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An Empirical Inquisition of the Impact of Exchange Rate and Economic Growth on Export Performance of Pakistan

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Abstract: The role of international trade in economic development is very important. International trade is a potential source to increase the world production of goods and services. All the trading nations get benefits of increased world production caused by international trade. The present study empirically analyzed the impact of exchange rate and economic growth along with some other important macroeconomic factors on exports performance of Pakistan by using time series data. The study applied the Augmented Dickey-Fuller (ADF) Unit Roots Test to check the stationarity of data series. Autoregressive distributed lag model is used to estimate the long run relationship among the variables, followed by Unrestricted Error Correction Model (UECM). Empirical results based on ARDL bound testing approach to co-integration show that there exist a long run equilibrium relationship between Pakistan exports performance and its factors. In this study; Exchange rate, gross domestic production and trade openness have positive and significant impact on export performance, whereas role of foreign direct investment in determination of exports performance of Pakistan seems to be insignificant according to our analysis. In the end, the estimates of labor force indicate the higher growth of labor force along with lack of skills leads to contribute adversely on export oriented sectors where skilled labor force is required.

Key words: Pakistan · Exports · Exchange Rate and Economic Growth

INTRODUCTION

The role of international trade in economic development of modern economies is well recognized in contemporary economic literature. International trade can be considered unavoidable in today's world in order to fulfill the continuously growing customers' needs in all parts of the world. The classical trade theories of international trade like absolute advantage theory and comparative advantage theory consider the international trade as a potential source to increase the world production of goods and services. These theories argue that all the trading nations get benefits of increased world production caused by international trade. The empirical literature on international trade demonstrates that the production gains from international trade are unequally distributed among the trading nations (Salvatore [1] and Afzal [2]). Each international economic agent (trading nation) tries to optimize its own gain out trade without considering the gains or losses of others. In such competitive international economic environment, formulation of commercial and economic policies aimed at optimizing gains out of international trade is a real challenge for the economists. This challenge gives birth to controversial ideas among the economists that what type of policy options should be utilized in formulation of trade policy in each nation.

The controversy regarding trade policy mentioned above led to categorize the trade economists into two groups as noted by Kavoussi [3]. These two groups are known as 'Trade Pessimists' and 'Trade Optimists'. The trade pessimists are considered inward looking economists that favor import substitution (IS) as well as protectionist trade policies. While the arguments like

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export promotion, free trade among the nations are favored by the outward looking trade optimists. The philosophy of trade optimism seems to be dominant philosophy of world trade in these days.

Liberalization of trade has become an important policy issue all around the world in general and in World Trade Organization (WTO) member states in particular, since the arrival of WTO. Supporters of trade liberalization argue that trade liberalization ensures higher rate of economic growth and also promotes the human welfare. They argue that after involving in trade, countries become able to produce goods and services in which they are specialized as indicated by the theory of comparative advantage. The specialization, in turn, enhances and encourages competition and improvement in production techniques which ensure the availability of large variety and better quality of goods and services to the customers at competitive market prices (Gupta and Choudhry [4]).

The concept of specialization based on the theory of absolute advantage by Adam Smith initiated a new debate about trade policy of export promotion versus import substitution (Frankel and Romer [5]). Exports are as much important for trade account of any country as its imports.

In the era of free and liberalized trade, importance of studying exports and import demand elasticity has increased in order to check the response of trade balance of any country to the changes in its general price level and domestic income. Trade responsiveness with respect to income and prices are equally important for an emerging economy. The way which balance of trade follows over time is seriously dependent on the country's import responsiveness with respect to its own national income as well as responsiveness of its exports with respect on the income of all other economies of the world. If world consist of two countries and they trade with each other in a way that trade account of each country is balanced, general price level in both countries is constant and their respective national income grows at the same rate, even then their respective trade account balance can change with the passage of time if each country's export elasticity with respect to other country's income are different from each (Johnson [6]). In this situation, the economy having relatively larger import demand elasticity with respect to income as compared with its export demand elasticity with respect to other economy's income is expected to experience more growth in its imports as compared with its exports, worsening of its trade account balance and finally deterioration of exchange rate. Moderate economic growth of such country may fail to help the issue of trade deficit for such an economy in case of unfavorable income elasticity (Houthakker and Magee [7]).

The empirical testing of trade elasticity like price and income elasticity of exports and imports seemingly has vast and crucial use in macro-economic policies of a small open economy. These uses ranges from global transmission of variations in domestic productivity and general price level and the effect "expenditure switching" (exchange rate, tariff, etc) and "expenditure dampening" (fiscal as well as monetary) policies on the balance of trade of an economy. Trade elasticity enables the policy makers to assess the employment, development and other welfare inferences of trade restriction by trading partners and by home country itself. Trade elasticity also explains the sternness for home country policy options caused by external balance (Goldstein and Khan [8]).

This study measures the responsiveness of exports to the changes in Gross Domestic Product, exchange rate, foreign direct investment, trade openness and total labor force in Pakistan. The study concentrates on exports because exports are source of foreign exchange.

Objectives of the Study

This Study Has the Following Objectives:

- To measure the effect of economic growth on exports of Pakistan.
- To measure the effect of foreign direct investment on exports of Pakistan.
- To measure the effect of exchange rate on exports of Pakistan.
- To measure the effect of labour force on exports of Pakistan.
- To measure effect of trade openness on exports of Pakistan.

Hypotheses of the Study:

- Exports of Pakistan do not respond to changes in economic growth.
- Exports of Pakistan do not respond to changes in foreign direct investment.
- Exports of Pakistan do not respond to changes in exchange rate.
- Exports of Pakistan do not respond to changes in degree of trade openness.
- Exports of Pakistan do not respond to changes in labour force.

Literature Review: In the past several decades much research in international economics has been devoted to study the behavior of exports in different countries. The course, the elasticity of income and investment remained the most important empirical estimates in the international economic literature. Being more than just theoretical debate, such estimates have implications for the balance of payments (Chang *et al*. [9]).

Most of the work on macroeconomic determinants is backed by international economics theories like absolute advantage theory, comparative advantage theory and Heckscher-Ohlin (H-O) theory and the issues studied mainly include competitiveness of the economies, directions of trade, trade flows among the economies of the world and the role of macroeconomic policies in enhancing exports, balancing trade flows and maximizing trade gains (Yasuyuki [10]).

The advocators of free trade say that government policies of intervention in the market disturb competitive working of the free trade market mechanism. But some researchers challenge these arguments of spillovers of trade either from government intervention or from free trade. For instance, Rodrik [11, 12] state that all those arguments presented to justify the policy interventions to accelerate exports seems unrealistic theoretically as well as empirically.

The role of foreign direct investment (FDI) in promoting export in East Asian countries as well as in South East Asian countries is hard to ignore. Most part of FDI undertakes through multi national corporations (MNCs) which have well established network, market relations globally and up to date market information.

Srinivasan [13] suggest that the case of East Asian and South East Asian countries should not be applied to all underdeveloped and developing countries because most of developing and underdeveloped countries have limited factors and commodity markets along with low level infrastructure. Whether FDI promotes export in developing countries or not is a controversial debate in literature and it is dependent upon the purpose of these flows of investment. If FDI is inspired to save tariff and to capture domestic market with low cost then FDI may not be useful in export promotion. In contrast, if the purpose of FDI is to get benefit from comparative advantage that domestic economy has over other nations then FDI may contribute to promote exports. The nature of FDI inflows also depends on country's policy regime. In the countries which following inward looking trade policy may encourage FDI to capture domestic market and facilitate the domestic population. Where as, if prevailing policy regime looks outward, they may attract FDI in export oriented industries to accelerate export (World Bank [14]). India took step to open up the Indian economy and liberalized investment policy for past two decades. Indian degree of openness is still lower than most of the developing countries. The tariff rates and tariff barriers were reduced but due to the less efficiency of market mechanism in India and lower level of infrastructure and thus could not get as much benefit as East Asian countries have gained (Srinivasan [13]; Sharma [15]).

Growth of export is considered as one of the major determinant of sustainable economic growth. There are several success stories of export led growth in developing countries and Chile is one of them. But exports in Chile are not significantly expanded yet as much as standard definition of export expansion suggest in the trade flow framework (Helleiner [16]). Primary exports are considered as the main secret of persistent export growth of Chile. But some scholars suggest trade policy of openness in Chile may not make the economy able to bear the shock if export markets face depression condition (Amsden et. al. [17]).

As for role of volatility in exchange rate in determination of international trade flows is concerned, there seems no agreed upon view in the literature regarding theoretical as well as empirical relationship between these two variables. Using the utility maximization framework Hooper and Kohlhagen [18]) developed a bilateral trade model in reduced form equations. The study also estimate this model empirically for both imports and exports and finds that utility is positively related with products and negatively with demand schedule and variation of products. On the same footings, alike trade equations are estimated for different countries in different time periods, for bilateral trade and overall trade flows between the countries, for various forms of volatility in exchange rate and for real as well as nominal variables. There is a lot of empirical literature on the significance of the relationship between volatility of exchange rate and international trade flows. Notable studied among the voluminous literature which support the idea that frequent fluctuations in exchange rate lower down the trade flows are Cushman [19; 20, 21], Akhtar and Hilton [22], Kenen and Rodrick [23]). In contrast, Hooper and Kohlhagen [18] and Asseery and Peel [24]) are not able to validate the hypothesis that fluctuating exchange rate leads to depress the international trade flows. With special reference to developing countries, one can find the evidence of negative relationship between the above mentioned two variables (Grobar [25]).

Baldwin and Krugman [26] and Dixit [27] also discuss the asymmetry of exchange rate volatility effects on export performance. They note that new exporting firms enter in the competitive export market during the periods of depreciation. These new entrants also remain in the market when exchange rate decreases and this is behavior is called hysteretic behavior.

The impact of stochastic exchange rate or random behavior of exchange rate on exports has got attention in the literature. According to Kandil and Mirzaie [28] aggregate demand and aggregate demand variation leads to exchange rate volatility. When one considers appreciation of local currency in this framework, it has supply side effects by decreasing the cost of imported raw material and intermediate goods and increase the supply of final goods and services and leads to more exports. On the other hand, appreciation of domestic currency leads to less competitiveness of domestic producers in international markets, reduces the volume of exports of the country, increases the imports and thus deteriorates the balance trade. This situation leads to the search for optimal level of exchange rate because supply side mechanism suggests that appreciation will lead to increase in export supply and depreciation will lead to decrease in it. But on the side, demand side mechanism support the depreciation and suggests that depreciation will lead to increase in demand for exports of domestic economy while the appreciation will do the reverse (Dincer and Kandil [29]). From the above discussion in the literature on can conclude that without any ambiguity, competitiveness of exports has close relations with cost of production. Liu and Shu [30] believe that low labor cost is the core advantage that Chinese firms have over the firms from rest of the world in export market. Shafaeddin [31] does not agree with the view presented by Liu and Shu [30] and argues that China's advantage in per unit labour cost in manufacturing sector is not much different from other developing economies. The study admits that China has labour cost advantage over other developing countries in its labour-intensive industries like textile and clothing but in other industries China is not as much low wage country as Indonesia, India and Bangladesh (Adams, Gangnes and Shachumurove [32]).

According to UNCTAD [33], foreign direct invest (FDI) is hoped to have positive relationship with export performance. But the role of FDI in export performance may vary at different levels of exports and trade regime prevailing in an economy. The empirical literature on different countries suggests that contribution of FDI in transforming the export composition is not ignorable. The case of China and Singapore is most recent example of the positive role of FDI in enhancement of exports of these economies due to its significant contribution to technological products, processes and development of export supply capacity especially in knowledge based industries (UNCTAD [34]).

The role of FDI in India is positive but it does not contribute to export expansion significantly (Sharma [35]).

The study considers the exports of five countries and the results reveal that Poland is the only economy among those five in which FDI plays a positive and significant role in determining the structure of exports of the economy. FDI in other four countries has negative sign which indicate FDI could be a changing force in the export structure of these countries. Foreign investors are investing on the basis of perception that these industries can perform well in medium term and can contribute to positive change in the structure of exports in these countries. The FDI supports the domestic effort to upgrade and reengineer the productive capacity. The literature and discussion presented in the above paragraphs suggest that country specific determinants and factors need to be studied in order to formulate the effective policy mechanism to enhance the export performance of the country (Majeed and Ahmad [36]).

Model and Data Source: In the light of arguments presented above, the model used for the present study is given below:

$$X^t = f(GDP_t, FDI_t, EXRT_t, LAB_t, TRD_t,)$$

Where

X^t = Volume of exports in time $_t$
GDP_t = Real gross domestic product in time $_t$
FDI_t = Foreign direct investment in time $_t$
$EXRT_t$ = Real exchange rate in time $_t$
LAB_t = Labor force in time $_t$
TRD_t = Trade liberalization in time $_t$.

In view of the discussion in preceding paragraphs log-linear form of our estimation equation is given below:

$$\text{In } X^t = \beta_0 + \beta_1 \text{ In } GDP_t, \beta_2 \text{ In } INFDI_t, \beta_3 \text{ In } EXRT_t, \beta_4 \text{ In } LAB_t, \beta_5 \text{ In } TRD_t, \varepsilon_t)$$

Where

In X^t = Natural logarithm of exports in time $_t$
In GDP_t = Natural logarithm of real gross domestic product in time $_t$
In FDI_t = Natural logarithm of foreign direct investment in time $_t$
In $EXRT_t$ = Natural logarithm of real exchange rate in time $_t$
In LAB_t = Natural logarithm of labor force in time $_t$
In LAB_t = Natural logarithm of trade liberalization in time $_t$.
In TRD_t = Error term

Data Sources: This study uses the variables of Export, gross domestic product, foreign direct investment, real exchange rate, labor force and trade liberalization for empirical analysis for the period of 1972 to 2009. The variables of exports of goods and services, gross domestic product, foreign direct investment, trade openness as a proxy for trade liberalization are taken from World development Indicators online database by World Bank [37]. The variables of gross domestic product, foreign direct investment and exports of goods and services are measured in constant prices of the years 2000 in Pakistani rupees. The real exchange rate variable is calculated by multiplying nominal exchange rate (rupees per dollar) with the US GDP deflator and divided it by domestic GDP Deflator. Data for nominal exchange rate, US GDP deflator and divided it by domestic GDP Deflator are also taken from World development Indicators online database by World Bank [37].

Econometric Methodology: Non- stationary behavior is considered common characteristic of time series data due the presence of time trend in such data. Most of the time series data is non-stationary because of the existence of time trend in it. According to Granger and Newbold [38], regression analysis applied on such type of data may provide spurious estimates. Philips [39] further adds that the existence of co-integrating relationship among the time series in the long run is necessary to get reliable results from regression analysis. Ensuring the stationary of time series is essential for testing co-integrating relationship among them. Thus the regression results obtained through Ordinary Least Square (OLS) method are reliable if the variables are stationary and co integrated. Ordinary least square based regression in its simple form may give reliable estimates if time series included in it are stationary and have co-integration among them.

Test of Unit Root: Augmented Dickey-Fuller (ADF) test is used to check the problem of non-stationary or unit root in the data by applying the regressions models given below.

$$\Delta X_t = \alpha + \delta X_{t-1} + \sum_{j=1}^{q} \gamma_j \Delta X_{t-j} + \in_{1t}$$

$$\Delta X_t = \alpha + \beta t_1 + \delta X_{t-1} + \sum_{j=1}^{q} \gamma_j \Delta X_{t-j} + \in_{1t}$$

Where

$$\Delta X_t = X_t - X_{t-1}$$

q = Optimum lag length of variable on which unit root test is applied.

The presence of unit root problem or stationary is accessed through the hypothesis given as under:

H_0 : $\delta = 0$ (the time series X_t is Non-Stationary or have unit root)
H1: $\delta < 0$ (the time series X_t is Stationary or does not have unit root).

Bound Testing Approach to Co Integration: Test of co integration is used to know about the presence of equilibrium relationship between the studied variables. Idea of co integration was initially presented by Engle and Granger [40]. It was enhanced later on by Johansen and Juselius [41], Johansen [42] and Pesaran *et al.* [43]. Johansen and Juselius [41] and Pesaran *et al.* [43] approaches are used commonly to check the existence of co integration among the variables involved. This thesis utilizes the well-known bound testing co integration approach using Auto-Regressive Distributed Lag (ARDL) structure, introduced by Pesaran *et al.* [43].

Contrary to available contemporary approaches to test the presence of long run co integrating relations, ARDL based approach of co integration checks the same thing without considering order of integration that either the time series involved are $I(0)$, $I(1)$ or have mixed order of integration. This test uses UECM which is an abbreviation of Unrestricted vector Error Correction

Mechanism and is considered to possess superior testing characteristics because it is not a residual based co integration test to check short run coefficients and long-run co integration through the error series as in the test of the Engle-Granger co-integration technique (Pattichis [44]). Use of ARDL is recommended test for checking co-integration for the small sample to avoid the small sampling error as advised and used by Mah [45]. Alam and Quazi [46] suggest that ARDL testing procedure may be utilized when the independent time series are endogenous.

For applying the ARDL bounds testing test of co integration, it is mandatory to symbolize Equation (4.6) in a conditional ARDL model or UECM as given below:

$$\Delta InX_t = a_1 + a_2 t + a_3 InX_{t-1} + a_4 InGDP_{t-1} + a_5 InFDI_{t-1} + a_6 InEXRT_{t-1} + a_7 InLAB_{t-1} + a_8 InTRD_{t-1} + \sum_{i=1}^{P} \beta_i \Delta InX_{t-j} + \sum_{j=0}^{P} \beta_j \Delta InGDP_{t-j} + \sum_{k=0}^{P} \beta_k \Delta InFDI_{t-k} + \sum_{l=0}^{P} \beta_l \Delta InEXRT_{t-l} + \sum_{m=0}^{P} \beta_m \Delta InLAB_{t-m} + \sum_{n=0}^{P} \beta_n \Delta InTRD_{t-n} + v_t$$

t = 1,2,3,...37,

Where variables used in the equation are already explained. The sign Δ, denotes the variation ($\Delta X = X_t - X_{t-1}$ and is known difference of the X) and v_t is the regression residual. ARDL method makes usages of Wald statistic which follows F statistics to verify the existence of a co integrating bond. F-statistics is used to test null hypothesis which states that there is no co integrating relation and is tested by checking the combine significance of coefficients variables with lag of one period.

Keeping in view the equations mentioned above, our statistical hypothesis to test co integration is given as under:

H_0: $\alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = \alpha_8 = 0$
(co integrating relationship of the variables does not exist)

H_a: $\alpha_3 \neq \alpha_4 \neq \alpha_5 \neq \alpha_6 \neq \alpha_7 \neq \alpha_8 \neq 0$

(There is co integrating relation among the variables).

Pesaran *et al.* [43] provides statistical table values of F-Statistic to test the hypotheses above mentioned.

The factors stated below are behind the non-standard distribution of bound testing values of F- test:

- The included variables' integration order (I (d)).
- The inclusion or exclusion of time trend and intercept term in the estimated model
- The number of explanatory variables used in the analysis.

When the estimated value of F statistic is lower than the value of lower bound or more than that of upper bound compatible with a suitable (99%, 95% or 90%) level of confidence, then a decisive conclusion is reached even having no earlier information regarding the integration level of independent variables. One may reject the null hypothesis which states the non-existence of co-integration, between the dependent and all independent time series included in the analysis under consideration, if the Wald based estimated F value proves higher than the critical value of upper critical bound. This indicates the existence of co-integration relationship in the variables that are studied. Final conclusion cannot be taken when the calculated F-value is inside the interval shaped by the values of lower critical bound and upper critical bound. It is the situation in which early knowledge of the integration level of independent variables becomes necessary before drawing any conclusion regarding the rejection or acceptance of null-hypothesis of no co-integration. In another situation while the calculated F-value is below table value for relevant critical lower bound, at specified level of significance, the null-hypothesis may not be rejected which states that co=integration does not exist (Pesaran *et al.* [43]).

When the co integration is applied and the results confirm its existence for long span of time, then it is time to check for the possible short run co-integrating relationship and dynamics by using the VAR based Error Correction Mechanism (ECM). The form of VECM which includes our concerned variables is as given below:

$$\Delta InX_t = a_1 + a_2 t + \sum_{i=1}^{P} \beta_i \Delta InX_{t-j} + \sum_{j=0}^{P} \beta_j \Delta InGDP_{t-j} + \sum_{k=0}^{P} \beta_k \Delta InFDI_{t-k} + \sum_{l=0}^{P} \beta_l \Delta InEXRT_{t-l} + \sum_{m=0}^{P} \beta_m \Delta InLAB_{t-m} + \sum_{n=0}^{P} \beta_n \Delta InTRD_{t-n} + \varphi ecm_{t-1} + \mu_t$$

t = 1,2,3,...,37,

We have defined all the symbols and time series variables already excepting ecm_{t-1}, which is time lagged series of residual term which represents error correction. Size and sign of the slope of co-efficient of this term "E C T_{t-1}(i.e.θ)" inform about the pace of converging or diverging from or to stable long term co integrating path when the included variables face some shocks. The significant θ approves the stability of short term equilibrium based relation of variables involved in the study and it provides another supporting factor to the stability of the long term co-integrating bond which equilibrates the time series used for study

Estimation Results: Empirical findings of the study are discussed and presented in the present part of the study. The analysis presented here focuses on the estimation of determinants of exports for Pakistan and their dynamics and stability. In order to get this target, this part starts with checking the stationarity of the variables by utilizing ADF unit root test because the presence of stationarity is pre-requisite for applying co integration tests for long run equilibrium. After getting knowledge about stationarity of the used data for analysis, the ARDL test of co integration is used to check whether long run stable equilibrium relation is present among Pakistani exports and their determinants. Similarly, shot term dynamics of the export performance as function to exchange rate and economic growth are presented and in the end, Diagnostic tests are presented as the evidence for reliability of results.

Unit Root Analysis: ADF test is used to analyses and check for the problem of unit root or non-stationarity in the data. Here data is used in transformed form with natural logarithm. The table 1 presents the results of unit root test based on ADF test. The results indicate that GDP, Exports of goods and services, exchange rate and labor force time series variables are non-stationary when they are checked at level while the remaining two variables, which are trade openness and FDI, are level stationary. The table 1 present statement of that null-hypothesis says that variables are non-stationary cannot be rejected at level for all variables except two. But at first difference it can be rejected for all the variables used in the study. It can be concluded from the empirics presented in table two that order of integration of the variables used here is different. The variables of exports, Labor force, GDP and exchange rate follow I (1) (first order of integration) while FDI and trade openness follow zero integration order I (0).

Table 1: Results of Augmented Dickey-Fuller (ADF) Test for Unit Root. length based on VAR by considering the time span covered by data, frequency of observations, lags requirement as well as number of included variables in ARDL model. Most of the lag selection criteria used in table two including Schwarz Bayesian Criterion (SBC) select lag 1 as an optimal lag length. VAR based results for selecting best lag length are presented in Table 2 below. Based on these results maximum lag length of 1 lag is used in ARDL parsimonious process for selecting ARDL order.

Test of Co-Integration: ARDL test of co-integration is applied to test the long run relation between exports, gross domestic product, foreign direct investment, real exchange rate and total labor force and trade openness.

The estimates of bound tests of co-integration, drawing upon ARDL equation in part 4 and are shown in Table 3. F-Statistics based on Wald test is employed to check the null-hypothesis which states that there is no co-integration ($\alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = \alpha_8 = 0$ between exports, gross domestic product, foreign direct investment, real exchange rate and total labor force and trade openness. The value of F-statistics is 6.7692 and is larger than the value of upper bound, 4.9753, given by Pesaran et al (2001) for 5% level of significance. So the null hypothesis may be rejected which states that there is no co-integration ($\alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = \alpha_8 = 0$) and alternative-hypothesis ($\alpha_3 \neq 0$, $\alpha_4 \neq 0$, $\alpha_5 \neq 0$, $\alpha_6 \neq 0$, $\alpha_7 \neq 0$, $\alpha_8 \neq 0$) stating that co-integration exists between dependent ad explanatory variables may be accepted.

The results of co-integration test presented in table 3 prove that exports, GDP, foreign direct investment, real exchange rate, total labor force and trade openness in Pakistan are co integrated and are in equilibrium in the long run.

When co integrated relationship is existed among the variables of study, in this way long run results of the study are reliable. The results symbolize long run elasticity of exports for gross domestic product, FDI, real exchange rate, total labor force and trade openness. The results of long run co integration are presented in Table 4.

The results of table 3 show that gross domestic product, real exchange rate, total labor force and trade openness have statistically significant impact on export of goods and services in Pakistan. But the impact of FDI on export of goods is negative and not significant in long run. Gross domestic product, real exchange rate and trade openness impacts positively on exports.

Table 1: Unit Root Test

ADF Test at Level			Linear Trend	
Variables	t -Statistic	p- Value	t -Statistic	p- Value
lnX_t	-0.510114	0.8777	-2.364576	0.3908
$lnGDP_t$	-0.797092	0.8076	-1.246752	0.8845
$lnFDI_t$	-0.401231	0.8984	-3.311058	0.0806
$lnEXRT_t$	-2.526115	0.1179	-3.212189	0.0981
$lnLAB_t$	0.218632	0.9701	-1.799155	0.6843
$lnTRD_t$	-3.063053	0.0386	-2.982020	0.1510
ADF Test at 1st Difference				
Variables	t -Statistic	p- Value	t -Statistic	p- Value
lnX_t	-6.150023	0.0000	-6.044214	0.0001
$lnGDP_t$	-4.377500	0.0014	-4.372889	0.0073
$lnFDI_t$	-7.602948	0.0000	-7.442438	0.0000
$lnEXRT_t$	-6.066036	0.0000	-5.976936	0.0001
$lnLAB_t$	-6.391117	0.0000	-6.331564	0.0000
$lnTRD_t$	-6.122370	0.0000	-6.063321	0.0001

Table 2: Lag Order Selection Criteria Based on VAR

Lag	LR	FPE	SBC	HQ
0	NA	1.18e-09	-3.260507	-3.438006
1	292.1750*	2.03e-13*	-10.34801*	-11.59050*
2	45.97892	2.33e-13	-8.803688	-11.11118
3	33.76420	3.80e-13	-7.320842	-10.69332

* indicates lag order selected by the criterion

LR: "Sequential modified likelihood ratio test statistic (each test at 5% level)"

FPE: "Final prediction error"

SBC: "Schwarz Bayesian criterion"

HQ: "Hannan-Quinn information criterion"

Table 3: Results of ARDL Bound Testing Approach to Co-integration

ARDL (1,0,0,1,1,0)		
F-Statistic (Wald-Test) = 6.7692		
	Pesaran *et al.* (2001)	
Level of Significance	Lower Bound Value	Upper Bound Value
5%	3.6607	4.9753
10%	3.0947	4.2461

Table 4: Long Run Relationships

Dependent Variable: lnX_t			
Variable	Coefficient	t-Statistic	p-Value
$lnGDP_t$	1.5765	2.8399	.009
$lnFDI_t$	-0.026080	-.51634	.610
$lnEXRT_t$	0.22218	2.6929	.012
$lnLAB_t$	-3.1168	-2.8273	.009
$lnTRD_t$	0.67073	1.9402	.063
Time	0.060850	1.6647	.108
Constant	-11.3497	-.75322	.458

The results demonstrate that gross domestic product is among the major determinants of exports in Pakistan and have the coefficient 1.5765. This implies that exports in Pakistan are highly elastic with economic growth and 1 % increase in gross domestic product leads to 1.5765 % increase in exports and this result is significant at five percent level. According to the economic theory, real exchange rate and exports are positively associated with each other in Pakistan. Other things kept constant, increase of one percent in real exchange rate leads to 0.22 percent increase in exports and this result is significant at five percent level. Thus we can say that exchange rate is also an important determinant of Pakistani exports. Similarly, trade openness positively effects on exports performance in Pakistan and its positive as well as significant coefficient of 0.6707 indicate that there will be 0.6707 percent increase in exports of the country if trade openness increases by one percent.

The results presented in table 3 shows that increase in labour force taking as percentage of total population is negatively related in long run to the export performance of Pakistan. It is argued in economic literature that unskilled labour force affects the export negatively because this kind of labour can not contribute much in productive process and they also cause an increase in domestic demand and reduce the export of goods and services. This result is statistically significant and indicates that, other things remains constant, one percent increase in labour force as a percentage of total population leads to 3.1168 percent reduction in export of the country in the long run. Results of study specify that contribution of FDI in enhancing exports of Pakistan is statistically insignificant.

Short Run Estimates: Once co integrating relationship of variables is established, we use VECM for estimating short run coefficients. Table 4 explains the short run dynamics of variables. According to table gross domestic product, FDI, real exchange rate and trade openness have significant effect on export of goods and services in short run while total labor force is impacted insignificantly in short run.

The one period lagged ecm is significant and negative. It is the verification of existence of long run relationship of variables. The results, explained in table 4, show that gross domestic product, FDI, real exchange rate and trade openness are significant in short span of time. The coefficient shows that the variable labour force is insignificant. The real income, real exchange rate and trade openness have positively impacted exports in short run. The results demonstrate that gross domestic product has the highest 1.7321 elasticity of exports as well as followed by trade openness 0.3131 and real exchange rate 0.0527. Foreign direct investment had negative coefficient of -0.0451 and is statistically significant in short run.

Table 5: Short Run Estimates

Dependent Variable = ΔlnX_t			
Variable	Coefficient	t-Statistic	p-Value
$lnGDP_t$	1.732147	2.429052	0.0218
$lnFDI_t$	-0.045089	-2.075153	0.0473
$lnEXRT_t$	0.052724	1.733893	0.0939
$lnLAB_t$	0.503327	0.820441	0.4189
$lnLAB_t$	0.313080	1.815384	0.0802
$lnTRD_t$	-0.635573	-6.799183	0.0000
Time	0.000378	0.304393	0.7631
Constant	-0.001274	-0.024521	0.9806

R2 = 0.6794
Adj-R2 = 0.5993
F-Statistic = 8.4767
Prob(F-statistic) = 0.000015
Durbin-Watson = 2.2846

Table 6: Diagnostic Tests:

Name of Test	Test Statistic	p-Value
Normality Test (Jarque-Bera Statistics)	2.317	0.314
Serial Correlation		
(Breush-Godfrey Serial Correlation LM Test)	0.956642	0.3367
ARCH Test		
(Autoregressive Heteroskedasticity Test)	0.110746	0.7414
Heteroskedasticity Test		
White Heteroskedasticity Test		
5.514546		
Breusch-Pagan-Godfrey	11.8471	0.1057
Model Specification Test		
(Ramsey RESET Test)	0.082308	0.7764

Diagnostic Tests: In order to check the robustness of our estimations, diagnostic tests are used. Diagnostic tests are based on the assumptions of Classical Linear Regression Models (CLRM) using least square methods. CLRM assumes that residual term of the regression model should be distributed normally, there should be no serial correlation and heteroskedasticity and model should be correctly specified. These assumptions are checked and their results are given in Table 5 below.

These estimates given above reveal that time series of error term of the model follows normal distribution and have no problem of heteroskedasticity and autocorrelation. The model used in the study is also well specified based on the results of Ramsey's RESET test. The results of this test suggest that the model is specified well.

In order to examine the consistency of the coefficients of our model the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMsq) were used. The geometrical demonstration of both tests is presented in Fig. 1 and Figure 2. The null-hypothesis of these tests which states that model is specified correctly may not be rejected as line graph of these test statistics

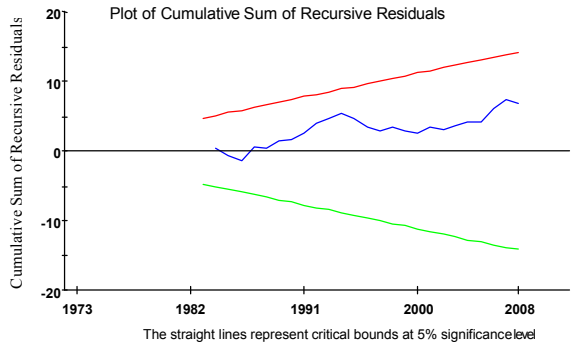

Fig. 1: Plot of Cumulative Sum of Recursive Residuals

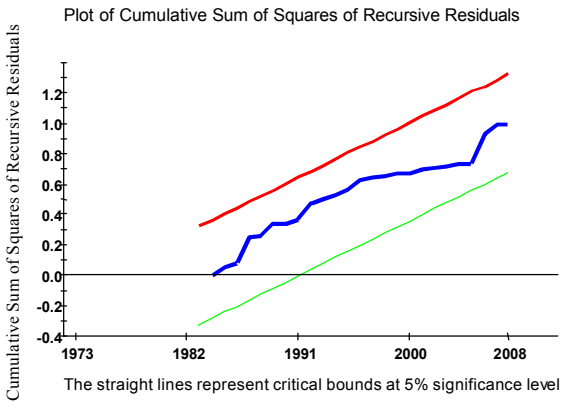

Fig. 2: Plot of Cumulative Sum of Squares of Recursive Residuals

lies inside the critical limits at 5% level of significance. Both figures show that the line graphs of both tests statistics are inside the critical limits so the model used in the study is correctly specified

CONCLUSION

This part presents the conclusions of the study based on statistical analysis of the data. This study is aimed at having empirical inquisition of the impact of economic growth and exchange rate along with some other macroeconomic factors on the exports performance in Pakistan. ARDL bound testing approach to co-integration is used to analyze the long run relationship among exports performance; economic growth, exchange rate, foreign direct investment, labour force and trade openness. Empirical results based on ARDL bound testing approach to co-integration show that there exists a long run equilibrium relationship among Pakistan's exports performance; economic growth, exchange rate, foreign direct investment, labour force and trade openness.

- Long run coefficients indicate that exports performance is highly influenced by the economic growth in the country proxied by gross domestic product as the coefficient of real GDP has the highest positive and significant value of 1.5765. This indicates that growth performance of Pakistan plays major role in determining the country's export performance and is the major determinant of exports.
- Trade liberalization has the significant and positive impact on exports performance of the country. Having the positive coefficient of 0.67073, trade liberalization seems to the second major determinant of Pakistan's export performance.
- Similarly the results indicate that role of exchange rate in determining the export performance of the country is also considerable. The exchange rate seems to the third major factor influencing the exports volume of the country as it has positive and statistically significant value of 0.22218.
- Role of Foreign Direct investment in determination of Pakistan's export performance seems to be insignificant according to our analysis. The results indicate that FDI is not a significant determinant of Pakistan exports because most of the foreign direct investment in Pakistan is utilized in non-exporting sector and is mostly used to fulfill domestic demand.
- The results of labour force variable indicate the higher growth of labour force along with lack of skills leads to contribute adversely in export oriented sectors where skilled labour force is required. The negative and statistically significant value of the coefficient of labour force suggests that government should focus on the skill development programs to develop country's human resources so that they can be provide bonus to the country by participating in economic and productive activities instead of being burden on the economy.

Recommendations:

- There is a need for insuring sustainable GDP growth in Pakistan as during the recent past GDP growth has shown fluctuating trends leading to uncertainty in exports sector. The govt should take solid measures to insure stability in GDP growth rate, specially manufacturing sector should be given top priority to trigal exports and increase its share in GDP. Similarly agriculture sector should be provided with the facilities to market and exports its value added products.
- Trade openness insures specialization and efficient allocation of resources leading to encourage exports. Pakistan has undergone structural changes after tax introduction SAP. But still there is a need to increasingly adopt trade openness as a measure of promoting exports.
- Exchange rate policy should be framed in context with the stabilization of internal economy of the country, volatility in exchange rate can shatter the confidence of investors hence destabilizing both real and financial sector of the country. Thus Govt should be careful in avoiding volatility in exchange rate.
- Unfortunately, FDI could not play its rate in developing country in Pakistan as FDI has not been channelized through institutional channels in these countries leading to misdirection of the inflow of foreign capital to domestic sector instead of directing it to the exports sector. The Govt should focus on devising channels which can insure FDI in those sectors which increases exports of the country.
- Labour force should be trained to cope with the state of the art technology being introduced by the FDI so that it can rep the fruit of modern technology and capital inflow due to reduction of tariff. For this purpose, the Govt. should identify in advance new requirements in modern sectors especially in information technology as job placement in abroad as like wise exports of the country.

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