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Foreign Trade and Economic Growth Relationship: Empirical Evidence from Libya

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Abstract
This study aims investigate the short- and long-run causal relationship between foreign trade and economic growth in Libya over the study period of 1990 - 2017. This study employs Johansen co-integration test, the error correction model (VECM), and Wald test to meet the objective of the study. The variables utilised in this study are gross domestic product (GDP) growth rate, exports and imports; the data is extracted from various sources such as the Libyan Central Bank and Libyan Ministry of Planning. The results of this study indicate there is a long-run relationship between the foreign trade and economic growth in Libya. In this vein, there is a short-run causality running from exports and imports toward economic growth.
Keywords: Export, Import, Economic Growth, Libya, Vector Error Correction Model.

Introduction

Foreign trade is historically the oldest and it reflects economic relations between individual economies and is part of a country's foreign relations (Jenicek & Krepl, 2009). Also, it is one of the vital sectors of any society, whether that society is developing or developed societies. Moreover, it helps in expand the marketing capacity by opening new markets for the state's products and helps in increasing the country's welfare through Expanding the base of options in the areas of consumption, investment and the allocation of productive resources in general (Al-Sawai, 2006).

In addition, it plays a strong role in enabling economic development through enabling it to exploit comparative advantages and develop sectors where economies of scale exist to obtain them, in exchange for more productive foreign. Besides that, it implements trade policies that related to tariffs, incentives, quotas, taxes, customs, administration, subsidies, investment, export promotion, trade facilitation and diversification (Vijayasri, 2013). On top of that, it has role to help the poor escape from extreme poverty (Gujrati, 2015)

In Libya, there is no disagreement about the important position of the foreign trade sector in the economy because of the exports role in finding external outlets for local production to increase the foreign currency revenues to supporting the balance of payments. In addition to

its role in providing imports in securing the various necessary needs of raw materials and intermediate goods for investment projects in the economic and social transformation plans, as well as providing goods that cannot be produced locally of consumer needs. Where, the foreign trade has contributed to the growth of the GDP for it counted on a large extent on the ability of industries oil exports, which represents of great importance for the national economy, and this reflects the extent to which the Libyan economy is dependent on the outside (Jaber, 2008). Therefore, for the role that foreign trade plays in the Libyan economy it is essential to know the impact and interaction between foreign trade and economic growth to providing more meaningful empirical evidence result for the decision maker to improve the foreign trade process and its effect on GDP.

Empirical Studies

Several empirical studies support hypotheses that foreign trade has a positive impact on economic growth. Chaudhary et al. (2007) utilize cointegration and multivariate granger causality to test the relationship between trade policy and economic growth during 1973-2002 in Bangladesh. The finding of study found that ,there is feedback effects between exports and imports and output growth in the short-run. Next, Omotor (2008) sought in his study to analysis the relationship between export and economic growth during the period 1979-2005 in Nigeria. The study result not provides evidence to support the export-led economic growth hypothesis. In China, Tang employed the (Ardl) model to investigate the empirical relationship between export and economic growth. He found that no long-run relationships among exports, real Gross Domestic Product, and imports. In the same vein, Zang and Bimbridge (2012) empirically examined the relationship between foreign trade in South Korea and Japan. The study utilizes vector autoregressive model (VAR). They found out that there is bi-directional causality between import and economic growth in two countries study.

Next, a range of neighboring countries also support the relationship between foreign trade and economic growth. For instance, Abou-Stait (2005) endeavored to test the assumption that exports are a leader for economic growth in Egypt over the period (1977-2003), which is the period Egypt government-wave economy to a free market economy. The study results show exports are one of the most important sources of growth in Egypt. Also in same context, Jaber (2011) aimed to identify the factors that contributed to the increase in the total Sudanese exports during the study period (1985-2010). The most prominent results of this study concluded that Sudanese exports had a positive effect in the short term on the gross domestic product; similarly, Mustafa (2011) studied the impact of extent the strategy for developing non-oil exports and it contribute to achieving economic growth in Algeria during the period (1970-2009) for encouraging exports. The empirical study shows that there is strong positive relationship between total exports and gross domestic product. The study recommended the necessity of activating the role of exports through the expansion of production and the activation of the private sector and small and medium enterprises in development process. Finally, Hussain and Saaed (2015) investigated the empirical relationship between export, import and economic growth in Tunisia during 1977-2012. The study revealed that there is unidirectional causality between exports and economic growth.

In Libya, Farag (2008) aimed to identify the role foreign trade planning and extent of its contribution to raising the rates of economic development in Libya during the period (1988-2003). The study concluded that foreign trade contributed to the growth of the gross

domestic product, which depends on capital and intermediate goods and as a main source of income through exports to finance the requirements of economic development. Hawitah and Shat (2009) Utilizes a sample regression to analysis Libyan foreign trade during the period (1977-2006) to track the development of exports and imports. One of the most important findings of the study is export has a positive effect in economic growth.

Furthermore, Elbeydi et al, (2010) sought to determine the direction of causality relationships between export and economic growth in Libya during the period (1980-2007). The empirical result study shows there is bi-directional causality between the exports and income growth in long-run. Also, the export promotions participate in the economic growth. Suleiman's study (2012) aimed to know the impact of foreign trade on the economic growth of the Maghreb countries during the period (1989-2005). The study concluded that both Libyan exports and imports have a greater impact than the impact of domestic investment on economic growth. In the same vein, Al-Bulazi (2012) targeted to examine the causal relationship between exports and economic growth. The finding confirms that there is bi-directional feedback causality between exports and the Libyan GDP.

Based on the above discussed studies, there is inconclusive evidence on the relationship between the foreign trade and economic growth across countries, hence this study aims to enrich the empirical evidence on trade and economic growth. Based on the discussion, this study aims to investigate the long-run relationship between foreign trade and economic growth and to identify the short-run relationship between foreign trade and economic growth.

Methodology

The study utilizes secondary data over the period of 1990 to 2017. The gross domestic product (GDP) growth, exports, and Imports for the period under study are used as variables. This data is extracted from various secondary sources including statistical reports from various Libyan institutions, the Libyan Central Bank, the General Information Authority, as well as from the Ministry of Planning in Libya.

To measure the relationship between economic variables under the study investigate requires at the outset to divide the variables included in the model into independent variable and dependent variables, and the direction of the functional relationship that is the subject of the study is as follows:

$$GDP = ƒ (EX, IM)$$

$$GDP = \alpha + \beta_1 EX_t + \beta_2 IM_t + \varepsilon t$$

where:-

GDP = Economic growth
Ex = Exports
IM = Imports

It is evident through the above function that gross domestic product (GDP) is the dependent variable, exports (EX) and imports (IM) are the independent variables, and it is mainly dependent on the special data that were mentioned in the economic bulletins issued by the Central Bank of Libya for the years of study (1990-2017). There are several methodologies

unit root test, Johansen co-integration test, and VECM Granger Causality used to achieve the objective in this research.

Unit root tests are important in examining the stationarity of a time series because non-stationary regressors invalidates many standard empirical results and thus requires special treatment. Non-stationarity can be tested using the Augmented Dickey Fuller test is used to identify the stationarity in
the series of data.
H0: Data are not stationary (Unit root exists)
H1: Data are stationary (Unit root does not exist)

If **ADF** statistics exceed critical value, the H0 can be rejected. Hence the H1 is accepted which means the data are stationary.

Johansen co-integration test is used to determine the number of co-integrating vectors; it provides two different likelihood ratio tests; the trace test and the maximum eigenvalue test The Johansen co-integration test is based on Vector autoregressive model (VAR).The decision criteria is to reject H0 if the Maximum Eigenvalue and Trace values are greater than the tabulated 5% critical value.

The VECM is a restricted Vector Autoregression (VAR) model that allows a short run and long run Granger causality. Granger (1969) has developed a simple test for checking the causality between variables. The granger causality test for the case of variable Yt and xt is the first step of the estimation of VECM model as below:

$$y_t = \alpha_1 + \sum_{i=1}^{k} \beta_i x_{t-i} + \sum_{i=1}^{k} \gamma_j y_{t-j} + e_{1t}$$

$$x_t = \alpha_2 + \sum_{i=1}^{k} \theta_i x_{t-i} + \sum_{i=1}^{k} \delta_j y_{t-j} + e_{2t}$$

The null hypothesis of the Granger causality test states that there is no relationship that exists between the dependent variable with the independent variables. In general, if there is no causal relationship existing between an independent variable and a dependent variable, then the specified variable does not Granger cause the dependent variable in the short-run, and vice versa.

Results and Discussion
To know stationary data or not, ADF and Phillips–Perron (PP) are employed to analyse the stationarity of all the variables, GDP = gross Domestic product; EX= Export; and IM Import. The Augmented Dickey-Fuller (ADF) and PP results show the (ADF and PP) test results indicated that all variables were stationary at first difference.

Table 1: ADF and PP Stationary Test Results

Variables	ADF		PP		Decision
	Level	First Difference	Level	First Difference	
GDP	-1.696	-6.170*	-1.319	-6.106*	1(1)
EX	-2.480	-5.416*	-2.516	-5.416*	1(1)
IM	-2.473	-5.184*	-2.559	-5.460*	1(1)
Critical Values					
1%*	-3.699	-3.711	-3.699	-3.711	
5%**	-2.976	-2.981	-2.976	-2.981	
10%***	-2.627	-2.629	-2.627	-2.629	

Note: GDP = gross domestic products; EX= Export; and IM Import.
The null hypothesis is that series is non-stationary or contains a unit root. The rejection of null hypothesis is based on the critical values and numbers in parentheses indicate number of lags (k) based on AIC

The optimal lag length of the VAR underlying the VECM is selected. Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC) lag-order selection statistics. From the Table 2 below, it reports lag-order selection statistics. The result shows lags order at two. This indicates that the recommended optimal lag is lag 2.

TABLE 2. VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-62.884	NA	0.0486	5.4903	5.6376	5.5294
1	-14.613	80.451*	0.0018	2.2177	2.8068*	2.3740
2	-3.697	15.463	0.0016*	2.0581*	3.0889	2.3316*
3	5.179	10.357	0.0018	2.0683	3.5409	2.4590
4	7.887	2.482	0.0039	2.5927	4.5070	3.1005

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

Johanson's cointegration approach used to determine the number of cointegrating equations. From Table 3 and Table 4, the Rank Test of (Trace) and (Maximum-Eigenvalue) statistics showed that there is one cointegrating vectors. Therefore, as per the statistics, H0 'there is no cointegration' between the variables is rejected at 1% level of significance, which implies that there is one cointegrating vector between three variables.

Table 3: Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob**
None*	0.620	36.246	29.797	0.007
At most 1	0.723	12.021	15.494	0.155
At most 2	0.080	2.101	3.841	0.147

Note: Trace test indicates 1 cointegration eqn(s) at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**Mackinnon- Haug – Michelis (1999)) p-values

Table 4: Unrestricted Cointegration Rank Test (Maximum-Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob**
None*	0.6205	24.224	21.131	0.0177
At most 1	0.3275	9.920	14.264	0.2172
At most 2	0.0806	2.101	3.841	0.1471

Note: Max-eigenvalue test indicates 1 cointegration eqn(s) at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**Mackinnon- Haug – Michelis (1999)) p-values

The VECM equation for the dependent variable GDP is as follows:

- D(GDP) = C(1)*(GDP(-1) - 2.56947344389*EX(-1) +5.89594180692*IM(-1) - 41.7101679036) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) + C(4)*D(EX(-1)) + C(5)*D(EX(-2)) + C(6)*D(IM(-1)) + C(7)*D(IM(-2)) + C(8).

where:
GDP = Dependent variable
EX, IM = Independent variables
C (1) = Coefficient of cointegrating equation (long-term causality)
C(4),C(5),C(6), and C(7) = Coefficient of cointegrating equation (short-term causality)

According to the VECM equation C(1)*(GDP(-1) - 2.56947344389*EX(-1) +5.89594180692*IM(-1) - 41.7101679036) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) C(1) is Coefficient of cointegrating equation (long-term causality) that shows that ECT (-0.118) is negative and highly statistically significant. That meaning Export (EX), and Import (IM) have long run causality on Economic growth or Export (EX), and Import (IM) cause GDP in long-run.

Table 5 : Results of vector error correction model

Variables	Coefficient	Std.error	t-Statistic	Prob
C(1)	**-0.118320**	**0.028377**	**-4.169522**	**0.0006**
C(2)	-1.900934	0.398348	-4.772040	0.0002
C(3)	-1.173372	0.433689	-2.705560	0.0150
C(4)	1.009895	0.316637	3.189438	0.0054
C(5)	0.925729	0.357041	2.592781	0.0190
C(6)	-0.314300	0.230494	-1.363593	0.1905
C(7)	-0.615848	0.247305	-2.490232	0.0234
C(8)	0.320612	0.075200	4.263473	0.0005

R^2 = 0.66
F-statistic = 4.89
Prob (F-statistic) = 0.003

Table 6 and Table 7 show that causality test results based on Wald causality test. The causality test is used to examine the causality of Export (EX), and Import (IM) in short -run. If the coefficients C (4) and C (5) jointly influence the economic growth, then there exists a short-run causality from Export to economic growth. Also, If the coefficients C (6) and C (7) jointly influence the economic growth, then there exists a short-run causality from Import to economic growth. The results of Wald test in Table 6, 7 indicate there is short-run causality running from Export (EX), and Import (IM) towards the economic growth since the probability of $\chi 2$ is less than 5% significant level, meaning that the null hypothesis can be rejected. Finally, For the model analysis, we find that the adjusted R^2 (66%) above average (50%). Which proves that the model is of good quality also Fisher's statistics and probabilities are significant.

Table 6 :Results of Wald test

Wald test statistic	value	df	prob
F statistics	6.818167	(2, 17)	0.0067
Chi-square	**13.63633**	**2**	**0.0011**

Null hypothesis C(4)= C (5) = 0
Null hypothesis summary:

Normalized restriction(=0)	Value	Std.err
C(4)	1.009895	0.316637
C(5)	0.925729	0.357041

Table 7 :Results of wald test

Wald test statistic	Value	df	prob
F statistics	3.662923	(2, 17)	0.00047
Chi-square	**7.325845**	**2**	**0.025**

Null hypothesis C(6)= C (7) = 0
Null hypothesis summary:

Normalized restriction(=0)	Value	Std.err
C(6)	-3.314300	0.230494
C(7)	-0.615848	0.247305

Table 8 : Diagnostic tests

Serial correlation (LM) Test			
F-statstic	0.016436	Prob F(2,15)	0.9837
Obs *R- squared	0.054667	**Prob Chi- Square (2)**	**0.9730**
Normality jarque-Bera Test	0.688995		**0.7085**
Heteroskedasticity Arch Test			
F-statstic	0.631386	Prob F(2,20)	0.5421
Obs *R- squared	1.365945	**Prob Chi- Square (2)**	**0.5051**

To validate the model, the diagnostic test statistics are presented in Table 8. Lagrange Multiplier, Jarque-Bera Normality, and Arch Test for check Heteroskedasticity are used. The LM ARCH tests indicate that the value of Prob Chi-Square is greater than 0.05, which confirm the absence of serial correlation and conditional Heteroskedasticity. Also, the JB test confirms the model is normally distributed.

Conclusion

Foreign trade is the main engine for economic growth due to imports the capital goods and raw materials to increase production, as well as because of the emergence of the export of surplus goods. This research is conducted to investigate the causality between foreign trade and economic growth in Libya. Research utilizes secondary data over the period of 1990 to 2017 to examine the causality between the variables under investigation in Libya, research used both ADF and PP unit to test the stationarity, Johanson's cointegration, VECM and Wald test. The empirical research results show that there is long run and short run causality running from Export and Import to economic growth in Libya. This result mean foreign trade has positive effect on economic growth that require exploitation of oil resources to revitalize industry and agriculture production to increase in exports of goods and reflection that on increase economic growth instead of exporting oil crude.

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