Bulletin of Business and Economics
ISSN - 2409 - 9368
http://rfh.org.pk/jur/magazine-category/bbe

# Impact of Exchange Rate on Exports in Case of Pakistan

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**Abstract**
Export of a country is one of the main factors indicating economics health of a country. This study examines the impact of exchange rate on exports in case of Pakistan by using annual time series data over the period from 1970 to 2015. Secondary data is taken from International monetary fund (IMF) and World bank (WDI). Study use Augmented Dicky-Fuller (ADF) and Phillip-Perron (PP) to check the stationary of the data. The study use Auto Regressive Distributive lag (ARDL) to check the relationship between the variables which are under consideration. Results of the study show that exchange rate have negative but insignificant impact on exports of Pakistan while World's income have positive and significant effect to exports.

**Keywords:** exchange rate, exports, world income, Pakistan
**JEL Codes:** F10, F30

## I. Introduction

Exports of any country play an important role in growth of that country and the main factor indicating economic health of that country. The relationship between exchange rate volatility and export investigated since the late 1970's when exchange rate moves from flexible to fixed exchange rate after the agreement of Bretton Wood in 1972-73. The Bretton Wood Agreement was the landmark system for monetary and exchange rate management established in 1944. Under the agreement currencies were pegged to the price of gold, and the US dollar was seen as a reserve currency linked to the price of gold. After that agreement the heated debate started in field of international finance (Abrams, 1980; Cushman, 1983; Kenen and Rodrik, 1986; Bailey, Tavlas, and Ulan, 1986; and Hooper and Kohlhagen, 1978). The main criticism on the flexible exchange rate is that in the flexible exchange rate uncertainty increase and international trade decrease. According to above argument the risk on international trade reduce and profit on international trade increase. In 1973 after the heated debate on exchange rate volatility it led researchers and policy makers to investigate that how exchange rate volatility affects the volume of trade for example (Clark, 1973) shows that with the increase in exchange rate will decrease the international trade. Some studies measured the impact of exchange rate volatility on exports but majority of these are unable to provide significant evidence among exchange rate volatility and export growth (Medhora, 1990 and Aristotelous, 2001).

In this study we take the data of exports and exchange rate from 1970 to 2015 by different sources like International financial statistics, International monetary funds, and World Bank. The major share in exports are Bed wear, rugs and carpets (8% of total exports), knitwear and cotton (28%), and rice (8%) other includes leather, fish, vegetables and fruits, and sports goods etc. Pakistan exporting partners are United States of America (15%), UAE (10%), Afghanistan (9.5%), China (9%), United Kingdom (3%) and Germany (2%), (Economic Survey of Pakistan). Exchange rate plays the important role and affects the exports of a country. In the start exchange rate and export have negative relation (WDI) but after the Bretton wood agreement government authorities decided to adopt floating exchange rate system. In 1998 the exports of Pakistan faced very worse situation due to nuclear experiment and all the world implied restriction on trade with Pakistan but in 2000 all these restrictions comes to end and Pakistan's exports increase. Importance of this study can be viewed in particular way that aggregate exports of Pakistan increase day by day but when we pay attention toward exports of different commodity it increases or decreases as compare to previous year so this study is important to explore the relationship between impact of exchange rate fluctuations on exports.

The objective of this study is to find the relationship between exchange rate and exports in case of Pakistan, and also find the relationship between the world's income or GDP and exports of Pakistan by using time series data from 1970 to 2015. Results of this study are expected to formulate policies that can help different exporting firms for good opportunities.

## II. Literature review

Hooper and Kohlhagen (1978) analyzed systematically the effects of exchange rate uncertainty on the trade. They investigated bilateral and multilateral trade among developed countries during 1965 to 1975. They measured exchange rate risk by standard error of nominal exchange rate fluctuations. They could not establish any significant impact of exchange rate volatility on the volume of trade. They measured the exchange rate risk volatility as the standard error of nominal exchange rate function.

Mustafa and Nishat (2004) explore the relationship of volatility of exchange rate and export growth of Pakistan using quarterly data from 1991:3 to 2004:2. Export growth is used as dependent variable while exchange rate volatility use as independent variable. The study use Error co-integration technique to check the relationship among the variables in the model. Results of the study shows that there is negative relationship in case of major trade partner UK and USA, while in case of Pakistan and India this relationship is observed only long run not in short run.

Akhter and Hilton (1984) examined the bilateral trade between West Germany and US. They determined that the exchange rate volatility has a significant negative impact on the exports and imports of two countries. However, the volatility of exchange rate has been measured by the standard deviation of effective exchange rates. The criticism on this study is that the researcher used the many countries and considered them on unit so he never get a good result because he was not specify the country.

Haseeb and Rubaniy (2014) explore the relationship among exchange rate instability and sectoral exports in case of Pakistan. Sectorial export is dependent variable and exchange rate is independent variable and GDP use as control variable. Study use ARDL technique to check the relationship among the variables. Results of the study shows negative relationship between exchange rate volatility and export of food processing machinery, grapes, meat and petroleum products but with iron and steel bars this is adjusted in long run.

Hossein and Rahman (1995) has hypothesized that Bangladesh export supply is a function of relative prices of its exports and the capacity output of the tradable sector. They have estimated the demand and supply models of exports with annual data and found that Bangladeshis export is highly sensitive to the income growth of its trading partners and estimated that a 10% rise in a foreign income would raise the demand for Bangladeshi exports by 23%. In this article researcher shown just one side of the exchange rate that the increase in the foreign income the export of Bangladesh increased but no focus that if the income of the foreign people decrease then what will happen so this study not give the exact results.

Aftab and Abbas (2012) concluded that exchange rate instability has significant negative relationship with sectoral export of Pakistan except waxes and animal oils, aircraft, transport equipment and arms however the signs of coefficient are negative relative price also show sign negative relationship for all the sectors except animal and vegetable, textile and textile articles were negative sign. Negative sign shows that decrease in demand for exports is due to an increase in relative price.

Arize et al. (2003) examined that does exchange rate volatility depress the export flows in case of ten developing countries over the quarterly period 1973 to 1998. Exports used as dependent variable while relative prices, world demand conditions and exchange rate volatility use as independent variable. Study use Johansen's multivariate procedure and Error correction mechanism (ECM) techniques to check the relationship of the variables under consideration. Results of the model shows as increase in the exchange rate volatility exert a significant negative effect upon export demand in both the short-run and long-run.

Korhonen and juurikkala (2008) asses the determinants of equilibrium real exchange rates in a sample of oil dependent countries by using the annual time series data from 1975 to 2005. Study use ARDL and ECM techniques to check the short run and long run relationships among the variables. Result of the study shows price of oil has a clear statistically significant effect on real exchange rates.

Aman et al. (2013) examined the relationship between exchange rate and economic growth in case of Pakistan by using time series date from 1976 to 2010. GDP is dependent variable while exports, imports, domestic savings, investment and FDI use as independent variable. Study use Simultaneous equation model (2SLS and 3SLS techniques). Result of this study show that exchange rate has positive associated with economic growth through the channel of export promotion incentives, enlarging the volume of investment, enhancing FDI inflow and promoting import substitute industry.

**III. Data and Methodology**

The topic which is under consideration is impact of Exchange rate on export in case of Pakistan. The study uses annual time series data over the period 1972 to 2015 from World development indicator (WDI) and Economic survey of Pakistan. Export is dependent variable and exchange rate and GDP are independent variables. Study use GDP as the proxy of income of importer country and GDP use as control variable. The study uses Ordinary least square (OLS) technique for estimation.

The model is:

$$X = \beta_0 + \beta_1 Ex + \beta_2 GDP + \mu$$

X = Export volume

Ex = Exchange Rate

GDP = Gross domestic product use as proxy of income of that country

**IV. Empirical Results**

We are using time series data in our analysis that is Impact of exchange rate changes on exports of Pakistan. There is a fundamental principle that time series data should be stationary. Before estimation we have to ensure that the data we are using in our analysis of all variables are stationary by applying the Augmented Dickey-Fuller (ADF) test and Phillip-Perron test. ADF shows the null hypothesis of considered variable show the unit root while alternative

hypothesis show the variable is stationary. Two variables GDP, X are stationary at level while Ex is stationary at first difference in both ADF test and Phillip-Perron test.

**Table.1 Unit root test results**

| | ADF | | PP | |
|---|---|---|---|---|
| | Level | First Difference | Level | First Difference |
| X | -6.78881* | | -6.79212* | |
| Ex | -3.15584 | -5.6959* | -4.61652 | -15.13862* |
| GDP | -4.45022* | | -4.25508* | |

* indicates 1% level of significance
** indicates 5% level of significance
*** indicates 10% level of significance

**V. Co-integration Results**

**Table.2 ARDL (Auto Regressive Distributive Lag)**

| F-statistics | 95%Lower Bound | 95%Upper Bound | 90%Lower Bound | 90%Upper Bound |
|---|---|---|---|---|
| 2.9395 | 4.0752 | 5.1214 | 3.3542 | 4.3192 |

After making the variable stationary we have to check the relationship between the variables which are under consideration, for this purpose we use ARDL approach because order of integration of all variable is different. The results of ARDL are showing in the Table.2. To check the long run relationship between the variables we compare the value of f-statistics with the value of 95%upper bound. The rule of thumb is that if the value of f-statistic is greater than the upper bound value then there is long run relationship between the variables. Here the results tells us that f-statistic is less than the 95% upper bound value so there is not long run relationship between the variables in the model.

**Table.3 ECM** (Error Correction Mechanism)

| | |
|---|---|
| ecm(-1) | -0.2791 |

For the short run relationship the value of ecm should be negative and ranges between zero and one. Our result showing in table.3 which tells the value is negative and between the zero and one so there is short run relationship exist between the variables under consideration.

**Table.4 Regression Results**

| Regressor | Coefficient | Standard Error | T-ratio [prob] |
|---|---|---|---|
| Ex | -854000000 | 1270000 | -0.6754 [0.503] |
| GDP | 0.0372 | 0.0134 | 2.7665 [0.009] |

| | | | |
|---|---|---|---|
| R-squared | 0.1851 | F-stat. | 2.9545 [0.044] |
| R-Bar-Squared | 0.1225 | WD-statistic | 2.01 |
| S.E. of Regression | 6.51E+09 | | |

Table.4 is showing regression result of the whole model where exchange rate has negative and statistically insignificant relationship with exports, while World's income (GDP) have positive and statistically significant relationship with exports. This study is unable to provide a significant relationship between exchange rate change and export which is similar to several studies in the literature like (Medhora, 1990) and (Aristotelous, 2001). There are some other studies which found negative and significant negative relationship in both short run and long run like (Arize, Malindretos, and Kasibhatla, 2003) and (Shaikh and Hongbing, 2011).

**VI. Conclusion**

It has been argued by some empirical researchers that exchange rate volatility has a positive effect on the level of exports. However, while some empirical researchers have been able to argue for the negative effects of volatility to exports others have been able to argue for positive or no effects at all. Our examination has focused on the effects of exchange rate volatility to aggregate exports for a sample Pakistan. Study used some econometric techniques to find

out the relationship between the variables. study use Auto regressive distributed lag (ARDL) to check the relationship among the variables which are under consideration. Our results have been able to identify a mixed relationship, which has proven to be insignificant for each of the cases examined here, and therefore we are in agreement with the studies that suggested that exchange rate volatility has negative but insignificant effects on the aggregate level of exports.

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