Can Exchange Rate Depreciation Lead to Increase in Exports of Pakistan? A Time Series Analysis

ABSTRACT

In this analysis, it is argued that Pakistan had passed through different exchange rate regimes in the last two decades. This study empirically analyses the impact of exchange rate fluctuations on Pakistan's exports. A monthly time series data of Export Volume, Import Volume, Real Effective Exchange Rate, Average Applied Tariff Rates for Pakistan, and major trading partners gross domestic product (GDP) has been taken for 2003-04 to 2018-19. Data for the first six months of 2019-20 has also been included in the analysis, as it was the period that witnessed substantial exchange rate depreciation. Ordinary Least Square (OLS) technique has been applied to check the time-series impact between Export Volume and Real Effective Exchange Rate and weighted average exchange rate. On co-integrated series, the Error Correction Model (ECM) has been used to find out the long-run and short-run relationships among variables of the same period. The results show that there is a positive, but less significant, impact of currency variations on Pakistan's exports, however, there is an inverse nevertheless significant impact of applied average tariff rates on Pakistan's exports. Furthermore, there is a positive correlation between the increase in exports and the weighted GDP of its trading partners (which creates exportable surplus due to industrial growth).

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1. INTRODUCTION

The effect of exchange rate fluctuation on trade has been and continues to be an extremely debated topic in international trade. It is general*y* presumed that exchange rate fluctuation adversely impacts international trade, however, there are different findings of various research papers showing a significant effect on trade to an insignificant impact on trade, depending upon the industrial base and exportable surplus of a country. Further, the effects of exchange rate volatility on trade, vary depending upon the fact that whether the country is advance (developed) or developing. From an empirical point of view, the literature since 2000 has reinforced the evidence that there is an ambiguous linkage between exchange rate volatility and exports.

Sizable volatility in the exchange rate has often been viewed as detrimental, since a great uncertainty associated with to exchange rate may threaten international trade by increasing the risk of trading activity. The excessive fluctuations of the exchange rate may inevitably create uncertainty in preparing macroeconomic policies, investment decisions, and international trade flows.

The role of trade and particularly exports in a country's economy is increasing day by day, as it is the main source of foreign exchange earnings, besides remittances. The amount of remittances sent by overseas Pakistanis (which is export of services) has also been near to the value of merchandise exports. For countries like Pakistan, where the government's revenues from direct and indirect taxes are insufficient to meet the current expenditure (including debts, development expenditure), the successive governments have been borrowing from both local as well as foreign sources, to bridge the fiscal gap. If the local currency continues depreciating under floating or flexible exchange rate regimes, domestic goods prices become lower than the foreign products and importers have to pay more amounts for the same quantity of imported goods than before depreciation. So, exchange rate depreciation normally better off the country's current account balances, terms of trade and so financial balances. Since the early 1990s, Pakistan has been in the process of liberalization of trade and moving towards an export-led growth trade policy.

Pakistan has been following a more liberal trade regime, as compared to other South Asian countries since early 2000 (ADB, 2015)[1]. Over the year's tariffs have been brought down to the maximum level of 20% (except automobiles & some other items) and many, incentives have been provided to attract foreign investment and to promote exports. However, Pakistan's export performance from FY2003-04 to FY 2017-18 lags far behind even from its South Asian neighbors like India, Bangladesh, and Far East Asian countries like Malaysia, Thailand, and Vietnam. Pakistan has been facing a peculiar situation of slow growth in its exports, whereas, imports have increased manifold, thus badly affecting the balance of payments, although the Government of Pakistan has taken several measures to boost exports.

Among several trade policy tools applied to increase exports of a country, depreciation of the currency is also considered to increase exports, as in relative terms the Pakistani products become cheaper in the international market. However, there are positive as well as negative impacts of currency depreciation. On the positive side, depreciation may be good for economic growth and generation of economic activities resulting from an increase in exports and incomes of exporters. This increases incomes and stimulates higher consumption of the people associated with the production of export products. Depreciation helps in increasing merchandise exports, discourages imports, which relatively becomes expensive, and improves trade balance. Furthermore, it increases revenue collection as the rupee value of imports would become higher. The negative impacts of depreciation may include an increase in foreign debt liability, as a more local currency would be required to pay one dollar of loans, a rise in industrial costs due to an increase in the value of imported inputs of products made for the domestic market or exports. In Pakistan for the

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[1] Impact of trade and FDI policies on industrial development in South Asia by Asian Development Bank (ADB),
"https://www.adb.org/publications/trade-and-fdi-policies-industrial-development-south-asia"

production of export items some imported inputs are used like Egyptian cotton, textile machinery/parts, chemicals in the textile sector that account for 60 percent of total exports.

According to WTO trade statistics the exports of developing countries grew by 12 percent annually since 2000, as compared to 5.6 percent for Pakistan and 10 percent for the world as a whole. Exports of some other developing countries in Asia, e.g. China, India, Malaysia, Thailand, and Vietnam have grown at a much faster pace than that of Pakistan, during the past 20 years. The main reasons are economic and political stability, high GDP growth, higher foreign/local investments, no threat of terrorism[2], fewer across border conflicts, better infrastructure and favorable economic policies followed consistently, in those countries. Table 1 shows the export performance of Pakistan and that of some selected countries from 1997 to 2017.

The Table 1 shows that Bangladesh's exports were less than Pakistan's exports in 1997, while that of Vietnam was almost at the same level. The exports volume of Turkey and India was three to four times higher than that of Pakistan, as Turkey's witnessed high GDP growth rates during 2002 to 2007, an average of 7.14 percent (5.03 percent to 9.64 percent) and from 2010 to 2017 the average was 6.24 percent (3.18 to 11.11 percent). In the case of India, the GDP growth rate from 2003 to 2007 was on average 7.20 percent (7.66 percent to 8.06 percent) and from 2009 to 2017 the average was 7.13 percent (5.24 percent to 8.50 percent).[3] However, after 20 years exports of Bangladesh are almost double those of Pakistan, as it has market access at zero rates of duties in US and EU markets being the least developed country. There is no comparison of Pakistan's exports with that of India, Turkey, and Vietnam. There are several reasons due to which Pakistan is left far behind in export performance, mainly war on terrorism, poor infrastructure, shortage of electricity, political instability, low GDP growth rate, low saving/investment, low labor productivity due to mainly unskilled labor, etc.

Table 1: Exports Comparison of Selected Countries over Past 20 Years (US$ billions)

Country	1997	2002	2007	2012	2017	2019
Bangladesh	4.02	5.42	13.14	24.31	38.79	47.20
China	182.88	325.6	1,220.06	2,048.78	2,263.37	2,498.56
India	35.01	50.1	145.9	289.56	295.85	322.78
Indonesia	53.44	57.16	114.1	190.03	168.81	167.49
Malaysia	78.74	94.06	175.96	227.45	216.43	238.16
Pakistan	8.77	11.93	17.84	24.61	21.88	23.81
Thailand	57.38	68.11	153.57	229.54	236.01	245.38
Vietnam	9.18	16.71	48.56	114.53	213.93	264.61
Turkey	26.24	35.76	107.27	152.46	156.99	171.53

Source: Trade Map

Several measures are taken by the countries to increase their exports, which *inter-alia* includes: (i) Low inflation and interest rates, (ii) Liberal trade regime and lower tariffs, (iii) Providing facilities to Small and Medium enterprises, (iv) Compliance of quality and standards as per the provisions of agreements on Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT), (v) Better Infrastructure and transportation facilities to reduce the cost of freight, (vi) Technological advancement and research, (vii) Higher rate of Foreign Direct Investment, (viii) Higher saving/investment rate, Integration with the world economy through production value chains, (ix) Zero-rating tax regime for export-oriented sectors. Pakistan's export performance and weighted average exchange rates for the period from FY 2003-04 to 2018-19 (fifteen years) are given in Table 2.

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[2] Daily and Monthly Costs of Terrorism on Pakistani Exports (May 2011) by Mamoon, Dawood; Akhtar, Sajjad and Hissam, Saadia, Pakistan Institute of Trade and Development.

[3] https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations

Table 2: Comparison of Pakistan Export Growth to PKR Depreciation

Year	Exports (US$ Billion)	Imports (US$ Billion)	Exports Growth (%)	Imports Growth (%)	Weighted Average Exchange Rate (Pak-Rs. to Dollar)	Depreciation (%)
2003-04	12.4	13.6	--	---	58.4	--
2004-05	14.5	19.0	17%	40%	59.6	2%
2005-06	16.6	24.9	14%	31%	60.3	1%
2006-07	17.3	26.9	4%	8%	60.7	1%
2007-08	20.4	35.3	18%	31%	64.2	6%
2008-09	19.1	31.7	-6%	-10%	79.5	24%
2009-10	19.7	31.1	3%	-2%	84.1	6%
2010-11	25.4	35.8	29%	15%	85.6	2%
2011-12	24.7	40.4	-3%	13%	90.3	5%
2012-13	24.8	40.2	0%	0%	97.4	8%
2013-14	25.1	41.7	1%	4%	102.8	6%
2014-15	24.1	41.4	-4%	-1%	101.4	-1%
2015-16	22.1	43.9	-8%	6%	104.2	3%
2016-17	20.5	46.9	-7%	7%	104.7	0%
2017-18	21.9	57.5	7%	23%	109.8	5%
2018-19	23.7	60.3	8%	5%	136.1	24%

Source: Authors' calculations based on SBP data

The above Table shows that Pakistan's exports have increased from US$12.40 billion in 2003-04 to US$24.82 billion in 2012-13, at an annual growth rate of 5.6 percent, while during the same period the currency depreciated at an annual rate of 4.4 percent. It is better to analyze the relationship in FY2011-12 when the currency was depreciated almost 6% and export volume decreased -2.57 and import volume increased 12%, but in the following year currency further depreciated almost 8%, while export increased marginally and imports remained above US$40 billion.

Pakistan's export base is extremely narrow as about 63% of its exports are comprised of textiles. The other export items are namely rice, leather, and synthetically made-ups that constitute around 15% of total exports. Unfortunately, the above four items are relatively low value-added products and fetch less foreign exchange. Pakistan has not made much effort to diversify its export products, even within textiles, the major exports remain cotton yarn, cloth, bed sheets, etc., and fewer efforts were made to increase exports of high value-added garments. Similarly, Pakistan's export destinations are also concentrated as 26 percent exports are to EU, 25 percent to the USA, 11 percent to China, UAE 9 percent. New markets for Pakistan's goods are also to be explored in African countries, East Asian Countries, South America, Russia, Eastern Europe, etc. Pakistan is also yet to enter into hi-tech exports. In short, Pakistan is lacking diversification of export products as well as export destinations, increasing export of high value-added and hi-tech products, which face fierce global competition is need of the hour. Pakistan can explore the emerging markets in Africa, ASEAN member countries where per capita income and consumption patterns are growing. For the diversification of the products, Pakistan can export halal meat, dairy products, processed food, electrical and mechanical goods, ladies and men garments and footwear, etc.

Briefly, the objective of the present study is to analyze the impact of exchange rate volatility on the export performance of Pakistan. Another objective is to empirically test the long-run relationship between these variables. So, based on the detailed introduction and objectives, the research question of the study is, "whether currency depreciation has a significant impact on Pakistan export performance as indicated by the title of the study.

2. LITERATURE REVIEW

In this section brief extracts from the previous research papers /studies conducted by different authors on the hypothesis that whether there is a significant positive relationship between the depreciation of currency and increase in exports. A systematic literature review methodology has been adopted in this paper. By using the Autoregressive-Distributed-Lag (ARDL) technique, the sectoral export trend is examined under different exchange rate regimes, findings of the study, however, suggest an insignificant and negative relationship between the variables (Aftab et al., 2012). When the standard deviation of the exchange rate is measured by its moving averages as an indicator of exchange rate volatility, results suggest that these fluctuations have a negative effect but significant impact on exports in Cyprus and Croatia (Serenis & Tsounis, 2013). Similarly, Alam et al. (2018) comprehensive review concluded that exchange rate volatility has adverse effects on the bilateral export of Pakistan with the USA and the United Kingdom while in the case of UAE and Saudi Arabia findings are insignificant but there is found positive results for Germany and Japan.

Zamir et al. (2017) found that exchange rate volatility has a significant but negative impact on major macroeconomic variables including export of Pakistan. The study suggested that instead of focusing on currency depreciation for increasing the export volume, the government should encourage import substitution. The issue of exchange rate volatility and industrial trade between Pakistan and the USA from 1980 to 2014 has been examined by Bahmani-Oskooee et al. (2017). The results of the study suggest that 50% of industrial units are affected by exchange rate volatility. Large industrial units are positively affected by ER in the long run. Similar results have been reported by Bahmani-Oskooee et al. (2016) for turkey and the USA under commodity trade analysis.

Ahmed et al. (2017) have analyzed the impact of the exchange rate on exports using data taken from1970-2015 and employing the ARDL approach. Finding suggests that there is an insignificant and negative relationship between export volume in Pakistan and exchange rate. In another study, Ahmed et al. (2017) also employed the ARDL technique and found an inverse but insignificant relationship between exchange rate volatility and exports. Their study corroborates that higher exchange rate volatility is associated with lower export growth in Pakistan. Kearns and Patel (2016) explain two different types of exchange rate for analysis; (i) trade-weighted exchange rates and (ii) debt-weighted exchange rates that are constructed by the Bank for International Settlements (BIS) and they find out their impact on a country's trade. The study indicates that both exchange rates have been differently affected by the trade of emerging economies and advanced economies. Responsiveness exchange rate variations on trade have a weaker effect on advanced economies than the emerging economies due to a strong financial system, as their financial system absorbs all exchange rate movements and uncertainties.

Hooy et al. (2015) find a positive relationship between Real Effective Exchange Rate (REER) depreciation and exports, especially exports high and medium-tech intermediates and final products in regional trade partners-ASEAN. And Li et al. (2015) provide evidence that high productive product exporters show little response to fluctuations in RMB currency movements in China. Ollivaud et al. (2015), present that a large number of fluctuations in the exchange rate have little effect on international trade and responsiveness is very low but it deepens the financial crises in the economy, especially taking the case of Japan and the United Kingdom. Baek (2014) studies product-level trade responses to exchange rate taking the data of Korea and the United States and concludes that both import and export of specific 71 products are affected by currency fluctuations. Exchange rate volatility hurts industrial production, Jamil et al. (2012). As they explained that after the introduction of the common currency in Europe, the magnitude of the negative impact of exchange rate volatility has reduced but overall it remains negative.

Manufacturers and producers of the domestic country also react differently against foreign and local currency movements. If domestic traders are risk lovers, countries' real exports may increase due to exchange rate volatility (Doğanlar, 2002). There is a negative and significant relationship between these two variables only in the long run not in the short run for Pakistan and India (Mustafa et al., 2004).

In the case of Pakistan, nominal exchange rate fluctuations have more impacts on trade balances than real effective exchange rate fluctuations. Sencicek and Upadhyaya (2010) have analyzed that there are positive but insignificant results on exports in case of a real effective exchange rate as it adjusts the inflation phenomenon.

Egert and Zumaquero (2008) checked the direct effect of exchange rate volatility on exports of different countries. It was examined whether there is an indirect effect on exports in different exchange rate regimes. The effect was checked at sectoral, bilateral, and aggregate levels. It results showed that there is a different impact on exports, depending upon size, direction, and the regime of exchange rate on different sectors and countries at different time-periods. The relationship between exchange rate and trade for developing countries Khan *et al.* (2012) found that when Pakistan uses the US-dollar as vehicle currency the exports and imports of Pakistan decline whereas when it brings into play domestic currency for trade, the imports and exports of host country become unaffected. They take monthly data from 1971:01 to 2009:12 and use GARCH and least square dummy variable techniques to surmise the results.

3. DATA

For estimation purposes, monthly time series data is taken from 2003/7 to 2019/12. It significantly captures the minimum number of observations for the degree of freedom in estimations purposes and regression analysis. To measure the exchange rate volatility impact on Pakistan's export performance, data has been obtained from different secondary sources. The monthly data of export value, real effective exchange rate, the weighted average exchange rate have been taken from the State Bank of Pakistan (SBP). Applied average tariff rates data has been taken from World Integrated Trade Solutions (WITS) and Trade Analysis Information System (TRAINS). While major trading partner's gross domestic product data is taken from World Development Indicators (WDI) and then weights are assigned according to their trade volumes.

4. METHODOLOGY

Dynamics of trade theories like neo-classical, traditional, modern trade and growth theories are widely taught in the world. The evolution of international trade theories started in the 16th century from mercantilist, who were in favors of holding assets in form of gold, precious stones, and metals to Adam smith's absolute advantage theory and David Ricardo's comparative advantage theory, who were representatives of commodities specialization in exchanging and trading of goods. Later on, Heckscher Ohlin presented the idea of factor abundance and commodity intensity for exporting the product and explained, "A country should export the commodity that is produced by its cheap and abundant factor of production.

Sequentially, the trade cycle theory was described by John Maynard Keynes. Keynes expressed six decades ago, how trade-cycle occurs in any economy. It depends completely on the marginal efficiency of investment instead of the marginal efficiency of capital. This theory explains the concept of trade and investment multipliers effects. Multiplier effects lead to an increase in income multiple times, which attracts demand for goods and services in the economy. So resultantly production of goods and services surges and thus domestically and internationally goods are started trading and trade balances become better off in the country.

When there is depreciation in the exchange rate, it will lead to weakening the current account balances in the short run. Initially, there is inelastic demand in the economy, sooner demand $\in_{Pm}^{Px}$ [4] improves and approximately becomes greater than one, current account balances also recover. So, time gaps and lags have a much important role in any macroeconomic policy. In the short run, consumers and producers have commodity contracts that aren't affected by the policy change. This phenomenon was described by Ian Bremmer in their book *"The J Curve: A new way to understand why nations rise and fall"* and later on it was known as the J-Curve theory.

If we may observe Pakistan export to exchange rate relationship, J-Curve theory holds. Pakistan's major imports have inelastic demand and exports commodities have little flexibility to change in the short run. But fear of exchange rate volatility normally distorts the trade balances that's why some nations prefer dirty or managed floating exchange rates over pegged or fully flexible exchange rates. One cannot ignore that exchange rate volatility plays an important role in resource allocation, export performance, and economic growth in Pakistan., But anticipations about the fluctuation in exchange rate policies have different impacts on investors' perceptions between two countries and hence on their export basket as explained by Siegel's paradox. In short-run consumers trade their preferred products over non-preferred commodities due to price uncertainty.

The country's exports demand depends on the number of factors that are already mentioned. Normally in literature export demand is taken as a function of real effective exchange rate or relative prices of goods and foreign consumers' income. As a result of depreciation, the relative price of domestic goods in terms of foreign currency becomes cheaper which induces foreigners to increase the demand for these products. On the other hand, the relative price of imports for the domestic consumer now becomes expensive, hence discouraging the demand for imports. So, exchange rate depreciation normally better off the country's current account balances and terms of trade both.

It has been observed from literature and existing data, currency appreciation or depreciation leads to fewer effects on large economies' trade baskets than small economies because several other factors hinder the relationship.

Mathematically, the export demand function can be written as:

$$X = f(E\frac{P_f}{P_d}, Y_f) \tag{1}$$

Here in this model, X is denoted for domestic country export that is dependent on or function of the real effective exchange rate and foreign income. The econometric analysis of the exchange rate volatility and export performance is examined in this section. In this part of the analysis, the econometric methodology has been discussed to explain the impact between these two variables and some other variables that are applied average tariff rate and weighted GDP of Pakistan's major trading partners.

To dichotomize the nexus between exchange rate volatility and export performance of Pakistan, the following model has been selected:

$$EXP_t = f(ER_t, X_t) \tag{2}$$

Where EXP is the export volume at t time-period for a specific country normally it is taken as net exports. Whereas ER is referred to as exchange rate of specific at t time-period and Xt is a vector of control variables

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[4] Price elasticity of demand for export relative to import elasticity of price.

including foreign income, size of the economy, the average applied tariff rates or trade restrictions, ease of doing business, interest rate, trade remedies law, inflation, import intensity of raw materials, domestic firms' productivity. All the variables have their importance but here, average applied tariff rates and trading partners' GDP are being taken for analysis.

$$Exp_t = \alpha + \beta\ REER_t + \delta TR_t + \theta FGDP_t + \varepsilon_t \tag{3}$$

In the above linear equation, export volume has been regressed on by real effective exchange rate, average applied tariff rate, and weighted GDP. Where α is constant in the equation which explains the averages of all unincorporated variables. To check the responsiveness of all variables on export elasticity, a log-log equation is modified.

$$LnExp_t = \alpha + \beta\ ln\ REER_t + \theta lnFGDP_t + \delta lnTR_t + \varepsilon_t \tag{4}$$

In the given equation, β is the elasticity of exports with respect to the real effective exchange rate, while $\theta\ and\ \delta$ represent the elasticity of exports with respect to weighted GDP and tariffs respectively. ε_t is the error terms and is subject to the assumption of minimum variance, zero-time correlation, and normality?

$$LnExp_t = \alpha + \beta\ ln\ WAER_t + \theta lnFGDP_t + \delta lnTR_t + \varepsilon_t \tag{5}$$

While is this equation $WAER$ explains the weighted average exchange rate and its β shows its sensitiveness to export volume.

5. RESULTS AND DISCUSSION

In this section, results have been explained based on the estimated models discussed earlier. Results based on equation 4 are presented in Table 3.

Table 3: Real effective Exchange rate-based Regression results

Variables	Coefficients	Probability
$REER_t$	0.278***	0.000
$FGDP_t$	0.914***	0.000
Avg. Applied Tariff Rate	-0.725**	0.047
N	187	
R^2	0.938	
$\bar{R}^2$	0.929	
F-Statistics	1599.1	
P-Value	0.0000	

Source: Authors' calculations. ***, **, * indicates level of significance at 1%, 5% & 10%, respectively.

According to the table based on Ordinary Least Square (OLS) estimations, the overall model is significant based on p-values. Results given in the above table indicate that real effective exchange rates and major trading partners' GDP has a positive and significant impact on the volume of exports in Pakistan. Findings also suggest that the elasticity of exports with respect to weighted GDP is estimated to be 0.91, implying that for a 1% increase in the GDP of Pakistan's major trading partners, export volume increases by 0.91%. On the same token, if point one percentage change occurs in $REER$ it will lead to a 0.27 percent increase in exports. Average applied tariff rates have a negative but significant impact on Pakistan's export volume.
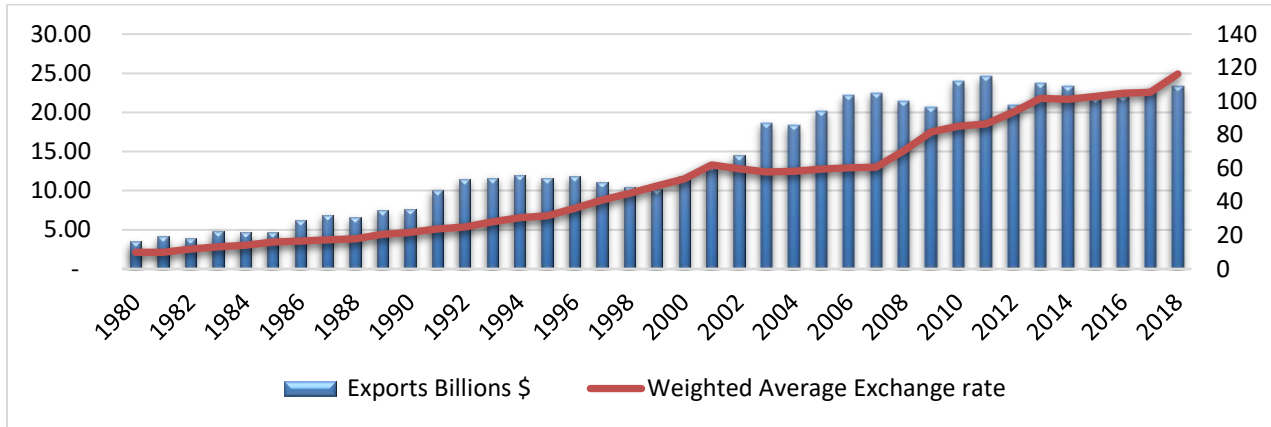
Figure 1: Relationship between Export volumes and Weighted Average Exchange Rate

Regression-based results are consistent with the displayed graph as it is clearly explaining that both have an increasing trend. The results for the weighted average exchange rate are presented in Table 4.

Table 4: Weighted Average Exchange rate-based Regression results

Variables	Coefficients	Probability
$WAER_t$	0.234***	0.000
$FGDP_t$	1.241**	0.003
Avg. Applied Tariff Rate	-0.453***	0.011
N	187	
R^2	0.927	
$\bar{R}^2$	0.919	
F-Statistics	1511.0	
P-Value	0.0000	

Source: Authors' calculations. ***, **, * indicates level of significance at 1%, 5% & 10%, respectively.

According to the table based on OLS estimations, the overall model is significant based on P-values. Results given in the above table indicate that real effective exchange rates and major trading partners' GDP has a positive and significant impact on the volume of exports in Pakistan. Findings also suggest that the elasticity of exports with respect to weighted GDP is estimated to be 1.241 implying that for a 1% increase in the GDP of Pakistan's major trading partners, export volume increases by 1.241 %. Similarly, if point one percentage change occurs in $WAER$ it will lead to a 0.23 percent increase in exports. Average applied tariff rates have a negative but significant impact on Pakistan's export volume. Results based on Fully Modified Least Squares (FMOLS) are presented in Table 5.

The results in Table 6 indicate that both series are integrated (1) and results suggest that there is a significant impact of REER on the export volume of Pakistan. The core objective of the cointegration test is to check whether a long-run relationship between the variables exists or not, so for the requirement for the estimation, variables series must be cointegrated. All variables are integrated 1 and the stochastic term is I(0). Engle-Granger Tau- Statistics and Engle-Granger Z - statistic demonstrate that series are cointegrated as their values (-7.56, -168.97) are statistically significant against their MacKinnon probability values (0.00, 0.00).

Table 5: REER based Engle-Granger Co-integration Regression

Variables	Coefficients	Probability
$REER_t$	0.417***	0.000
$FGDP_t$	1.217***	0.000
Avg Applied Tariff Rate	-0.788***	0.005
N	187	
R^2	0.798	
$\overline{R}^2$	0.780	
Rho − 1	-1.49	
P-Value	0.0000	

Source: Authors' calculations. ***, **, * indicates level of significance at 1%, 5% & 10%, respectively.

Error Correction Model (ECM) explains both series are co-integrated and there is a long-run relationship, while the negative value in the results is in favor of the short-run relationship. Based on the Schwarz information criterion (SIC), there are 2 lags taken. Overall models' goodness is significant that is examined by the value of τ. τ explains all results are consistent with the OLS results. *REER*, weighted GDP, and Average applied tariff rates have a significant impact on Pakistan's export volume. Findings also suggest that the elasticity of exports with respect to weighted GDP is estimated to be 1.21 implying that for a 1 percent increase in the GDP of Pakistan's major trading partners, export volume increases by 1.21 percent. Average applied tariff rates have a negative but significant impact on Pakistan's export volume. Point one percentage increase in RE*ER* will lead to a 0.41 percent increase in export volume. Weighted Average Exchange Rate (WAER) results are consistent with the previous model (REER model) results.

Table 6: WAER based Engle-Granger Co-integration Regression

Variables	Coefficients	Probability
$WAER_t$	0.311***	0.000
$FGDP_t$	1.401***	0.000
Avg Applied Tariff Rate	-0.0252**	0.003
N	187	
R^2	0.791	
$\overline{R}^2$	0.780	
Rho − 1	-1.45	
P-Value	0.000	

Source: Authors' calculations. ***, **, * indicates level of significance at 1%, 5% & 10%, respectively.

6. CONCLUSION

The objective of the present study is to analyze the impact of exchange rate volatility/fluctuation on Pakistan's exports, as it is argued that depreciation would positively affect the exports. Another objective is to empirically test the long-run relationship between these variables. For this purpose, monthly data of export values, real effective exchange rate, weighted average exchange rate, and weighted GDP has been taken for the period from 2003/7 to 2018/12. The findings of the study suggest that there would be a significant positive impact on the exchange rate on exports of Pakistan. The increase in exports depends upon several other factors such as low cost of doing business, comparable cost of energy concerning regional countries, high labor productivity, high savings & investment ratio, diversified export products, use of latest technology in export sectors, etc. Furthermore, there is a positive correlation between the increase in exports and the weighted GDP of its trading partners (which creates exportable surplus due to industrial growth).

Historically in the case of Pakistan, when the currency was artificially pegged by the government, export volume remains stagnant and when the currency was allowed to depreciate, Pakistan's export performance

started getting better and export volume increased. Other than the real or weighted average exchange rate, lower applied average tariff rates also have a positive impact on country's export performance. In the period when Pakistan liberalized its trade regime and as average tariff rates decrease, the export volume increased.

Despite positive results, the depreciation of currency discourages imports and helps in improving the balance of payments; however, depreciation also makes imported inputs of export industries expensive. This increases the cost of production of export products.

Due to the depreciation of the currency, the prices of imported products increase, which results in higher inflation. In a country like Pakistan, which is mainly dependent on imported edible oils and crude oil, the depreciation of currency will result in higher prices of edible oils and petroleum products in the domestic market. This put further pressure on domestic prices and prices of most of the products start increasing due to an increase in transportation cost.

The policy recommendations from this paper are:
   i) In this study depreciation of the exchange rate shows a positive and significant impact on the export growth of Pakistan. Exchange rate depreciation may have a larger impact on exports when the industrial policy is export-led (giving maximum incentives to export sectors) rather than import substitution driven industry policy.
   ii) In addition to this, in developing country like Pakistan where the industrial base is quite narrow and the number of export products and export destinations are also very few, depreciation of the Rupee shows a positive correlation with exports, however, there should be an increase in competitiveness of exported products with respect to regional blocs as Pakistan has very nominal/marginal competitive to Bangladesh, India, Malaysia, and Thailand.
   iii) Pro-growth and stabilization policies in the country may provide certainty to exporters to export and give a boost to investors.

Conflict of Interests:
The authors have declared that no competing interests exist.

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