Effects of Exchange Rate Instability on
Imports and Exports of Pakistan

Atif Kafayat[1]

Abstract: The instability in exchange rate (appreciation and depreciation in home currency) is an important factor indetermination of trade balance of a country. Fluctuating exchange rates impacts the decision making of investors and traders, it shatters their confidence which ultimately leads to the slowness of trade process. In this research paper the effect of exchange rate instability is measured on imports and exports of Pakistan. For this purpose Regression analysis is used and it is calculated that if instability is created due to depreciation in home currency (Pak rupee) then it has positive impact on Pakistan's exports, while it has absolutely no effect on imports of Pakistan. Since Pak rupee has very limited appreciation during last 20 years so appreciation effect of home currency can not be calculated on Imports and exports of Pakistan. In theoretical prospective the devaluation of home currency should decrease the volume of imports, because it will cost more for Pakistan to import goods from other countries. But our empirical findings show that, this is not the case between exchange rate and imports of Pakistan. The imports of Pakistan grew even in large figure as the home currency depreciated against other currencies. So this shows that depreciation of home currency do not effect the imports in of Pakistan. Our findings through regression analysis show that by decrease in value of home currency imports of Pakistan increase. So depreciation in home currency has no effect on imports volume.

Key terms: Exchange rate instability; Imports; Exports

JEL Classification: F31

1. Introduction

The Exchange rate is a macroeconomic variable, which is very important for the trade process. Instability in exchange rate slows down the trading process, as both investor and trader wants exchange rates to be more favorable. They tend to wait until exchange rate turns in their favor. So instability in exchange rates not only impacts the decision making of trader and investor but it also destabilize the capital movement and volume of trade. The effect of exchange rate instability on imports and exports is examined in three different time spans.

[1] MS/M Phil (Management Sciences) Finance at University Institute of Management Sciences PMAS UAAR Pakistan, Address: PMAS-Arid Agriculture University Rawalpindi, Shamsabad, Muree Road Rawalpindi – Pakistan, Tel.: +923449204654, Corresponding author: Atif_kafayat@yahoo.com.

1.1 Long term effects

In long terms exchange rate instability influences long term decision making by effecting the volume of imports and exports, investment allocation and government's sales and purchase policies.

1.2 Medium term effects

In medium terms exchange rate instability affects the balance of payments and level of economic activity.

1.3 Short term effects

In short term exchange rate instability affects the local traders and consumers as the commodity prices are influenced by it. Instability in exchange rates creates opportunities for Pakistani investors to invest in foreign currency i.e. US Dollar in order to gain profits, this result in appreciation of Dollar's value against home currency and home currency depreciates. So when home currency weakens the price and volume of imports and exports are effected by it.

Since this research involves the exchange rate of Pakistan, it is necessary to know that what type of exchange rate system Pakistan is using currently. Pakistan is using Managed float system since 1981 adopted by General Zia ul huqq after the collapse of fixed exchange rate system in 1973. Managed float system is a system in which central bank can intervene in determination of exchange rate by setting the boundaries or limits for fluctuations in exchange rate.(Also known as "ceiling" and "floor"). Following diagram will explain the type of exchange rate systems in international trade.

1.4 Objectives of Study

Main goal of this research are to how exchange rate instability affects the imports and exports of Pakistan? If instability of exchange rate is caused by depreciation of home currency then it will affect exports positively and imports negatively and if instability is caused by appreciation of home currency then it will affect exports negatively and exports positively. We also assume that there is no hedging against instability of exchange rate because if hedging is done then there will be very low or minimal effect on imports and exports. Question arises that how exchange rate affects the imports and exports of Pakistan? The answer could be given by following example. Let's suppose that Rupee has depreciated and new exchange rate is risen froe 85 to 86 USD/PKR. The increase of one rupee in value of US dollar will create opportunity for Pakistani exporter sell its products in international market and earn profit because now the exporter is receiving 86 rupees instead of 85 rupees. Similarly should decrease the imports because know Pakistan has to pay 86 rupees instead of 85 rupees. Same principle will be repeated if exchange rate

goes from 85 to 84 USD/PKR but this time decreasing exports and increasing imports.

2. Literature View

Floating exchange rate system was adopted by developing countries in 1971 after the collapse of US dollar as base of fixed exchange rate system. This change has generated some questions that whether the flotation or instability has some effects on imports and exports. So the answer to these questions could be found by review of literature. Therefore, many researches have calculated the relationship between exports, imports and exchange rate volatility. Most of the theoretical and empirical work in Pakistan on its exchange rate instability is done on the bases of real exchange rate (e.g. Afridi, 1995; Afridi and Siddiqui, 1994; Burney and Akhtar, 1992; Chishti and Hasan, 1993; Khan, 1986a; Siddiqui *et al.,* 1996). As it is mentioned before that real exchange rates don't include the inflation effect of the time period so it is more needed to use nominal exchange rate and estimate its effect on imports and exports of Pakistan. This article is focused on effects of nominal exchange rate instability on imports and exports of Pakistan. Various studies carried out to estimate the relationship between trade and exchange rate uncertainty have reported mixed results. Akhtar and Hilton in (1984), Kumar and Dhawan in (1991), Peree and Steinherr in (1989), Persson and Svensson in (1989) and Kenen and Rodrik in (1986) found negative impact of exchange rate instability on trade because of exchange rate risk. Rogoff in (1998) stated that exchange rate volatility creates significant problems for both exporters and importers. Arize in (1996, 1998) reports negative significant long run and short run relationship between exchange rate instability on imports and exports.

From long time Pakistan is suffering trade deficit because of its sharp growth of imports and study growth of exports. Because of rise in domestic demand the imports have grown significantly over the two decades. So in order to address this situation government of Pakistan need to adopt sound economic strategies and also need to change and reform the structure of country economy. One strategy is manipulating exchange rate is to obtain desired benefits. So by considering exchange rate volatility as important variable which affects the imports and exports of Pakistan, the other factors (i.e. income and price elasticity), there effect would be assumed less dominating. The results show that fluctuation in exchange rate has no impact on demand of imports. (Shaista aslam and Qazi Masood 2010).

Since the end of Breton wood system, there is significant fluctuation in nominal exchange rates, so it can be argued that change in real exchange rates are due to changes in nominal exchange rate under floating exchange rate system.(Genberg and Swoboda 1993).In 1978, Hooper and Kohlhagen calculated negative relationship amomg exchange rate instability and volume of trade but found

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positive association with export prices when exporters bear the exchange risk and negative impact when importers bear the risk. In 1987, Edwards estimated that high fluctuation in nominal exchange rate negatively effect level of international trade. The appreciation of currency because of the fluctuation results in large capital inflows negatively affects the trade Baldwin and Krugman (1989). Bacchetta and Wincoop (1998), Devereus(2002) found that there is insignificant association between nominal exchange rate volatility and trade flows. The instability in exchange rate creates options for investors to invest in international market. Positive instability increases the potential gains from international trade, which makes production more profitable because exporters want to sell more in international market.

3. Data and Methodology

The Data on exchange rates, imports and exports of Pakistan has been taken from international financial statistics (IMF) and ONDA (a forex website). Monthly data is collected from January, 1981 to February, 2011.The Exports and Imports are calculated in Million $ form.

Three variables are constructed (Exchange rate, Imports, Exports) where exchange rate is an independent variable and both import and export are dependent variables. The exchange rate which is used is Nominal exchange rate of Pakistan not the real exchange rate. There is one difference among nominal exchange rate and real exchange rate, which is that nominal exchange rate, includes inflation and real exchange does not.

Real exchange rate = Nominal exchange rate – Inflation.

The instability in exchange rate is calculated by following method.

$$\text{Percent } \Delta \text{ in exchange rate} = \left(\frac{S - S_{t-1}}{S_{t-1}} \right) * 100$$

S = current spot rate

St-1 = previous month spot rate

A positive percentage shows that exchange rate and home currency has appreciated and negative percentage shows the depreciation of exchange rate and home currency. The direct quotation is used to calculate exchange rates of Pakistan. Direct quotation shows the price of foreign currency in terms of local currency; in this case foreign currency will be US dollar as most of trade payment of Pakistan is paid in Dollar currency. (Indirect quotation is US dollar per Rupee) so because of

direct quotation above scenario will be reversed and will become, a positive percentage will show depreciation in exchange rate and appreciation in home currency while a negative percentage will show appreciation in exchange rate and depreciation in home currency.

3.1 Hypotheses

Our hypotheses are:

H1: Instability in exchange rate due to depreciation in home currency will increase the volume of Exports of Pakistan.

H0: Instability in exchange rate due to depreciation in home currency has no effect on exports of Pakistan.

H1: Instability in exchange rate due to depreciation in home currency will decrease the volume of Imports of Pakistan.

H0: Instability in exchange rate due to depreciation in home currency has no effect in imports of Pakistan.

The model which is used for calculating the effect of exchange rate instability on imports and exports of Pakistan will be regression analysis. Two separate regression test would be applied on Imports and exports of Pakistan.

First regression analysis is among exchange rate and exports of Pakistan. The equation is

$$Exp = \alpha + \beta \Delta er$$

Exp = Exports of Pakistan

Δer = Change in exchange rate

The second regression analysis is between exchange rate and imports of Pakistan. The equation is

$$Imp = \alpha - \beta \Delta er$$

Imp = Imports of Pakistan

Δer = Change in exchange rate

4. Empirical Findings and Results

Table 1

Regression results for Exchange rate and Exports			
362 Months (Jan.1981- Feb. 2011)			
Independent variable		Exchange rate	
Dependent variable		Exports	
F value		1486.938	
F Significance		7E-130	
Multiple R		0.897264	
R²		0.805083	
Variable	**Coefficient**	**T stat**	**P-value**
Intercept	-5.22258	-0.22863	0.819289
Exchange rate	19.32686	38.56083	7E-130

Table 1 is showing the regression results for exchange rate instability caused by depreciation of Rupee and exports of Pakistan. There are 362 observations used to calculate the effect of exchange rate instability on exports of Pakistan.

F value / F significance: The F value (1486.938) is significant at 0.1 level. This shows that our model is highly suitable and appropriate at for measuring the relationship between exchange rate and exports of Pakistan.

Multiple R: Multiple R tells the correlation between independent variable and dependent variable, and the value (.897264) shows that there is strong positive relation ship between two variables. This measure that, if Dollar per rupee value increases then exports of Pakistan also increases.

R²: R² shows that 80% change in exports of Pakistan is due to exchange rate instability.

Exchange rate/ coefficient T stat and P value: The coefficient of independent variable is 19.3268 and it is significant at 1% level. Value of t stat is 38.5086 and p value is 7E-130 which shows that actual value of parameter is not zero.

Thus through empirical finding it is determined that our first hypothesis "if instability in exchange rate is caused by depreciation of home currency then it will have positive effect on exports of Pakistan" is proved correct. Followings are the graphical representation of relationship exchange rate and exports of Pakistan.
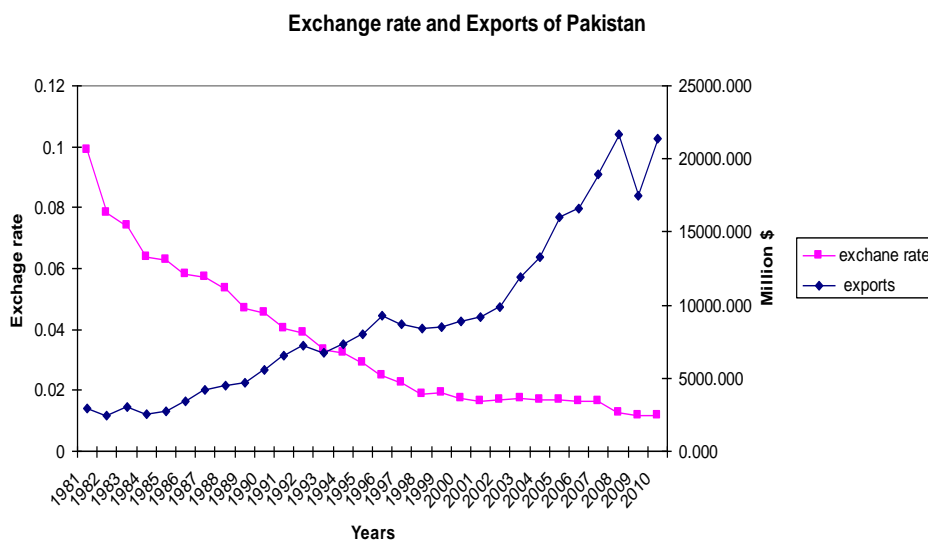
Exports of Pakiatan

Graph 1

Graph 1 is showing exports of Pakistan of past three decades. It is clearly seen that exports of Pakistan has a steady and low growth over the years.

Exchane rate USD/PKR
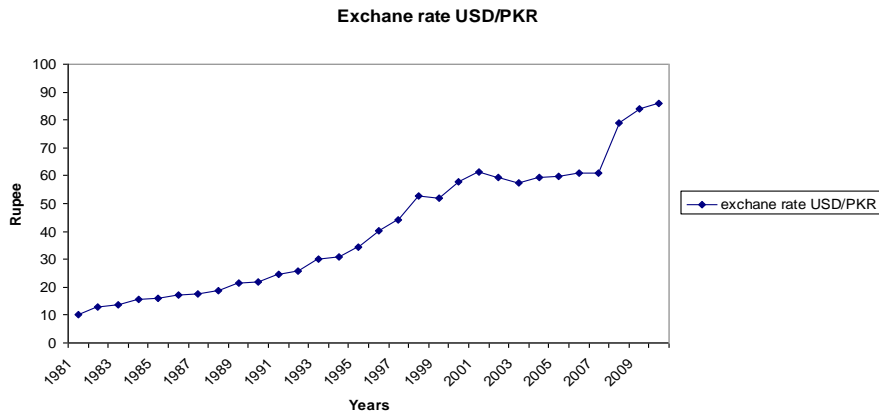
Graph 2

Graph 2 is showing Exchange rate USD/PKR of past 30 years. The exchange rate has increasing trend. Following is the graph explaining the relationship between exchange rate and exports of Pakistan.

Exchange rate and Exports of Pakistan

Graph 3.

This is the graph showing movement of exchange rate instability and exports of Pakistan. The figure shows constant decrease in home currency and constant increase in volume of exports. This graphical presentation also verifies our first hypotheses that by depreciation of home currency Pakistan's exports are positively affected.

Table 2

Regression results for Exchange rate and Imports			
362 Months (Jan.1981- Feb. 2011)			
Independent variable		Exchange rate	
Dependent variable		Imports	
F value		565.1649	
F Significance		8.81E-76	
Multiple R		0.781588	
R²		0.61088	
Variable	**Coefficient**	**T stat**	**P-value**
Intercept	-184.204	-2.71725	.006901
Exchange rate	35.36001	23.7732	8.81E-76

Table 2 is showing the regression results for exchange rate instability and imports of Pakistan.

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F value / F significance: The F value (565.1649) is significant at 0.1 level. This shows that our model is highly suitable and appropriate at for measuring the relationship between exchange rate and imports of Pakistan.

Multiple R: Multiple R tells the correlation between independent variable and dependent variable, and the value (.781588) shows that there is strong positive relation ship between two variables. This measure that, if Dollar per rupee value increases then imports of Pakistan also increases.

R²: R^2 shows that 61% change in imports of Pakistan is due to exchange rate instability

Exchange rate/ coefficient T stat and P value: The coefficient of independent variable is 35.36001 and it is significant at 1% level. Value of t stat is 23.7732 and p value is 8.81E-76 which shows that actual value of parameter is not zero.

Thus through empirical finding it is determined that our second hypothesis "if instability in exchange rate is caused by depreciation of home currency then it will have negative effect on imports of Pakistan" is proved incorrect. Because we want to estimate for the negative relationship, the value of coefficient of independent variable must be negative i.e. (-35.36001). Only then our second hypothesis could be correct. So our second hypothesis is rejected and its null we will have to accept a null hypothesis which is: "Instability in exchange rate due to depreciation in home currency has no effect in imports of Pakistan."

Here it is clearly seen that there is contradiction between theoretical implication and empirical findings of our regression model. According to our hypothesis the instability in exchange rates due to depreciation of Rupee should negatively affect the volume of imports, but our findings suggest that this is not the case and depreciation of home currency is increasing imports of Pakistan. So our second hypothesis is proven wrong. There could be many reasons that why Pakistan's imports always rise no matter how much Rupee is depreciating.

Because of all these reasons Pakistan's imports rise always, thus not showing the effects of exchange rate instability. Following is the graph showing imports movement against depreciation of Rupee. To support our conclusion regarding imports we give reference of research article "Exchange Rate Volatility and Pakistan's Import Demand" by Shaista Alam (University of Karachi) and Qazi Masood Ahmed (Institute of Business Administration, Karachi) has found that instability in exchange rate has no effect on demand of imports of Pakistan.

Imports of Pakistan

Graph 4

Graph 4 is showing the imports of Pakistan over the years. There is been a steady growth in imports form 1981 to 1995 but after that imports have grown rapidly and since 2003 imports have risen sharply.

Exchange rate and Imports of Pakistan
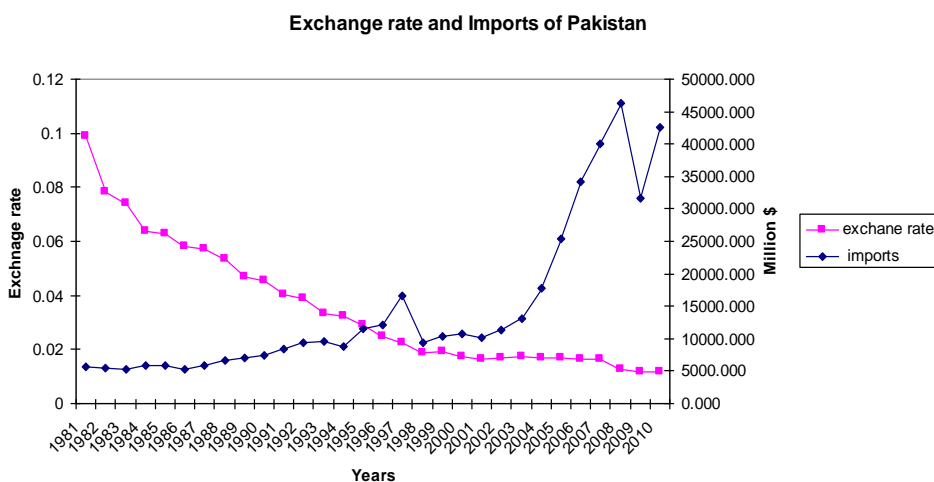
Graph 5

Graph 5 shows the movement of exchange rate instability and imports of Pakistan. It is seen that although home currency is depreciating but imports are increasing which contradicts with theory.

5. Conclusion and Recommendations

It is concluded that instability in exchange rate caused by depreciation of home currency positively effect the exports and no or minimal effect on imports in case of Pakistan. This should have reduced the trade deficit of Pakistan, but due to Pakistanis ever growing imports it is not possible. From the above conclusion we cannot say that with certainty that exchange rate instability is always better for trade balance because in most of the years the instability in exchange rate is mainly due to excess depreciation of Rupee and not by the excess appreciation. It is also concluded that by devaluating the home currency is not always beneficial for reducing trade deficits in case of Pakistan. The most important thing for Pakistan is to increase the production capacity and exports. The example of China is very suitable in that case as China has artificially devalued its currency and gaining huge benefits from it because of its massive production. We strongly suggest that Pakistan should do the same, and follow China's footsteps to gain maximum advantages of lower currency value. The proceeding year's 2011and 2012 bear the same trend as of previous years as the devaluation of Rupee caused positive impact on exports while bearing a minimum effect on imports. The year 2013 experienced sharp decline in value of Rupee and it played the same increasing effect on exports while imports declined not lonely because of devaluation of currency but for other social, political and economic reasons. Here are the amounts of these years (**2011**: Exchange rate USD/PKR=84.0678, Exports Million $=23445.9, Imports Million $=42753.1), (**2012**: Exchange rate USD/PKR=97.0679, Exports Million $=27591.7, Imports Million $=46904.2), (**2013**: Exchange rate USD/PKR=107.5890, Exports Million $=29796.2, Imports Million $=34847.1).

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