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Exchange Rate Volatility and Economic Growth: An ARDL Analysis

Tayyba Aslam
M. Sc. Student, Department of Management Sciences, COMSATS University Islamabad, Vehari Campus

Abstract

It has been argued by some empirical researches that exchange rate volatility has a positive effect on exports and economic growth. However, while some empirical researchers have been able to argue for the negative effects of volatility to exports and economic growth and others have been able to argue for positive or no effects at all. However, in this study we examine the impact of exchange rate volatility on economic growth of Pakistan by using annual time series data from 1972 to 2019. In this study we used some econometric techniques to find out the relationship between the variables. The study used Auto regressive distributed lag (ARDL) to check the relationship among the variables which are under consideration. The results suggested that exchange rate volatility and economic growth have positive and significant relationship in long run and negative and insignificant relationship in short run. ERV, IVA, AVA, SVA had significant impact in the long run but INF, ER had insignificant impact in the long run. Inflation had negative and insignificant impact on economic growth. It is not possible to completely eliminate the exchange rate volatility so the government should adopt efficient macroeconomic policy that minimize the volatility of their respective currency.

INTRODUCTION

1.1. Statement of the problem

The impact of asymmetric shocks causes by exchange rate volatility on economic growth has been major absorption of both academic and policy makers for some decades now. According to the literature the depreciation of exchange rate tends to increase to exports and reduced imports. While appreciation of exchange rate decreases the exports and increased the imports. So, the deprecation of exchange rate causes income transfer from importing countries to exporting countries through a shift of term of trade and this affects the economic growth of both importing and exporting nations.

Exchange rate fluctuations have involved in staggering manners and its big impact on exchange rate fluctuations have evolved in an astonishing manner largely on its impact on exports (Arize, Osang, & Slottje, 2000; Assery & Peel, 1991; Bahmani-Oskooee & Hegerty, 2007; Vieira & MacDonald, 2016; Wang & Barrett, 2007), employment growth (Belke & Setzer, 2003; Belke & Kaas, 2004), trade (Bredin, Fountas, & Murphy, 2003; Clark, Tamirisa, & Wei, 2004; Doyle, 2001; Musila & Al-Zyoud, 2012; Imran et al., 2021; Tenreyro, 2007); inflation (Danjuma, Shuaibu, & Sa'id, 2013);investment (Fuentes, 2006; Kiyota &Urata, 2004; Serven, 2002), and more generally economic activity (Adewuyi & Akpokodje, 2013; Kandil, 2004) and growth (Danne, 2006; Holland et al. 2011; Levy-Yeyati & Sturzenegger, 2003; Mundell, 1995).

The studies on the effect of exchange rate volatility on exports in ASEAN-5 group in which include Thailand, Malaysia, Singapore, Indonesia, and the Philippines (Kamal P. Upadhyaya 2020). Estimation of each ASEAN county used panel data. The result of this study showed that change in world output and domestic output has a positive effect on export volume and when decline in the terms of trade has a negative effect on export volume. Exchange rate volatility had a negative effect on export volume of ASEAN-5.

This study on exchange rate volatility on exports in Vietnam using quarterly data from the first quarter of 2000 to the fourth quarter of 2014(Vinh Nguyen Thi Thuy & Duong Trinh Thi Thuy 2019). This study showed the exchange rate volatility had negative effect on exports in the long

run. Devaluation of domestic currency negatively effects on exports in the short run but positively effect in the long run. An increase in the real foreign income causes decreased the exports of Vietnam.

This study on short run and long run impact of real exchange rate misalignment and volatility on Indonesian export to the US by using the quarterly data sample over the period 1990:Q1 – 2007:Q4 (Deni Kusumawardani1& M. Khoerul Mubin 2018).According to the result of this study the long run model showed that half of the commodities was significantly and positively affected by real exchange rate misalignment and only a small number of commodities is significantly affected by the exchange rate volatility. The long-run estimation shows that 10 out of 18 commodities were significantly affected by real exchange rate misalignment, and 9 of them were positive. The exchange rate volatility affected only 6 commodities 3 of them were negative and the other three were positive and in the short run 9 commodities were significantly affected by real exchange rate misalignment, where 8 of them had positive sign. The real exchange rate misalignment, the positive effect in both the short-run and the long-run.

This study on the impact of exchange rate volatility and international trade performance on 12 African countries by using quarterly data, over 1971Q1-2015Q4 (Mohsen Bahmani-Oskooee & Abera Gelan 2017). According to the this study the result showed in the short run exchange rate volatility increased and decreased exports in eight countries out of 12 countries that were Egypt, Ethiopia, Lesotho, Mauritius, Morocco, Nigeria, Sierra Leone, and South Africa and long-run had negative effects in Nigeria and Sierra Leon, and positive effects in Egypt, Ethiopia, and Lesotho. The world income had a major determinates of exports in most countries implying that as the world economy grows, Africa exports more. Unlike many other countries, there was not substitution effects in Africa. Substitution effect would had existed if the world income carried a negative coefficient estimate. In the short-run, volatility had significant effects on the imports of seven countries (i.e., Egypt, Lesotho, Mauritius, Morocco, South Africa, Tanzania, and Tunisia) and in long-run had positive and meaningful effects only in the case of South Africa.

This study on the impact of exchange rate volatility on international trade activities for Mexico, Indonesia, Nigeria, and Turkey for the period 1995-2012 using monthly data (Asteriou, D., Masatci, K. and Pilbeam, K. 2016). According to the results of this study there was no relationship between exchange rate volatility and international trade activities except for Turkey and even in this case the magnitude of the effect of volatility was very small in the long run. In the short run significant causal relationship from volatility to import/export demand in Indonesia and Mexico and in the case of Nigeria unidirectional relationship from export demand to volatility is found, while for Turkey no relationship between volatility and import/export demand was observed.

This study on the effect of Exchange rate volatility and on export performance of Tea firms by using the monthly time series data from January 2008 to December 2012 (Chirchir, Muse and Jagongo 2015). The results in this study indicated that exchange rate volatility and domestic tea prices were some of the variables that influenced export performance of tea firms in Kenya to the world markets. However, the tea substitute's prices did not influence the export performance of tea firms to the importing countries. The study further realized interdependence between exchange rate stability, macroeconomic stability and export performance and hence policy makers needs to consider the existing degree and likely effects of exchange rate volatility while designing, developing and implementing trade policies.

This study examined the role of effective exchange rate volatility on exports and also investigated the impact of international financial crises of 2008 by using set of 106 countries for developing and emerging economies without including oil exports countries for the period of 2000-2011

(Flavio Vilela Vieira & Ronald MacDonald 2015). This study showed if increase (decrease) real exchange rate volatility reduces (increase) export volume of the country and according to this study export volume were 0.14 percent higher after the financial crisis of 2008 compared to the previous period (2000-2007). There was also showed that the export volume was price (REER) and income (trade weighted) inelastic.

This study on examined the role of financial sector development in influence the impact of exchange rate volatility on the exports of five emerging East Asian countries – China, Indonesia, Malaysia, the Philippines and Thailand by using a panel data set of 85 country-pairs for the period from 1990:Q1 to 2006:Q4 (Myint Moe Chit & Amrit Judge 2014). According to this study the effect of exchange rate volatility on exports was depend on the level of financial sector development. The countries that had less financially development economy its exports were very affected by exchange rate volatility and those countries that had strong financial development these countries exports were less affected by exchange rate volatility.

The Impact of exchange rate movements on exports: An analysis of Indian non-financial sector firms by using Indian non-financial sector firms for the period 2000 to 2010 (Yin-Wong Cheung and Rajeswari Sengupta 2013). The empirical results showed there had been a strong and significant negative impact on currency appreciation and currency volatility on market shares of India's exporting firms. Indian firms asymmetrically effects to exchange rates. Real effective exchange rate (REER) change effects it arise from a negative appreciation effect than a depreciation effect. Indian firms that had a small share of exports their response to REER and volatility most strong then the firms that had a large share of exports. Exporter's services were impacted more strongly by exchange rate fluctuation then the firms exporting goods.

This study on the impact of the impact of exchange rate volatility on Exports in Turkey. Turkey aggregate export was examined for the period of 2003:2 to 2010:12 and monthly data were used in estimation (Harun Yüksel et.al… 2012). This study shows there was a negative relationship between exports and volatility, but this relationship was not significant at the level of 5%. There were many researches the impact of exchange rate volatility on exports but there was no unity for validation of the results. High fluctuations in exchange rates create uncertainty about the profits to be made then reducing the gains of international trade and hampering the volume of trade.

This on the impact of Exchange Rate Volatility and Exports: New Empirical Evidence from the Emerging East Asian Economies by using 25 years of quarterly data of five emerging East Asian countries as well as 13 industries countries and examine the exports between the emerging East Asian and industrialized (Myint Moe Chit Et.al (2010). This study showed that exchange rate volatility was negative impact on the exports of emerging East Asian countries.

This study on the impact of exchange rate volatility on Turkish Exports by applying the quarterly data for the period 1993Q3- 2009Q4 (Halil Altinta et.al…. 2009). According to this study long run estimation results show that foreign income and real exchange volatility had positive and significant impact on Turkish export and relative price effect on Turkish export had negative and significantly. ECM showed that relative price had a negative significant impact, foreign income had an insignificant impact and nominal exchange rate volatility had positive and significant impact on Turkish exports.

This study on the impact of exchange rate volatility on exports and its effect on foreign trade of eight Latin American countries over the quarterly period 1973–2004 (Augustine C. Arize et.al.2008). The results showed increased the exchange rate volatility had a negative effect on exports in both short run and long run in each Latin American countries.

This study the on impact of exchange rate volatility on exports in four East Asian countries (Hong Kong, South Korea, Singapore, and Thailand) and using the quarterly export volumes of East Asian countries to the US and Japan for the period from 1981 to 2004 (Vixathap et.al... 2007). The study concluded that the exchange rate volatility has negative impacts on exports either in the short-run or in the long-run, or both. However, the study found that the impact of the exchange rate volatility does not show any stylized differences depending on whether the importing country is Japan or the USA, even though dollar invoicing dominates in East Asia.

This study examine Short-Run and Long-Run Effects of Exchange Rate Volatility on the Volume of Pakistan Exports and its major trading partner countries under the fixed exchange rate regime for the period 1985 to 2001(Thanasis Stengos Et.al 2005). The result of this study shows the exchange rate volatility has negative effect on the exports. In Pakistan exporters are risk-averse that is mean increase in exchange rate volatility, exporters reduce their exports to reduce their risk. This study showed the impact of exchange rate volatility on growth and economic performance in Pakistan by using annually data from 1973 to 2003 that were collected from Statistical Bulletin of Government of Pakistan, Finance Division (Toseef Azid et.al…. 2005) this study showed when flexible exchange rate used it had positive impact on economic performance but cannot measure the impact of exchange rate uncertainty on GDP growth.

This study showed the impact of exchange rate volatility on UK exports to EU countries by using monthly data disaggregated by market of destination and sectors for the period 1993ml to 2001m6 (Glauco de Vita and Andrew Abbott 2004). . This study showed that UK exports to the E14 were generally income elastic and relative price inelastic. In the short-term exchange rate volatility appeared had a statistical insignificant effect on UK exports to the EU14 at both aggregate and sectorial level but in the long run exchange rate volatility had a negative and significant impact on export volume.

This study showed the impact of terms of trade and real exchange rate volatility on investment and growth in sub-Saharan Africa by using panel data of 14 sub-Saharan African countries over 1980–1995 (Michael Bleaney & David Greenaway 2000). According to this study exchange rate volatility had a negative effect on investment and in the of trade also negative impact on investment. When the terms of trade are more favorable, and the real exchange rate was less overvalued then growth and investment both were higher. Absence of any trend decline in the terms of trade; it is difficult to explain this real depreciation as an equilibrium adjustment.

1.2 . Objective of this study

1.2.1. Explore the link between Exchange Rate Volatility and Economic Growth

Our objective of this study of exchange rate volatility is that we find the relationship between exports, imports, trade and economic growth.

1.3. Significance of the study

1: The study has encapsulated the impact of exports and trade in analysing the along with exchange rate volatility

2: The study offers some policy recommendation on behalf of estimation results

1.4. Organization of the study

The study organized the exchange rate volatility into different chapters. First chapter is the ‘Introduction’ in this chapter we introduce the exchange rate volatility. And introduce the relationship between exchange rate volatility and economic growth.

Second chapter is the Literature Review. In this chapter we describe different articles reviews related to exchange rate volatility. These articles are related to national and international study.

Third chapter is related to Data model and Methodology, in this chapter we describe the data source, type of data, and describe the methodology techniques. We used secondary data for observation.

Fourth chapter is related to result and interpretation of the results. In this chapter we used different models like ARDL model, ADF Unit root test for finding our result, in this chapter we find results in short run as well as in long run.

Fifth chapter is related to Conclusion and policy implication. In this chapter we conclude that who exchange rate volatility accept in Pakistan and we recommend the policies that implies in Pakistan for improve exports and economic growth.

LITERATURE REVIEW

2.1. Introduction

In this section overviewed existing researches developed in this field. It is difficult dilemma that exchange rate volatility really effects on the trade. Many empirical studies have introduced on this topic. So the results are mixed. So there are different view of points that have been supported by the empirical literature results. The big literature discussion starts on the international trade and its connection on exchange rate starts in the 30s of the twenty century. Some theoretical studies have views points the increase in exchange rate volatility causes to decline in the volume of trade flows (Clark, 1973; Hooper and Kohlhagen, 1978). The recent studies suggest no clear cut relationship between exchange rate volatility and trade flows and economic growth.

2.2. Review of the previous studies

Kamal P. Upadhyaya et.al…. (2020) investigated the effect of exchange rate volatility on exports in ASEAN-5 group in which include Thailand, Malaysia, Singapore, Indonesia, and the Philippines. Estimation of each ASEAN county used panel data. In this study domestic output, world output, term of trade and exchange rate volatility were in-depended variables and export volume were depended variable. Export volatility was measured by GARCH model. Unit root tests were used to indicate that all the variables series were integrated in one order and they were stationary in first difference form. A Johansen-Fisher panel co integration test was reject the null hypothesis of no co integration. The model of this study showed the error correction term was used to show that unobserved country-specific variables were not correlated with in-depended variables. The result of this study showed that change in world output and domestic output had a positive effect on export volume and when decline in the terms of trade had a negative effect on export volume. Exchange rate volatility had a negative effect on export volume of ASEAN-5. According to the result of this study suggest that it is not possible to completely eliminate the exchange rate volatility so the government should adopt efficient macroeconomic policy that minimize the volatility of their respective currency. ASEAN-5 countries should adopt floating exchange rate system and the central bank of the countries should intervene in the market to minimize the exchange rate volatility and central banks might work to reduce the volatility in their respective price level.

Van Chien Nguyen & Thi Tuyet Do (2020) investigated the effects of inward every sight of foreign investment, import, and real exchange rate shocks on export performance in Vietnam by using time series dataset in the period of 2009 – 2018 and data were collected from the General Statistics Office of Ministry of Planning and Investment in Vietnam, World Development Indicator and Ministry of Finance, State Bank of Vietnam. Augmented Dickey–Fuller test and the vector error correction model with the analysis of co integration were used in this study. According to this study the higher value of imports significantly quickens export performance in the short run but insignificant in long run. When the foreign investment increased then the export performance

more decreased in both short run and long run. According to this study exchange rate effect on the external balance in the long run but not effect in the short run. So, Vietnam export performance converges on its long-run equilibrium by approximately 6.3% with the speed adjustment via a combination of import, every presence of foreign investment, and real exchange rate fluctuations. Historically, countries worldwide are more likely to devaluate their currencies to support export performance. This evidence is not supported by Kemal and Qadir (2005) who said that exchange rate is negatively consistent with export activities. This result is in line with the studies of Nguyen and Trinh (2019), a depreciation of local currency impacts export negatively in the short run but positively in the long run.

Mukesh Kumar et.al… (2020) estimated the impact of currency depreciation on exports of SAARC countries by using panel data set for the period of 1981 to 2017of four selected countries (Pakistan, India, Sri Lanka, and Bangladesh). The dataset had been collected from World Development Indicators (WDI) and International Financial Statistics (IFS). To estimate the changing of core variables were incorporated through panel ARDL model. According to the result of this model currency depression had indirect and significant impact on exports in the long run. If increase in real exchange rate it reduced the exports of the South Asian economics. In this study ECM model confirmed that the model had converge to its equilibrium in long term. So the currency depreciation in the developing economies of South Asia had not been found effective in improving the exports and trade of these economies. Inelastic nature of exportable products; lack of market diversification, confinement of domestic demand in international markets; and limited regional integration among SAARC economies were the noticeable elements of declined exports. So. The SAARC countries should decreased their external and internal regional risks and issues directly in order to control the high gap of exports declining.

Vinh Nguyen Thi Thuy & Duong Trinh Thi Thuy (2019) estimated the impact of exchange rate volatility on exports in Vietnam using quarterly data from the first quarter of 2000 to the fourth quarter of 2014. Autoregressive distributed lag (ARDL) bounds testing approach was used to estimate the level of relationship between effective exchange rate volatility and exports. According to this study showed the exchange rate volatility had negative effect on exports in the long run. Devaluation of domestic currency negatively effects on exports in the short run but positively effect in the long run. An increase in the real foreign income causes decreased the exports of Vietnam. According to this study suggest Some important policy implications, firstly the state bank of Vietnam should announcing a solid exchange rate between VND and the US to announcing a central rate and cross rates with eight strong currencies in the right direction to promote the exports. Secondly, government should adopt the policy that down the problems of Vietnam exports. Production cost, brand value, product quality, and technology content are key factors which threaten to decrease exports volume.

Chen Liminga et.al…. (2019) investigated the Impact of economic policy uncertainty (EPU) on exchange rate volatility of China from December 2001 to November 2018. The relationships between EPU and exchange rate volatility were likely to perform discriminately at different quintiles. In this regard, the quintile regression method allows the coefficients to vary with multiple quintiles so quintile regression (QR) was applied. The result of this study showed the impact of economic policy uncertainty on exchange rate volatility in China expose asymmetric as well as heterogenetic in different markets and EPU for china impacts positively and significant on exchange rate quintile volatility. It was also observed that EPU has a mixed effect on exchange rate volatility with apparent economy-by-economy differences. The US, Europe and Japan EPU had significant impacts, while Hong Kong EPU was insignificantly correlated with exchange rate

volatility. Policymaker should manage exchange rate fluctuations and averting protentional risks that may arise due to significant dependence among different markets.

Duc Hong Vo et.al….. (2019) investigated the impact of exchange rate volatility on manufacturing exports so according to this purpose taking the data of the manufacturing sectors and 10 of its sub sectors that were engaged in the exports of goods between Vietnam and 26 its key export partners during the period 2000-2015. GARCH model was used to measure exchange rate volatility. This study focus the link between exchange rate volatility and export performance. The potential factors that affect the relationship such as the global financial crisis, Vietnam's participation in the World Trade Organization, or even the export partners' geographic structures, were also accounted for in the model. According to the result of this study showed the strategy that depreciate the currency of Vietnam causes to increased manufacturing exports in the short run and the exchange rate volatility had negative effect on manufacturing exports in the long run. Exchange rate volatility impact on manufacturing subsectors depends on two factors firs the type of export and second export destination. Policy maker should focuses on these factors before recognized the policy.

Deni Kusumawardani1& M. Khoerul Mubin (2018) examined the short run and long run impact of real exchange rate misalignment and volatility on Indonesian export to the US by using the quarterly data sample over the period 1990:Q1 – 2007:Q4. The real exchange rate misalignment was obtained by estimating the fundamental equilibrium exchange rate (FEER) model, and the exchange rate volatility measured by employing the GARCH model ARDL bound test approach was employed to check to check the existence of long-run equilibrium between export volume and the variable under consideration. The short-run estimation using the error correction model. The long run model showed that half of the commodities was significantly and positively affected by real exchange rate misalignment and only a small number of commodities is significantly affected by the exchange rate volatility. The long-run estimation shows that 10 out of 18 commodities were significantly affected by real exchange rate misalignment, and 9 of them were positive. The exchange rate volatility affected only 6 commodities 3 of them were negative and the other three were positive and in the short run 9 commodities were significantly affected by real exchange rate misalignment, where 8 of them had positive sign. The real exchange rate misalignment, the positive effect in both the short-run and the long-run. When the price of tradable goods relatively higher than the no tradable goods, some of the production resources will automatically move from the production of no tradable to that of tradable goods.

Alexey Yurievich Mikhaylov (2018) estimated the volatility spillover effect between stock and exchange rate in oil exporting countries in Russia and Brazil. The data sample based on daily observation. FIGARCH model was used in this study to predict volatility if the structural breaks are incorporated in the model. In the emerging markets volatility spillover was observed mainly in one direction: from the currency market to stock market. A model was developed to predict the impact of oil prices on stock market indices for Russia, Brazil. The results indicate that bidirectional spillover effect existed in the period 2009–2017 years. It was strong before the Late–2000s Financial Crisis. The results of this research could be useful for institutional and individual investors, as they can get advantages from knowing the model long memory for forecasting the volatility in the emerging markets.

Mohsen Bahmani-Oskooee & Abera Gelan (2017) estimated the impact of exchange rate volatility and international trade performance on 12 African countries by using quarterly data, over 1971Q1-2015Q4. To estimate the impact of exchange rate volatility on exports and imports both in short run and long run used the bounds-testing approach. In the short run exchange rate volatility

increased and decreased exports in eight countries out of 12 countries that were Egypt, Ethiopia, Lesotho, Mauritius, Morocco, Nigeria, Sierra Leone, and South Africa and long-run had negative effects in Nigeria and Sierra Leon, and positive effects in Egypt, Ethiopia, and Lesotho. The world income had a major determinates of exports in most countries implying that as the world economy grows, Africa exports more. Unlike many other countries, there was not substitution effects in Africa. Substitution effect would had existed if the world income carried a negative coefficient estimate. In the short-run, volatility had significant effects on the imports of seven countries (i.e., Egypt, Lesotho, Mauritius, Morocco, South Africa, Tanzania, and Tunisia) and in long-run had positive and meaningful effects only in the case of South Africa.

Zouhair Mrabet and Mouyad Alsamara (2017) examined the impact of parallel market exchange rate volatility and oil exports on real GDP in Syria over the period of 1990Q1–2010Q4. Autoregressive distributed lag (ARDL) model was used to instigated the impact of real exchange rate volatility on real GDP. The results showed that real GDP was explained by three main variables: parallel market exchange rate, money supply, and oil exports. The long-run equilibrium showed that parallel market exchange rate volatility had a negative impact on real GDP and the positive impact of money supply and oil exports. In the short-run impact of parallel market exchange rate volatility on real GDP growth was positive and had a very small impact in the long run. Empirical analysis suggests that Syria, as a developing country and increase its economic growth when the exchange rate is more stable. The policy implication in a country like Syria had to reduce exchange rate volatility. In the long-run, a stable exchange rate regime has a positive impact on foreign trade and economic growth. There is not possible a complete stability of exchange rate in developing countries such as Syria because there are many shocks that hits these countries. So that Syrian monetary policy should reduce exchange rate volatility to promote economic growth and reduce the uncertainty in the economy.

Bernardin Senadza & Desmond Delali Diaba (2017) examined the effect of exchange rate volatility on trade in Sub-Saharan Africa by using a sample of 11 floating-exchange rate SSA economies, namely, the Gambia, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Nigeria, Sierra Leone, Tanzania, Uganda, and Zambia, from 1993 to 2014. GARCH model was used to measure the exchange rate volatility. This study not showed the effect of exchange rate volatility on imports. Exchange rate volatility had negative effect on exports in the short run and positive impact in the long run. The fluctuation in exchange rate due to the volatility of fundamental shocks and policy regimes. The policies that would help avoid the underlying causes of volatile exchange rate movements. The ineffective trade performance in Sub-Saharan Africa causes the macroeconomic shocks. Moderation in exchange rate volatility may not be necessary to positive impact on trade. If control the fiscal and monitory shocks may improve the growth rate and also stable economic environment for trade.

Mohsen Bahmani-Oskooee et.al… (2016) investigated Short run and long run effects of exchange rate volatility on commodity trade between Pakistan and japan by using annual data over the period 1980-2014 were available for 43 Pakistani exporting industries to japan and 60 Pakistani importing industries from Japan. To examine the impact of exchange rate volatility on the volume of trade used the autoregressive distributed lag (ARDL) approach to co integration and error correction modeling. This study showed short run effects of exchange rate volatility in seven Pakistani export industries and 12 Pakistani importing industries. The short run effects lasted into long run only in four exporting and seven importing countries. So not many industries are affected by exchange rate volatility neither in short run nor in long run.

Asteriou, D., Masatci, K. and Pilbeam, K. (2016) estimated the impact of exchange rate volatility on international trade activities for Mexico, Indonesia, Nigeria, and Turkey for the period 1995-2012 using monthly data. GARCH model was used to examine the volatility in nominal and real effective exchange rate data. Autoregressive distributed lag (ARDL) bound testing approach was used to find long run relationship and Granger causality models was used to estimate the short run effects. According to the results of this study there was no relationship between exchange rate volatility and international trade activities except for Turkey and even in this case the magnitude of the effect of volatility was very small in the long run. In the short run significant causal relationship from volatility to import/export demand in Indonesia and Mexico and in the case of Nigeria unidirectional relationship from export demand to volatility is found, while for Turkey no relationship between volatility and import/export demand was observed.

Hock-Tsen Wong & Hock-Ann Lee (2016) estimated the impact of exchange rate volatility on bilateral exports of Malaysian manufactured goods to China. Threshold generalized autoregressive conditional heteroscedasticity (TGARCH) model were used to estimate the exchange rate volatility. The Johansen cointegration method and the dynamic ordinary least squares (DOLS) estimator were used in the estimation. According to this study there was some evidence that showed the exchange rate volatility had significant impact on real exports and some time the impact of exchange rate on real exports maybe positive and negative. If increased in the real exchange rate and depreciation of real exchange rate causes increased the exports and increased the real foreign demand was decreased the exports. In the long run, exporters of Malaysia will improved their products through innovation and high technology. The exports competitiveness of Malaysia could be improved. Also, an effective marketing approach shall be used to further promote exports of Malaysia and more focused on intra-regional trade in AEC, which would provide a good market opportunity for exports of Malaysian manufactured goods. More diversified of export market would result more stable of economy of Malaysia. Exports can improve economic growth and increased the income of Malaysia and create employment opportunities and reduce the 33333problem of unemployment in Malaysia.

Sarfaraz Ahmed Shaikh & Ouyang Hongbing (2015) examine the impact of Exchange Rate Volatility and Trade Flows: Evidence from China, Pakistan, and India by using the time series data from 1980 to 2013. To investigate the relationship between exchange rate and exports used the ARDL approach. This study showed there had a negative and significant relationship between exchange rate volatility and exports in case of China, Pakistan, and India. However, in the long run the exchange rate and the exchange rate volatility had positive relationship with china exports so, the exchange rate had negative impact on exports for some countries but not for all countries. Policymakers that applying the economic policy should look the volatility for some countries but not for all countries.

Flavio Vilela Vieira & Ronald MacDonald (2015) examined the role of effective exchange rate volatility on exports and also investigated the impact of international financial crises of 2008 by using set of 106 countries for developing and emerging economies without including oil exports countries for the period of 2000-2011 and GMM estimator are used for this purpose. This study showed if increase (decrease) real exchange rate volatility reduces (increase) export volume of the country and according to this study export volume were 0.14 percent higher after the financial crisis of 2008 compared to the previous period (2000-2007). There was also showed that the export volume was price (REER) and income (trade weighted) inelastic. This study suggest that policymaker should adopted different policies that causes minimize the exchange rate volatility to increase their country export volume.

Sidheswar Panda & Ranjan Kumar Mohanty (2015) investigated the effects of exchange rate volatility on exports India by using time series data for the period from 1970-71 to 2011-12. To measure the exchange rate volatility simple rolling standard deviation was used and to find long run relationship between the variables Johansen cointegration technique was used. This study finds that one co-integrating the relationship exists among the exports, real exchange rate volatility and world GDP. Exports volume of India is positively related with exports and its export volume negatively related with its own real exchange rate volatility. The results if these studies showed in time series model the moderation in the real exchange rate volatility increased the export volume. The Reserve Bank of India should regularly monitor the exchange rate volatility and try to it remain stable when it infracts its level.

Chirchir, Muse and Jagongo (2015) established the effect of Exchange rate volatility and on export performance of Tea firms by using the monthly time series data from January 2008 to December 2012. The study used Ordinary Least Square (OLS) to check the relationship between variables and GARCH model to check the variance. ADF test used to check stationary of data. The results in this study indicated that exchange rate volatility and domestic tea prices were some of the variables that influenced export performance of tea firms in Kenya to the world markets. However, the tea substitute's prices did not influence the export performance of tea firms to the importing countries. The study further realized interdependence between exchange rate stability, macroeconomic stability and export performance and hence policy makers needs to consider the existing degree and likely effects of exchange rate volatility while designing, developing and implementing trade policies.

Myint Moe Chit & Amrit Judge (2014) examined the role of financial sector development in influence the impact of exchange rate volatility on the exports of five emerging East Asian countries – China, Indonesia, Malaysia, the Philippines and Thailand by using a panel data set of 85 country-pairs for the period from 1990:Q1 to 2006:Q4. GMM-IV estimation technique was used. According to this study the effect of exchange rate volatility on exports was depend on the level of financial sector development. The countries that had less financially development economy its exports were very affected by exchange rate volatility and those countries that had strong financial development these countries exports were less affected by exchange rate volatility. The stable exchange rate had some necessary conditions if these countries want to increase its exports then its currency deprecated. So, the emerging East Asian countries should attempt to stable their exchange rate and improve their financial sectors.

Olugbenga A. Onafowora & Oluwole Owoye (2014) investigated the impact of exchange rate volatility on export growth of Nigeria with its most important trading partner the United States by using quarterly data from January 1980 to April 2001. Cointegration and were used for empirical testing. These tests indicate the cointegration factor linking real exports, real foreign income, relative export prices, and real exchange rate volatility in the long run. This study showed if the volatility increases in exchange rate then it increases the uncertainty the profit that we earned from exports, so it had significant negative impact on exports in short term and long term both. The result of tests also showed that if we want improvement in our trades then real exchange rate should be decline. Real foreign income had positive impact on export activity. The liberalization and economic reform policies that implemented in the post 1986 period were significantly increased the demand of Nigeria exports. Exports activities in Nigeria can be prove by if government employs policies that aim to stable competitive exchange rate and employ macroeconomics policies that avoid overvaluation of real exchange rate and raise export

competitiveness with the incentive of export diversification. So, the policymaker should establish crystal-clear policies that stable the real exchange rate.

Hongwei Du & Zhen Zhu (2014) estimated the effect of exchange rate risk on exports by using data from the period 1974 to 1975 in six industrial countries USA, UK, Japan, Sweden, France, and Italy. To measure the exchange rate risk GARCH model was used. According to this study six countries data that used in this model had found significantly negative and positive impact of exchange rate risk on exports. In this study find the regime switching model capture the exchange rate risk better and empirical evidence by and large was consistence with Viaene and Vries. Who said that the existence of the forward markets and current account position of the country would be determinate the impact of exchange rate volatility on trade.

Dimitrios Serenis and Nicholas Tsounis (2014) investigated the impact of exchange rate volatility into small countries Cyprus and Croatia exports by using time series data from the first quarter of 1990 to first quarter of 2012. To check the stationary on the used multivariate cointegration error correction model had been used. ARDL model was used for measuring exchange rate volatility on exports. According to this study exchange rate volatility had a positive effect on the exports of Croatia and Cyprus. Policymaker should consider volatility for some but not all countries when applying economic policy, especially, for those like Cyprus and Croatia that it was found that the exchange rate volatility had a positive impact on exports.

Axel Grossmann et.al… (2014) estimated the dynamic of exchange rate volatility by using panel data for 29 economics. Panel vector autoregressive model (PVAR) was used to estimate the dynamics of the overall exchange rate volatility. High-frequency and low-frequency components of volatility differently effect on the economic shocks. According to this study investigated to discover interesting dynamic interrelationships between macroeconomic as well as financial variables and exchange rate volatility. The results showed that there was little difference in the responses of macroeconomic and financial variables to the overall volatility vis-à-vis the high-frequency components. The effects of exchange rate volatility to macroeconomic and financial variables are found to be much stronger for developing countries relative to developed economies. The policymakers should monitor and attempt to influence the high-frequency components of exchange rate volatility. Policymakers can affect high-frequency volatility through many of the same transmission mechanisms than overall volatility.

Khan, Azim and Haider (2014) investigated the impact of domestic and foreign currency valued exchange rate volatility on the export and import demand functions with reference to Pakistan's trading partners. In this study monthly time series data of 29 countries used from 1970:01 to 2009:12. Autoregressive conditional heteroscedastic (ARCH) model used to determine the relationship between variables and Hadri Lagrange multiplier (HLM) test used to check the stationary. The study concluded that exchange rate volatility had a highly significant impact on both the real import and export demand functions. However, the short-run analysis reveals that volatility has no significant effect on trade when Pakistan trades only with developing countries.

Yin-Wong Cheung and Rajeswari Sengupta (2013) investigated the Impact of exchange rate movements on exports: An analysis of Indian non-financial sector firms by using Indian non-financial sector firms for the period 2000 to 2010. The empirical results showed there had been a strong and significant negative impact on currency appreciation and currency volatility on market shares of India's exporting firms. Indian firms asymmetrically effects to exchange rates. Real effective exchange rate (REER) change effects it arise from a negative appreciation effect than a depreciation effect. Indian firms that had a small share of exports their response to REER and

volatility most strong then the firms that had a large share of exports. Exporter's services were impacted more strongly by exchange rate fluctuation then the firms exporting goods.

Ali, Mehboob and Raza (2013) investigated the relationship between the exchange rates and the export sectors of Pakistan by using time series data of Pakistan from July 2003 to April 2010. For the estimation of the long run relationship co-integration and Autoregressive time series regression models were used while generalized autoregressive conditional heteroscedastic methodology had been used to estimate the effects of the exchange rates volatility on export sectors. The results of co-integration and Ordinary Least Square revealed a significant long run relationship between exchange rates and export sectors, which confirmed that the depreciating currency in case of Pakistan improves the competitiveness of the export sectors, while there is an evidence of volatility effects on the export sectors.

Shabana Praveen et.al… (2012) estimated analysis of the factors affecting exchange rate variability in Pakistan by using annual data for the period 1975-2010 that taken from Economic Survey of Pakistan (various issues) and International Financial Statistics. Simple Linear Regression model with ordinary least method (OLS) was used to estimate the results. This showed that inflation is most important factor that create volatility in exchange rate and inflation had negative effect on the exchange rate volatility when inflation had high currency become devalue. Second important factor that caused to change in exchange rate volatility was economic growth and third important factor was import and export that caused variation in exchange rate. Fiscal and monitory policy that had both caused influence in the exchange rate. So that there are need of effective fiscal and monitory policy that stabilize the exchange rate and reduced inflation and increased the economic growth.

Rana Ejaz Ali Khan et.al…. (2012) analyzed the effectiveness of Exchange Rate in Pakistan by using annual time series data for the years 1980-2009. Unit root was used for stationary. Johansen's cointegration test were used for long-run equilibrium relationship between the variables that were used in the model. Granger causality test were used to check the causality between the variables. This study showed there was no long-run equilibrium relationship between exchange rate and inflation so there was no casualty but found long-run equilibrium relationship between exchange rate and trade. Exchange rate and FDI were cointegrated with each other, so there was long-run equilibrium relationship between exchange rate and FDI and causality found in both directions. GDP and exchange rate were cointegrated with each other but there was no casualty found in both directions. So, exchange rate policy is not effective to have the desired results for macroeconomic variables. Only foreign direct investment is the area for which exchange rate may contribute.

Harun Yüksel et.al… (2012) examined the impact of the impact of exchange rate volatility on Exports in Turkey. Turkey aggregate export was examined for the period of 2003:2 to 2010:12 and monthly data were used in estimation. In previous studies OLS regression method was employed to ensure the reliability. Time series data were used for estimation. To determinate the relationship between the pairs of the variables cross correlations tests were used. This study shows there was a negative relationship between exports and volatility, but this relationship was not significant at the level of 5%. There were many researches the impact of exchange rate volatility on exports but there was no unity for validation of the results. High fluctuations in exchange rates create uncertainty about the profits to be made then reducing the gains of international trade and hampering the volume of trade.

Iqbal Mahmoud et.al… (2011) investigated Exchange Rate Volatility & Macroeconomic Variables in Pakistan by using annual data from 1975 to 2005. GARCH model had been used to

calculate the volatility of exchange rate and OLC had been used to investigate the relationship between depended and in-depended variables. This study showed exchange rate volatility had positive effect on GDP growth and trade openness and negative effect on FDI. Policy makers should notice the impact of exchange rate volatility on each macroeconomic variable and should adopted that policy that has increase the volume of trade and make more attractive foreign direct investment.

Myint Moe Chit Et.al (2010) estimated Exchange Rate Volatility and Exports: New Empirical Evidence from the Emerging East Asian Economies by using 25 years of quarterly data of five emerging East Asian countries as well as 13 industries countries and examine the exports between the emerging East Asian and industrialized countries use the gravity model. Verification of long run relationship among the variables use the unit root test and co integration model. This study showed that exchange rate volatility was negative impact on the exports of emerging East Asian countries. Emerging East Asian countries should focus on stabilizing the exchange rate between its trading partner countries rather than solely follow regional exchange rate and monitory policy.

Zahoor Hussain Javed and Muhammad Farooq (2009) investigated the impact of economic growth and exchange rate volatility in case of Pakistan by using quarterly data from 1982 to 2007. To find out the relationship between exchange rate volatility and economic growth had been find out by using Error Correction techniques along with Auto Regressive Distributed Lag Model (ARDL). This study finding reserve money had negative impact on growth because when we increased domestic reserve money maybe reduced the international reserve and economic growth. Exchange rate volatility, reserve money, exports had long-run positive relationship with economic growth, but the statistical value of exports, and imports are insignificant. But in the short run, exports, imports, manufacturing production, exchange rate volatility, economic growth and reserve money had positive or negative relationship to economic growth. So domestic economic performance has very sensitive to the exchange rate volatility in the long-run period cooperation in the short run.

Halil Altinta et.al…. (2009) estimated the impact of exchange rate volatility on Turkish Exports by applying the quarterly data for the period 1993Q3- 2009Q4. For this purpose, multivariate cointegration and error correction model (ECM) techniques were used in this study. According to this study long run estimation results show that foreign income and real exchange volatility had positive and significant impact on Turkish export and relative price effect on Turkish export had negative and significantly. ECM showed that relative price had a negative significant impact, foreign income had an insignificant impact and nominal exchange rate volatility had positive and significant impact on Turkish exports. Policy makers cannot improve the country balance of trade in the long run and short run with the price-oriented policies. Policy makers should follow the exchange rate stabilizing policy.

Ivan T. Kandilov and McCorriston's (2008) examined the effect of exchange rate volatility on agriculture trade among the G_10 countries that were developed and developing countries. Using time series data of bilateral trade between the sixty-nine countries and these countries represent a broad sample of developed, emerging, and developing economies. GARCH model used to measure the uncertainty of exchange rate. This study showed exchange rate volatility had a large negative impact on agricultural trade between members of the G-10. According to this study agriculture export subsidies are correlated with the exchange rate volatility. The effect of exchange rate volatility is more in developing countries then in the developed countries. Only the exchange rate volatility of the vehicle currency in US dollar not to the exporter importer currency its matter

for developing countries exporters. After controlling nonlinear effects, the elasticity of developing country agricultural exports with respect to the vehicle currency (U.S. dollar) exchange rate volatility was –0.507 and export subsidies elasticity for G-10 countries was –0.056.

Augustine C. Arize et.al…. (2008) examined the impact of exchange rate volatility on exports and its effect on foreign trade of eight Latin American countries over the quarterly period 1973–2004. Different cointegration techniques were used to estimates cointegration relations. To estimate the short run dynamic in each country error-correction technique were used. The results showed increased the exchange rate volatility had a negative effect on exports in both short run and long run in each Latin American countries. These results have many policy implication that improved exports in Latin America, firstly the economic policies that imply in Latin America have aim to stable exchange rate and increased the volume of trade among the countries in Latin America. Seconds increased the North American Free Trade Agreement southward may find little support from Latin American countries. Finally the positive effect of trade liberalization policy may not only damage the exchange rate variability but also increased balance of payments crisis.

Osang and Slottje (2008) investigated empirically the impact of real exchange-rate volatility on the export flows of eight Latin American countries by using the quarterly time series data over the period 1973–2004. The study used the co-integration techniques. Estimates of the short-run dynamics were obtained for each country utilizing the Error-Correction technique. The results of the study showed that the increases in the volatility of the real effective exchange rate, approximating exchange-rate uncertainty, exert a significant negative effect upon export demand in both the short-run and the long-run in each of the eight Latin American countries. These effects may result in significant reallocation of resources by market participants.

Saang Joon Baak et.al…. (2007) investigated the impact of Exchange rate volatility and exports from East Asian countries to Japan and the USA by using the quarterly data starts from the first quarter of 1981 and ends in the last quarter of 2004 .In this study investigated the dominant roles of the US and Japan as trading partners of those East Asian countries explain the exports of East Asian countries to Japan and the US by three economic variables, the GDP of an importing country, the bilateral exchange rate and the exchange rate volatility . Johansen co integration tests were used to determinate the long run equilibrium relationship among the variables. This study showed except for the case of Hong Kong's exports to Japan the exchange rate volatility had negative impacts on exports either in the short-run or in the long-run, or both. In the case of the exports to Japan indicates a negative and significant long-run relationship between exports and exchange rate volatility in South Korea, Singapore, and Thailand, and a positive but insignificant long-run relationship in Hong Kong and in the case of export of US results showed a negative and significant long-run relationship between exports and exchange rate volatility in South Korea, Singapore and Thailand, and a positive and significant long-run relationship in Hong Kong. Finally, it should be noted that the impact of the volatility did not show any stylized differences depending on whether the importing country is Japan or the US, even though dollar invoicing dominates in East Asia. If the exchange rate stable between the Japanese yen and the US dollar is stable, then it increases trade volume of East Asian countries.

Vixathap et.al... (2007) investigated the impact of exchange rate volatility on exports in four East Asian countries (Hong Kong, South Korea, Singapore, and Thailand). The study focuses on the quarterly export volumes of East Asian countries to the US and Japan for the period from 1981 to 2004. The study used co-integration test and estimations of Error Correction models to indicated the relationship between variables. The study concluded that the exchange rate volatility has negative impacts on exports either in the short-run or in the long-run, or both. However, the

study found that the impact of the exchange rate volatility does not show any stylized differences depending on whether the importing country is Japan or the USA, even though dollar invoicing dominates in East Asia.

Titus O. Awokuse & Yan Yuan (2006) investigated the impact of exchange rate volatility on U.S poultry exports using a panel data for 49 importing nations over two sub periods: 1976 – 1985 and 1986 – 2000. A feasible generalized least square (FGLS) estimation technique was applied to the data. In this study the empirical analysis was characterized by two key elements First, this study focused on the effect of exchange rate risk on a particular agricultural commodity poultry product in which it is assumed that the effects of exchange rate volatility was same in direction and magnitude across commodities or sectors. Second exchange rate risk was used to check for the sensitivity of empirical results to the choice of exchange rate volatility measure. The empirical results of this study suggest that two of the three exchange rate volatility measures indicate a statistically significant and positive impact on foreign demand for US poultry exports. Overall, combining the empirical results from the two sub periods and across the three alternative measures of volatility, it was reasonable to conclude that the effect of exchange rate volatility on US poultry exports. First and third measure of exchange rate volatility statistically significant estimates across the two sub periods but second measure of volatility failed to produce a statistically significant estimate in either of the two sub-periods. So, the choice of exchange rate volatility measures matter in empirical investigations of this nature.

Thanasis Stengos Et.al (2005) examine Short-Run and Long-Run Effects of Exchange Rate Volatility on the Volume of Pakistan Exports and its major trading partner countries under the fixed exchange rate regime for the period 1985 to 2001. Johansen's technique was used to estimate co-integration relation and error correction model used to estimates of short run dynamic and ARCH model used to measure exchange rate volatility. The result of this study shows the exchange rate volatility has negative effect on the exports. In Pakistan exporters are risk-averse that is mean increase in exchange rate volatility, exporters reduce their exports to reduce their risk. So, there is need to stabilized policy that aimed to reduce the excessive exchange rate volatility and used best strategy to promote exports in Pakistan.

Aurangzab, Stengos and Asif (2005) investigated empirically the impact of exchange rate volatility on Pakistan's exports to its major trading partners under the floating exchange rate regime for the period 1985 to 2001. The study used monthly time series data from June 1985 to August 2001. Estimates of the co-integrating relations were obtained by using Johansen's technique, and estimates of the short-run dynamics were obtained by utilizing an Error-Correction model (ECM). The major findings indicated that increases in exchange rate volatility approximated by the conditional variance of exchange rates exert a significant negative effect upon the volume of exports in the short-run.

Todani and Munyama (2005) examined the characteristics of short-term fluctuations/volatility of the South African exchange rate and investigates whether this volatility has affected the South Africa's exports flows. The study used ARDL approach to check the relationship between variables and ARCH models were used to check the variability. ADF used to check the stationary of data. The results of the study suggested that, depending on the measure of volatility used, either there exists no statistically significant relationship between South African exports flows and exchange rate volatility or when a significant relationship exists, it is positive. No evidence of a long run gold and services exports demand relations were found. These results were however not robust as they show great amount of sensitivity to different definitions of variables used.

Glauco de Vita and Andrew Abbott (2004) investigated the impact of exchange rate volatility on UK exports to EU countries by using monthly data disaggregated by market of destination and sectors for the period 1993ml to 2001m6. ARDL testing were used for cointegration. This study showed that UK exports to the E14 were generally income elastic and relative price inelastic. In the short-term exchange rate volatility appeared had a statistical insignificant effect on UK exports to the EU14 at both aggregate and sectorial level but in the long run exchange rate volatility had a negative and significant impact on export volume.

Zehra Aftab And Aurangzeb (2002) estimated the impact of the long-run and short-run impact of exchange rate devaluation on Pakistan's trade performance by using quarterly data for the period 1980–2000 of the trade performance with Pakistan's ten major trading partners were empirically tested. Johansen technique were used to determine the number of co-integrating vectors among the variables of the import and export demand functions, and the trade balance. This study showed the real deprecation may be used as the policy tool to improve the trade balance.

Christine Sauer and Alok K. Bohara (2001) estimated Exchange Rate Volatility and Exports: Regional Differences between Developing and Industrialized Countries by using panel data for 22 industrialized and 69 developing countries during the 1973–93 period. Real exchange rate volatility was measured by the by the conditional variance from an ARCH model. This study provides the strong evidence that the trade effects of real exchange rate volatility are more dangerous in developing countries especially in Latin America and Africa than the OCED or Asian LDCs. Specially LDCs, Latin American and African exporters face the highest level of uncertainty that had negatively affected on exports. In this study it observed the exchange rate volatility is largely due to domestic factors and policy maker that promoted the export increased polices would be well advised to adopt that measures that promoted exchange rate stability.

W. L. Chou (2000) investigated the impact of exchange rate volatility on China exports by using time series data from 1981.Q1 to 1996.Q4. Exchange rate volatility was estimated by the conditional variance of the real effective exchange rate index from an autoregressive conditional heteroscedastic model (ARCH). The result of these study showed that exchange rate volatility had a long-run negative effect on total exports, the exports of manufactured goods, and exports of mineral fuels but not on exports of foodstuffs, beverages, and tobacco. According to this study exchange rate volatility had a positive impact on exports of industrial materials. According to this study exchange rate create uncertainty hinder trade in China. So, there is need to establish forward exchange markets for the RMB. However, this will require the introduction of capital account convertibility by China. China had established current account convertibility in 1996. But the scheme of capital account convertibility has yet to be finished. Restrictions on capital flows have contributed importantly to insulate China from the Asian financial crisis that began in July 1997. Hence, China is likely to postpone introducing capital account convertibility. The establishment of forward exchange markets can only be regarded as a long-run policy objective for China.

Aristomene Varoudakis and Khalid Sekkat (2000) investigated the impact of Exchange rate management and manufactured exports in Sub-Saharan Africa over the period 1970–1992 for 11 SSA countries among these countries, six belong to the CFA zone: Cameroon, Congo, Cote d'Ivoire, Mali, Senegal and Burkina Faso and non-CFA countries: Ghana, Kenya, Zimbabwe, Tanzania and Zambia. The impact of exchange rate policy was examined through the effect of three indicators: real effective exchange rate _REER changes, real exchange rate _RER volatility, and _model-based measures of RER misalignment. This study showed that export supply equations were estimated for three manufacture sectors (textile, chemicals, and metals) and two exchange rate regimes: a fixed rate regime represented by six CFA countries and second a more

flexible rate regime represented by five non-CFA countries. This study suggests that exchange rate management matters for export performance in SSA. This is indicated both by the significant impact of changes in the REER and by the negative influence exerted independently by exchange rate misalignment. The developed countries show that no systematic and significant impact of volatility on trade can be detected, but a potential important effect of misalignment does exist that exchange rate mismanagement in SSA has reduced the incentives for exporters to increase their incursion on foreign markets.

Michael Bleaney & David Greenaway (2000) investigated the impact of terms of trade and real exchange rate volatility on investment and growth in sub-Saharan Africa by using panel data of 14 sub-Saharan African countries over 1980–1995. To check the exchange rate volatility GARCH model was used. Sub-Saharan Africa was a low-income country who more depended on the exports of the primary products. According to this study exchange rate volatility had a negative effect on investment and in the of trade also negative impact on investment. When the terms of trade are more favorable, and the real exchange rate was less overvalued then growth and investment both were higher. Absence of any trend decline in the terms of trade; it is difficult to explain this real depreciation as an equilibrium adjustment. This study suggests that there are need of some combination of significant trade liberalization and elimination or real exchange rate overvaluation.

Asseery and D.A. Peel (1991) investigated the effect of exchange rate volatility on exports by using quarterly data for five countries namely, Australia, Japan, United Kingdom, United States and West Germany over the period 1972 to 1987. ARCH model used to estimate the real exchange rate volatility. Standard unit root tests, namely Dickey Fuller (DF) and Augmented Dickey Fuller were used to examine the stationary in the model. This study showed real exchange rate volatility had significant impact on exports in sample countries and that for the great majority of the countries the impact is positive.

DATA AND METHODOLOY

3.1. Introduction

In this section, we're going to give an explanation for about the sources of data and methodology which we used for the estimation with the help of outcomes graph and table. This examine became based totally on secondary source of data

3.2. Data Source

This observe is based on the secondary source data of statistics for all the related determinants the data. The records are accrued during 1972 to 2019. Data have been gather from the subsequent source as, World development indicators (WDI).

3.3. Description of variables

3.3.1. Dependent variable

GDPPC (Goss Domestic Product per capita),

3.3.2. Independent variables

SAV (Service value added), IVA (Industrial Value Added), AVA (Agriculture value Added), ER (Exchange Rate), ERV (Exchange rate volatility), INF (inflation)

3.4. Methodology

The main objective of our study is to determine the impact of exchange rate volatility on economic growth of Pakistan We envisioned the determinants with unique variables and tests. We used distinct variables to test the effect of exchange rate volatility on economic growth to begin with we're able to use unit roots test to test the table bound of variables. After check the desk certain of

the variables. We have been given used ARDL bond test approach to estimation short run and long run parameters.

3.4.1. ARDL Approach to Co-integration

There are a few traits of ARDL approach which might be discusses as below: The autoregressive disbursed lag method can be used most effective one single equation to approximation the LR (long run) and SR (short run) effect of the version concurrently. The estimates acquired from the autoregressive dispensed lag technique are green and impartial. Whilst we are applying autoregressive dispensed lag manner then the trouble of serial relationship and indigently is solved. (Peasant et al, 2001). Autoregressive allotted lag technique to co-integration is beneficial for small samples as compare to Johansen Juselius co-integration technique and Engel-Granger (Narayan, 2007). The autoregressive distributed lag (ARDL) method to co-integration does not need that each one variables to be the equal order. This technique can be used any order of integration whether or not I (zero) or I (1) or mixer of both. whilst we are going to practice ARDL technique unit root take a look at has no considerable critical in figuring out the combination order of the mention variables inside the given model. (ARDL) autoregressive disbursed approach to co-integration was first time use by using the pesaran et al. (2001) to overcome the dangers of Johansen co-integration procedures and Engle Granger. ARDL method is the aggregate of autoregressive and allotted lag models st would be applied.

3.5 ARDL Model Specification

Unrestricted Errors Correction fashions (UECMs) to provide an explanation for the connection of exchange rate volatility and exports increase for Pakistan equations are given beneath. The parameters are the corresponding long term multipliers whereas the short run dynamic coefficients of the ARDL models. Is white noise mistakes and Δ is the primary distinction operator.

3.6. ARDL Bounds Testing Procedure

Its miles essential to check the existence of long term relationship before estimating long time factors and errors correction models. For the purpose, ordinary Least Squares (OLS) technique is hired to find out the price of F or Wald Statistic for the joint importance of the parameters of lagged variables i.e.

The null hypothesis indicates that the parameters of the lagged variables in equations are simultaneously equal to 0 indicating no long term dating or no co integration. The opportunity speculation explains that as a minimum one of the parameters of the lagged variables is not equal to zero suggesting long time dating or co integration. The null speculation is tested in the direction of the opportunity speculation the usage of F-statistic. The F-statistic has a no preferred distribution which is predicated upon whether or not or no longer or now not the variables covered within the ARDL model are incorporated of order I(0) or I(1) or an aggregate of I(0) and I(1). The computed F is in comparison with vital values proposed thru Pesaran et al. (1996). Of the computed F statistic is greater than the upper certain vital fee, the null hypothesis of no long term courting is rejected. Of F-statistic is a fantastic deal less than the decrease wonderful critical values, the null hypothesis is normal implying that there may be no a long term dating or co integration. Ultimately, of the F-statistic lays the various lower and pinnacle positive essential values, the check is inconclusive for the given diploma of importance.

Of long run dating exists, the long term parameters may be expected through the usage of the following equations for every country:

In the above equations parameters associated with the summation signs constitute the short run parameters and the coefficient of ECM in each equations constitute ( ) indicates the rate of

adjustment closer to the long-run equilibrium. Coefficient of adjustment should be horrofic and statistically extensive for convergence.

EXCHANGE RATE VOLATILITY AND ECONOMIC GROWTH: AN ARDL ANALYSIS

4.1. Introduction

In this chapter we investigated the relationship between Exchange rate volatility and economic growth. We interpret the results of Descriptive statistics and Correlation analysis, Unit root analysis ARDL Bounds analysis, short run and long run analysis.

4.2. Descriptive Statistics and Correlation Analysis

It is a set of descriptive coefficient which reviews a given data set which can be demonstration of whole population or sample and the measure used to define this data set are measure of central tendency and measure of dispersion. The measure of dispersion include the standard deviation, minimum and maximum variables, kurtosis, Jarque-Bera and Skewness while the measure of central tendency include mean, median and mode

Table 4.1: Descriptive Statistics of Key Variables (1972-2019)

	SVA	GDPPC	IVA	AVA	ER	ERV	INF
Mean	13.41	2.74	23.38	27.16	48.45	30.34	9.12
Median	13.44	2.18	23.51	26.02	41.11	31.80	7.92
Maximum	17.36	8.71	27.10	36.47	121.12	72.67	26.66
Minimum	9.24	-1.64	20.20	21.47	9.90	1.05	1.34
Std. Dev.	2.30	2.33	1.50	3.63	35.46	17.77	5.37
Skewness	0.05	0.54	0.15	0.88	0.58	0.43	1.39
Kurtosis	1.91	2.83	3.15	3.14	2.05	2.67	5.05
Jarque-Bera	2.26	2.21	0.22	5.84	4.25	1.61	22.51
Probability	0.32	0.33	0.90	0.05	0.12	0.45	0.00
Observations	45	45	45	45	45	45	45

Mean is the central average value of data. Center is known as the middle value of the range of the values and mode is most respective value in a data. In our study we used 1972 to 2019 data. So the observations of each variables are 47 years. The mean value of Gross Domestic Product Per Capita (GDPPC) is 2.74 and the median is 2.18 with maximum Gross Domestic Product Per Capita (GDPPC) 8.71 and minimum is -1.64. The skewness means that measure of symmetry distribution of the data. The skewness in the Gross Domestic Product Per Capita (GDPPC) is 0.54 and the kurtosis is 2.83.The standard deviation means that to explain the variation for central valve. The variation in Gross Domestic Product Per Capita (GDPPC) is 2.33 and probability is 0.33. The mean value of ER is 48.45 and the median is 41.11 with maximum ER is 121.12 and minimum is 9.90. The skewness means that measure of symmetry distribution of the data. The skewness in the ER is 0.58 and the kurtosis is 2.05.The standard deviation means that to explain the variation for central valve. The variation in ER is 35.46 and probability is 0.12.The mean value of ERV is 30.34 and the median is 31.80 with maximum ER is 72.67 and minimum is 1.05. The skewness means that measure of symmetry distribution of the data. The skewness in the ERV is 0.43 and the kurtosis is 2.67.The standard deviation means that to explain the variation for central valve. The variation in ERV is 17.17 and probability is 0.45 and remaining all the variables explain in the same way as the above variables explain

4.2.2. Correlation matrix

Correlation means that to explain the strength of relationship between two variables. The meaning of word correlation is relationship between two variables. Correlation can be positive and negative respectively. Correlation can be positive when both values rise together. It will be negative when on value increases in the opposite direction of other. The value of that correlation lies between +1 to -1. There are three classifications of correlation and these are stronger correlation, medium correlation and weak correlation

Table 4.2: Correlation Matrix of Key Variables (1972-2019)

Correlation	SVA	GDPPC	IVA	AVA	ER	ERV	INF
SVA	**1**						
GDPPC	-0.49	1					
IVA	0.40	-0.01	1				
AVA	-0.48	-0.01	-0.27	1			
ER	0.12	0.32	-0.12	-0.69	1		
ERV	-0.71	0.53	-0.39	0.18	0.41	1	
INF	0.08	-0.33	-0.25	0.32	-0.19	0.06	1

Results of the correlation matrix shows there is a positive as well as negative correlation between different variables. Like Service value added and gross domestic product per capita (GDPPC) has the negative –ve correlation (-0.49) this valve shows that this correlation was week negative correlation between them. When we find the correlation between Gross domestic product per capita and (IVA) then result that there is negative correlation between them. We find out that ERV and Economic growth have the strong positive correlation. Inflation and Economic growth have negative correlation.

4.3. Unit Root Analysis

Unit root method is commonly works to check the stationary of the data set and it is authoritative before the estimate of data. There are two techniques work to check the stationary of the data that are ADF (Augmented Ducky Fuller) test and PP (Phillips-Peron) test. Time series data said to be stationary of these conditions are is current mean, variance, and covariance all are found to be invariant time series data is depends on time.

Our Null hypothesis and Alternative hypothesis will be stated as:

Null hypothesis H0: $\rho = 1$ (Data is not stationary)

Alternative hypothesis H1: $\rho \neq 1$ (Data is stationary)

Decision rule of ADF* > t critical value then null hypothesis is rejected and conclude that data is stationary and of ADF* < t null hypothesis is not rejected and conclude that Data is not stationary. ADF test results will decide the technique or method we have to apply to estimation the model.

Table 4.3: ADF Test

ADF Unit Root Test							
Variables	**None**	**Lags**	**Intercept**	**Lags**	**Trend**	**Lags**	**Conclusion**
ER	-1.17	0	-0.45	0	1.01	0	I(0)
	-0.33		-0.09		-0.03		
ERV	-1.37	1	-1.55	1	8.29	0	I(0)
	-0.04		-0.01		0		
GDPPC	-7.29	0	-8.1	0	4.9	0	I(0)
	0		-0.08		0		
SVA	-6.49	1	0.12	0	1.86	1	I(1)
	-0.97		-0.56		-0.44		
INF	-4.19	0	-2.19	0	-4.39	0	I(1)
	-0.57		-1.57		-0.50		
AVA	-6.09	1	-6.39	0	-3.30	1	I(1)
	-0.77		-0.67		-0.07		
IVA	-3.09	0	-1.33	0	3.05	0	I(1)
	-0.89		-0.92		-0.99		

Results of the Augmented Ducky Fuller test shows that some variables are stationary and some are non-stationary. In our results ER, GDPPC, ERV are stationary variables and Economic growth, AVA, INF, IVA and SVA are the non-stationary variables. Due to mixed order of integration we used ARDL bound test approach.

4.4. ARDL Bounds Analysis

When we check the relationship between variables then we used ARDL bound test technique for this purpose. Due to ARDL bound test we find that the cointegration exist or not. The result of ARDL bounds test are given below.

Table 4.4: Results of F-Test

		5% Critical Value		**10% Critical Value**	
Model	**F- Statistic**	**I(0)**	**I(1)**	**I(0)**	**I(1)**
GDPPC/ SVA,IVA,AVA,ER, ERV,INF	6.17	3.82	4.71	3.21	4.50

The result of this test shows that the value of F- Statistic is 6.17 which is greater than upper bound at 5% level of significance. This results shows that the cointegration exist between the variables. And long run relationship exist.

4.5. Long Run Analysis

When we find the relationship between Economic growth and other variables like AVA, IVA, AVA, ER, ERV etc., then we used auto Regressive Distributed Lag (ARDL) model. This model is used to test the existence of long run relationship between variables in multivariate time series models. The ARDL approach was used because of its advantage such as the involvement of just a single equation set up making it easy and simple to interpret compare to other conventional techniques.

Table 4.5: ARDL Estimates of Exchange Rate Volatility and Growth Model (1972-2019)

Dependent Variable: GDPPC				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GDPPC	0.1168	0.1311	0.8908	0.3816
IVA	0.4051	0.1061	3.8189	0.0008
AVA	0.5789	0.1668	3.4701	0.0019
ER	0.0165	0.0170	0.9681	0.3422
ERV	0.0805	0.0138	5.8249	0.0000
INF	-0.1034	0.0530	-1.9510	0.0624
C	21.6983	5.3230	4.0763	0.0004

The value of the coefficient of INF was -0.1034 that means if 1% increase in INF leads to 0.1034 decreased in Economic growth that showed the inflation is not good for the economy. The coefficient value of the IVA is 0.4051 that showed if the 1% increase in IVA then 0.4051 increased in Economic growth. The coefficient of AVA showed that 1% increase in AVA that leads to 0.5789 increased in Economic growth. The coefficient of ER showed that 1% increase in ER that leads to 0.0165 increased in Economic growth. The coefficient of ERV showed that 1% increase in ERV that leads to 0.0805 increased in economic growth. Estimation of the long run results presented as the table 4.5 that indicates GDPPC, IVA, AVA, ER and ERV were the significant while INF was not significant.

4.6. Error Correction Analysis

In the error Correction analysis when analyse that When disturbance accurse in the model then how many time required for recover this error. This is the short run analysis error correction shows the speed of adjustment. When we find the result of the independent variables to dependent variables then these shows that some have positive effect and other are negative effect.

Table 4.6: Error Correction Estimates of Exchange Rate Volatility and Growth Model (1972-2019)

Dependent Variable: GDPPC				
Selected Model: ARDL(2, 1, 0, 4, 0, 0, 2)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(SVA(-1))	0.4346	0.1497	2.9024	0.0076
D(GDPPC)	-0.0828	0.0974	-0.8498	0.4035
D(IVA)	0.4292	0.1401	3.0644	0.0052
D(AVA)	0.2667	0.1887	1.4131	0.1700
D(AVA(-1))	0.0522	0.1891	0.2762	0.7847
D(AVA(-2))	0.0819	0.2006	0.4084	0.6865
D(AVA(-3))	0.3934	0.1727	2.2781	0.0315
D(ER)	-0.0175	0.0175	-1.0019	0.3260
D(ERV)	-0.0852	0.0218	-3.9023	0.0006
D(INF)	-0.0723	0.0582	-1.2415	0.2259
D(INF)	-0.1258	0.0499	-2.5212	0.0184
CointEq(-1)	-1.0595	0.1928	-5.4942	0.0000

The short run results reveal that the coefficient of CointEq (-1) is -1.0595, this shows that the coefficient was negative, and this has the significant. This value shows the disturbance in the model

and approximately one year required for recover this shock. The result suggests the speed convergence.

CONCLUSION AND POLICY IMPLICATIONS

Conclusion

It has been argued by some empirical researches that exchange rate volatility has a positive effect on exports and economic growth. However, while some empirical researchers have been able to argue for the negative effects of volatility to exports and economic growth and others have been able to argue for positive or no effects at all. However, in this study we examine the impact of exchange rate volatility on economic growth of Pakistan by using annual time series data from 1972 to 2019. In this study we used some econometric techniques to find out the relationship between the variables, the study use Auto regressive distributed lag (ARDL) to check the relationship among the variables which are under consideration. The results suggested that exchange rate volatility and economic growth have positive and significant relationship in long run and negative and insignificant relationship in short run. ERV, IVA, AVA, SVA had significant impact in the long run but INF, ER had insignificant impact in the long run. Inflation had negative and insignificant impact on economic growth.

Policy Recommendations

High fluctuations in exchange rates create uncertainty about the profits to be made then reducing the gains of international trade and hampering the volume of trade. Our findings do have important policy recommendations:

- It is not possible to completely eliminate the exchange rate volatility so the government should adopt efficient macroeconomic policy that minimize the volatility of their respective currency.
- .Policymaker should manage exchange rate fluctuations and averting protentional risks that may arise due to significant dependence among different markets.
- There is not possible a complete stability of exchange rate in developing countries such as Pakistan because there are many shocks that hits these countries. So that Pakistan monetary policy should reduce exchange rate volatility to promote economic growth and reduce the uncertainty in the economy. Fiscal and monitory policy that had both caused influence in the exchange rate. So that there are need of effective fiscal and monitory policy that stabilize the exchange rate and reduced inflation and increased the economic growth.
- The State Bank of Pakistan should regularly monitor the exchange rate volatility and try to it remain stable when it infracts its level.

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