Introduction

Economic progress is one of the key objectives in every corner of the world. Economic growth has a plenty of contributors in which export-led hypothesis is the fundamental element of economic enhancement. In over four decades, Bangladesh has managed a tangible growth in its export of goods and services (Mamun and Nath, 2005). In the beginning, Bangladesh witnessed a robust inward-based economy ranking. However, there are both theoretical and empirical analysis between economic growth and exports. Addressing these literature, the causality between exports and economic growth is ascertained by several factors. Explicitly, the growth of exports directly affect the economic growth as an element of GDP. Moreover, exports improve the both capital

1 According to Dodaro (1991), only after Ghana, Bangladesh faced the 2nd highest position of the price distortion index among the 41 countries.
and intermediate goods by controlling the foreign exchange limitations (McKinnon 1964, Chenery and Strout 1966).

According to Helpman and Krugman (1985), exports can also support the narrow local markets of the poor economies to obtain benefits using the economies of scale. However, exports also contribute in resource allocation by enhancing its efficiency and more specially, increases the utilization forms of capital due to the over existing competition in the global market (Balassa, 1978; Bhagwati and Srinivasan, 1979; Krueger 1980). In General. There are four different comments on the causality between exports and economic growth. First view is about the hypothesis of neoclassical export-led that means the unidirectional causality from export growth to economic growth\(^2\). Following this hypothesis, Rodrik (1988), Grossman and Helpman (1990), Baldwin and Forslid (1996), Segerstrom et al., (1990), Ghirmay, Grabowski and Sharma (2001), and Rivera-Batiz and Romer (1991) suggest that exports of goods and services make a robust technological progress which ultimately increases the output level, improves workers and managerial skills, enhances productive capacity, ensures better utilization of the resources, and maintains proper resource allocation. Also, Abdulai and Jaquet (2002) reveal that there is a huge improvement in real wages and employment.

The second hypothesis is the unidirectional relationship from economic growth to exports. Explaining this hypothesis, Shan and Tian (1998) and Sharma et al., (1994) recommend that this causality will be accepted if the domestic demand is less than the production. However, a high level of productivity generates a lower unit cost of production which ultimately accelerates the export growth (Kaldor, 1967). The third hypothesis is the aggregation of the first and second statement in which there is a bilateral association between exports and economic growth (Wernerheim 2000, Hatemi-J. 2002). At last, the fourth hypothesis suggests no causality between exports and economic growth because these components are mainly improved for the technological progress (Yaghmaian 1994).

However, there exist a plenty of studies to determine the contribution of exports on the economic growth of developing economies. For instance, Balassa (1978 and 1985), Jung et al., (1985), Chow (1987), Shan and Sun (1988), Bahmani-Oskoei, Mohtadi and Shabsigh (1991), Bahmani-Oskoei et al., (1993), Levin et al., (1997). These studies empirically find a positive causality between exports and economic growth. Moreover, there are some cross-country analysis

\(^2\) According to Afxentiou and Serletis (1992), Export oriented approach controls the foreign exchange limitations.

To promote exports, Bangladesh takes different initiatives to improve efficiency of workers, to build export-oriented industries, to control tariff rationalization, to enhance private sector investment. More importantly, the government establishes many export processing zone, special economic zone. However, there also exist some studies about the effect of export on the economic growth of Bangladesh. For instance: Mamun and Nath (2005); Begum et al., (1998); Ahmed (2000), and Ahmed et al., (2009).

The objective of this paper is to examine the relationship between exports and economic growth of Bangladesh. The remainder of the study proceeds as follows: Section 2 describes methodology, Section 3 presents the results and discussion, and finally, Section 4 reports conclusions.

**Methodology**

The main objectives of this research is to examine causality between export and economic growth of Bangladesh. The study uses time-series data of 39 observations during 1980-2018. The data is collected from the World Development Indicators (WDI). To exhibit the causality, the empirical study uses a simple model to investigate the relationship between export and economic growth.

\[ Y = f (X, Z) \]  

Where, \( Y \) indicates gross domestic product which is used a proxy of economic growth, \( X \) is exports of goods and services, and finally, \( TOT \) is the terms of trade.

To find the relationship, after taking natural logarithm of gross domestic product we can rewrite the equation (1) as the following equation:

\[ \ln GDP = \beta_0 + \beta_1 Export_t + \beta_2 TOT_t + \epsilon_t \]  

Where, Coefficients \( \beta_1 \) and \( \beta_2 \) are empirically expected to be a positive indication.

**Table 1. Summary statistics of the variables:**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Observation</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNGDP</td>
<td>39</td>
<td>24.93431</td>
<td>0.5639586</td>
<td>24.07761</td>
<td>25.99188</td>
</tr>
<tr>
<td>Export</td>
<td>39</td>
<td>11.4238</td>
<td>5.138301</td>
<td>3.396255</td>
<td>20.16159</td>
</tr>
<tr>
<td>TOT</td>
<td>39</td>
<td>100.4153</td>
<td>29.87837</td>
<td>56.54478</td>
<td>162.2642</td>
</tr>
</tbody>
</table>
Results and Discussion

Unit Root Test

The unit root test is applied to investigate the stationary of the variables. In this study, Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1981) is employed to find a unit autoregressive root. The ADF test is based on the following regression,

\[ \Delta Y_t = \alpha + \delta Y_{t-1} + \mu_t \]  

(3)

Where, \( \alpha \) is the constant term, \( \delta \) is the slope coefficient, \( t \) is a linear time trend, and \( \mu \) is the error term.

Table 2: Augmented Dickey-Fuller (ADF) test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Without trend</th>
<th>With trend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level</td>
<td>1st Difference</td>
</tr>
<tr>
<td>LNGDP</td>
<td>-6.848***</td>
<td>-3.156**</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(0)</td>
</tr>
<tr>
<td>Export</td>
<td>-1.152</td>
<td>-4.023***</td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(1)</td>
</tr>
<tr>
<td>TOT</td>
<td>-0.466</td>
<td>-3.014**</td>
</tr>
<tr>
<td></td>
<td>(3)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Notes: ( i ) figures within parentheses indicate lag length chosen by the Akaike Information Criterion (AIC); ( ii ) *, **, and *** denote rejection of the null hypothesis of unit root of the 10%, 5%, and 1% significance level respectively.

Following the empirical results of the Augmented Dickey-Fuller (ADF) test indicate that some variables are non-stationary at levels as the calculated T-statistics are less than the critical values but employing the first difference all the variables (such as: LNGDP, Export, and TOT) become stationary for both with and without trend.

Granger Causality test:

This study uses Granger causality test (Granger 1969) to investigate the causal relationship between exports and economic growth of Bangladesh.

\[ \Delta LNGDP_t = \sum_{i=1}^{n} \beta_{1i} LNGDP_{t-1} + \sum_{j=1}^{n} \beta_{12} Export_{t-j} + \varepsilon_{1t} \]  

(4)

\[ \Delta Export_t = \sum_{j=1}^{n} \beta_{21} Export_{t-1} + \sum_{i=1}^{n} \beta_{22} LNGDP_{t-i} + \varepsilon_{2t} \]  

(5)

\[ \Delta TOT_t = \sum_{j=1}^{n} \beta_{31} TOT_{t-1} + \sum_{i=1}^{n} \beta_{32} LNGDP_{t-i} + \varepsilon_{3t} \]  

(6)

Where, \( i \) and \( j \) represent lag length.
### Table 3: Granger Causality Wald Test

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>$\chi^2$-value</th>
<th>P &gt; $\chi^2$</th>
<th>Direction of Causality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export does not granger cause LNGDP</td>
<td>8.0722**</td>
<td>0.018</td>
<td>Export $\rightarrow$ LNGDP</td>
</tr>
<tr>
<td>LNGDP does not granger cause Export</td>
<td>0.09828</td>
<td>0.952</td>
<td></td>
</tr>
<tr>
<td>TOT does not granger cause LNGDP</td>
<td>0.64114</td>
<td>0.726</td>
<td>LNGDP $\rightarrow$ TOT</td>
</tr>
<tr>
<td>LNGDP does not granger cause TOT</td>
<td>12.617***</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Export does not granger cause TOT</td>
<td>10.021***</td>
<td>0.007</td>
<td>Export $\leftrightarrow$ TOT</td>
</tr>
<tr>
<td>TOT does not granger cause Export</td>
<td>6.1813**</td>
<td>0.045</td>
<td></td>
</tr>
</tbody>
</table>

Notes: *, **, and *** denote rejection of the null hypothesis of unit root at the 10%, 5%, and 1% significance level respectively.

In the table 2, the probability values conclude that null hypothesis (i.e., Export does not granger cause LNGDP) is rejected as the calculated value is less than 0.05. On the other hand, the null hypothesis (i.e., LNGDP does not granger cause Export) cannot be rejected. Therefore, it indicates that Granger causality goes one way from Export to LNGDP which is called unidirectional causal relationship. Following this causality, the null hypothesis (i.e., TOT does not granger cause LNGDP) is rejected but the hypothesis (i.e., LNGDP does not granger cause TOT) is accepted with 1% significance level. There is also a unidirectional causal association from LNGDP to TOT. Moreover, there is a bidirectional causal relationship between Export and TOT.

### Table 4. Hypotheses Assessment Summary

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Significance</th>
<th>Prob.</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export does not granger cause LNGDP</td>
<td>0.05</td>
<td>0.018</td>
<td>rejected</td>
</tr>
<tr>
<td>LNGDP does not granger cause Export</td>
<td>0.05</td>
<td>0.952</td>
<td>accepted</td>
</tr>
<tr>
<td>TOT does not granger cause LNGDP</td>
<td>0.05</td>
<td>0.726</td>
<td>accepted</td>
</tr>
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<td>0.045</td>
<td>rejected</td>
</tr>
</tbody>
</table>

### Conclusion and Recommendations

In this study, an effort was applied in order to investigate the relationship between exports and economic growth of Bangladesh through the analysis of granger causality test. The analysis of granger causality test suggests that there is a unidirectional causal effect from export and terms of trade to economic growth, while there is no causal relationship from economic growth to export.
and terms and trade. Furthermore, the results of causality analysis suggest that there is a strong bilateral causal relationship between export and terms of trade. The policy implications from the empirical findings suggest that the government should concentrate on labor efficiency, export oriented industries, and easy rules and regulations for export fields to generate additional advantages for higher economic growth.

References