2003), Prasad (1997) and Nishat (2004) as they supported my point that Exchange rate fluctuations have positive impact on economic factors of Pakistan's economy but Kandilov (2008) and Khan (2012) findings were against me that they found negative impact of exchange rate fluctuations on economic factors of economy of Pakistan.

### **Recommendations**

- The government of Pakistan should have to focus on other economies of the world for trade other than dollar, so that trade should be balanced and dollar to Pakistani rupee fluctuations should be minimized.
- In order to improve exports of Pakistan, the economy of Pakistan must have to stabilize exchange rate fluctuations through proper exports policy given on annual and semiannual basis.
- In order to stabilize the GDP growth of Pakistan every step should be taken for minimizing the exchange rate fluctuations through observing the neighbors' countries GDP growth and their standards for minimizing exchange rate fluctuations.
- The government of Pakistan should revise all its macro and micro economic policies and should consider substitute economy for trade purpose other than US dollar.
- Inflation should have to be controlled and within certain limit to improve the economy of Pakistan because if inflation rate is increased above the normal expectation then trade would seriously be affected and economy of Pakistan would decline.

- This research recommend that to stabilize the economy of Pakistan then the policy regarding the macro and micro economic variable should focus on short and long term relationship between exchange rate fluctuations and exports, imports, GDP and inflation of Pakistan.

## **Conclusion**

After analyzing the data for exchange rate between Pakistan and US on annual basis and its impact is observed on GDP, exports, imports and inflation from 1990 to 2013 different results are obtained which can help to understand exchange rate fluctuations and its effect on entire economy.

This research concludes that economy of Pakistan can strengthen if it is not fluctuated continuously and remains in stable position for a long time. From different statistical tests it is concluded that exchange rate fluctuations has short and long term effect on imports, exports and GDP of Pakistan which means that with fluctuations in exchange rate between Pakistan and US the economy of Pakistan would be affected seriously due to disturbance in exports, imports and GDP of Pakistan bringing the economy of Pakistan in bad position. Inflation is concerned with exchange rate in long term relation and the impact of exchange rate could only be seen in long run because in short run exchange rate fluctuation is not responsible for the changes in inflation rate of Pakistan.

In order to stabilize the economy of Pakistan the policy makers should focus on different instruments for stable exchange rate with in Pakistan like forward and future contracts so that exchange rate can fluctuate within its limits by not disturbing the whole economic variables necessary for strengthening the economy of Pakistan.

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