ISSN(E):2522-2260
ISSN(P):2522-2252

Journal DOI: https://doi.org/10.29145/jqm

Indexing/Abstracting

Published by
Department of Quantitative Methods
School of Business and Economics
University of Management and Technology, Lahore, Pakistan

Journal of Quantitative Methods

An Analysis of the Relationships among Exports, Imports, Physical Capital and Economic Growth in Pakistan

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Manuscript Information

Submission Date: June 24, 2019

Publication Date: February 28, 2020

Conflict of Interest: None

Supplementary Material: No supplementary material is associated with the article

Funding: This research received no external funding

Acknowledgment: No additional support is provided

Citation in APA Style: Shah, S. A-Y., Ahmad, N., Aslam, W. & Subhani, B. H. (2020). Relationships among exports, imports, physical capital and economic growth in Pakistan: An econometric analysis, *Journal of Quantitative Methods*, *4*(1), 99-119.

This manuscript contains references to 27 other manuscripts.

The online version of this manuscript can be found at
https://ojs.umt.edu.pk/index.php/jqm/article/view/339

DOI: https://doi.org/10.29145/2020/jqm/040105

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Journal of Quantitative Methods
4(1) 99-119
https://doi.org/10.29145/2020/jqm/040105

Relationships among Exports, Imports, Physical Capital and Economic Growth in Pakistan: An Econometric Analysis

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Received: July 28, 2019; Last Revised: Sept 20,2019; Accepted: Dec 20, 2019

Abstract

This review emphasized the relationship among capital formation, economic growth, exports and imports in case of Pakistan scenario using time series data from 1976 to 2015. Augmented Dickey Fuller Test, Johansen Co-integration, Vector error correction model and Granger Causality techniques have been used to check the relationships among exports, imports and economic growth. The results from this study show that the exports, imports, real GDP and gross fixed capital formation have a long run relationship and are co-integrated. This study uses the data of Pakistan and concludes that GDP doesn't granger cause with the export and import while export and imports do granger cause with the GDP in the long run. Finding of the study also displays that physical capital formation has no impression over GDP. Previous study shows the positive relation among exports, imports, capital formation and economic growth while this study shows that in the long run capital formation and economic growth has no effect. Government subsidizes the exports and also increases the duty bills on imports that help boost the domestic industries manufacture the goods and motivate to produce the best quality of goods.

Keywords: economic growth, exports, imports, capital Formation, real GDP, Granger causality.

JEL Classification Codes: F2: O47

[1]**Author's Acknowledgment:** I hereby declare that this paper is a part of my thesis.

1. Introduction

Export is a function of international trade whereby goods produced in one country and shipped to another country for future sale or trade. The relationship between export and economic growth is considered as an attractive topic among the under developing countries. Economic growth is the part and parcel of economic development and a question arises here that how a country can increase their economic growth through various resources? The answer of this question is hidden in the export-led growth (ELG) formula which means that an increment in the export can increase the economic growth. It has been proven by the literature that export has a positive effect on the economic growth. Ram (1885) and Greenaway (1988) disclosed that the exports and economic growth have positive relationship between each other.

It is a commonly accepted phenomenon among the economists that the economic growth is a difficult process that depends on the income distributions, physical and human capital formation, fluctuation of prices, political stability and even more on the geographical characteristics. The export-led growth hypothesis (ELGH) assumes that export is one of the main determinants of growth. This phenomenon shows that a country's overall performance does not only depend on manpower and investment within economy but also depends on the exports of the country as well. Export and economic growth relationship not only supports the domestic economy perhaps it takes part in an international market. The global market competency may lead to innovation and it also compels the domestic producers to eliminate the inefficiency. Bhagwati (1998) put forward that trade increment becomes the source that increases GDP, income increases; trade level also increases and in this way it becomes a periodic cycle.

Import is a mode of transformation of products and services from host countries to home; it may be any objects like (machinery, pharmaceutical, technological equipment). Import can be demonstrated as a goods and services product by the foreign country and purchase by the local economy, it means that forming an interaction between two economies which are located in different places. Carbaugh (2013) study exhibited the positive relation between import and economic growth. Rapid increase in the economy growth is not caused by the import but countries that have open trade system have much economic growth as compared to the countries having close economy system.

Economic and non-economic factors are used to determine the demand of the imports. These factors include the political circumstances, economic conditions, production and labor cost. Rivera-Batiz and Romer (1991) renowned that increases in the economic activity may increase the imports. This phenomenon happens because real income of the countries increases the consumption power of that country which increases the imports. In this way, there is direct relationship between the imports and economic growth.

To some extent, development is the prime concern of any country that is highly associated with the economic growth. Export is the most important part of trade and plays an important role in order to enhance the percentile of economic growth. Export led growth and import substitution are considered important marvels for the development of economic growth as well as a best reward of all factors of production. This mechanism upsurges the investment channels which cause high savings along with high income.

Capital formation and capital accumulation is important for any nation to meet the objectives of economic development. However, on one hand, the economic development can be measured through the capital equipment on a limited scale to increase the production of mining, agriculture, plantations and industries. While on the other hand, capital is also required to construct hospitals, roads, living standard, research and development, and schools (Jhingan, 2011; Ainabor, Shuaib & Kadiri, 2014). Other source of capital formation is capital and money market for economic development in any nation. These markets are a platform for those who have excesses surplus to save and those who have a deficit and borrow from the market for investment. That process will help in the creation of employee opportunities and reduces the poverty level.

As Pakistan is an emerging economy that needs to enhance exports and foreign reserves in order to meet the level of economic growth. This can be used to fulfil the necessities of the country by importing the scarce resources. Export and import is a vehicle to run the economic growth. Pakistan is closely linked with the rest of the world due to its strategic position and major trading partner i.e. China, UAE, and Saudi Arabia and will have a positive impact on the economy of Pakistan. Pakistan's exports growth rate is 8 % compared to the growth of imports i.e. 13%. It has a large gap in 2013-14 and

2014-15 that the total exports are 20,834$-20,176$ and imports are 34,645$-34,086$ which showed the trade deficit. Where exports to GDP ratio have declined from 13% to 10% and imports to GDP ratio had increased by 19%. So, SBP reduced the markup rate from 11.5% to 9% which reduces the financial cost of export and tend to reduce the trade deficit [2]Economy survey 2014-2015.

Most of the researchers study the relation of export-led growth with the economic growth (Baldwin, 1997; Rivera-Batiz & Romer, 1991; Segerstrom, Anant, & Dinopoulos, 1990; Balassa, 1978 and Grossman, 1990). But most of the research has been conducted in the developed countries rather than the developing countries. Pakistan is a developing country and previous researches are conducted on the basis of the export-led growth, imports, gross fixed capital formation and economic growth is done by Ullah (2009) which scrutinized the export-led growth in case of Pakistan in this range. His study revised the relationship among real exports, imports, gross fixed capital formation and economic growth of Pakistan. This study is different from the research of Ullah (2009) on the basis of the time duration as he used the time series data from 1970 to 2008 while this study used the time series data from 1976 to 2015. Ullah (2009) constructed his research on the unidirectional relationship among the variables through the Granger Causality while this study indicates the bidirectional relation among the variables. He also discussed the temporal long term effect of the relationship while this study discusses the temporal short term and long term effect of the relationship.

This study contains the following objectives

- Explore the presence of strong linkages among economic growth, exports, imports and physical capital of Pakistan.
- To determine the causal nexus among export-led, imports, physical capital and economic growth of Pakistan

Export adhere to the economic development in two ways. First, it increases the level of profit and help the countries to balance their investments and secondly, it increases the productivity of country. Furthermore country's exports enable to incorporate international markets in such a way that it also compensates bad domestic shocks of

[2] Economy survey 2014-2015

economy. There are extensive literature on export and eonomic growth but on the other hand, limited literature on import. Import plays an important role in manufacturing base of the country, it also helps building the export base industry for economic developemnt. It helps those economies who have sufficient domestic poduction, and import high quality goods and services from other countries to enhance the economic developemnt. The essence of economic development is based on the creation of social capital and economic overhead, which increases the national output by providing job opportunities and minimize the poverty level from demand and supply side.

2. Literature Review

A number of researchers exposed in their studies a strong relationship between export-led growth and economic growth i.e. (Baldwin, 1997; Rivera-Batiz &Romer, 1991; Segerstrom, et al., 1990; Balassa, 1978 &Grossman, 1990). Exports are considered as a powerful element for whole economic activities of a country's progress (Medina-Smith, 2001). Countries' unemployment and balance of payment (BOP) can be subsidized through exports. On behalf of countries' development and competition in international market, the ELG hypothesis affirms the domestic manufacturers and countries to be equipped with up to date tools and techniques to survive and strengthen the economic development (Abou-Stait, 2005). In under developing countries, economic growth is a burning issue thatdepends on the development of export growth. According to Dollar and Kraay (2003) trade origins hoist the economic progress of under developing countries and it also raises the living standard of inhabitants of one nation. There are many examples of progress through exports like China, Malaysia, and Coast Rica .

Li, Chen and San (2010) testified the data of imports, exports and economic growth by using the co-integration test in case of China and results showed that growth in the imports increases the economic growth of China and exports have an opposite effect. Asafu-Adjaye (1999) conducted the study on same variables for period 1960-1994. They did not find any relation among variables and also no sustenance for export-led growth hypothesis in the case of India. In addition, according to the economic history and trade policy of India, these results were not so surprising.

Ullah (2009) scrutinized the export-led growth in case of Pakistan in this range, they revised the relationship between real exports, imports, gross fixed capital formation and economic growth of Pakistan by using the unit root test (checking the stationarity), Co-integration test (long run linkages among variables) and Granger Causality by using the VEC model to testify the unidirectional and bidirectional relationship among variables. The study showed that increase in exports may lead to an increase in the economic growth. This study also applied the unidirectional and bidirectional causality among variables closed to describe the economy. The GC (Granger causality) test enlightened the unidirectional causality among variables e.g. (imports, exports and economic growth).

Hussain and Saaed (2015) inspected the impact of trade on economic growth of Tunis from 1977 to 2012. Furthermore, the study examined the stationarity, long run relationship, unidirectional and bidirectional effects among variables by using URT (unit root test), JC (Johansen co-integration) test GC (Granger Causality) based on VEC (Vector Error Correction Model). Results exhibited that, economic growth has unidirectional effect on import and export and there was no effect on physical capital. These results indicated that growth of Tunisia depends on the growth-led import and export lead to import. Hussain and Saaed (2014) revised the study on the same theme and this study has taken data from the period 1990- 2011. For empirical analysis, it is suggested that GC (Granger Causality) and Co-integration significance level should be at 5 percent. Result of this study showed same results as of the previous study which has been conducted for showing the relationship among import, export and economic growth.

For marginal countries, the capital formation has been a pain in the neck for the economic growth and development. Previous literature directed that countries face trivial issues like high interest rate, inflationary pressures, balance of payments and high foreign debt encumbrances etc. Going on the subject of capital formation and economic development, modern empirical studies conducted in Africa, America, Asia, Latin America and showed that there is perilous relation between capital formation and economic growth (Khan & Reinhart,1990; Ghura & Hadjimichael, 1996; Ben-David & Loewy, 1998; Collier & Gunning, 1999; Ndikumana, 2000).

3. Data and Methodology

The research study aims to analyze the relationship among the GDP, exports, imports and gross fixed capital formation. This study conducted in Pakistan, is based on secondary data from 1976 to 2015. It also manages the data from different resources and tackles the data with different tools and techniques for the significance of the results.

3.1. Econometric Model

Ullah (2009) used the exports , imports, physical capital and economic growth in his study to explain the effect on Pakistan's economy by using the unit root test (checking the stationarity), Co-integration test (long run linkages among variables) and Granger Causality by using the VEC model to testify the unidirectional and bidirectional relationship among variables.

The relationship among import, export economic growth and physical capital expressed in the form of mathematical equation and the regression equation for model is:

Economic growth (EG) = f (exports, imports, gross fixed capital formation)

$$RGDP = \beta_1 + \beta_2 Exp + \beta_3 Imp + \beta_4 GFCF + e_t$$

e_t is the error term which is used to explain the economic growth. *RGDP* is the Real Gross Domestic Product that explains the economic growth and used as dependent variable in this study. *Exp* is denoted for the explanation of the Exports, *Imp* is used as the Imports and *GFCF* is denoted for the Gross Fixed Capital Formation. Exports, Imports and Gross Fixed Capital Formation are used as the independent variables. $\beta_1, \beta_2, \beta_3$ and β_4 are coefficient parameters of the model.

3.2. Data Source and Techniques

Data used for analysis has been taken from the World Development Indicators for time period 1976-2015. Variables used for the study are in log form.

3.3. Variables Description

Selection of variables is established on the past studies and the current study recycled the following variables. The table below describes the variables and also lists the symbols and previous studies which have been conducted on the same variables.

Variables	Symbols	Definition
GDP	Y	Ultimate goods and services predefine time period known as Real GDP of country.
Exports	X_1	An export is a phenomenon which bolsters the country's to send out product and services outside the country boundary.
Imports	X_2	Import can be stated as buying goods and services other countries to meet the local needs and wants.
Gross fixed capital formation	X_3	GFCF can be stated as net increment in physical assets along with deduction of investments from disposals in a specific period of time. It's just like expenditure method to measure the GDP.

3.4. Conceptual Framework

Following figure shows the study framework

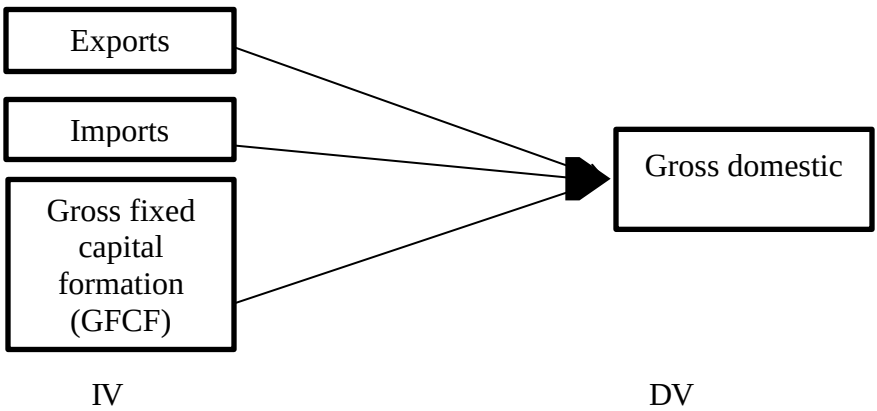

Figure 3.1: Relationship of Variables

3.5. Robustness Tests

3.5.1. Unit Root Test

It is checked through unit root test that either variables stationary or not. The stationarity of the data depends on the consistency of the covariance, variance and mean over the period of the time. The stationary property of the variables is checked through DFT (Dickey-Fuller test) or ADF (Augmented Dickey Fuller test) before conducting the test for co-integration and granger causality. ADF (Augmented Dickey Fuller test) was established to control the correlation of error term. These tests are used to check the integration among the variables.

The results for the ADF concluded that at level first real import, export, GDP, and gross fixed capital formation are stationary. Variables are integrated in the same order at all levels (Khan, Azra, Zaman, Ahmad, & Shoukat, 2012).

3.5.2. Johansen Co-integration

Johansen and Juselius (1988) examine the long run relation among the variables. It is a multiple equation method which helps to identify through canonical correlation method that shows how many co-integration relationships exist. Before estimating the empirical estimation, this study has determined the lag of vector autoregressive (VAR) model in level. Lag length of the VAR system can be measured by two ways like AIC (Akaike information criterion) and SBC (Schwarz Bayesian Criterion), and it can be attained by reducing AIC and SBC. Furthermost AIC and SBC are used to suggest that the lag length of VAR model is 4 (Medina-Smith, 2001).

3.5.3. VEC (Vector error correction model)

In order to derive the (VECM), lag selection was done using AIC selection criteria. Secondly, Augmented Dickey Fuller was used to check stationarity of the variables. Then Johansen co-integration test was used to see co-integration existence among the variables. With a positive indication of the existence of integration, vector error correction model is used to appraise the presence of long-run causality. These results (VECM) are interpreted from the (Pfaff, 2008) using the VAR, SVAR and SVAC models from the journal of statistics software. The value of R^2 indicates that the variation in the dependent variable has been explained by the independent variables. Model significance depends on, when f-statistics is greater than critical value.

3.5.4. Granger Causality

The causality between variables can be measured by using the GC (Granger causality). The change in one variable will cause the change in the other variables. Granger causality test is built on the Vector Error Correction model. Co-integration existence vector allows the VECM for the purpose of the Causality.

4. Descriptive Statistics

This section contains the basic analysis of all the variables that are going to determine their effect on the GDP in case of Pakistan.

Descriptive statistics are used to describe the base level features of the data in a study. Study having large data set, these stats may help the researchers to build their arguments about the data and present it in a summary table. The descriptive statistics for various variables are presented in Table 4.1

Table 4.1 Descriptive Statistics

Variables	Minimum Value	Median	Mean	Maximum Value
Y	13.34	61.41	85.84	271.00
X_1	1.438	9.05	12.26	31.43
X_2	2.584	10.88	16.67	46.37
X_3	12.52	16.97	16.34	19.24

In table 4.1, the mean refer to a central value of a discrete set of number. The highest mean value has been shown for GDP i.e. 11.87 and lowest of gross fixed capital formation i.e. 16.33 respectively. Median represents the central value in a data set. It is a better measure than mean when the data set contains outliers. In the current sample, maximum and minimum values are abbreviated as Max and Min.

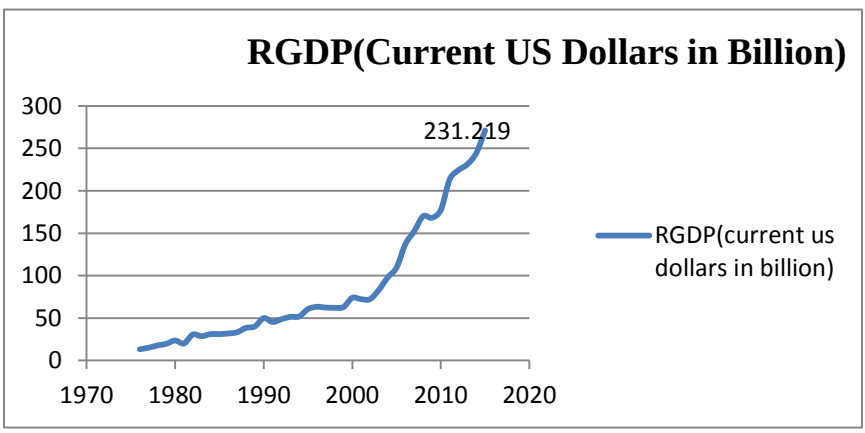

Figure 4.1: GDP Trend over the Years

In the figure 4.1, the median for the data set of GDP is 61.4 while the minimum and maximum value for the data is 13.34 and 271.00.

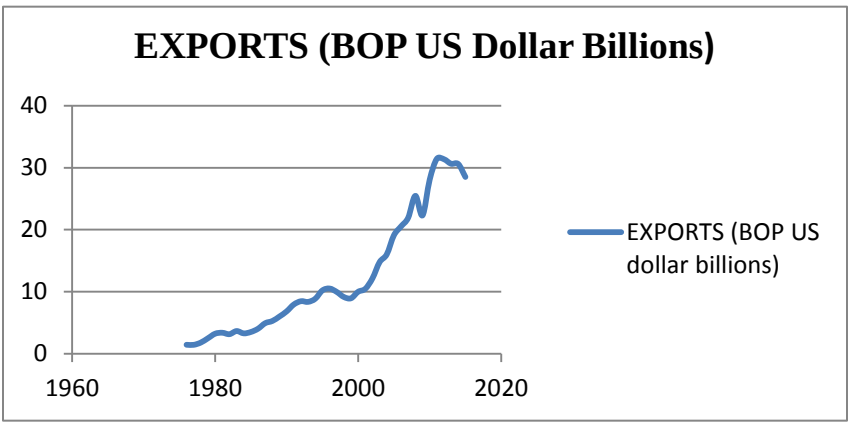

Figure 4.2: Exports Trend during the Years

The figure 4.2 shows the exports trend during the years. In 1977, exports are at the minimum level of $1.438 billion while in 2011, exports are on the maximum level i.e. $31.430 billion. The mean of the exports is 12.260 and the median of the data for export is 9.050.

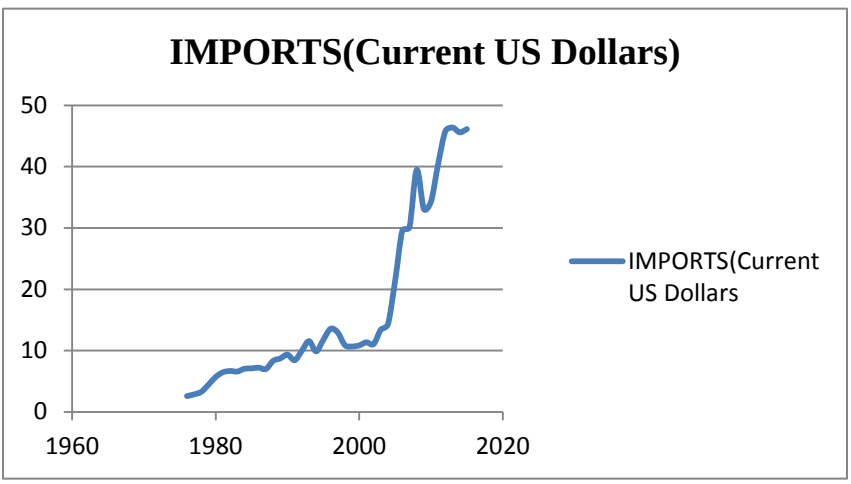

Figure 4.3: Imports trend over the Years

The figure 4.3 shows the trend of imports over the years. In 1976, imports are at the lowest point of $2.584 US billion while in 2013; imports are at the maximum level of $46.370 US billion. The mean of the data for the imports are 16.670 and the median for the data is 10.880.

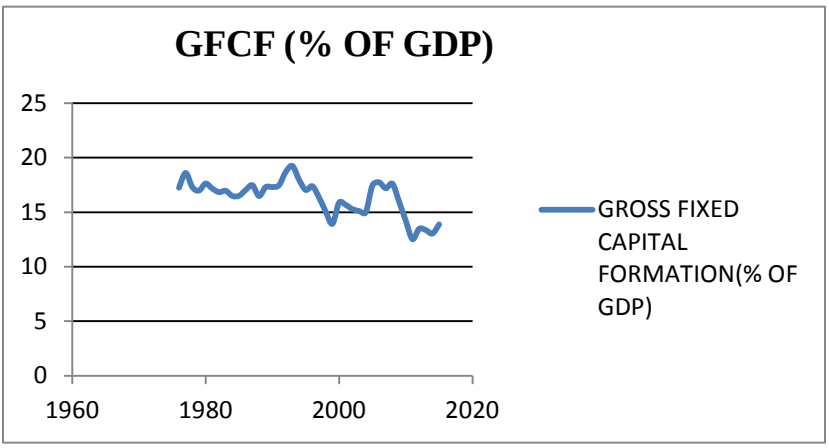

Figure 4.4: Gross fixed Capital Formation

In figure 4.4, gross fixed capital formation trend is shown over the years. In 2011, gross fixed capital formation are at the lowest level of 12.52% of GDP while in 1993 gross fixed capital formation is at the maximum level of 19.24% of GDP. The mean of the gross fixed capital formation data is 16.34 while the median of the gross fixed capital formation is 16.97.

5. Results and Discussion

5.1. Augmented Dickey Fuller Test (Unit Root Test)

The Augmented Dickey Fuller test has been tested to check the stationarity of the variables at level and first difference in R Software using library. The test results as seen in tables 5.1.a and 5.1.b represented by the t-statistics and their respective critical values. These tables show the variables real GDP, real Exports, real Imports and real Gross Fixed Capital represented as y, x_1, x_2, and x3 respectively. Unit root test showed the stationarity results of variables and further divided into two types showing drift and trend results.

In table 5.1.a, the analysis of variables in both drift and trend are shown at level. It is seen that the t-statistics results of the variables Y, X1, X2 and X3 are low in variables as compared to their critical value i.e. for Y variable the t-statistics is 0.02 whereas the critical value is 2.93 (0.02<2.93). Similarly for X1 its value is (0.50<2.93) for X2 its value is (0.26<2.93) and for X3 its value is (2.74<2.93). So the results

indicate towards acceptance of the hypothesis that the variables are non-stationary from the drift at level.

Table 5.1.a: Augmented Dickey Fuller Test (Unit Root Test) at Level

	DRIFT			TREND		
Variables	**t-statistics**	**Critical value**	**Results**	**t-statistics**	**Critical value**	**Results**
Y	-0.02	-2.93	Accept	-1.62	-3.50	Accept
X_1	0.50	-2.93	Accept	-2.48	-3.50	Accept
X_2	-0.26	-2.93	Accept	-1.91	-3.50	Accept
X_3	-2.74	-2.93	Accept	-2.95	-3.50	Accept

Similarly, in trend, it is seen that the t-statistics results of the variables Y, X1, X2 and X3 are also low as compared to critical value i.e. for Y, t-statistics is 1.62 and the critical value is 3.50 (1.62<3.50). For X1 the value is (2.48<3.50), for X2 the value is (1.91<3.50) and for X3 the value is (2.95<3.50). So the results from trend also lead towards acceptance of the hypothesis that the variables are non-stationarity.

Table 5.1.b: Unit Root Test at First Difference

	DRIFT			TREND		
Variables	**t-statistics**	**Critical value**	**Results**	**t-statistics**	**Critical value**	**Results**
dY	-4.47	-2.93	Reject	-4.40	-3.50	Reject
dX_1	-3.89	-2.93	Reject	-3.94	-3.50	Reject
dX_2	-3.74	-2.93	Reject	-3.68	-3.50	Reject
dX_3	-4.78	-2.93	Reject	-4.81	-3.50	Reject

The table 5.1.b shows the analysis of variables in both drift and trend at first difference. It is seen that the value of t-statistics of the variables Y, X1, X2 and X3 are higher than the value of critical value i.e. for Y variable the t-statistic is 4.47 and the critical value is 2.93 (4.47>2.93). Similarly for X1 the values are (3.89>2.93), for X2 the values are (3.74>2.93), for X3 the values are (4.78>2.93) which showed the stationary of variables. So the results from drift at first difference make us to reject the null hypothesis that the variables are non-stationary. While table 5.1.b shows the results from trend which also explain the value of t-statistics of the variables Y, X1, X2 and X3 is higher than the critical value i.e. the value for Y variable, the t-statistic is 4.4036 and the critical value is 3.50 (4.40>3.50). For X1 the values are (3.94>3.50), for X2 the values are (3.68>3.50) and for X3 the values are (4.81>3.50). These numerical figures indicated that all

variables are stationary. Hence the results from trend at first difference rejected the null hypothesis that the variables are non-stationary.

Table 5.1.c: Results from p-Value

Coefficient	ADF test	p-value	Results
Y	-2.58	0.34	Accept
Dy	-9.19	0.01	Reject
X_1	-2.00	0.57	Accept
dX_1	-5.03	0.01	Reject
X_2	-1.53	0.75	Accept
dX_2	-5.19	0.01	Reject
X_3	-2.47	0.38	Accept
dX_3	-5.80	0.01	Reject

Table 5.1.c shows the results of the variables Y, X_1, X_2, and X_3 from the p-value. The p-value of the variables is higher than the non-stationary variables. So after the first difference, the value of the probability of the variables is very low which explains that the variables are stationary. As, in the test it explains that the p-value at the level is on the higher side that is 0.34. So acceptance of the null hypothesis happens that the variables are non-stationary. After the 1st differences p-value of variable Y is low 0.01 which shows that the variables are stationary. Similarly, p-value in the case of X_1, X_2 and X_3 at the level is high and variables are non-stationary at level. At 1st difference the p-value is low for the variables which show that variables are stationary. After all the values of variables are stationary than the Johansson co-integration and granger causality test are used to find the results.

5.2. Johansen Co-integration

Long run variables relationship can be determined through Johansen co-integration. (*) indicates the rejection at the 95% critical value. To determine the co-integration among variables, lag length is taken through AIC for efficient results. From AIC method, the lag length is 4 for this data. Johansen co-integration has two ways to analyze the results i.e. trace and lambda max. Lambda max and trace tests are used to identify the co-integration vector in the model.

Table 5.2.a: Results from Lambda Max

Hypothesized co-integration H0	Lambda max	Critical value 1%	Critical value 5%	Critical value 10%
r = 0	44.05*	32.14	27.14	24.78
r≤1	12.54	25.75	21.07	18.90
r≤2	7.42	19.19	14.90	12.91
r≤3	0.10	11.65	8.18	6.50

(*) show rejection at 5%

However, the null hypothesis of at most one co-integration vector cannot be rejected at r≤1 which show that exports, imports and gross fixed capital formation are co-integrated with each other. In the lambda max, at r=0 the value of test is higher than the critical value which is 44.05 and 32.14. This shows that there is no correlation between the variables. At r≤1 there is correlation between the variables because the value of lambda max test is less than the critical value i.e. 12.54< 25.75. This shows that the value at r≤2, r≤3 is less than the critical value so all variables are co-integrated with each other and there exist at least three co-integrating vectors.

Table 5.2.b: Results from Trace Statistics

Hypothesized co-integration H0	Trace statistics	Critical value 1%	Critical Value 5%	Critical value 10%
r=0	64.10*	55.43	48.28	45.23
r≤1	20.06	37.22	31.52	28.71
r≤2	7.53	23.52	17.95	15.66
r≤3	0.10	11.65	8.18	6.50

(*) show the rejection at 5%.

In the trace statistics, the value of trace statistics is 64.10 which is greater than critical value i.e. 48.28 at r=0, at 5% critical value which shows that there is no co-integration. The value at r=0 shows that Correlations between the variables in long-run detected at the first level. At the first level the value of test is greater than critical value i.e. 20.06≤31.52. At the level of 1 the variables are correlated with each other in long-run. The results of Johansen co-integration show that there must be some relation between the variables. Change in one variable may cause the change in other variable. Co-integration is determined between the variables.

5.3. Vector Error Correction Model

In order to derive the vector error correction model (VECM), lag selection was done using AIC selection criteria. Secondly, Augmented Dickey Fuller was used to check stationarity of the variables. Then Johansen co-integration test was used to see, if co-integration is present among the variables. With a positive indication of the presence of co-integration, VECM test is used to check the reality of long-run connection. The ECT in the table shows the adjustment of the variables towards the steadiness in the long-run.

Table 5.3.a: Vector Error Correction Model

Coefficient	Estimates	Standard error	t-statistics	Probability
ECT1	-0.84	0.46	-1.83	0.08
Multiple R-square	0.6754	**Adjusted R-square**	0.4688	
p-value	0.0064	**F-statistics**	3.269	

The negative value of ECT i.e. -0.84 shows 84% chances of convergence towards long-run equilibrium. The p-value is being significant at 10% level. The results of the vector error correction model are interpreted from the Bernhard Pfaff (2008) using the VAR, SVAR and SVAC models from the journal of statistics software. The value of R^2 indicates that 67.5% of the deviation in the dependent variable has been clarified by the independent variables. The f-statistics is greater than the critical value which shows overall significance of the model.

5.4. Granger Causality

According to the table 5.4.a, from the F-statistics and Probability values conjectured that no pivotal relationship from real GDP growth to export. It is explained from the values of F-statistics i.e. 1.06 and probability value i.e. 0.30. From this, it is clear that the value of F-statistics is very small and the value of probability is 0.306 which is high. Then again, from real exports to GDP table showed the unidirectional relationship. The value of F-statistics is high i.e. 4.67 and the value of probability is low i.e. 0.03. It shows that a change in the exports leads to a change in the real GDP. Similarly, there is no causal relation from the real GDP to real Imports. F-statistics has a value of 8.04 and the p-value is 0.97.

Table 5.4.a: Results from Granger Causality

H_0 Hypothesis	F-Statistics	Probability value	Results
dY does not Granger cause dX_1	1.06	0.306	Accept
dX_1 does not Granger cause Dy	4.67	0.033	Reject
dY does not Granger cause dX_2	8.04	0.97	Accept
dX_2 does not Granger cause DY	4.74	0.03	Reject
dY does not Granger cause dX_3	0.09	0.76	Accept
dX_3 does not Granger cause Dy	1.77	0.18	Accept

In this situation, the p-value is too high which shows that there is no causal relation from real GDP to real Imports. By the way, results also showed the unidirectional relationship between imports and real GDP and it is explained through the value of F-statistics i.e. 4.74 and the p-value i.e. 0.03. It shows that change in the imports leads to a change in the real GDP. On the other hand, change in the real GDP has no effect on the imports. Further, real GDP has no causal relationship with gross fixed capital. The F-statistics has a value of 0.09 and p-value of 0.76. Also gross fixed capital has no causal relationship with real GDP because F-statistics has low value i.e. 1.77 and a high p-value i.e. 0.18.

6. Discussion and Conclusions

Today, the economic stability is facing intense global economic challenges which have raised serious fright for economists and policy makers across the globe. Among others, such challenges include how to capture the international market, how to increase the exports of the country, and foreign investments. Similarly in case of Pakistan, the situation is equally alarming, where foreign investment is seen to have an adverse impact on economic degradation. This study sets out the time series data approach in command to examine the relationship between exports, imports and GDP specifically in case of Pakistan using data from 1976 to 2015. The aim behind this study was to assess the relationship among the variables like (exports, imports, GDP & gross fixed capital formation) in Pakistan.

Vector Error Correction model, Granger Causality and co-integration were used to test the relationship between Exports, Imports, GDP and Gross Fixed Capital Formation. Unit Root Test for the data was used to examine the stationarity of the variables using Augmented

Dickey Fuller (ADF) test after which co-integration. Vector Error Correction model and Granger Causality were conducted. Vector Error Correction model was used to estimate the long-run relation within the variables. The findings from the Unit Root Test examine that the variables are non-stationary at level while variables are stationary at first difference. Therefore, the variables were found to be integrated, Johansen co-integration test estimates that the real GDP, real Exports, real Imports and Gross Fixed Capital Formation indicate an existence of long run relationship and show that how many co-integrated vectors exist in the model.

The Vector Error Correction model test concluded that there would be long-run relationship between exports to GDP, imports to GDP and Gross Fixed Capital Formation to GDP. Finally, Granger Causality test confirmed that there should be a relationship between GDP, Exports and Imports but there is no relationship between GDP and Gross Fixed Capital Formation. Results from the model display that the real GDP, exports, and imports are statistically significant while gross fixed capital formation has no effect on the GDP of the country. Further results indicate a positive relation between exports, imports and GDP.

Conflict of Interest	None
Supplementary Material	No supplementary material is associated with the article
Funding	This research received no external funding
Acknowledgment	No additional support is provided
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Citation: Shah, S. A-Y., Ahmad, N., Aslam, W. & Subhani, B. H. (2020). Relationships among exports, imports, physical capital and economic growth in Pakistan: An econometric analysis, *Journal of Quantitative Methods, 4*(1), 99-119. https://doi.org/10.29145/2020/jqm/040105