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## **THE RELATIONSHIP BETWEEN TRADE OPENNESS AND ECONOMIC GROWTH: A CASE STUDY OF PAKISTAN\***

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### **ABSTRACT**

The aim of this study is to examine the short-run, long-run, and causal relationship among trade openness and economic growth in Pakistan. To test the hypotheses of this study, a time series data for the period of 1973-2010 was used. Macroeconomics variables such as Economic growth, value of real gross domestic product (GDP), value of exports (XP) and value of imports (MP) are variables of interest in current study. To study the long-run, short-run and causal relationships among trade openness and economic growth, Co-integration and Granger causality tests are used in this study. The results of this study support the long-run relationship among trade openness and growth. The findings of this paper are unidirectional causality from export to growth and import and from growth to imports but did not find any bidirectional causality relationship among the variables.

**Keywords:** Trade openness, Economic growth, Gross domestic product, Pakistan.

### **INTRODUCTION**

Theory envisages that there are two way causal relationships between export and economic growth. But dissimilarity persists in the literature available on causal relationship among trade openness and growth. According to Michaely (1977), Feder (1983) and Todaro and Smith (2010) those countries grow faster whom exports have large share in their output. Technological spillovers and other externalities have impact on the economy as a part of export growth. Consequently, an extensive empirical literature is available on association

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between exports and growth. On the other hand, the literature on the subject of association among imports and growth is rare because their relationship is much complicated. The imports' demand is determined by economic and as well as non-economic factors. These factors include such as exchange rate, relative prices, economic activities, domestic economic conditions as well as world economic conditions, cost of labor and capital and political situation. The upsurge in economic activity results in increase of imports because increase in real income increases the consumption. Therefore, there is direct relationship between growth and imports (Bahmani-Oskooee & Alse, 1993).

The previous study found that endogenous growth models stressed upon that imports are very important channel to flow the foreign technology / knowledge towards home economy (Ahmad & Harnhirun, 1996; Granger, 1969; Henriques & Sadorsky, 1996). Labor productivity increased as the labor acquires the knowledge and skills to adopt new technologies (Ghatak & Price, 1997). Moreover, it is widely acknowledged that imports have an important role in the countries' economic growth and GDP, whose manufacturing base is export oriented (Gupta, 1985; Johansen & Juselius, 1990).

According to previous studies exports have also perform a key role in economic development of a country, huge volume and high value of exports increases the productivity and boost economic growth (Barro, 2001; Barro, Sala-i-Martin, Blanchard, & Hall, 1991; Gemmell, 1996). Exports have major contribution in triumph of Asian Newly Industrialized Economies (NIEs) and other emerging Asian economies Malaysia and Thailand. But this is not a general agreement and just a case of Asian economies and this may not be replicable in case of other countries. Jaffe and Westerfield (1985) evoked a question that whether dependence on export-led-growth will lead to a continuous growth in case of LDEs, if there is unpredictability in long run in world markets. It includes the tariffs, quotas and subsidies for import substitution. These policies help the domestic industries and firms. Many countries used the export promotion and protection policies parallel. Both strategies may well be complementary (Bahmani-Oskooee & Alse, 1993).

The objective of current study is to study the causality and inter-linkages between trade openness and economic growth. The granger causality method is also used to find the evidence in favor of nay hypothesis such as Export-Led-Growth (ELG), Import-Led-Growth (ILG), Growth-Led-Export (GLE), or Growth-Led-Import (GLI) in case of Pakistan. The rest of the study consists of four sections: Section 2 contains on the literature review on the cited subject, Section 3 consists on data and methodology, Section 4 discusses the empirical results and lastly Section 5 concludes the discussion.

## LITERATURE REVIEW

For cross sectional data, Balassa (1985), Balassa (1978), Tyler (1981) and Ram (1987) used the OLS method to examine the association among economic growth and exports of a country. They found export was an essential sector for economic growth. They used the sample data for seventy developing countries over the time period of 1960-1981. While, Colombatto (1990) rejected the hypothesis of export-led growth, he also used the sample of seventy countries and methodology used was OLS. Chow (1987), investigated the causal relationship among industrial development and export growth, he found feedback causality for all eight NIEs except Argentina. Jung and Marshall (1985), found no causality in case of Brazil and Mexico while he founds the causality running from output to exports in case of Taiwan and Korea.

Darrat (1986) found no unidirectional causality in case of Singapore, South Korea, Taiwan and Hong Kong but he found unidirectional causality towards export from output in case of Taiwan. Darrat (1987), rejected the hypothesis of export-led growth in another study for three countries while studying four countries, results of his study only support the hypothesis for Korea. Dodaro (1993) only found seven out of 87 countries in a panel data case the causality from exports to GDP. Ahmad and Kwan (1991), rejected hypothesis of export-led growth while studying the 47 developing countries of Africa. Al-Yousif (1997), studied the case of Malaysia by using multivariate model and found results as short run phenomenon is the export-led growth. Ghartey (1993), used the VAR modeling to test the export-led-growth hypothesis for USA, Taiwan, and Japan. His results were confirming growth led export in case of USA, the export-led growth in Taiwan, and a bi-directional causality in Japan. Boltho (1996), concluded that economic growth in Japan is boosted by the domestic forces instead the international demand. Nandi and Biswas (1991) and Bhat (1995) studied the India and found evidence in favor of export-led growth hypothesis.

In case of Pakistan Al-Mutairi (1993) did not find any causal relationship for period 1959-97. Khan, Malik, Hasan, and Tahir (1995), found bi-directional causality among economic growth and export growth for Pakistan. Export led growth hypothesis for 97 different countries have been estimated by (Sampath & Anwar, 2000) over the period of 1960-1992. They concluded that there is unidirectional causality. On the other hand, Ahmed, Butt, Alam, and Kazmi (2000) examined the relationship between foreign debt, economic growth and exports for four South Asian countries including Pakistan, Bangladesh, Sri Lanka, India, and four other South East Asian countries. They found the evidence of export-led growth only for Bangladesh.

Models by Mankiw, Romer, and Weil (1990), Grossman and Helpman (1991), Rivera-Batiz and Romer (1991), hypothesize that trade openness results in specialized inputs and higher economic growth. Buffie (1992) showed that shocks to exports leads to export-led growth. Oxley (1993), results were contrary to the Export Led Growth hypothesis, he used the data for Portugal. Bhagwati (1978), defined it as virtuous circle, he defined that the income will be increases if trade increases and this more income against increases trade. The most appealing economic scenarios suggest a feedback causal relationship between trade and growth. As per maximum available literature it is identified that export and import both are important channels for economic growth and both should be considered while investigating the relationship or causality. However, by taking only one aspect may lead to biased results.

## DATA AND METHODOLOGY

An annual time series data from the period of 1973 to 2010 was used in this study. Economic growth (Gr) is represented by the value of real GDP and Value of exports (XP) and values of imports (MP) are used for exports and imports respectively. The data for all the variables has been taken from the Hand book of Statistics, State Bank of Pakistan. All the variables are used in the form of natural logarithm. When researchers used the economic growth as regress and trade openness as regressor, they be likely to explain it the causality from latter to former. The suitable way is to use Granger causality testing because the traditional OLS method is not proper way because it did not offer the reaction of a second variable to first. Theory suggests the feedback causality among economic growth and trade openness, which means it suggests the both export-led-growth and growth-led-export.

The stationarity of the data is necessary to be tested, before conducting causality tests. If the series has a unit root than they must have same order of integration to imply the co-

integration test. If all the series have same order of integration then the error correction model will be used with the Granger causality. If the data is co-integrated then it is must to test the granger causality and use the error correction model to determine the long run relationship. This model will determine the causal relationship within the tri-variate frameworks.

The simple granger causality model will be as under for two basic variables in the model:

$$\Delta \text{Gr} = \alpha_0 + \alpha_1 \Delta \text{Gr} + \alpha_2 \Delta \text{XP} + \alpha_3 \Delta \text{MP} + \epsilon_t$$

$$\Delta \text{XP} = \beta_0 + \beta_1 \Delta \text{Gr} + \beta_2 \Delta \text{XP} + \beta_3 \Delta \text{MP} + \eta_t$$

$$\Delta \text{MP} = \gamma_0 + \gamma_1 \Delta \text{Gr} + \gamma_2 \Delta \text{XP} + \gamma_3 \Delta \text{MP} + \theta_t$$

Where,

Gr is Ln of Real GDP; XP is value of exports, MP is value of Imports and  $\epsilon_t, \eta_t, \theta_t$  are error terms for two equations.

If the Gr, XP and MP's series are co-integrated with each other than their error correction model will be of the form:

$$\Delta \text{Gr} = \alpha_0 + \alpha_1 \Delta \text{Gr} + \alpha_2 \Delta \text{XP} + \alpha_3 \Delta \text{MP} + \alpha_4 E_{t-1} + \epsilon_t$$

$$\Delta \text{XP} = \beta_0 + \beta_1 \Delta \text{Gr} + \beta_2 \Delta \text{XP} + \beta_3 \Delta \text{MP} + \beta_4 C_{t-1} + \eta_t$$

$$\Delta \text{MP} = \gamma_0 + \gamma_1 \Delta \text{Gr} + \gamma_2 \Delta \text{XP} + \gamma_3 \Delta \text{MP} + \gamma_4 T_{t-1} + \theta_t$$

Here,  $E_{t-1}$ ,  $C_{t-1}$  and  $T_{t-1}$  are error correction terms. According to Granger (1969) Engle and Granger (1987), causality should be run in at least one way in case of co-integration. Causality might be two way and one way from one variable to another variable, but there should not be results suggesting the no causality. In such a case there is a possibility that these variables are caused by another variable which is not included in the model.

## RESULTS AND DISCUSSION

The estimation process starts with the unit root test that whether the data is stationary or not. Therefore, the order of integration is to be checked to imply the co-integration method on the time series. The Augmented Dickey Fuller (ADF) Test is used to analyze the unit root. The result of unit root investigation is presented in Table 1.

**TABLE 1**  
Results of ADF-Unit Root Investigation

Variable	At Level		At 1 <sup>st</sup> Difference		Conclusion
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	
Gr	-0.8793	-2.4868	-6.1932*	-6.1085*	I(1)
XP	-1.1709	-2.0047	-5.4614*	-5.4485*	I(1)
MP	-1.4247	-2.4142	-4.7594*	-4.6438*	I(1)

*Note.* \* denotes the significance at 1% level.

The results show that all the variables are stationary at first difference. All variables dependent and independent have 1st unit root. Therefore, their order of integration is I (1) for all series. It is concluded that all variables are co-integrated at first difference. Before applying the co-integration technique, it is necessary to find the lag length of the time series data. The lag length is found through the VAR technique by using the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC). AIC suggested the 2nd Lag length while the SC suggests the 1st lag length in VAR. The co-integration method is used to test the long run relationship. The co-integration results for long run relationship in Table 3. It shows that it has two co-integrating vectors.

**TABLE 2**  
Co-integration Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.447996	44.48214	35.19275	0.0038
At most 1 *	0.318848	20.71414	20.26184	0.0433
At most 2	0.125308	5.355354	9.164546	0.2467

*Note.* Trace test indicates 2 co-integrating eqn(s) at the 0.05 level.

\* denotes rejection of the hypothesis at the 0.05 level.

\*\*MacKinnon-Haug-Michelis (1999) p-values

The results of 1st co-integrating equation show that Exports and Imports have positive relationship with the dependent variable, GDP. The one unit increase in exports will lead to increase the 0.58 increase on the GDP. This means that one percent increase in exports leads to raise the GDP level 58%. Similarly, the case with the imports and GDP but the both relationships is statistically insignificant.

**TABLE 3**  
Co-integrating Equations

GDP	XP	MP	C
1.000000	-0.587272 (0.95822)	-1.720351 (0.97461)	8.268212 (2.10651)
2 Co-integrating Equation(s):		Log likelihood	61.63027
GDP	XP	MP	C
1.000000	0.000000	-2.221145 (0.19038)	7.212050 (1.73009)
0.000000	1.000000	-0.852747 (0.17419)	-1.798421 (1.58296)

The error correction methodology is used to test the short run relationship. It also provides the Error correction term which shows the speed of adjustment of short run error correction into the long run period. The sign of speed of adjustment leading to the disequilibrium in case of 1 co-integrating vector while in case of two co-integrating vector the coefficient of speed of adjustment leads to the equilibrium and adjusting the error in short run for dependent variable equation i.e. GDP equation.

**TABLE 4**  
Error Correction Model for One Co-integrating Equation

Error Correction:	D(GDP)	D(XP)	D(MP)
CointEq1	0.018022 (0.05117) [ 0.35220]	0.061149 (0.01416) [ 4.31757]	0.068713 (0.01578) [ 4.35580]
D(GDP(-1))	-0.020962 (0.17706) [-0.11839]	-0.105048 (0.04900) [-2.14363]	-0.101811 (0.05458) [-1.86523]
D(XP(-1))	0.576669 (0.62776) [ 0.91861]	0.298389 (0.17375) [ 1.71739]	0.517970 (0.19353) [ 2.67649]
D(MP(-1))	0.001037 (0.39860) [ 0.00260]	-0.053750 (0.11032) [-0.48721]	0.089448 (0.12288) [ 0.72792]

**TABLE 5**  
Error Correction Model for Two Co-integrating Equations

Error Correction:	D(GDP)	D(XP)	D(MP)
CointEq1	-0.067138 (0.06683) [-1.00466]	0.035223 (0.01830) [ 1.92521]	0.092528 (0.02079) [ 4.45117]
CointEq2	-0.157438 (0.08281) [-1.90118]	-0.080617 (0.02267) [-3.55580]	0.000715 (0.02576) [ 0.02774]
D(GDP(-1))	-0.024562 (0.17103) [-0.14361]	-0.106144 (0.04683) [-2.26678]	-0.100804 (0.05320) [-1.89472]
D(XP(-1))	0.378769 (0.61531) [ 0.61558]	0.238143 (0.16846) [ 1.41365]	0.573312 (0.19140) [ 2.99538]
D(MP(-1))	-0.201757 (0.39964)	-0.115486 (0.10941)	0.146160 (0.12431)

Error Correction:	D(GDP)	D(XP)	D(MP)
	[-0.50485]	[-1.05550]	[ 1.17574]

The Granger causality method is used to test the direction of causality among the variables. The results shows that the only two null hypotheses are rejected that is exports does not granger cause the GDP and other one is Exports does not granger cause Imports. It is concluded that only exports causes the GDP and Imports while no evidence of other causality and the causality between exports and GDP and Imports is uni-directional causality.

**TABLE 6**  
Granger Causality

Null Hypothesis:	Obs	F-Statistic	Prob.
XP does not Granger Cause GDP	40	4.20390	0.0475
GDP does not Granger Cause XP		0.35322	0.5559
MP does not Granger Cause GDP	40	2.25212	0.1419
GDP does not Granger Cause MP		3.35224	0.0752
MP does not Granger Cause XP	40	0.16521	0.6867
XP does not Granger Cause MP		4.09792	0.0502

## CONCLUSION

There is vast literature on determination of association among economic growth and international trade. The debate is also among the researchers that Import substitution or export promotion is suitable trade policy for economic growth. The period of the decades of 1950s and 1960s was the economic growth through import substitution in developing countries. The next decade of 1970s was export substitution policy decade in developing countries (Shirazi, Manap, & Din, 2004). Export promotion policy helps the economies for resource allocation done in a better way, achieving economies of scale and production efficiency through technical progress, human and physical capital formation, enhancing employment opportunities and at last the economic growth. The results accept the hypothesis of export led growth but there is not bi-directional causality as also found in the recent studies on Pakistan's export led growth. The results also show that there is uni-directional causality from exports to imports and also supports the growth-led-imports but not import-led-growth.

The long run relationship found among trade openness and economic growth but there is no evidence for short run relationship. There is unidirectional causality from growth to import but not from import to growth and this fact cannot be ignored that imports have an important role in growth. The raw material imported increases the value addition in the products. Imports also generate employment opportunities for transportation services and in the sales sector which increases the pace of economic growth. However, if final goods are imported it will lead to the decrease in the demand of domestic products and also affect the employment opportunities. Exports boost the economic growth and helps in achieving the economies of scales. Exports help in earning of foreign exchange and increase the employment opportunities. Pakistan should continue the imports of intermediate goods and

focus on the expansion of the exports in world market. The knowledge efficiency and technical progress should be increased to increase the level of exports and to accessing the new markets.

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**APPENDIX 1****Lag Length**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-82.41901	NA	0.014369	4.270951	4.397616	4.316749
1	51.98748	241.9317	2.72e-05	-1.999374	-1.492710*	-1.816181
2	64.30795	20.32877*	2.33e-05*	-2.165398*	-1.278736	-1.844809*
3	67.62895	4.981501	3.16e-05	-1.881448	-0.614788	-1.423463

*Note.* \* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion