

# Does Exchange Rate Uncertainty Effects Exports? A Disaggregated Study of Pakistan Economy

Muhammad Shoaib

Department of Economics, Kohat University of Science and Technology, Kohat, Pakistan

Bashir Ahmad Khilji

Department of Economics, Preston University, Islamabad, Pakistan

Zahoor Khan

Center for Excellence in Islamic Finance, IM Sciences, Peshawar, Pakistan

Muhammad Shafiq<sup>1</sup>

Department of Economics, Kohat University of Science and Technology, Kohat, Pakistan

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## Abstract

This study has been conducted to find out the effect of exchange rate uncertainty on the export volume of Pakistan to its major trading partner countries. Volatility in the nominal exchange rate of Pakistan has been estimated through Generalized Autoregressive Conditional Heteroscedastic (GARCH) process. The findings showed that exchange rate uncertainty has negative significant impact on the volume of exports of Pakistan with all considered trading partner countries. In case of Hong Kong, Kuwait and Malaysia relative prices have negative significant effect on the volume of exports, while for the rest, trading partner countries the relationship is found positive and significant. It is further documented that political instability has significant negative impact on the volume of exports in almost all the trading partner countries. Exchange rate volatility curtails the volume of exports, so appropriate policies are required to be adopted, which will stabilize the exchange rate.

**Keywords:** Exports; GARCH; GMM; Volatility.

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Cite this article: Shoaib, M., Khilji, B. A., Khan, Z., & Shafiq, M. (2016). Does Exchange Rate Uncertainty Effects Exports? A Disaggregated Study of Pakistan Economy. *International Journal of Management, Accounting and Economics*, 3(12), 779-796.

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<sup>1</sup> Corresponding author's email: [shafiq@kust.edu.pk](mailto:shafiq@kust.edu.pk)

## Introduction

International trade is considered the backbone of economic development for any country. After the establishment of World Trade Organization (WTO) and General Agreement on Trade and Tariffs (GATT), international trade has globalized to a very large extent. Trade helps in the division of labor, increases efficiency of the economy as well as competitiveness and specialization of the country in production (Thomas & Grosse, 2005; Al-Hazaimeh et al, 2011). International trade plays an important role in the improvement of human welfare and their economic condition. Moreover high level of exports enhances the economic condition by increasing production of domestic goods, which results in increase in per capita income and reduces unemployment.

Exchange rate is a very important concept in macroeconomics; it can be defined “as the price of currency of a country in relation to the price of currency of another country”. All the national currency equations are expressed in exchange rate. Volatility is mostly concerned with exchange rate in existing literature. Volatility, Unpredictability, uncertainty or instability in a variable is a measure of risk. So in all international transactions volatility meaning can be expressed as uncertainty.

Uncertainty is commonly expressed as the imperfection of human knowledge (Willet (1981). Kaplan (1981) explains the basic idea behind the risk and concluded that there are three important questions which indicate that it has a triplet effect and these three questions are associated with the term risk i.e. What basically means what is going to happen, Probability and uncertainty are mostly used as synonymous terms which in most economics literature. In 1973 the breakdown of Bretton Woods System of fixed exchange rate regime has drawn the whole world into a new era of globalization in which major trading countries have accepted a new system of floating exchange rate, this means that the relative prices of currencies in different countries can now fluctuate. In recent years the issue of impact of exchange rate uncertainty on volume of trade has got a lot of attention. Exchange rate volatility adversely affects Foreign and Domestic investments, which reallocate resources among different sectors of a country causing an uncertain impact on exports and imports, and resultantly effect the investment environment (Azid, et al. (2005). Arize, (1998) and McKenzie, (1999) suggested if hedging is expensive then exchange rate volatility has a negative impact on the trade by causing reduction in the volume of trade. Highly volatile exchange rate will slow down the growth of trade flows by creating uncertainty about the future profits which will further affect the delivery of goods and hence will result in an adverse effect on the international trade. Most of the previous models showed negative effects of exchange rate uncertainty on trade, if exchange rate is more volatile it leads to an increase in the uncertainty of future profits as either the value of exports may reduce in terms of foreign currency so in this situation exporters who are risk-averse will decrease exports supply. Risk-aversion phenomenon increases the negative effects of exchange rate fluctuations.

Contrary to the negative hypothesis some of the previous works have also identified a positive relationship between exchange rate uncertainty and exports. The models used in these studies focused on the accumulation of huge amount of profits from exchange rate movements. Exchange rate uncertainty was considered as an option which can be used in situations whenever the economic conditions are favorable which results in earning of

huge amount of profits proving a positive relationship between exchange rate fluctuations and exports. These hypotheses are the results of restrictive assumption in the theoretical models. Clark in 1973 used a model for a firm which was producing homogeneous products for exports. He assumed that the firm is receiving foreign currency for its exports products, as the production decision was already taken so firm's output decision is dependent upon the unpredictable future profit, which is further dependent upon exchange rate movements. In the context of bilateral trade framework Kohlhagen and Hooper in 1978 also demonstrates that exchange rate uncertainties reduces the volume of trade. Corbo and Caballero (1989), argued that if exporters are risk-neutral so an increase in the exchange rate volatility would have positive effects on the volume of exports. So if economic conditions are favorable for the investor, to invest more capital and produce more goods, which brings profits to the firm. In an economy tradable goods constitute a very significant portion of output, and in return helps to achieve a high level of economic growth. Dhawan and Kumar (1991) explored the effect of exchange volatility on Pakistani exports and found that the effect of exchange rate uncertainty on Pakistani exports demand is negative, they suggested that Germany and Japan can also act as alternate markets in place of United Kingdom and United States for Pakistan's major exports. Afzal and Shah (2006) proved that depreciation of both real and nominal exchange rate have an expansionary impact on Pakistan's exports supply. Similarly Aurangzeb et al. (2005), Mustafa & Nishat (2004) and Najia & Sultan (2012) also focused on the effects of exchange rate uncertainty on Pakistani exports but most of the previous studies ignored the political instability term as a proxy for political risk and an accurate measure of exchange rate uncertainty were also ignored which significantly affects exports gains.

#### *An Overview of Trade Performance of Pakistan.*

To boost up its trade and to protect its domestic industry Pakistan has adopted different policies from 1950 to 1970 which includes high tariffs and quotas etc., but during 1980's Pakistan had liberalized its international trade by relaxing Quantitative Restrictions programs and adopted Structural Adjustment Programs of International Monetary Fund (SAP). Due to increase of imports and slow growth in exports Pakistan has always remained in trade deficit and faced BOP problems. Despite of law and order situation and energy crisis Pakistan economy has shown a consistent high growth in the last decade which has boosted economic activities by increasing investments (Alam and Ahmad 2011). But from the last few years' electricity shortage, Political instability and increase in petroleum prices has severely affected Pakistan's domestic industry in result of which exports are also affected and share of major exporting products shown a decrease from last few years.

From 1980 to 2014 the exports volume of Pakistan has increased at a very satisfactory rate but due to increase in the dominancy of new economies i.e. China and South East Asian countries, the demand for Pakistani products in the international market has shrunked a little. The aggregate volume of exports in the year 2014 was approximately 20147 million US Dollars. This increase in the volume of exports is due a rapid hike in the production of food items and its export to Pakistan's major trading partner countries. The growth in the production of food products was 12.3 percent while the textile industry which is considered as strength of Pakistan exports has achieved a growth rate of 6.1

percent<sup>2</sup>. Sugar export has been able to give the economy 392.2 Million US Dollars while the rice production has declined up to 7 percent in the year 2012.

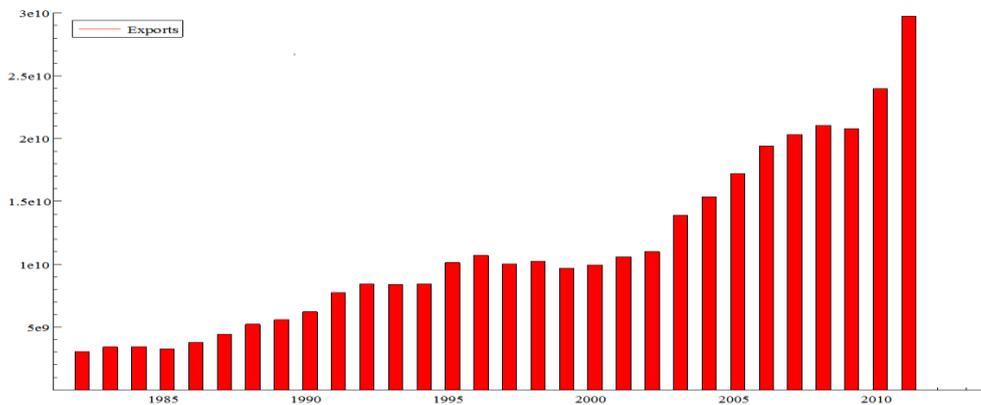


Figure 1. Export performance of Pakistan  
 Source: World Economic Outlook (WEO) 2014

Table 1 Major Exports Markets of Pakistan

Country	2010-2011		2011-2012		2012-2013		2013-14	
	Rs. (Billion)	Share	Rs. (Billions)	Share	Rs. (Billions)	Share	Rs. (Billions)	Share
U.S.A	338.3	16	315.3	15	341.3	14	291.9	15
China	139.7	7	195.9	9	252.5	11	199.9	10
U.A.E	154.6	7	205.6	10	205.4	9	153.7	8
Afghanistan	199.6	9	200.6	10	200.0	8	144.5	7
UK	103.1	5	105.7	5	121.2	5	120.6	6
Germany	108.8	5	94.0	4	93.6	4	87.8	4
France	34.1	2	29.8	1	93.7	4	56.5	3
Bangladesh	86.8	4	56.6	3	68.7	3	52.2	3
Italy	67.6	3	51.6	2	52.2	2	51.2	3
Spain	48.9	2	43.7	2	51.0	2	31.8	2
All others	839.3	51	811.9	38	887.0	37	802.0	40
Total	2,120.8	100	2,110.6	100	2,366.5	100	1991.6	100

Source: Pakistan Economic Survey 2014/15

Pakistan is an agricultural country so it majorly exports the agricultural products to rest of the world which are important raw material in the industrial outputs. Pakistan also exports food items and fruits to its major trading partner countries. Cotton produced in Pakistan is considered to be the best quality in the world, which has a significant high demand, along with cotton products, leather products and rice is also exported by

<sup>2</sup> Pakistan economic survey (2014/15)

Pakistan. Pakistani Handmade sports goods has a very high demand in the whole world and for most of the international sports events sports goods are imported from Pakistan in a good number.

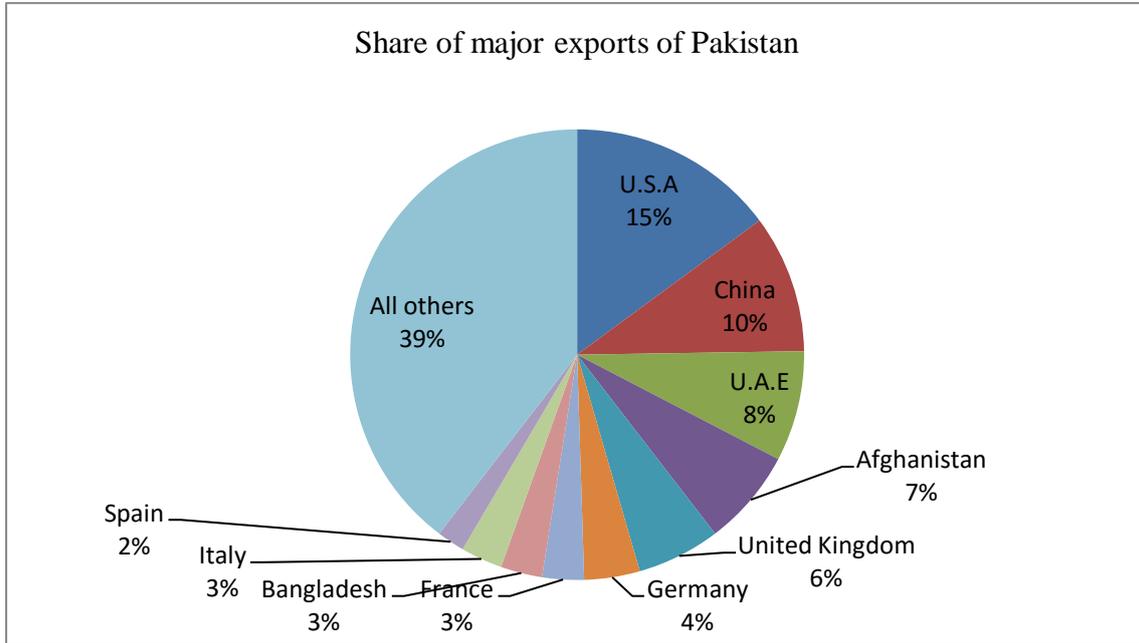


Figure 2 Share of Major Exports of Pakistan

Table 2 Major Imports Markets of Pakistan

	Rs. (Billion)	Share	Rs. (Billion)	Share	Rs. (Billion)	Share	Rs. (Billion)	Share
U.A.E	469.5	14	685.1	17	837.4	19	588.1	17
China	494.9	14	685.1	17	642.4	15	562.8	16
Kuwait	284.8	8	358.8	9	392.5	9	333.6	10
KSA	388.8	11	449.6	11	334.5	8	254.8	7
Malaysia	210.3	6	216.9	5	202.9	5	167.1	5
Japan	142.2	4	171.4	4	197.3	5	143.9	4
India	149.0	4	134.8	3	175.5	4	137.1	4
U.S.A	154.7	4	132.0	3	156.6	4	134.6	4
Germany	80.2	2	100.1	2	131.0	3	104.8	3
Indonesia	68.8	2	104.4	3	125.3	3	96.1	3
All other	1,012.2	29	970.9	24	1,154.4	27	926.0	27
Total	3,455.3	100	4,009.1	100	4,349.9	100	3,448.9	100

Source: Pakistan Economic Survey 2014/15

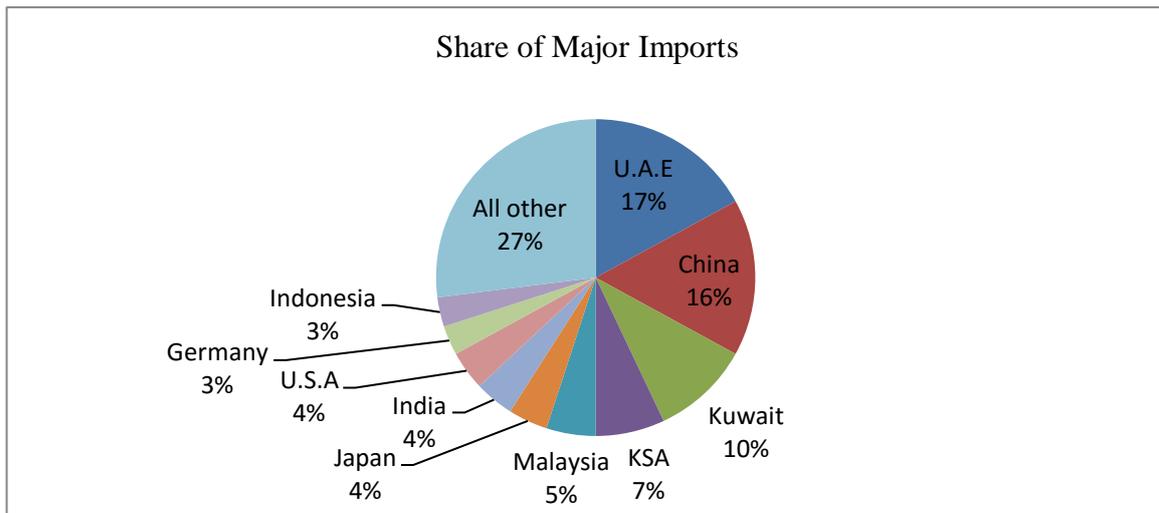


Figure 3: Share of Major Imports of Pakistan

Pakistan's mostly exports its products to United States of America, United Kingdom, Germany, Hong Kong, Malaysia and United Arab Emirates. These were the major importers of Pakistani product up to 2005 and 2006 but after 2005 the share of these countries start to decline and went to 35.2 percent of total exports in 2012 from 47.2 percent in early 2005 as a result Pakistani exporters have found new markets and the share of other countries start to increase and reached to 64.8 percent of total exports in 2012. This geographical variation in major exports of Pakistani products was due to the introduction of strategic trade policy frame work STPF 2009-12 and which have enabled Pakistani exports to find new markets for its products and increased its exports to Afghanistan, China and Bangladesh. Wherein the volume of exports to Pakistan's major exporting partners have declined.

There exist two important reasons in this regard. Firstly, new markets were reached by the Pakistani exporters and secondly due to china's dominancy in the international market the demand for Pakistani products have been downward. Apart from that Pakistani exports were also severely affected by Pakistan's war on terror and lawlessness in major cities of Pakistan specifically the industrial hub of Pakistan is Karachi where the law and order situation is very bad and which has caused an increase in the shutting down of major manufacturing units plus an decrease in the investments from foreign and local investors. Energy crisis have also added a lot in this regard otherwise the trade condition of Pakistan would have been different if all these problems were eliminated.

## Research Methodology

### *The Econometric Model*

Dhawan and Kumar (1991) proposed the following econometric model to find out the impact of exchange rate uncertainty on exports.

$$Expv = \beta_0 + \beta_1 Eco_{(Foreign)} + \beta_2 RP + \beta_3 Pol_{(Home)} + \beta_4 Exr + \beta_5 \sigma^2 + \beta_6 Eco_{(Home)} + \beta_7 Lag(Expv) + \varepsilon$$

### *Interpretation*

- i.  $Expv$  = Exports volume of Pakistan to its different trading partners
- ii.  $Eco_{(Foreign)}$  = Economic condition of foreign country
- iii.  $RP$  = Relative prices of Pakistan as compared to its trading partner country
- iv.  $Pol_{Home}$  = Political condition of home country
- v.  $Exr$  = Nominal exchange rate of Pakistan
- vi.  $\delta^2$  = Conditional Variance
- vii.  $Eco_{Home}$  = Economic condition of Home country
- viii.  $Lag(Expv)$  = Lag of export volume of Pakistan

### *Data (Sources And Description)*

Export volume to different trading partners of Pakistan is the dependent variable in this study so disaggregated data of exports volume of Pakistan from 1982 to 2014 is extracted from various issues of Pakistan Economic survey. Gross Domestic Product per Capita is widely used as a measure of economic condition in home country so in this study GDP Per Capita is used as a proxy for economic condition in home country. Economic condition in foreign country is also an important variable in our study. Data for GDP per Capita in both home country and foreign from 1982 to 2014 is taken from “World Economic Outlook (WDI 2014)” issued by International monetary fund annually. Uncertainty in the exchange rate is the conditional variance nominal exchange rate series calculated through GARCH process. As GARCH process requires high frequency data so for this purpose monthly data of nominal exchange rate of Pakistan is taken from the International Financial Statistics (IFS). Political instability is an important non-economic variable in this used. Data for Political instability from 1982 to 2014 on is taken from “Freedom house”<sup>3</sup>. This survey attempts to find and asses the participation of every citizens of a country in the political process. Different scores are allotted to each country on the basis of “free”, “partly free” and “Not free”. Weights ranging from 1 to 7 are allotted to each of the country based on civil liberties and political rights. Proper dummies are constructed in case of Pakistan i.e Political instability score is “1” if Pakistan is politically free or partly free and “0” if Pakistan is not politically free.

Relative prices are used as a measure of inflation and are believed to be a very important determinant of exports. Higher relative price means that the local products

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<sup>3</sup> Freedom house is an American based organization which publishes its annual report on different countries on political stability, social and liberty rights.

became expensive which decreases its demand. Relative price is measured separately for all the trading partner countries as (Chit et al 2008)

$$\text{Relative prices} = \frac{\text{WPI(Pak)}}{\text{CPI(Partner)}} * \frac{1}{\text{ER(Partner)}}$$

Relative prices<sup>4</sup> was measured as whole sale price index of Pakistan divided by Consumer price index of trading partner country multiplied by one divided by nominal exchange rate of trading partner country.

### *Generalized Autoregressive Conditional Heteroscedasticity (Garch)*

One of the assumptions of classical linear model is that residual terms will always be having a normal mean while its variance will always be equal to one equal and this assumption is commonly called as Homoscedasticity.

$$\text{Var}(\varepsilon_t) = \delta^2 \tag{2.1}$$

The OLS estimates will be wrong if the variance is not constant and is considered to be Heteroscedastic. In dealing with real world data this assumption of variance is not necessary to be consistent all the time, so to address this kind of problem it is not required to rely on the consistency of its assumption which in most of the cases leads to autoregressive conditionally heteroscedastic model for the errors of variance.

$$\delta_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 \tag{2.2}$$

Equation 2.1 is called ARCH 1 model. The basic problem associated with ARCH 1 model is that in some cases it violated the non-negativity constraints. So the solution for this problem is allowing the conditional variance to depend upon its own previous lag Bollerslev (1986). This is called as the GARCH model of variance and is an extension of ARCH model.

$$\delta_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta \delta_{t-1}^2 \tag{2.3}$$

For variance equation this is like ARMA (1, 1) model and is called GARCH (1, 1) model of variance. GARCH model is mostly used in modelling of financial time series. It can also be incorporated in ARMA model. GARCH model gives superior estimation of the volatility and considered to be a best forecast of variance. Hence in this study it is being used.

### *Testing for Stationarity*

Times series data in most of the cases comes across the problem of un-stationarity or unit root so in order to keep the time series data stationary and more importantly to avoid spurious regression<sup>5</sup> problem different econometric techniques are used. Augmented

<sup>4</sup> Estimated by Chit et al. (2008)

<sup>5</sup> Spurious regression is a type of regression in which two variables are wrongly estimated and they are wrongly interpreted which causes to unbiased results.

Dicky-fuller technique (ADF) is the most advanced version of Dickey fuller (DF) technique with having more advanced time series models.

Simple Autoregressive model can be represented as:

$$Y_t = \alpha Y_{t-1} + \varepsilon_t \quad (2.4)$$

The hypothesis of (i)  $H_0 : \alpha = 1$  indicates that the series has unit root is tested against the alternative hypothesis of (ii)  $H_1 : \alpha < 1$  which shows that the series is stationary. In order to avoid the problem of autocorrelation lags are added to Augmented Dickey-fuller technique (ADF) so the general form of the ADF test becomes

$$\Delta Y_t = \alpha Y_{t-1} + \alpha_1 \Delta Y_{t-1} + \dots \dots \dots \alpha_k \Delta Y_{t-(k+1)} + \varepsilon_t \quad (2.5)$$

Or

$$\Delta Y_t = \delta + \alpha Y_{t-1} + \sum_{i=1}^k \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (2.6)$$

*Generalized method of moments (gmm)*

In order to estimate an econometric model different estimation techniques can be used. One of the most used estimation technique is the Ordinary Least Square (OLS). But to have consist estimate OLS technique cannot be applied due to the presence of endogeneity<sup>6</sup> problem. Other preferred estimates are Generalized method of Means (GMM), Three Stage Least Square (3SLS) etc. In this study Generalized Method of Means (GMM) estimation technique will be used due its ability to overcome the problem of endogeneity and its ability to captures country specific effects because disaggregated country wise data is used in this study and due to similarity of the data it often creates the problem of endogeneity because separate equation for separate trading partner is going to be calculated which in most of the cases leads to the this problem when we use OLS or 3SLE technique in finding the parameters of our model. To avoid many time series problems, GMM is considered to be the most sophisticated technique.

**Results and discussion**

Before estimating GARCH model it is very essential to analyze the trend in the data graphically. The exchange rate needs to be normally distributed in order to get the conditional variance series. The graphical analysis of the Nominal exchange rate has been presented as under.

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<sup>6</sup> Problem of endogeneity arises when there exists a correlation between the independent variable and the error term in the model which leads to unbiased results.

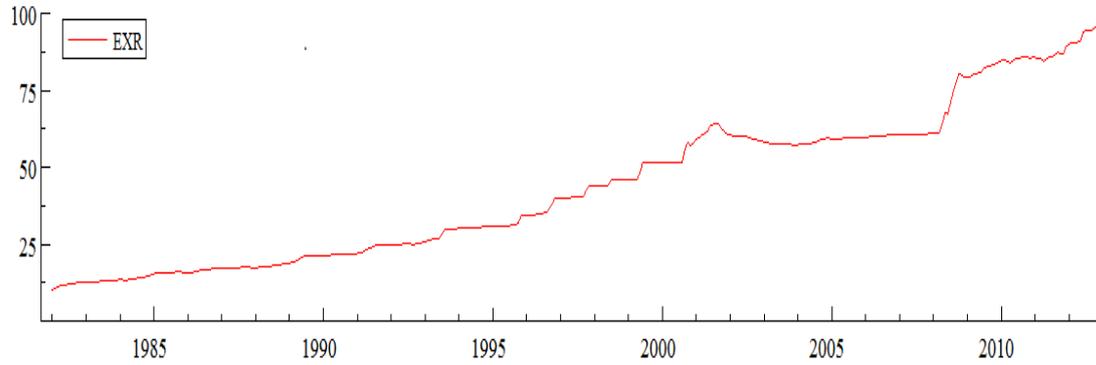


Figure 4. Nominal exchange rate trend

Source: Author's own construction using data from International financial statistics 2014

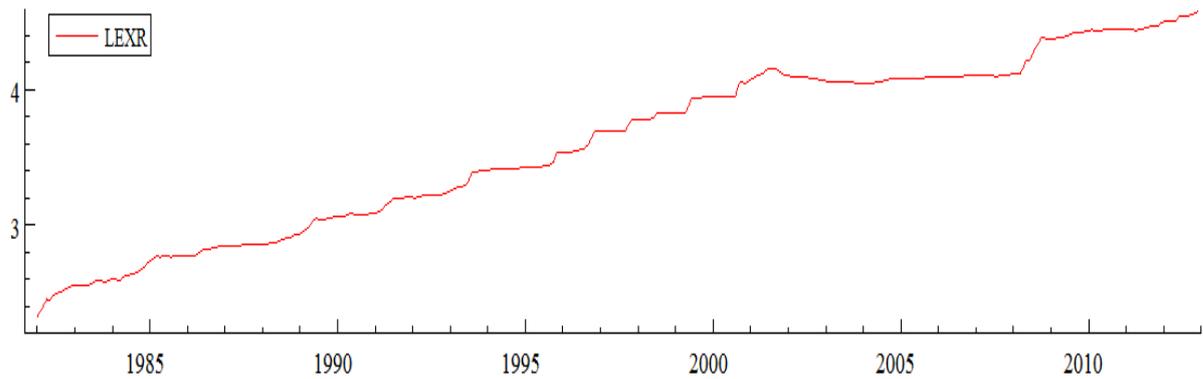


Figure 5 log transformation of nominal exchange rate of pakistan

Source: Author's own construction using data from International financial statistics 2014

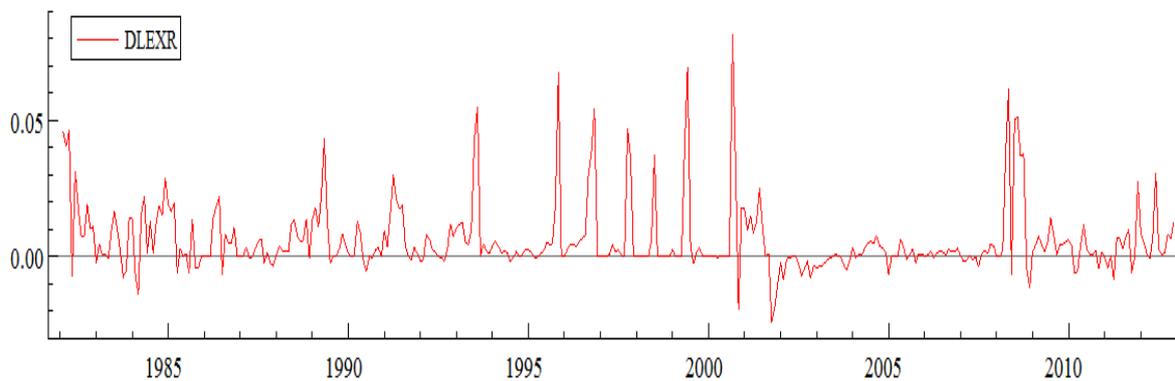


Figure 6 d-log transformation of nominal exchange rate of pakistan

Source: Author's own construction using data from International financial statistics 2014

Figure 4 show that the nominal exchange rate has an upward trend which does not fulfill the condition for fitting of an efficient GARCH model. So it became necessary to proceed to the next step by taking the natural log of nominal exchange rate. Figure 06 shows difference and log transformation (D-Log) of nominal exchange rate which makes the series becomes stationary and fulfills the condition of a stationary series for a best fit GARCH model.

*Fitting of garch (generalized autoregressive heteroscedasticity) model.*

Prior to going for a best fit GARCH model, there are very important steps which need to be perfumed. The first and most important step is normalizing the raw data. In the following table the descriptive statistics of raw data has been presented before applying the GARCH process. The statistical value for Kurtosis of D-Log transformation of nominal exchange rate is positive which indicates that the data is not normal which allows us to use student T distribution. In order to check for Stationarity Augmented dickey fuller test has been applied which shows that both the raw data and log transformation data of nominal exchange rate is non-stationary while D-Log transformation of nominal exchange rate is stationary at level.

In order to identify the presence of No-arch effect in the series LM Arch test<sup>7</sup> is used to check the Null of No-arch effect. Section -1 show the results of LM-Arch test conducted for the presence of Arch effect. LM-Arch test confirmed Arch affect by rejecting the Null hypothesis of No-Arch effect at 05 percent level of significance. GARCH model has two equations namely the mean equation (ARMA) and the variance equation. Mean Equation is used to generate the conditional variance through the variance equation of the model. Both mean and variance equation shows that ARMA and GARCH terms are significant at 05 percent level of significance indicating that volatility is an important determinant of exchange rate. Increased coefficient regarding ARCH term as compared with GARCH period suggests that the news from preceding times describes a lot more volatility when compared with conditional variance regarding previous time period. Section 3 of the table shows the final model diagnostics. Model diagnostic is done so that there is no ARCH effect left in the model. The result indicates that the model GARCH (1, 1) is best fit and there is no ARCH effect left in the model.

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<sup>7</sup> Lm-Arch test is used for presence of problem of Autocorrelation in the series.

Table 3 results of garch (1, 1) process

	Variables	Nominal exchange rate	Log transformation	D-log transformation
1.	Lm arch test			
	Arch 1-2	1.8362e+00 [0.0000]**	4.4976e+005 [0.0000]**	15.070 [0.0000]**
	Arch 1-5	74031 [0.0000]**	1.8231e+005 [0.0000]**	5.7599 [0.0000]**
2.	Mean equation		Variance equation	
	M	0.001469 (0.0001)	Constant ( $\Omega$ )	-0.854155** (0.0012)
	Ar (1)	0.432699* (0.0064)	Arch (alpha 01)	0.785171*** (0.0000)
	Ma (1)	0.001398* (0.09925)	Garch (beta 01)	0.068746** (0.02573)
	Student df	2.750740 (0.0000)	Alpha(1)+beta(1)	0.8539
3	Model diagnostic			
	Arch 1-2		0.048747 [0.9524]	
	Arch 1-5		0.084982 [0.9946]	
	Arch 1-10		0.069725 [1.0000]	
Note: 1. Mean equation arma (1,1) and variance equations garch (1,1) shows significance at 10% (*), 5% (**) and 1% (***) respectively .				

*Augmented dickey fuller test (adf) tests*

Results of Augmented dickey fuller (ADF) test are furnished in table 4. The results of Augmented dickey fuller (ADF) test indicates that all the variables are not stationary at level but become stationary by taking their first difference. Exports volumes of Pakistan to United States of America and American GDP per capita variables as a proxy for economic condition of importing country are stationary at 10 percent level of significance while the remaining variables are stationary at 05 percent level of significance.

Table 4: augmented dickey fuller (adf) test

Variables	Exports (EXPV)		Relative prices (RP)		Pol <sub>(Home)</sub>		Nominal Exchange Rate (Exr)		ECO <sub>(Home)</sub>		ECO <sub>(Foreign)</sub>	
	Country	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level	First Difference	Level
USA	1.29 (0.99)	-1.85* (0.062)	-1.52 (0.12)	-7.50*** (0000)	-0.73 (0.38)	-5.25*** (0.002)	2.907 (0.998)	-3.43** (0.018)	3.40 (0.99)	-4.98*** (0.004)	2.29 (0.99)	-2.93* (0.05)
UK	-1.62 (0.75)	-8.56*** (0.000)	0.93 (0.90)	-4.27*** (0.0001)	-0.73 (0.38)	-5.25*** (0.002)	2.907 (0.998)	-3.43** (0.018)	3.40 (0.99)	-4.98*** (0.004)	-1.67 (0.73)	-3.07** (0.003)
Kuwait	1.01 (0.91)	-7.17*** (0.000)	0.57 (0.83)	-4.23*** (0.0001)	-0.73 (0.38)	-5.25*** (0.002)	2.907 (0.998)	-3.43** (0.018)	3.40 (0.99)	-4.98*** (0.004)	1.24 (0.94)	-7.55*** (0.000)
Malaysia	2.29 (0.99)	-5.04*** (0.00)	0.288 (0.76)	-4.02*** (0.0002)	-0.73 (0.38)	-5.25*** (0.002)	2.907 (0.998)	-3.43** (0.018)	3.40 (0.99)	-4.98*** (0.004)	2.71 (0.99)	-4.01*** (0.0002)
KSA	-0.51 (0.87)	-4.48*** (0.0013)	-0.63 (0.43)	-4.58*** (0.000)	-0.73 (0.38)	-5.25*** (0.002)	2.907 (0.998)	-3.43** (0.018)	3.40 (0.99)	-4.98*** (0.004)	0.83 (0.88)	-3.71*** (0.0006)
France	-1.63 (0.75)	-5.95*** (0.0002)	0.005 (0.81)	-3.37*** (0.0015)	-0.73 (0.38)	-5.25*** (0.002)	2.907 (0.998)	-3.43** (0.018)	3.40 (0.99)	-4.98*** (0.004)	-1.62 (0.75)	-4.18** (0.013)
Hong Kong	1.37 (0.95)	-1.76* (0.074)	0.50 (0.81)	-3.35*** (0.0015)	-0.73 (0.38)	-5.25*** (0.002)	2.907 (0.998)	-3.43** (0.018)	3.40 (0.99)	-4.98*** (0.004)	-2.53 (0.30)	-4.41*** (0.0079)
Iran	0.139 (0.71)	-6.12*** (0.000)	1.57 (0.96)	-3.38** (0.021)	-0.73 (0.38)	-5.25*** (0.002)	2.907 (0.998)	-3.43** (0.018)	3.40 (0.99)	-4.98*** (0.004)	0.617 (0.84)	-3.64*** (0.0007)

Note: P- Values are given in parenthesis.

Critical values shows level of significances at (\*), (\*\*) and (\*\*\*) shows 10 %, 5 % and 1 % respectively.

### *Generalized method of moments (gmm) estimates*

The Generalized methods of moments (GMM) results are presented in table 3 The J. Statistics value in the table is approaching to zero which indicates that GMM model is best fit.

### *Economic condition at home country*

In this study GDP per capita is taken as a proxy for economic condition of home country. The GMM results indicates that if economic condition in home country improves the volume of exports to Saudi Arab, Hong Kong, and Malaysia significantly increases while the increase to United states, Kuwait and United Kingdom is also positive but insignificant while to the rest of countries the coefficient has negative sign which means that if the economic condition in home country improves the export volume to these countries significantly decreases. The positive relationship indicates that as the economic condition at home improves the economic activities at home increases increasing the volume of domestic production and also improves the quality of export goods because foreign demand increases while the negative sign indicates that as the economic condition at home improves the exporters of Pakistan searches for new markets and partners which are more near to the country and the profit margin is higher

### Economic condition of importing country

Another important determinant of exports is the economic condition of importing country which plays a very important role in determining the volume of goods and services to be imported. In the context of international trade if the economic condition of trading partner improves it positively affects the volume of exports of the other trading partner country. In this study GDP per capita is taken as a proxy for economic condition of the importing country. The results shows that among eight trading partners of Pakistan five countries economic condition has positive significant relationship with the exports volume of Pakistan. In case of Saudi Arab, France, United Kingdom, Malaysia and Hong Kong the relationship significantly positive indicating that if the GDP per capita improves of the these countries their demand for Pakistani products increases significantly. While in case of Iran and United States of America the results are opposite showing that if the economic condition of Iran and United States of America improves the exports volume of Pakistan decreases to both Iran and United States of America. This negative sign also indicates that when the economy improves by increasing the GDP per capita the reliance on locally products increase bringing a decrease in the Imports.

### Political instability

In this study Political instability is one of the important non-economic determinants of exports. From literature it is clear that as the political condition of a country stabilizes the economic activities flourishes bringing an increase in the volume of exports to the other countries. The result shows that the sign political instability term is positive only in case of France while in case of other seven trading partner countries political instability has a negative and significant impact on the volume of exports indicating that at one side due to political instability the economic activities in the country shrinks which declines the demands for its goods and services significantly.

### Relative prices

Another important variable in this study is the relative prices. If the relative prices of Pakistani commodities increases this indicates that the export commodities become expensive for the foreign countries showing a decrease in the volume of exports from Pakistan. Mixed results are evident from this study. The results from this study shows that sign of coefficient for United States, UK, Saudi Arab, France and Iran is positive and significant which indicates that the increase in prices has positive effect on the volume of exports. This positive sign may also indicates that in case theses trading partner countries the exports commodities are specialized commodities of Pakistan so if their prices increases their demand is very less effected to these countries. However in case of Kuwait, Malaysia and Hong Kong the sign of coefficient is negative and significant only indicating a handsome amount of decrease in the volume of exports if the relative prices changes.

### Exchange rate uncertainty

As the title of this study indicates that the most important and objective variable of this study is finding the effect of exchange rate uncertainty. The exchange rate uncertainty

variable is calculated using the GARCH process. The conditional variance series generated through the GARCH process is used as a proxy for exchange rate uncertainty. The result from this study indicated that the relationship between exchange rate uncertainty and exports is negative in case of almost all of the trading partners. The sign of coefficient of conditional variance term is negative and significant in most of the cases. The magnitude of coefficient of all the countries is fair enough to indicate that the exchange rate is more volatile and it will negatively affect the volume of exports to its trading partner countries. The exchange rate uncertainty only in case of Saudi Arab has negative insignificant impact on exports volume otherwise in case of other seven trading partner countries the exchange rate uncertainty has negative significant impact on the volume of exports.

### Nominal exchange rate

An important determinant of exports is the nominal exchange rate. Exchange rate is the value of domestic currency in terms of foreign currency. Nominal Exchange rate is an important policy variable in this study. The results presented in table 5 indicate that the relationship between exchange rate and exports in case of Pakistan is positive and significant in case of almost all trading partner countries except Malaysia. Changes in the exchange rate have positive but insignificant effect on the exports volume to Malaysia. United States of America, UK, Kuwait, Saudi Arab, Hong Kong and France have positive and significant effects on the exports volume. While in case of Iran the sign of coefficient is positive but insignificant. The magnitude of coefficient in case of most of the trading partners is also high enough which indicates a higher response of export volume to changes in the nominal exchange rate of Pakistan.

### Conclusions

This study contributes to a very large extent to the existing literature on the relationship between exchange rate uncertainty and exports. Some very unusual results are documented by this study in case of certain variables. Major contribution of this study is to find the effects of three important determinants of exports which were previously ignored. The study concludes that political instability negatively affects the volume of exports but the magnitude of political instability term is also higher and the relationship in case of most of the trading partner countries is also negative and significant. Relative prices as a proxy for inflation negatively affect the volume of exports. Higher the prices of export commodities lower will be the demand for export commodities in case of Pakistan. If Pakistani rupee devalues it export demand increase proving the application of martial learner condition in case of Pakistan. This can also be concluded that exports of Pakistan are very responsive to increase in incomes of both host country and home countries.

Table 5 Generalized method of Moments (GMM) Results

Variables	$Eco_{(Foreign)}$	$RP$	$Pol_{(Home)}$	$Exr$	$C.Var$ ( $\delta^2$ )	$Eco_{(Home)}$	$Lag\ of$ $Exp.$	$C$	$R^2$	$D-W$	$J-$ $Statistics$
Country	$\beta_1$	$\beta_2$	$\beta_3$	$\beta_4$	$\beta_5$	$\beta_6$	$\beta_7$				
USA	-0.723 (0.341)	1.00*** (0.000)	-0.227*** (0.0004)	0.479*** (0.0001)	- 0.0091** (0.0321)	0.0128 (0.438)	0.072 (0.072)	17.37* (0.0123)	0.997	2.65	0.14
UK	0.219** (0.0307)	0.168*** (0.000)	-0.0503* (0.026)	0.546*** (0.000)	- 0.004*** (0.000)	0.076 (0.233)	0.628 (0.000)**	0.764* (0.097)	0.98	2.97	0.23
Kuwait	0.083 (0.150)	- 0.420*** (0.000)	-0.048* (0.027)	0.604*** (0.000)	- 0.004*** (0.002)	0.011 (0.897)	0.549 (0.000)**	-1.180* (0.073)	0.89	2.297	0.211
Malaysia	0.502** (0.004)	- 5.564*** (0.000)	-0.769*** (0.000)	- 1.776*** (0.000)	-0.011** (0.0169)	2.630*** (0.000)	0.693 (0.000)**	- 34.5*** (0.00=0)	0.95	2.88	0.227
KSA	3.123*** (0.000)	0.156** (0.007)	-0.221*** (0.000)	0.493*** (0.000)	-0.001 (0.457)	3.123*** (0.000)	0.599 (0.000)**	- 5.84*** (0.000)	0.92	2.39	0.25
France	0.715*** (0.000)	0.767* (0.098)	0.003 (0.656)	0.557*** (0.000)	- 0.006*** (0.000)	-0.395*** (0.000)	0.471 (0.000)**	- 1.53*** (0.0008)	0.983	2.20	0.23
Hong Kong	2.35*** (0.000)	-0.042 (0.730)	-0.217*** (0.000)	0.172*** (0.006)	- 0.005*** (0.000)	0.774*** (0.000)	-0.042 (0.134)	- 9.11*** (0.000)	0.950	2.230	0.23
Iran	-0.874 (0.162)	2.15 (0.594)	-1.386** (0.009)	2.934 (0.594)	-0.027* (0.0851)	5.454** (0.045)	0.116 (0.742)	-23.83 (0.121)	0.754	1.87	0.36

Note: P- Values are given in brackets. Critical values shows level of significances at (\*), (\*\*) and (\*\*\*) shows 10 %, 5 % and 1 % respectively.  
 Source: Author's estimation based on data collected From WEO with computer program Eviews.

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