

# Impact of Real Effective Exchange Rate on Trade Balance of Pakistan; A Dis-Aggregate Analysis

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## ABSTRACT

The current study used a dis-aggregated model of exports and imports to empirically analyze its impact on the trade balance. The sole purpose of the dis-aggregate model is in-depth analysis as Pakistan since independence and especially during the current decade facing severe trade deficit due to high fluctuation in the exchange rate and an increasing trend in imports. The export model revealed that overvaluation of the real effective exchange rate decreases the exports of Pakistan. However, the imports model revealed that devaluation or depreciation in the real effective exchange rate may further aggravate the cost of importing goods and thus lead to an increase in the trade deficit of Pakistan. From forecasting analysis, the study concluded that in future the imports will be further increases as shows an upward trend. In this regards the government should use appropriate economic policies for import substitution strategies to control the severe trade deficit of Pakistan.

## KEYWORDS

Trade Balance, Exports, Imports, Real Effective Exchange Rate, Dis-Aggregate Analysis

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## INTRODUCTION

International trade can deeply affect the macroeconomic variables of an economy. International trade improves the socio-economic performance of the developed and developing economies. In modern era, the international trade among large open economies and small open economies specifically influence the exchange rate and trade balance of small trading partners.

The trade balance or external balance is an important sector of the economy. But Pakistan being a developing country, the performance of external sector remained poor. The basic reason was the inelastic demand for imports including the oil, machinery, and other imports for the exports oriented industries. The exports performance of Pakistan remained unsatisfactory. The reason was that Pakistan facing tough competition from the other competitor in the foreign market. As Pakistan exporting the agriculture goods and other primary products, therefor the demand for Pakistani products is elastic in foreign market. The trade balance of Pakistan shows negative trend over the observed period of time.

As depreciated ER is found to be fruitful for any economy, because its increases export, and decreases imports, but it is not the case of Pakistan. Because the depreciated exchange rate has could not played their due role, due the fact that Pakistan is an agriculture country and heavily depended on primary exports to feed their economy as the primary products are price elastic in nature, while the share of large scale manufacture products is very low in the aggregated export of Pakistan. The overvalued real effective exchange rate may adversely effects trade balance, due to inelastic demand for imports and highly elastic demand for exports in foreign market. The undervaluation of real effective exchange rate increases the cost of exporter due to expensive import of raw material for export accommodation. As Pakistan is a small open economy the exchange rate changes of rupee largely impacted Pakistani trade balance than any other large open economy.

The overall trade of any economy depends on the bilateral exchange rate decision taken by the country with respect to trading partners. It is important to grasp the fluctuations in exchange rate to analyse the trade balance dynamics. This research work keeping in view the real effective exchange rate, to analyse the response of each trading partners. Pakistan is a developing economy, have highly elastic demand for its exports and inelastic demand for imports in foreign market. It is important to know the heterogeneous responses of bilateral trade of Pakistan with major trading partners due to the impact of real effective exchange rate. The bilateral exchange rate system i.e. real effective exchange rate is considered more market oriented exchange rate system in global economy (Dhasmana, 2013).

## RESEARCH QUESTIONS

The main objectives of the study are

- i. To investigate the impact of real effective exchange rate on trade balance at disaggregated level.
- ii. To explore the forecasting analysis of Pakistan exports and imports



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- iii. To empirically examine the causality analysis of Pakistan exports and imports with real effective exchange rate and economic growth of Pakistan.

## REVIEW OF LITERATURE

### LITERATURE ON EXPORTS AND EXCHANGE RATE

Thorbecke and Kato (2011) attempted to examine the relation between exchange rate volatility and exports of consumption goods of Japan to seventeen other countries for the period of 1988-2009 using panel data. The study concluded that that ten percent appreciation of Japanese yen can reduce Japanese exports by nine percent, indicated that appreciation in exchange rate has an inverse effect on the exports of consumption goods of Japan to the studied seventeen countries. Hussain (2010) analysed the impact of exchange rate on Pakistan exports and found inverse relation between exchange rate and prices negative effects the exports of Pakistan. Palazzo and Rapetti (2008) investigated the effect of RER on the export performance of Argentina over the period of 2002-2008. The empirical evidence concluded that stable and competitive real exchange rate was the major factor that increased the export base of Argentina.

Yeksel, Kuzey and Sevinc (2012) examined the impact of exchange rate volatility on export (X) for Turkish economy for the period of 2003-2010. The empirical results found negative relation of exchange rate volatility with export of the Turkey. Cheung and Rajeswari (2013) investigated the impact of real effective exchange rate on the share of exports of non-financial sector firm for Indian economy during the period of 2000-2010. The regression analysis of the data revealed that there is robust and significant negative effect of the overvaluation of REER on the market capitalisation of Indian exporting firms. The response of smaller exporting firm is sharper than larger exporting firm due to overvaluation of real effective exchange rate.

Hassan et al., (2016) conducted a research study on the impact of REER on export for the Bangladesh economy used time series data from 2003-2005. The study concludes that the overvaluation REER has negative impact on export in long run, while in short run the impact was insignificant. Wondemu and Potts (2016) investigated the impact REER on export performance in Tanzania. The analysis revealed that undervalue real exchange rate increased the export of Tanzania, while overvaluation of real exchange rate remained ineffective for Tanzania. The real exchange rate of Tanzania remained undervalue over a long period of time, which increased the export performance of Tanzania. However, the undervalue exchange rate increased the inflation in Tanzania.

Hunegnaw (2017) conducted a research study on the effect of exchange rate fluctuations in ten countries of East Africa used disaggregated data of export manufacturing to analyse the impact of real effective exchange rate on exports. The empirical results showed that depreciation of REER increased of manufacturing sector exports. Ahmad, Qasim and Chani (2017) investigated the impact of exchange rate on export over the period from 1970 -2015 for Pakistan. The study insignificant role of exchange rate and even have negative affect on the export of Pakistan, however, the world income was significant and positively related with the export of Pakistan. Safuan (2017) examined the impact of exchange rate volatility on export for Indonesian economy over the period of 1996-2014 with major trading partners, i.e. Japan, United States of America (USA) and China by using both aggregated and disaggregating approach for the analysis of data. The study found the negative impact of exchange rate volatility on export in term of aggregated and disaggregated approach.

### LITERATURE ON IMPORTS AND EXCHANGE RATE

Oteng-Abayie and Appiah-Nkrumah (2009) conducted a research study on the relationship between import demand, real exchange rate and GDP to estimate demand function for the economy of Ghana over the period of 1970-2002. The econometric analysis of data revealed long term relationship among merchandise imports, GDP and real exchange rate that depreciation of real exchange rate and increase in the real income increased the demand for merchandise imports. The empirical analysis revealed that in short run 65 percent, 80 percent and 95 percent shocks in real exchange rate, real income and merchandise imports explained by its own shocks.

Jiang (2014) investigated the impact of exchange rate instability on export and import over the period of 1981 to 2012 for the economy of China. The econometric analysis of the data revealed that exchange rate has positive impact on export and import in long run. The study concluded that proper policies should be adopted to maintain the exchange rate on competitive level to increase favourable trade in China. Jiranyakul (2013) analysed the relationship of real exchange rate and imports demand for Thailand for the period 1997- 2011. The study found no short run impact of the misalignment of real exchange rate on import. However, in long run the negative impact of the misalignment of real exchange rate on import was found. Tirmazee and Naveed (2014) conducted a research study on the impact import demand function on trade balance of Pakistan over the period of 1970 to 2010. The findings showed significant relationship of foreign exchange and term of trade and concluded that the falling trend of import to GDP ratio during 1980-2000 may be due the fact that falling in the net capital inflow. Hassan et al (2014) conducted a research study comprising on pricing and non-pricing factors which contributing to the import demand function of Pakistan. They used the econometric techniques of bound testing approach to found the long run co-integration between real imports and its determinants, while ECM within bound testing approach to found the short run relationship between real imports and its determinants. The findings of the study showed that money supply, urban & rural population, real exchange rate, per capita GDP has significant relationship with real import demand and leads to an increased in the imports in

Pakistan, while inflationary pressure within the economy have negative relation with the real imports. However, the study suggested that solely the exchange rate policy will not be appropriate to correct the balance of payment deficit.

Oluyemi and Isaac (2017) investigated the impact of exchange rate on imports and trade balance of Nigeria during 1996-2015 and found an insignificant effect of exchange rate on imports of Nigeria. The study concluded that high level of imports can be discouraged through imports substitution of goods. The study also didn't found any impressive effect of exchange rate on trade balance that devaluation of exchange rate can bring reduction in trade deficit of Nigeria.

## METHODOLOGY OF THE STUDY

### EMPIRICAL MODELS FOR DIS-AGGREGATE ANALYSIS OF EXPORT

The theoretical model for Dis-Aggregate analysis of export towards its major trading partner's countries is given by

$$X_{i,t} = f(\text{GDP}_{\text{pak}}, Y_{i,t}, \text{REER}_{i,t}, \text{KS}, \text{ToT}) \quad (1)$$

The "X<sub>i,t</sub>" represents the Exports of Pakistan against the *i*<sup>th</sup> trading partner. The exports is the function of domestic income ( $GDP_{\text{pak}}$ ), income of the major trading partners ( $Y_{\text{pak}}$ ), capital stock (KS), term of trade (ToT) and real effective exchange rate (REER). The econometric model for regression analysis of export is given by

$$X_{i,t} = \beta_0 + \beta_1 Y_{\text{pak}} + \beta_2 Y_{w,i} + \beta_3 K_t + \beta_4 \text{REER}_{i,t} + \beta_5 \text{TOT}_t + \beta_6 \sum_{k=1}^n X_{i,t-k} + \beta_7 \sum_{k=1}^n Y_{\text{pak}} + \beta_8 \sum_{k=1}^n Y_w + \beta_9 \sum_{k=1}^n \text{KS} + \beta_{10} \sum_{k=1}^n \text{REER} + \beta_{11} \sum_{k=1}^n \text{TOT} + \mu \quad (2)$$

The above Autoregressive Distributive Lag (ARDL) model gives the empirical functional relationship of export (X) with REER, capital stock (KS), term of trade (ToT), income of the trading partners ( $Y_w$ ) and domestic income ( $GDP_{\text{pak}}$ ).

### MODEL OF CAUSALITY TEST FOR DIS-AGGREGATE ANALYSIS OF EXPORT FUNCTION

The study will use Granger causality test to determine the direction of the causality among the variables of export model in order to determine the uni-direction and bi-direction relationship of the variables of export model.

$$\begin{aligned} \log X &= u_1 + \sum_{k=1}^n \alpha_m \log X_{t-n} + \sum_{k=1}^n \beta_n \log \text{REER}_{t-n} + \varepsilon_{1t} \\ \log \text{REER} &= u_2 + \sum_{k=1}^n \beta_n \log \text{REER}_{t-n} + \sum_{k=1}^n \alpha_m \log X_{t-n} + \varepsilon_{2t} \\ \log X &= u_1 + \sum_{k=1}^n \alpha_m \log X_{t-n} + \sum_{k=1}^n \beta_n \log (Y_w)_{t-n} + \varepsilon_{1t} \\ \log Y_w &= u_2 + \sum_{k=1}^n \beta_n \log (Y_w)_{t-n} + \sum_{k=1}^n \alpha_m \log X_{t-n} + \varepsilon_{2t} \\ \log X &= u_1 + \sum_{k=1}^n \alpha_m \log X_{t-n} + \sum_{k=1}^n \beta_n \log (Y_{\text{pak}})_{t-n} + \varepsilon_{1t} \\ \log (Y_{\text{pak}}) &= u_2 + \sum_{k=1}^n \beta_n \log (Y_{\text{pak}})_{t-n} + \sum_{k=1}^n \alpha_m \log X_{t-n} + \varepsilon_{2t} \end{aligned}$$

### EMPIRICAL MODELS FOR DIS-AGGREGATE ANALYSIS OF IMPORTS

The theoretical model for Dis-Aggregate analysis of Imports from major trading partner's countries of Pakistan is given by

$$M_{i,t} = f(\text{GDP}_{\text{pak}}, Y_{i,t}, \text{REER}_{i,t}, \text{FXR}, ) \quad (3)$$

The "M<sub>i,t</sub>" represents imports of Pakistan from its *i*<sup>th</sup> trading partners countries. Similarly, equation (3) of disaggregated model shows imports function of domestic income ( $GDP_{\text{pak}}$ ), income of the major trading partners ( $Y_w$ ), foreign exchange reserve (FXR), term of trade (TOT) and real effective exchange rate (REER). The econometric model for regression analysis of import function is given by

$$M_{i,t} = \beta_0 + \beta_1 Y_{\text{pak}} + \beta_2 Y_w + \beta_3 \text{REER}_{i,t} + \beta_4 \text{FXR}_{i,t} + \beta_5 \sum_{k=1}^n M_{i,t-k} + \beta_6 \sum_{k=1}^n Y_{\text{pak}} + \beta_7 \sum_{k=1}^n Y_w + \beta_8 \sum_{k=1}^n \text{REER} + \beta_9 \sum_{k=1}^n \text{FXR}_{i,t} + \mu \quad (4)$$

The above model of ARDL gives the empirical functional relationship of imports with REER, income of the trading partners ( $Y_w$ ) and domestic income ( $GDP_{\text{pak}}$ ).

### MODEL CAUSALITY TEST FOR DIS-AGGREGATE ANALYSIS OF EXPORT FUNCTION

The Granger causality test will be regress to determine the direction of the causality. This test is used to determine the direction of the variable from both sides simultaneously to determine the one-way and two-way causation among the variables of import model.

$$\begin{aligned} \log M &= u_1 + \sum_{k=1}^n \alpha_m \log M_{t-m} + \sum_{k=1}^n \beta_n \log \text{REER}_{t-n} + \varepsilon_{1t} \\ \log \text{REER} &= u_2 + \sum_{k=1}^n \beta_n \log \text{REER}_{t-n} + \sum_{k=1}^n \alpha_m \log M_{t-n} + \varepsilon_{2t} \end{aligned}$$

$$\begin{aligned} \log M &= u_1 + \sum_{k=1}^n \alpha_m \log M_{t-n} + \sum_{k=1}^n \beta_n \log(Y_w)_{t-n} + \varepsilon_{1t} \\ \log Y_w &= u_2 + \sum_{k=1}^n \beta_n \log(Y_w)_{t-n} + \sum_{k=1}^n \alpha_m \log M_{t-n} + \varepsilon_{2t} \\ \log M &= u_1 + \sum_{k=1}^n \alpha_m \log M_{t-n} + \sum_{k=1}^n \beta_n \log(Y_{pak})_{t-n} + \varepsilon_{1t} \\ \log(Y_{pak}) &= u_2 + \sum_{k=1}^n \beta_n \log(Y_{pak})_{t-n} + \sum_{k=1}^n \alpha_m \log M_{t-n} + \varepsilon_{2t} \end{aligned}$$

**EMPIRICAL ANALYSIS, RESULTS & DISCUSSIONS**

**EMPIRICAL ANALYSIS & DESCRIPTIONS OF DIS-AGGREGATED EXPORTS MODEL**

International trade is an important financial estimation if it is positive. For the balancing of trade exports exhibits the crucial role as it not only improves the trade growth and development but also helps in financing the imports of the country. The significance of exports return raised not only the national income but also provides more employment opportunities and significantly reduces the poverty raising the wellbeing’s of the societies. Moreover, Exports surplus minimized the import burden on the economy helps in reducing budgetary deficit, filling the inflationary gap and enhancing the rapid growth of the nation. However, all most of the developing economies experiences huge deficit in their foreign trade due to high gap in imports and exports.

The economy of Pakistan is experiencing huge trade deficit due to high imports and lower exports. This demonstrates more interest for this investigation to in deeply examine the effect of important trade factors i.e real effective exchange rate, growth of domestic country and income of major trading partner’s countries to evaluate the exports of Pakistan during 1978 to 2018. Before going to regression analysis the group unit root test is regressed and their summary is portrayed in table (1).

**Table 1. Group Unit root Test: Summary**

Method	Statistic	Prob.**	Cross-Section	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.65942	0.0485	3	105
Breitung t-stat	2.14541	0.0140	3	102
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.08130	0.0010	3	105
ADF - Fisher Chi-square	34.7010	0.0000	3	105
PP - Fisher Chi-square	40.8389	0.0000	3	113

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

The result summary of group unit root depicted in table (1) revealed that exports of Pakistan, growth of Pakistan, real effective exchange rate and income of trading partner’s countries of Pakistan shows stationarities as the p-values are significant at 1% that symbols towards the rejection of null hypothesis of unit root and any other sever problem in the data. For further analysis the ARDL is applied as it is applicable at both levels of integration {I(1) & I(0)} in the form as.

$$X_{i,t} = \beta_0 + \beta_1 Y_{pak} + \beta_2 Y_{w,i} + \beta_3 K_t + \beta_4 REER_{i,t} + \beta_5 TOT_t + \beta_6 \sum_{k=1}^n X_{i,t} + \beta_7 \sum_{k=1}^n Y_{pak} + \beta_8 \sum_{k=1}^n Y_w + \beta_9 \sum_{k=1}^n K + \beta_{10} \sum_{k=1}^n REER + \beta_{11} \sum_{k=1}^n TOT + \mu \tag{5}$$

The regression result of the above model is given in table (2).

**Table 2. Dis-Aggraded Analysis of Pakistan’s Exports**

Variables	Coefficient	Std. Error	t-Statistic	Prob.
X(-1)	0.454476	0.142863	3.181206	0.0002
YPak	0.315096	0.082859	3.802823	0.0000
K.Stock	0.753724	0.244304	3.085186	0.0004
S. Arabia	0.269129	0.089087	3.020956	0.0007
S. Arabia (-1)	0.496704	0.100493	4.942677	0.0001
Turkey	0.150389	0.095022	1.582668	0.1300
Kuwait	0.159099	0.064109	2.481672	0.0226
LOG(YUK)	0.229045	0.181349	1.263007	0.2219
LOG(YUK(-1))	0.223943	0.173179	-1.293130	0.2115
USA	0.315051	0.084907	3.710561	0.0009
USA(-1)	0.268937	0.099159	2.712188	0.0015
France	0.575493	0.323529	1.778800	0.0865
France(-1)	0.442489	0.300444	1.472782	0.1572
Germany	0.853300	0.309169	2.759977	0.0125

Italy	1.240643	0.249339	4.975733	0.0001
Italy(-1)	0.753551	0.251360	2.997893	0.0018
Japan	0.320286	0.101304	3.161618	0.0051
REER	-0.668583	0.196982	-3.394127	0.0030
TOT	0.668583	0.196982	3.394127	0.0030
C	-3.990804	5.293073	-0.753967	0.4601
R-squared	Adj. R-squared	DW Stat Value	Prob(F-statistic)	
0.894279	0.886174	2.108883	0.000000	

Exports are considered as a sharp activity in financial advancement, healing of trade deficit, financing of imports and rapid growth of the economy of any country. The hypothetical literature unequivocally bolsters the pivotal effect of exports and the research investigator, policy, market and economic analyst considered it "as engine of rapid development and growth" of the economy. Those economies are more prominent in their trade growth and development whose exports are increasingly noticeable than their imports. Unfortunately the growth of exports of Pakistan is much less than imports that not only creates the huge trade deficit but also leads to huge trade burden, budget deficit, restricts the economic activities, inflation etc. the results of table (2) highlights that previous year exports and growth of Pakistan economy has positive effect on exports growth of current year. However, for steady trade balance and export growth the GDP growth rate needs improvement to fruitfully contribute in minimizing the trade deficit of Pakistan. The result indicates that 1% increase in growth of Pakistan may bring 0.31% export growth of Pakistan.

Responsiveness of capital stock available in the country is one of the undeniable characteristics of exports growth related improvement and unquestionably a huge determinant to its portraying idiosyncrasy. Various investigators have investigated the effects and centrality of capital stock on exports and have dominant role in most of the countries especially of developed and heavy manufacturing countries. The theoretical composing immensely supports the positive and enabling effect of capital stock on exports growth. The results of this study portrayed in table (2) found significant effect on exports growth of Pakistan.

The supportive role of real effective exchange rate in foreign trade and especially in exports is very crucial that plays helpful job in monetary development of nations through encouraging the other countries for empowering the demand of the domestic goods. It not just wins a lum-entirety benefit from exports of a country yet in addition satisfies that necessity which a nation can meet through imports, in this way real effective exchange rate makes strong associations among the countries by developing the trade. Literature underpins the inverse relation between the exports and real effective exchange rate that appreciation in exchange rate brings falls in exports. The consistent results has been found by this study as portrayed in table (2) shows that 1% appreciation in real effective exchange rate cause declines of 0.69% of exports of Pakistan towards the major trading countries.

The findings of dis-aggregated analysis of the impact of exports of Pakistan towards European countries found significant, except France, UK and Turkey means that the exports of Pakistan significantly contribute and find their ways in these countries to fruitfully contribute in growth of Pakistan besides that European nations are developed countries have comparative advantage of especially manufacturing goods over that of Pakistani products. Further, the analysis integrate that developing and Arab countries found good for Pakistani products that significantly contribute to growth via exports of Pakistan as the value of exports towards Saudi Arabia, UAE and Kuwait are found satisfactory and significant. Moreover, the exports to Japan also found significant.

#### **BOUND TESTING ANALYSIS FOR EXPORTS GROWTH**

After analyzing the short-run analysis the bound testing approach is applied for analyzing long run relation of exports with GDP growth of Pakistan, real effective exchange rate and income of major trading partners countries, however, the results portrayed in table (3) confirms the short run relation only as the bound value is less than critical bound value at 1 and 5% .

<b>Table 3. Bounds Test Results</b>		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	3.091100	2
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	3.17	4.14
5%	3.79	4.85
2.5%	4.41	5.52
1%	5.15	6.36

The con-integration analysis shows that there is strong co-integration exit among the Pakistan exports and major trading partner's countries of Pakistan except UK, France and Turkey.

Variables	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(YPak)	0.341060	0.111285	3.064743	0.0052
DLOG(K. stock)	0.318112	0.097210	3.272402	0.0032
DLOG(China)	0.460698	0.152741	3.016195	0.0060
DLOG(S. Arabia)	0.378869	0.095068	3.985260	0.0005
DLOG(Turkey)	0.220382	0.309935	0.711059	0.4836
DLOG(Kuwait)	0.159099	0.064109	2.481672	0.0226
DLOG(UK)	0.229045	0.181349	1.263007	0.2219
DLOG(USA)	0.690502	0.307978	2.242053	0.0341
DLOG(France)	0.220382	0.309935	0.711059	0.4836
DLOG(Germany)	0.853300	0.309169	2.759977	0.0125
DLOG(Italy)	1.240643	0.249339	4.975733	0.0001
DLOG(Japan)	0.320286	0.101304	3.161618	0.0051
DLOG(REER)	-0.701469	0.321911	-2.179076	0.0394
DLOG(TOT)	0.692669	0.270773	2.558122	0.0170
CointEq(-1)	-1.454476	0.142863	-10.180932	0.0000

The long run relation between the growth and exports is one of the obvious demands of financial development and certainly a significant determinant to its characterizing peculiarity of the economies. Most of the researchers, economist and analyst are keenly interested to examine the long run relation of the variables and the same is endeavoured to investigate the long run effect of growth, income of major trading economies, real effective exchange rate and exports of Pakistan, however, the empirical analysis of the study found any impressive impact of Pakistan's GDP growth, real effective exchange rate and income of trading partners countries on exports growth of Pakistan in the long run as portrayed in below table (5).

Variables	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(YPak)	0.362297	0.094163	3.847560	0.0007
DLOG(K. stock)	0.802138	0.248129	3.232744	0.0034
DLOG(China)	0.326141	0.103616	3.147586	0.0042
DLOG(S. Arabia)	0.366779	0.060400	6.072448	0.0000
DLOG(Turkey)	0.103397	0.066184	1.562262	0.1347
DLOG(Kuwait)	0.109386	0.040103	2.727594	0.0134
DLOG(UK)	0.003508	0.131433	0.026692	0.9790
DLOG(USA)	0.565984	0.178330	3.173796	0.0041
DLOG(France)	0.210742	0.303127	0.695227	0.4933
DLOG(Germany)	0.586672	0.189103	3.102389	0.0059
DLOG(Italy)	0.567620	0.161113	3.523125	0.0023
DLOG(Japan)	0.220207	0.070021	3.144874	0.0053
DLOG(REER)	-0.519167	0.213429	-2.432500	0.0250
DLOG(TOT)	0.594871	0.240853	2.469854	0.0210
CointEq(-1)	-2.743809	3.642096	-0.753360	0.4605

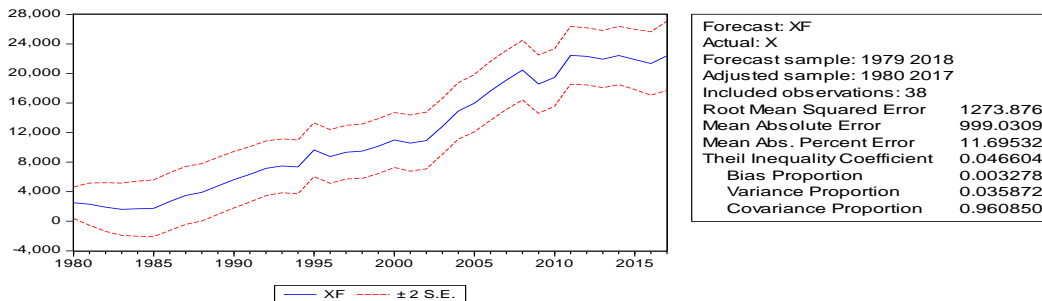
The reliability of the results is checked through by applying the serial and auto-correlation test as there is greater chances of it in case of time series data. However, the findings of the study is reliable as the BG test results portrayed in below table (6) rejects any sign of errors or mis-specification in the above regression results.

Test Statistics	Value	Prob.
F-statistic	0.986938	Prob. F(2,30) 0.3845
Obs*R-squared	2.345892	Prob. Chi-Square 0.3095

## FORECASTING ANALYSIS OF EXPORTS GROWTH

The stress issue for most of the developing countries that they facing gigantic insufficiency in their exports that is the essential driver of the rapid growth. The lacking of exports growth is mainly due to the poor trade strategies and execution of the developing countries. Like some of other developing countries the trade balance situation of Pakistan is also not satisfactory

as the imports growth is much high as compared to exports growth especially from last decade. The forecasted graph of exports of Pakistan shows high rate of volatility and fluctuation. Moreover, the up and downward trend predicts the concerns that exports of Pakistan are highly unstable and in future too it may face the downward trend. Further, the forecasted graph suggests that precautionary measures are necessary to bring steady and sustain growth in exports.



Graph 1. Forecasted Analysis of Exports Growth of Pakistan

### CAUSALITY ANALYSIS FOR EXPORTS GROWTH

The literature enormously bolster the progressive and empowering impact of exports on growth and most of the observational studies revealed blended connection of exports and growth of the economies. The primary driver of quick empowering of trade and rapid engine of growth is the rise of exports. However, for increase in exports there is also need of sustained and satisfactory growth of the economy. In other words exports growth and economic growth are the consistent and conforming element of each other. The results of causality analysis also highlights that these two factors are strongly depending on each other as there is bi-directional causal relation exists between exports and growth of Pakistan economy.

Further, the uni-directional relation exists between real effective exchange rate and exports. The exchange rate affects the exports of Pakistan that means that any volatility in the exchange rate will greatly affect the exports of Pakistan. However, the exports of Pakistan haven't any effect on real effective exchange rate.

**Table 7. Causality Analysis Dis-Aggregated Exports Model**

Variables	Exports	GDP	REER	Yw	Causality Relation
Exports	---	0.0104	0.1967	0.1698	X → GDP
GDP	0.0122	---	0.3045	0.6136	GDP → X
REER	0.0188	0.6057	---	0.6895	REER → X
Yw	0.1443	0.1707	0.1964	---	No Causality Relation

### EMPIRICAL ANALYSIS & DESCRIPTIONS OF DIS-AGGREGATED IMPORTS MODEL

Though increase in imports of goods and services are not considered good for the economy, but for emerging and developing countries that are not self-sufficient in fulfilling the domestic needs and capital intensive materials required the imports of goods from other countries. For the rapid growth and development of the manufacturing sector there is also need of capital goods. Imports are the items that can incorporate which can't be conveyed locally or that can accessible at a more affordable expense.

Most of the developing countries including Pakistan are exceptionally depended on imported goods. To overhaul the predictable and consistent improvement in the production, for consistent and rapid growth and development the developing countries imports capital concentrated merchandise to counterbalance the hole among the nations. Pakistan likewise imports substantial equipment's and capital products for improving the growth of manufacturing sector and also for some of the basic necessities for fulfilling the basic requirements of their individuals. The import of goods and services is surveyed as an enlightening variable to precisely evaluate its significance and relation with real effective exchange rate and growth of Pakistan economy.

**Table 8. Group Unit root Test: Summary**

Method	Statistic	Prob.**	Cross-Section	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.44098	0.0003	3	105
Breitung t-stat	2.09316	0.0218	3	102
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.24750	0.0000	3	105
ADF - Fisher Chi-square	45.9515	0.0000	3	105
PP - Fisher Chi-square	52.4106	0.0000	3	113

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

The above statistics of group unit root test doesn't permits any sign of spurious or unit root as the p-value of all the test estimates are highly significant. For further investigation of the impact of real effective exchange rate, growth of Pakistan economy, income of the major trading partners countries on the imports of Pakistan, the ARDL techniques is to be run as it is independent of the level of stationarity and integration. The imports model and outcomes of ARDL regression is portrayed in below table (9).

$$M_{i,t} = \beta_0 + \beta_1 Y_{pak} + \beta_2 Y_w + \beta_3 REER_{i,t} + \beta_4 \sum_{k=1}^n FXR_{i,t} + \beta_5 \sum_{k=1}^n M_{i,t} + \beta_6 \sum_{k=1}^n Y_{pak} + \beta_7 \sum_{k=1}^n Y_w + \beta_8 \sum_{k=1}^n REER + \beta_9 \sum_{k=1}^n FXR_{i,t} + \mu$$

(6)

Numerous investigator and analyst have found the significant effect of growth on imports that as the developing economies grows it needs more capital goods from developed countries. Most of the developing countries also face shortage of goods while some economies prefer for imports of goods due to costly domestic production. From several decades the exports of Pakistan didn't grows efficiently while the economy is depending on imports. Because of fast changes in return approaches and globalization the capital and industrial goods exchange became focus part component for strategy producers. There is additionally enormous hole exists among the estimations of monetary forms, trade of merchandise and measure of exchanging items among the developing and developed nations that also increase the needs of imports for developing and emerging nations. It is acknowledged in the findings of this study that effect of growth on imports is positive that as there is rise in growth of Pakistan the imports of goods will be increases up to 0.18%.

The effect of change of budgetary condition of the world economies is extremely crucial especially for import dominant countries. As the global income changes it definitely affect the trade among the countries and any of the financial shocks badly affect the global trade adversely. However, the findings of this study portrayed in table (9) indicate that the effect of income of trading partner's countries on imports of Pakistan remains ineffective as the estimator value is insignificant.

The impact of real effective exchange rate on imports of goods and services is very pivotal particularly for those countries that are mostly depended on imported goods. It is assumed that decline in exchange rate may bring an increase in the cost of imported goods and also raise burden on the economy. That's why there is an inverse relation exists between the real effective exchange rate and imported goods. The findings of this investigation endeavors the same effect and relation and conclude that 1% devaluation the exchange rate increase the cost of imported goods up to 0.12%.

As stated above that Pakistan is developing country heavily dependent on the imported products and facing huge trade deficit. The dis-aggregated imports analysis found the consistent findings and the outcomes depicted in table (9) is evidence that approximately all of the major trading partner's countries national income and growth have dominant effect on the imports of Pakistan. The real statistics of Pakistan economy, the trade balance and economic survey of Pakistan also evident that imports have apparent role in Pakistan economy as the same have been found in this investigation demonstrated in below table.

**Table 9. Dis-Aggregated Analysis of Pakistan's Imports**

Variables	Coefficient	Std. Error	t-Statistic	Prob.
IMP(-1)	0.231492	0.262951	0.880364	0.3935
China	0.574871	0.154915	3.710886	0.0034
China(-1)	0.426298	0.130451	3.267861	0.0056
S. Arabia	0.283394	0.117908	2.403525	0.0307
S. Arabia(-1)	0.367433	0.112483	3.266545	0.0056
Turkey	0.258404	0.117015	2.208291	0.0444
Kuwait	0.224523	1.213774	0.184979	0.8559
Kuwait(-1)	0.029624	0.021924	1.351221	0.2038
UK	0.350614	0.097011	3.822994	0.0028
UK(-1)	0.135086	0.043894	3.077488	0.0082
France	0.147200	0.067305	2.187061	0.0512
USA	0.480580	0.208359	2.306499	0.0337
GER	0.197449	0.068800	2.869900	0.0152
Italy	0.164104	0.063631	2.579000	0.0256
Japan	0.273979	0.106549	2.571397	0.0260
REER	-0.122352	0.065929	-1.855813	0.0744
FXR	0.566070	0.270897	2.089617	0.0459
Ypak	0.181722	0.055835	3.254601	0.0077
C	5852.030	4344.573	1.346975	0.1994
R-squared	Adj. R-squared	DW Stat Value	Prob(F-statistic)	

0.917819	0.905172	2.026153	0.000000
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### BOUND TESTING ANALYSIS FOR IMPORTS GROWTH

As Pakistan economy is highly dependent on the imported goods. Therefore, after analyzing the short-run analysis the bound testing approach has been regressed to evaluate the long run relation and the results of table (10) endorsing the long run relation of imports with real effective exchange rate and growth of Pakistan economy.

Test Statistic	Value	K
F-statistic	4.971964	2
	Critical Value Bounds	
Significance	I0 Bound	I1 Bound
10%	3.17	4.14
5%	3.79	4.85
2.5%	4.41	5.52
1%	5.15	6.36

The co-integration test is applied to examine the co-integration among the studied variable. The below table shows that foreign imports have dominant impact on trade balance of Pakistan except the imports of Turkey, UK and France the it doesn't shows any significant co-integration with trade balance of Pakistan.

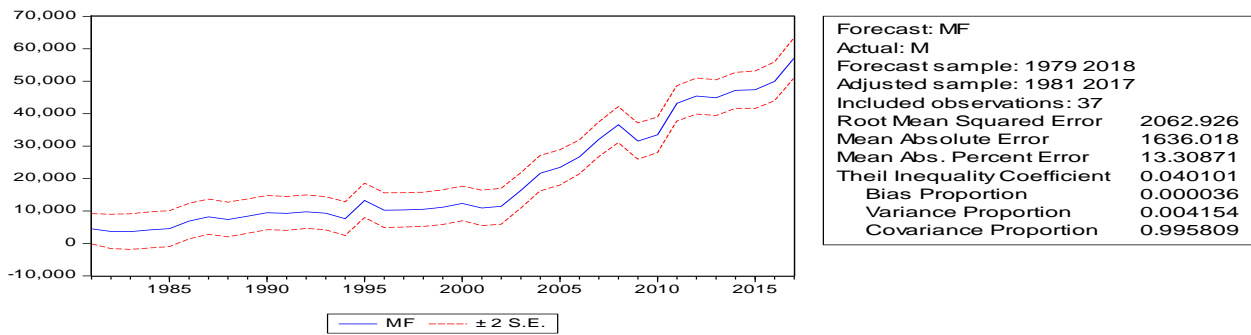
Variables	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(YP)	0.116277	0.027095	4.291411	0.0002
DLOG(YC)	0.838829	0.259012	3.238568	0.0032
DLOG(YS)	0.378869	0.095068	3.985260	0.0005
DLOG(YT)	0.016944	0.103017	0.164478	0.8707
DLOG(YK)	0.318112	0.097210	3.272402	0.0034
DLOG(YUK)	0.129232	0.167791	0.770198	0.4484
DLOG(USA)	0.120672	0.040442	2.983767	0.0362
DLOG(YF)	-0.920347	0.644064	-1.428968	0.1654
DLOG(YG)	0.609362	0.222289	2.741304	0.0422
DLOG(YI)	0.838829	0.259012	3.238568	0.0042
DLOG(YJ)	0.341060	0.111285	3.064743	0.0052
DLOG(REER)	-0.123653	0.0541571	-2.283232	0.0489
DLOG(FXR)	0.246958	0.073088	3.378909	0.0024
CointEq(-1)	-1.045742	0.116507	-8.975779	0.0000

Trade is confined mainly to exports and imports of tangible goods. Trade inadequacy happens when a country isn't free in making its essentials. Of course, many of the developing countries totally or partially depended on the imported goods for their rapid and sustained growth and development. Likewise, the economy of Pakistan is also profoundly depended on imported goods. The outcome of long run analysis demonstrates that there is long-run relation between growth of imports of Pakistan and real exchange rate up to 0.06% in inverse direction.

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LOG(YP)	0.209416	0.034534	3.064022	0.0034
LOG(YC)	0.555244	0.131867	4.210643	0.0000
LOG(YS)	0.362297	0.094163	3.847560	0.0000
LOG(YT)	0.016203	0.099092	0.163513	0.8714
LOG(YK)	0.195158	0.086323	2.260789	0.0317
LOG(YUK)	0.123579	0.156498	0.789656	0.4372
LOG(USA)	0.465888	0.236238	1.972113	0.0585
LOG(YF)	-0.880090	0.585868	-1.502198	0.1456
LOG(YG)	0.451846	0.209372	2.158104	0.0346
LOG(YI)	0.802138	0.248129	3.232744	0.0024
LOG(YJ)	0.326141	0.103616	3.147586	0.0032
LOG(REER)	-0.065461	0.022781	-2.873615	0.0236
LOG(FXR)	0.413574	0.122049	3.388600	0.0013
C	-10.802139	5.302279	-2.037263	0.0523

**FORECASTING ANALYSIS OF IMPORTS GROWTH**

Trade is the basic economic activity as to export the goods to earn foreign reserve and to imports the goods to fulfill the needs and requirements. Being an agriculture country the exports of Pakistan economy are mainly relied upon the primary goods. To overcome the premium issue Pakistan started development of their industrial sector and also the markets for their products in foreign countries. However, for rapid growth of manufacturing sector, Pakistan needs imports of capital and high mechanical goods due to which the imports of Pakistan were remained very high as compared to exports. The forecasting analysis of imports of Pakistan shows upward trends especially after 2004 as seen in the graph (2). Further, imports have outflanked conveys in practically reliably since 1950 and consistently till day and is expected to stand up to an inadequacy on its leveling of trade.



Graph 2. Forecasted Analysis of Imports of Pakistan

**CAUSALITY ANALYSIS FOR IMPORTS GROWTH**

Pakistan is a developing country suffering from high political instability, challenges of high volatilities in their exchange rate, economic and financial policies, energy crises and from last two decades the problem of terrorism. These major issues disrupted the smooth economic growth and the economy is highly depending on imports of goods. The causality result given in table (4.18) captured the bi-causal relation between growth and imports of Pakistan economy that both factors affect each other. For steady growth of Pakistan, imports playing a crucial role while in order to maintain the persistent growth the imports of capital and other goods is required. Moreover, the bi-directional relation also exists between imports and real effective exchange rate.

Further, the uni-directional causal relation exists from imports towards income of the Pakistan trading partner’s countries. This may be of because that Pakistan heavily imports goods from its major trading partner’s countries as portrayed in table (13).

**Table 7. Causality Analysis of Dis-Aggregated Imports Model**

Variables	GDP	Imports	REER	Yw	Causality Relation
GDP	---	0.0119	0.3045	0.6136	GDP → M
Imports	0.0286	---	0.0407	0.0100	M→GDP, M→REER, M→Y
REER	0.6057	0.0313	---	0.6895	REER→M
Yw	0.6713	0.1794	0.1964	---	No Causality Relation

**CONCLUSION**

The major problem of Pakistan is the trade deficit, which due to the highly elastic demand for Pakistani product (exports) in foreign countries and inelastic demand for imports due to low productivity within the country to fulfil the domestic needs and requirements. Pakistani manufactured products facing very high competition in foreign markets, mostly in textile products. Pakistan lost their share in export, on the other hand, since last decade there is significant increase in imports of Pakistan that leads to high trade deficit and adversely affect trade balance of Pakistan. From the findings of this study it can be concluded that the real effective exchange rate showed the profound effect in decreasing export as REER remained overvalued with respect to major trading partner’s countries and the findings is consistent with the studies of (Cheung and Rajeswari, 2013; Ahmad, Qasim and Chani, 2017; Safuan, 2017). Moreover, the impact of real effective exchange rate on import showed the inverse relationship, which shows that further devaluation of domestic currency will aggravate the cost of importing goods and may increase cost push inflation in short run and the findings is consistent with the studies of (Kemal and Qadir, 2005; Afzal, 2007; Oluyemi and Isaac, 2017). However, both the imports and exports plays significant role in enhancing the economic growth of Pakistan.

The causality analysis of Pakistan export reveals the bi-directional relationship of export and economic growth. Furthermore, the causality analysis revealed uni-directional relationship between real effective exchange rate and exports of

Pakistan. The empirical analysis reveals that the misalignment in real effective exchange rate brought instability in export and economic growth of Pakistan. However, the impact of export on real effective exchange rate was insignificant.

The causality analysis of Pakistan imports shows the bi-causal relation between the import of Pakistan and economic growth, both variable dependent on each other. Also, bi-casual relation reveals between real effective exchange rate and imports of Pakistan. Furthermore, the uni-causal relationship exists of imports to income of the major trading partners.

### CREDIT AUTHOR STATEMENT

**Kaleem Ullah:** As MS/Mphil student collected the data, analyzed, did writing and developed the Methodology. **Gulzar Ali:** As a supervisor help in improvement in the methodology, results and in interpretation, supervise the whole research and did necessary changes and give suggestin time time during the whole research. **Sara Rafiq:** Help in reviewing, giving some valuable suggestion for improving and proof reading of the paper (Editing in paper).

### COMPLIANCE WITH ETHICAL STANDARDS

It is declare that all authors don't have any conflict of interest. Furthermore, the data used in this stidy are secondary data and didn't contains anythings that are directly or indirectly related to any humans beings not need of any consent.

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