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AN EMPIRICAL STUDY OF THE NEXUS AMONG IMPORTS, EXPORTS AND ECONOMIC GROWTH IN PAKISTAN

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Abstract

In the age of globalization, economic growth through international trade has become one of the objectives included in the economic policies of all countries. This research endeavor explores the relationship between imports, exports and economic growth in Pakistan for the 1976-2015 period using Johansen cointegration analysis, a vector autoregressive model and a Granger causality test. The unit test indicates that the variables are stationary at first difference. There is no cointegration, and the VAR model is estimated, indicating a positive but statistically insignificant nexus among imports, exports and economic growth. The results of the postregression tests are satisfactory. The pairwise causality tests indicate unidirectional causality from exports to economic growth, validating the export-led economic growth hypothesis, and unidirectional causality from imports to economic growth, validating the import-led growth hypothesis. This study recommends export

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An empirical study of the nexus among imports, exports and economic growth in Pakistan

promotion measures, productive import measures and manufacturing sector diversification to boost economic growth.

**JEL CLASSIFICATION:** F40; F41; F43.
**KEYWORDS:** ECONOMIC GROWTH; IMPORTS; EXPORTS; VECTOR AUTOREGRESSIVE MODEL; GRANGER CAUSALITY.
1. Introduction

The politico-economic policies of all countries, in addition to other economic indicators, focus on GDP growth rate, exports, and imports and always strive to balance trade. Trade, the sum of exports and imports, is considered a pivotal determinant of the economic growth of any economy. Exports, the surplus sold in the international market after fulfilling domestic demand, are important because they reduce domestic market dependency, help maintain market share and profit, expand the market base, especially in foreign markets, and diminish market volatility, allowing for local industries to become potentially responsive to seasonal fluctuations, consumer behavior, changes in demand and economic dynamics domestically. Exports improve foreign exchange reserves, boosting national income and economic growth and uplifting overall welfare in terms of standards of living and quality of life. Importantly, the domestic supply gap, which involves the purchase of imports to fulfill domestic demand, improves the diversity of products for domestic customers, and technology imports boost investment and economic growth. However, a country can become dependent on the exporting country and squeeze its foreign reserves, sometimes leading to deficits in the balance between trade and payment (Bakari and Mabrouki, 2017).

Economies with enormous export shares enjoy fostered economic growth compared to those with low export shares (Marin, 1992; Thornton, 1996). Under the umbrella of export-led growth (ELG), advocated by Romer (1988), economies tend to specialize in goods that have a comparative advantage due to optimal resource allocations, leading to a favorable balance of payments and the dynamic trade gains from improved production through new technology adoption. Earnings from exports enable the importing of capital, and raw materials attract investment and boost economic growth. Foreign competition leads to innovation and efficiency in the industrial sector, and export promotion measures enhance the marginal return to scale (Nidugala, 2001; Kónya and Singh, 2006).

Furthermore, foreign trade multipliers boost production and open new employment opportunities. Foreign exchange through exports is used to finance the importing of goods (both consumer and capital goods), which enhances economic growth (Ramos, 2002). The importation of technology and innovative ideas increases labor productivity, which in turn improves export surplus. Such importation also leads to efficiency in resource allocation, economies of scale, improved marginal return to scale, enhanced
productivity, the transfer of technology and innovative ideas (Bhangwati, 1988; Krugman, 1984). Another hypothesis involves growth-led exports, suggesting unidirectional causality from economic growth to exports.

For both production and employment, exports are thought to be the main prime growth factor. Export promotion leads to economic growth on the grounds of the Keynesian multiplier effect, i.e., the foreign trade multiplier effect, and earned foreign exchange from exports is used to finance capital imports, which in turn boost economic growth. Export competitiveness leads to innovative production in domestic industries, economies of scale and technical progression, which make domestic industries competitive in the international market (Ramos, 2002).

Imports, which include raw material, consumption and capital good imports, positively affect economic growth (Esfahani, 1991; Ram, 1985). The import-led growth (ILG) hypothesis states that economic growth is also determined by imports, and the endogenous growth model suggests that innovative ideas, intermediate technology, capital imports, and the transfer of knowledge are necessary for uplifting the economic growth of a domestic economy. Enhanced trade openness, exports and imports lead to enhanced GDP and real income gained, which in turn heighten the exchange of goods and services in the international market, which is known as a virtuous circle (Din, 2004).

Certain economic and noneconomic determinants, such as exchange rates, relative prices, domestic and foreign economic affairs, cost of production, social and political stability and economic activities, affect import demand. It has been revealed that real income and the relative prices of commodities are considered to determine import demand on the grounds that greater economic activities increase real income and consumption and diversify the consumption pattern, which in turn increases import demand; thus, through the multiplier effect, import demand leads to rapid economic growth (Rivera-Batiz, 1985).

Imports of new technology, i.e., machines, equipment and innovative ideas, boost labor productivity over time. The import multiplier effect means that economic growth leads to an increase in imports, which leads to higher consumption and thus directly impacts economic growth (Uğur, 2008; Thangavelu and Rajaguru, 2004).

Since Pakistan achieved its independence, its trade balance has always been in deficit. Pakistan, a semi-industrialized developing economy, needs to promote its exports and extend its export base in the international market not
only to balance its trade and payments but also to obtain enough exchange earnings to achieve economic stability (Gov. of Pakistan, 2016). This study has significant importance because of its contribution to the trade literature in Pakistan. Furthermore, the literature on economic growth brings to light either the import-growth nexus or export-growth nexus, but this study is cumulative, focusing on the nexus among imports, exports and economic growth, i.e., to estimate the impact of trade, imports and exports on the economic growth of the country in a multivariate framework.

Main Objectives

- To examine the nexus among economic growth, exports and imports.
- To put forward a recommendation for the concerned policymaking authority.

Based on the above objectives and the literature reviewed, the following research hypotheses are formulated:

**H₀ (1):** There is a significant relationship between exports and economic growth.

**H₀ (2):** There is a significant relationship between imports and economic growth.

2. Review of Literature

In the 18th century, the father of economics, Smith (1776), and the 19th century economist, Ricardo (1817), emphasized international trade in the sense of specializing and exporting in the production of those commodities in which a country enjoys absolute advantage and comparative advantage, respectively. In the early 1960s, development economists intensified their energy spent investigating the trade-growth nexus, which has a direct bearing on GDP, the standard of living and the quality of life of society. Exports and imports are the prime factors that affect economic growth and development. Across the globe, different studies have been performed to conduct theoretical and empirical analyses of the nexus among economic growth, exports, and imports, and the estimated results are different due to the difference in the size of the economy, the composition of the economy and the policies implemented.

Regarding the trade-growth nexus, different schools of thought interpret scenarios differently. The first thought revolves around the export-led growth
ELG) and import-led growth (ILG) hypotheses, stating that causality runs from exports to economic growth in the sense that exports improve productivity, economies of scale, production quality, capital investment, competitive prices, and employment creation and increases foreign exchange reserves, thus improving economic growth. Similarly, import-led growth occurs when productive goods are imported, which further accelerates economic activities; thus, economic growth is in the arena of the import-led growth (ILG) hypothesis. The export-led economic growth hypothesis was studied by Siliverstovs and Herzer (2006) in the Chilean economy through an investigation of the nexus among imports, exports, and economic growth. Hunjra et al. (2014) studied the same relation in Pakistan and observed a long-run relationship and a unidirectional relationship from imports and exports to GDP, confirming the export-led and import-led growth hypotheses. Muhammad et al. (2012) estimated trade-growth causality, indicated a long-run relationship and validated the ELG hypothesis in Pakistan. Some studies have confirmed the import-led growth (ILG) hypothesis in different economies. For example, Yuhong et al. (2010) studied trade-growth cointegration in China and confirmed the ILG hypothesis. Likewise, Ghali (2000) examined the export-to-growth ratio in Tunisia and confirmed the ELG hypothesis.

The second school of thought revolves around unidirectional causality running from economic growth to exports and imports and sometimes among trade variables from exports to imports and from imports to exports, referred to as growth-led exports (GLEs) and growth-led imports (GLIs), export-led imports (ELIs) and import-led exports (ILEs), respectively. The abovementioned hypotheses state that higher economic growth means higher productivity, lower per unit cost, economies of scale and exporting surplus, which lead to more exports abroad. Similarly, more exports fetch more reserves, which are in turn used to import productive and consumptive goods and services (export-led imports). Therefore, causality runs from growth to imports and among the trade variables from exports to imports, or vice versa. Saaed and Hussain (2015) highlighted causality running from economic growth to imports, a unidirectional causality between exports and imports and from exports to economic growth, confirming growth-led imports (GLIs), export-led imports (ELI) and export-led growth (ILG) in Tunisia, respectively. The same parameters were studied by Ramos (2002) for the Portuguese economy, which endorsed a causality from exports to imports but not vice versa.
The third school of thought indicates bidirectional causality running between trade variables and economic growth. Bakari and Mabrouki (2017) studied cointegration in the nexus between trade and economic growth. The results indicated no long-run relation but witnessed bidirectional causality from imports to economic growth and exports to economic growth, validating the ILG, ELG, GLI and GLE hypotheses in Panama. Khan et al. (1995) studied the nexus between trade and economic growth in Pakistan and confirmed bidirectional causality between export growth and economic growth. Similarly, in the same study area, Khan and Saqib (1993) examined the strong nexus between exports and economic growth. Hussain (2014) studied the cointegration of trade variables and economic growth. The results indicated no cointegration, but bidirectional causality was running between GDP and no causality between trade variables, verifying export-led growth in Pakistan.

The fourth school of thought highlights no causality, neither between trade variables (exports and imports) nor between trade variables and economic growth. In this regard, Hussain and Saeed (2014) studied the nexus among exports, imports, and economic growth in the Kingdom of Saudi Arabia. The results indicated that a long-run relationship existed, and the Granger test indicated unidirectional causality from exports to imports and from economic growth to imports and no causality from exports to economic growth and from imports to economic growth, validating the ELI and GLI hypotheses and invalidating the ELG and ILG hypotheses. Similarly, Shirazi and Manap (2004) studied the nexus among exports, imports, and GDP in Pakistan using cointegration and Granger causality relations. The study results indicated cointegration among variables, unidirectional causality from imports to GDP, and unidirectional causality from exports to GDP, but no causality was witnessed between exports and imports.

2.1. Pakistan Scenario

Pakistan, being among the top eleven emerging economies (Neil, 2007), stands as the 5th best market across the globe (Farwa, 2016). As per a 2016-17 economic survey, the contributions of the three economic sectors—agriculture, industry and services—were approximately 19.82%, 21.02% and 59.16%, respectively. During the first nine months (July-March) of 2016-17, the total exports recorded were US$ 15.119 billion, with a decline of 3.06% compared to the same period in the previous year, encompassing food items
(US$ 2,685.9 million), textiles (US$ 9,278.9 million), petroleum (US$ 139.2 million), other manufacturers (US$ 2,274.1 million) and all other items (US$ 740.5 million). The imports recorded during the same period were US$ 38,503.8 million, with a growth rate of 18.7% compared to the same period during the previous year, encompassing food items (US$ 4,528 million), machinery (US$ 6,465 million), petroleum (US$ 6,686.7 million), consumer durables (US$ 3,470 million), raw materials (US$ 5,610.9 million), telecom (US$ 1,028.8 million), and all other items (US$ 3,139.2 million). The economy of Pakistan showed an economic growth of 5.28% in 2016-17, which is its highest recorded growth rate in the last decade (Gov. of Pakistan, 2017).

3. Methodology

3.1. Data and Model Specification

To investigate the nexus among exports, imports, and economic growth in Pakistan, annual time-series data for 40 years, from 1976 to 2015, were extracted from the World Bank development indicators (WBI). The data encompass macroeconomic indicators of the exports of goods and services (current US$), imports of goods and services (current US$) and real gross domestic product (constant 2010 US$).

In analyzing the data, the time-series data analysis encompasses graphical analysis, a unit root test, optimal lag selection through a VAR model, a cointegration test, and the estimation of the model and Granger causality.

The empirical model used to study the nexus among economic growth, exports and imports in a number of studies, such as Bakari (2017), Khan et al. (2012), and Saaed and Hussain (2015), is given as follows:

\[
\begin{align*}
GDP_t &= f(X, M) \\
\ln GDP_t &= \delta_0 + \delta_1 \ln(X) t + \delta_2 \ln(M) t + \epsilon_t
\end{align*}
\]

where X is exports, M is imports, \(\delta_0\) is the constant term, \(\delta_1\) is the elasticity coefficient of exports, \(\delta_2\) is the elasticity coefficient of imports, and \(\epsilon_t\) is the error term, which is assumed to be independent and normally distributed.

The next step is to test the variable series for unit root analysis to test whether the time series is stationary or not. The variable series is stationary when it is time-invariant in terms of the mean, variance and covariance. For this purpose, augmented Dickey-Fuller (1979) and Phillips Perron (1988) tests are used. The empirical model of the ADF test is given below:
\[
\Delta Y_t = \gamma_1 + \gamma_2 t + \gamma_3 Y_{t-1} + \sum_{i=1}^{m} \alpha_1 \Delta Y_{t-1} + \varepsilon_t
\]

(3.3)

where \( Y_t \) is the test variable to be subjected to the unit root test, \( t \) is the trend variable, \( Y_{t-1} \) is the test variable’s lag value, \( \Delta Y_{t-1} \) is the lag value of the dependent variable, \( \varepsilon_t \) is the pure white noise error term, and \( \gamma_3 \) is the coefficient value of the variable series to be tested. The null hypothesis (the variable series is nonstationary) is tested against the alternative hypothesis (the variable series is stationary), given as follows:

- Ho : \( \gamma_3 = (1 - \rho) = 0 \) Data are unit roots
- H1 : \( \gamma_3 = (1 - \rho) < 0 \) Data are not unit roots

To check the cointegration between the variable series considered, the cointegration tests of Johansen and Juselius (1990) and Engle and Granger (1987) are used, assuming the null hypothesis of no cointegration and the alternative hypothesis of the existence of cointegration. The Johansen test has a comparative advantage over the EG test because it determines multiple cointegrating vectors, usually used for large sample sizes, and the variables must be integrated in the same order. If cointegration exists, then the next step is to estimate the vector error correction model (VECM), but in the case of no cointegration, the vector autoregressive (VAR) model is estimated.

In the case when there is no cointegration between variables, the use of VAR is suggested, the empirical model of which is given as follows:

\[
\Delta Y_t = a + b Y_{t-1} + \sum_{i=1}^{n-1} c_1 \Delta Y_{t-1}
\]

(3.4)

The Granger causality test is used to determine the causality or the direction of the relation moving from one variable to another or vice versa when there exists a long-run relationship (Mehmood, 2013).

\[
\Delta GDP_t = \sum_{i=1}^{n} \alpha_1 \Delta GDP_{t-1} + \sum_{i=1}^{n} \beta_1 \Delta X_{t-1} + \sum_{i=1}^{n} \gamma_1 \Delta M_{t-1} + \varepsilon_t
\]

(3.5)

\[
\Delta X_t = \sum_{i=1}^{n} \alpha_1 \Delta GDP_{t-1} + \sum_{i=1}^{n} \beta_1 \Delta X_{t-1} + \sum_{i=1}^{n} \gamma_1 \Delta M_{t-1} + u_t
\]

(3.6)
\[ \Delta M_t = \sum_{i=1}^{n} \alpha_1 \Delta GDP_{t-1} + \sum_{i=1}^{n} \beta_1 \Delta X_{t-1} + \sum_{i=1}^{n} \gamma_1 \Delta M_{t-1} + vt \]  

(3.7)

4. Results and Discussion

This section covers the results and discussion of the nexus among economic growth, imports, and exports. The first step of any analysis is to determine the description of the variables considered. The results indicated that for the given study of 40-year time series, the mean GDP was $85,777.63$ million US$, the mean exports were approximately $12,247.43$ million US$, and the mean imports were approximately $18,897.75$ million US$.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports (SM)</td>
<td>40</td>
<td>12,247.43</td>
<td>9,687.102</td>
<td>1,438.288</td>
<td>31,433</td>
</tr>
<tr>
<td>Imports (SM)</td>
<td>40</td>
<td>18,897.75</td>
<td>15,763.51</td>
<td>2,643.865</td>
<td>51,141</td>
</tr>
<tr>
<td>GDP (SM)</td>
<td>40</td>
<td>85,777.63</td>
<td>72,572.16</td>
<td>13,338.48</td>
<td>270,556.1</td>
</tr>
</tbody>
</table>

Source: Authors’ estimations from data

4.1. Graphical analysis

Before an analysis of time-series data, it is mandatory to plot the variable series considered. According to Gujarati and Porter (2009), the analysis of data before subjecting it to graphical analysis can lead to negative results. The graphical analysis of the variable series indicates that GDP, exports and imports trend upward, as depicted in Figure 4.1.
4.2. Unit root test

Time-series data are often contained within the stationarity problem, which is why the next step is to subject the variables to a unit root test to examine whether they are stationary or not. Second, a unit root rest is also conducted to determine the order of integration among the variables under study. Augmented Dickey-Fuller (1979) and Phillips Parron (1988) tests are used.

Table 4.2. Results of Unit Root Tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF Test (Trend and Intercept)</th>
<th>PP Test (Trend and Intercept)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At level</td>
<td>At first difference</td>
</tr>
<tr>
<td>Ln (Exports)</td>
<td>-2.172</td>
<td>-5.181***</td>
</tr>
<tr>
<td>Ln (Imports)</td>
<td>-2.085</td>
<td>-4.399***</td>
</tr>
<tr>
<td>Ln (GDP)</td>
<td>-1.885</td>
<td>-5.100***</td>
</tr>
</tbody>
</table>

Notes: *** indicates the significance of the unit root test at 1 percent.
Source: authors’ estimations from data
The test results depicted in Table 4.2 indicate that both the ADF test and PP test for GDP, imports and exports are statistically insignificant at level, leading to nonrejection of the null hypothesis of the existence of unit roots in the variables. The test results at the first difference are statistically significant at 1 percent and revealed that there is no unit root (stationarity) in the variables and that the null hypothesis is rejected. Hence, all of the variables are integrated in first order, i.e., I (1).

4.3. VAR Optimal Lag selection Criterion

When all the variables are stationary in the same order, i.e., first order/difference, the next step is to check the cointegration among the variables taken into account. Before cointegration analysis, it is necessary to choose the optimal lag length, which is required for further analysis. The VAR model is used for optimal lag length selection based on different criteria, i.e., LR, FPE, AIC, SC and HQ.

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.391096</td>
<td>NA</td>
<td>0.000231</td>
<td>0.141022</td>
<td>0.271637</td>
<td>0.187070</td>
</tr>
<tr>
<td>1</td>
<td>131.0798</td>
<td>233.1204*</td>
<td>3.22e-07*</td>
<td>-6.436745*</td>
<td>-5.914285*</td>
<td>-6.252554*</td>
</tr>
<tr>
<td>2</td>
<td>139.3984</td>
<td>13.48972</td>
<td>3.38e-07</td>
<td>-6.399916</td>
<td>-5.485611</td>
<td>-6.077581</td>
</tr>
<tr>
<td>3</td>
<td>142.4970</td>
<td>4.522253</td>
<td>4.78e-07</td>
<td>-6.080920</td>
<td>-4.774771</td>
<td>-5.620441</td>
</tr>
</tbody>
</table>

Notes: * represents the optimal lag selected by the criterion
Source: authors’ estimations from data

The results of the VAR model for the selection of the optimal lag value are listed in Table 4.3, indicating that all of the given criteria from LR to HQ suggest choosing lag one (1) as the optimal lag length for the cointegration analysis, which was the same result as that in Saeed and Hussain (2015). The next step is to test the model to identify if any cointegration exists.

4.4. Johansen test of cointegration

As all the variables were stationary in the same order, i.e., at first order, the suggested tests for cointegration are those of Engle and Granger (1987) and Johansen and Juselius (1990). The Johansen test encompasses the maximum
eigenvalue and trace statistics. The results of the Johansen test of cointegration are presented in Table 4.4

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
<th>Max. Eigenstatistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0.259966</td>
<td>16.97684</td>
<td>29.79707</td>
<td>0.6418</td>
<td>11.44</td>
<td>21.132</td>
<td>0.603</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.134598</td>
<td>5.536607</td>
<td>15.49471</td>
<td>0.7495</td>
<td>5.493</td>
<td>14.265</td>
<td>0.678</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.001138</td>
<td>0.043284</td>
<td>3.841466</td>
<td>0.8352</td>
<td>0.043</td>
<td>3.841</td>
<td>0.835</td>
</tr>
</tbody>
</table>

Source: Authors’ estimations from data

The Johansen test results revealed that there is no cointegration between the variables, as the numerical values of the trace statistic and maximum eigenstatistic are less than the critical value at 5%, which suggests that the null hypothesis (no cointegration) is not rejected, and these results were confirmed by Hussain (2014) and Bakari and Mabrouki (2017). Hence, no cointegration among the tested variables was witnessed. As there is no cointegration among the variables, the study proceeded to estimating the vector autoregressive model.

4.5. VAR Estimation

The results of the VAR model are given in Table 4.5, indicating that there is a positive but statistically insignificant impact of exports on economic growth. Similarly, the impact of imports on economic growth is positive but statistically insignificant, and the results are in line with those of Bakari and Mabrouki (2017) and Bakari (2017).
### Table 4.5. Results of the VAR Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>LY</th>
<th>LE</th>
<th>LI</th>
</tr>
</thead>
<tbody>
<tr>
<td>LY(-1)</td>
<td>0.855554</td>
<td>0.151246</td>
<td>0.069216</td>
</tr>
<tr>
<td></td>
<td>(0.11392)</td>
<td>(0.16492)</td>
<td>(0.20269)</td>
</tr>
<tr>
<td></td>
<td>[ 7.51041]</td>
<td>[ 0.91706]</td>
<td>[ 0.34149]</td>
</tr>
<tr>
<td>LE(-1)</td>
<td>0.087586</td>
<td>0.953121</td>
<td>0.124854</td>
</tr>
<tr>
<td></td>
<td>(0.07847)</td>
<td>(0.11361)</td>
<td>(0.13963)</td>
</tr>
<tr>
<td></td>
<td>[ 1.11612]</td>
<td>[ 8.38918]</td>
<td>[ 0.89419]</td>
</tr>
<tr>
<td>LI(-1)</td>
<td>0.041644</td>
<td>-0.140074</td>
<td>0.762562</td>
</tr>
<tr>
<td></td>
<td>(0.09258)</td>
<td>(0.13404)</td>
<td>(0.16473)</td>
</tr>
<tr>
<td></td>
<td>[ 0.44981]</td>
<td>[-1.04504]</td>
<td>[ 4.62920]</td>
</tr>
<tr>
<td>C</td>
<td>0.478612</td>
<td>0.166401</td>
<td>0.438697</td>
</tr>
<tr>
<td></td>
<td>(0.29430)</td>
<td>(0.42608)</td>
<td>(0.52364)</td>
</tr>
<tr>
<td></td>
<td>[ 2.62627]</td>
<td>[ 0.39054]</td>
<td>[ 0.83778]</td>
</tr>
</tbody>
</table>

Notes: ( ) represents standard errors, and [ ] represents t-statistics.

\[\text{LnY} = C(1) \times \text{Ln(Y(-1))} + C(2) \times \text{Ln(E(-1))} + C(3) \times \text{Ln(LI(1))} + C(4)\]

### 4.6. Diagnostic tests

To diagnose the problems related to model specification, serial correlation, normality and heteroscedasticity, postestimation diagnostic tests were conducted. The results are depicted in Table 4.6.
The postregression diagnostic test displayed in Table 4.6 indicates that 99.22 percent of the variation in economic growth is explained by imports and exports. The serial correlation LM test result is insignificant, leading to the nonrejection of the null hypothesis (no serial correlation) that the model is free from serial correlation problems. The result of the Jarque-Berra test is statistically insignificant at 5%, implying the nonrejection of the null hypothesis (data are normal), indicating that the data are normally distributed. The P-value of the heteroscedasticity test is 0.33, which is greater than 0.05, implying that residuals are free of heteroscedasticity. The results are in line with those of the reviewed literature.

### 4.7. Pairwise Granger Causality Test Results

To assess the direction of causality, a pairwise Granger causality test was conducted. The results of the Granger causality test are depicted in Table 4.7.

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Observations</th>
<th>F-Statistic</th>
<th>P-Value</th>
</tr>
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<td>0.0575**</td>
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Notes: *** represents significance at 1 percent, and ** represents significance at 5 percent.

Source: authors’ estimations
The test results indicate that there is a unidirectional causality running from exports to economic growth at the 1% level of significance, validating the export-led growth hypothesis, and the results are in conformity with those of the studies of Kória and Singh (2006), Thirunavukkarasu and Achchuthan (2014), Hatemi (2002), Albiman and Suleiman (2016), Shirazi and Manap (2004), Saaed and Hussain (2015), and Bakari (2017). Similarly, imports Granger cause growth unidirectionally at the 5% level of significance, confirming the import-led growth hypothesis in the case of Pakistan, which is in line with Thirunavukkarasu and Achchuthan (2014), Kória and Singh (2006), and Bakari (2017). However, there is no evidence of causality from exports to imports and vice versa, which has been validated by Shirazi and Manap (2004) and Hussain (2014).

5. Conclusions

This research study aimed to investigate the nexus among exports, imports, and economic growth in Pakistan by incorporating annual data of the variable series from 1976 to 2015. The study employed time-series data analysis encompassing cointegration analysis, aVAR model and the Granger causality approach. The results indicated that all the variables were graphically upward trended and stationary in first order. No cointegration existed among variables, and a positive and insignificant impact of the trade variables on economic growth was seen. The results of the pairwise Granger causality test indicated that there is unidirectional causality running from exports to economic growth because exports compel economic units to allocate resources efficiently, have economies of scale, operate in tangible productive efficiency after acquiring productive technology, improve capital formation, and improve foreign reserves earning through market linkages and networking, which boost the job market and ultimately ends at economic growth. Statistically significant unidirectional causality was witnessed from imports to economic growth because Pakistan imports encompass capital goods, information technology, and additive raw materials, which directly and indirectly increase agricultural, manufacturing and service production, multiply the level of output and thus improve the GDP growth rate. On the basis of the nexus among economic growth, exports, and imports, the study concluded that the export-led and import-led growth hypotheses are validated in Pakistan.
6. Recommendations

The policy implications in light of the study findings are as follows: the government should discourage exports of primary goods and focus on diversifying and incentivizing manufacturing sector production and export-oriented industrial structures to obtain diverse exports to attract foreign markets. Small and medium-sized enterprises must be encouraged to take this approach along with ensuring export quality. Export promotion measures should be taken to bring home foreign reserves, boost economic activities and create employment opportunities. The Government should, if not exempting export taxes, lessen its burden, and exports should be subsidized. Imports should be productive, not consumptive and costly, and unproductive imports should be curtailed. The government should establish diversified trade relations and ensure trade stability and foreign reserve maintenance.

References


Smith A. (1937), *The wealth of nations* [1776].


