
“RELATIONSHIP AMONG EXPORT, IMPORT AND ECONOMIC GROWTH: USING CO-INTEGRATION ANALYSIS”

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ABSTRACT:

Export is one of key factor on the sustainability of economic growth either in developing or developed countries. This issue attracted researchers to examine the relationship between export and economic growth in Bahrain by using data from 1986 until 2018. Johansen co-integration and Granger causality is conducted for data analyze. The finding reveals that the co-integration between all variables are existence at 5% significant level. For granger causality test, found that there is no causality exists between export, import and capital with and economic growth. Therefore, this finding will contribute to government in making policy to control the export for avoid unsustainable of economic growth.

The findings indicate that the inconclusive effects of previous empiric research on export, import and capital and economic growth have not been finalized.

Keywords:

Exports; Imports; capital; Economic growth and Bahrain

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1.1 INTRODUCTION:

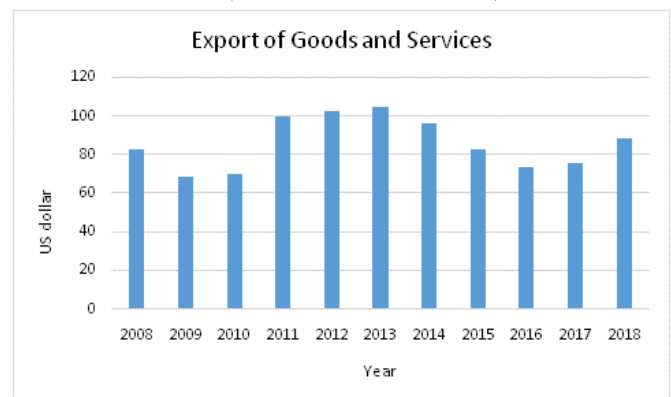
Countries' strong and stable economic growth leads much to improved quality of life, increased earnings and lower levels of unemployment in developing countries (Hasan & Ali, 2019; Oudat, & Ali, 2020). Because of the benefits of economic growth, most of the literature focuses on this subject (BilecikŞeyhEdabali&, Kırıkkale, 2020; Croes; Ridderstaat, Båk, & Zientara, 2021). Theoretically, exports and imports will play an important role in economic growth (Ruranga, Ruturwa, & Rwema, 2020). Theoretical and observational research rely on either export/development ties or

import/ growth ties or export, import and economic growth links; (Bakari, & Mabrouki, 2017). International trade includes both exports and imports, where countries have ample natural resources; foreign export goods and services; and foreign remittances can continue to lead to an increase in human income per capita. Imports are also growing income per capita where countries do not have enough natural resources, natural resource imports or raw materials are needed. In addition, innovations will be used in the manufacturing sector and these products and services exported to foreign countries, raising per-capita incomes. As

liberalisation, globalisation, and the exponential growth of computer systems generate new market opportunities, economic and financial institutions are more dynamic and diverse than they have ever been before (Ali,&Oudat, 2020; Ali, & Wan, 2016). We also reported that world trade (exports and imports) boosts economic development (Reddy, 2020). For imports the country typically expresses its weakness in fulfilling its own demands and making it dependent and expenses for foreign nations (Karamanaj, 2014). Contrarily to exports, imports lead to the departure of local currency and weaken the trade balance to weaken economic growth (Yüksel&Zengin, 2016). However, and in some cases, it is considered a source of import for economic growth, particularly if it includes hardware and electronics to help and improve investment or includes products that require more than the value of the imported output (Bakari, &Mabrouki, 2017). Due to this fact, their capacity to influence the social and economic growth of the countries remains a contentious subject for export and import. In addition, there are two theories structuring the impact of exports and imports on growth. In the first hypothesis, exports are known to be the driving force of the economy called the export lead hypothesis (ELG). It also assumes that the path of causality goes from export to production. The alternative assumption is that economic growth increases exports which are known as growth-leading exports (GLE). The causal significance varies from economic development to exports. Bahrain's economy is heavily dependent on oil and gas. Bahrain has invested heavily on the banking and tourism industries since the late 20th century. In 2008, the City of London Global Financial Centers Ranking named Bahrain the fastest-growing financial hub in the world. Bahrain's banking and financial services sector, particularly Islamic banking, has benefited from a regional boom driven by oil demand. The

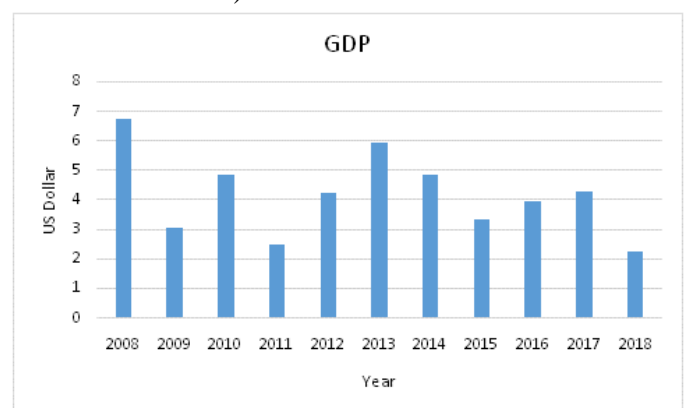
most exported commodity in Bahrain is oil production, accounting for 60 per cent of export earnings, 70 per cent of government revenues, and 11 per cent of GDP. The second most exported material is aluminium, followed by finance and building goods. Bahrain is the fourth freest economy in the Middle East and North Africa region, and the 63rd freest economy in the world, according to the 2020 Economic Freedom Index.

Export reviews of GDP in Bahrain are as follows:
Figure 1: Export of Goods and Services in Bahrain from 2008-2018 (in Billion US Dollar)



Sources: World Bank

Figure 2: GDP in Bahrain from 2008-2018 (in Billion US Dollar)



Sources: World Bank

The study aims to explore how the co-integration studies could impact the key questions about exports, imports and economic growth. Section 2

details some of the literature that makes up the connection between trade and economic growth. The second part of this segment is to address the parameters for the presented methodology and the underlying evidence used in the study. The essay briefly states that there are many experimental reports found, and then addresses the many explanations of the findings. Fol-feth, our topic in Section 5 is in-form.

1.2 RESEARCH QUESTIONS:

According to this report, the relation between exports, imports distributions and economic growth is not still known. More smooth and effective models and studies would be required to come to a consensus. When you know the answers to the following three questions, evaluating the subject would be reasonably straightforward.

1. What effect does the export do on the economy of Bahrain?
2. What effect does the import do on the economy of Bahrain?
3. What effect does the capital do on the economy of Bahrain?

1.3 LITERATURE REVIEW:

In the literature, research on foreign trade has been done in several respects. It is also inconclusive and the relation between foreign trade and its associated industry is commonly studied. Foreign trade involves all exports and imports in those countries that have adequate natural capital, export products and services to foreign countries, and international remittance, which would further raise the population's per capita income (Reddy, 2020).

Okyere, &Jilu, (2020) described and quantified the effect of exports and imports on Ghana's economic development from 1998 to 2018. Via unit root and cointegration checks, variable consistency and long-term balancing are accomplished through the first-order cointegration gap. There are no big causal ties

between foreign trade imports and Ghana's GDP growth. Ghana's GDP growth, such as cocoa, is a source of considerable export ties. The currency and inflation rate are not sources of GDP from Granger. In fact, GDP is the source of the Granger currency and inflation rate. According to BilecikSeyhEdebalı&, Kırıkkale (2020), the asymmetric economic growth rate relationship between Turkey's (1988-2019) manufacturing industries and its service industries over the period 1988-2019 was evaluated using the Nonlinear Autoregressive Distributed Lag (NARDL) model. An empirical study of the statistical relationship between the rate of economic growth and the rate of imports suggests a non-linear relationship. The NARDL (2,2) model is used to make inferences on whether an asymmetrical short-run/long-run relation exists. Although there is an asymmetrical pattern between the series in the long run, the direction of the trend is opposite in the short run. Our projections yield that a 1 percent rise in the import growth rate causes a 0.606 per cent increase in the economic growth rate, and a 1 percent decrease in the import growth rate leads to a 0.565 per cent reduction in the economic growth rate. While a rise in the import growth rate of 1 percent is associated with a 0.374 percent increase in the economic growth rate, a decrease in the rate of import growth of 1 percent is associated with a 0.573 percent decline in the economic growth rate. Model diagnostic evaluation showed that the model is likely to fail to represent the nature of the data. Analysis of Reddy (2020) Evaluated how exports and imports contribute to economic growth in India over the period 1980-2012. The results of the study illustrated the long-term correlation between exports, imports and economic development, as well as the unidirectional causality from economic growth to exports; exports to economic growth; exports to imports; imports to economic growth. In the long-term, there is a bi-

directional causal correlation between economic growth and exports; and exports and imports. The aim of the paper is to show that both exports and imports are contributing to economic growth in India. Ruranga, Raturwa and Rwema (2020) Studied the impact of various trade policies on economic growth in Rwanda. This paper uses GDP and other related trade volumes to explain economic growth. The annual time series data were used from 1961 to 2018 in the Global Development Indices. Regression models have been used to make predictions about VAR. The findings showed that VAR was a successful model, GDP and Exports fluctuated at first differences, while Imports fluctuated at later differences. As a result, one of the shows was paired with another one, and the third series was merged into the second series. The co-integration hypothesis was dismissed because of the lack of long-term equilibrium between the three variables. The causality test showing a correlation between exports and imports with growth. In that regard, we also noted that there were strong causal ties between economic growth and exports. However, a strong link existed between GDP and imports. The results indicate that exports and imports have had a positive effect on Rwanda's economic growth. Dukuly, & Huang, (2020) conducted research using secondary data produced by the World Bank Development Indicators (WBDI) for the period 2000-2019. The research used the Ordinary Least Squares (OLS) time series regression model and Stock and Wilson (1988) methodology to evaluate Liberia's trade output using macroeconomic indicators/variables that have an effect on economic development, such as Exports, Foreign Direct Investment (FDI), Population Growth, Imports, Gross Fixed Capital Formation (GFCF) and Gross Domestic Product (GDP) The regression results obtained from the Ordinary Least Squares test indicate a linear correlation and a straight-line relationship between

the variables, namely: exports, foreign direct investment, population and economic development in Liberia. With the projected results, imports have a negative impact and are linked to Liberia's GDP growth. The export impact was positive and very statistically important.

Bakari, Fakraoui, & Tib, (2019) analyzed the correlation between domestic investment, exports, imports and economic growth for the Brazilian economy over the period 1970-2017, using the VECM methodology. In the short term, our analytical studies have shown that imports, exports and domestic spending are the source of economic development. Economic prosperity is also the source of exports. Exports, imports and economic activity are the source of domestic spending. However, in the longer term, our findings have shown that domestic consumption and exports have a positive impact on economic development. Imports also have a detrimental impact on economic development. The findings revealed that global growth and imports had a favorable effect on domestic investment. Exports are having a detrimental impact on domestic spending. Finally, we notice the lack of a substantial effect of economic growth, exports and domestic investment on imports, as well as economic growth, domestic investment and imports on exports.

The relationship between exports, imports and economic development has been analysed by Guntukula, R. (2018), For the first time, the analysis uses monthly datasets. The Johansen Co-integration and Granger Causality Experiments were used in the empiric analysis using the Augmented Dickey Fuller (ADF) and Dickey Fuller (DF) tests. The present research spans the 12-year period from April 2005 to March 2017. The findings of the Granger Causality Test indicate that there is bi-directional causality between exports and economic growth (IIP) as well as between imports

and economic growth. The analysis therefore suggests that there has been a bi-directional causality between exports and economic growth that supports export-led development and a growth-led export hypothesis. Bakari, & Krit, (2017) looked at the relationship between exports, imports and economic development in Mauritania. Annual statistics were obtained from World Bank studies for the period between 1960 and 2015, according to the findings of the study, unit root tests revealed that the sequence of economic growth, exports and imports were stagnant when the first gap was considered. It was also determined, using a co-integration analysis, that there is a relationship between the three variables in Mauritania. In addition, and according to the Vector Error Correction Model, exports have a positive impact on economic development. Imports, however, have a detrimental impact on economic development. In addition, the findings of the Granger Causality Test indicate that there is no causal association between exports and GDP.

Karticasari, (2017) analyzed the various relationships between exports, imports, and investments and economic growth. Collected data were obtained from the quarterly economic analysis of the Riau Islands Province of Indonesia for the period 2009-2016 or 8 years. It showed that in part, exports had little or no impact on economic growth, while imports had a major negative effect on economic growth, while spending had a significant positive effect. At the same time, smoking prevalence rates, the percentage of college graduates, and the percentage of urban residents all impacted the economic growth of the Riau Islands province of Indonesia. Many studies have stated in current literature that foreign trade exports have had a positive effect on economic development, e.g. Bakari, & Krit, 2017; Dukuly, & Huang, 2020; Dukuly, & Huang, 2020; Okyere, & Jilu (2020).

On the other hand, few studies have recorded that exports have had an insignificant negative impact on economic growth in Karticasari, (2017) in addition to this research.

1.4 METHODOLOGY:

Analysis of this research using the annual time series results from 1986 to 2018 in Bahrain. The data were collected from the World Bank and the International Monetary Fund (IMF). As noted by Pesaran et al., (2001) and Narayan (2005), the sample size for time series is agreed by 30 to 80 data sets. The following equation is the approximate equation that will be used for this analysis.:

$$Y_t = \alpha_0 + \beta_1 EXP_t + \beta_2 IMP_t + \beta_3 K_t + \varepsilon_t \quad (1)$$

Where Y is the economic growth measured by the real gross domestic product (GDP), EXP is export, IMP is import, K refer to capital and INF is inflation.

The test that will be used in this study are unit root test, Co-integration analysis and granger causality. The unit root test will be conducted to see the intensity of all variables at level and first differences by using Augmented Dickey Fuller (ADF) (Sahlan, 2010; Le & Vinh, 2011). The hypothesis for this test is:

$$H_0: \delta$$

$$= 0 \text{ (unit root test exist or not stationary)}$$

$$H_1: \delta$$

$$\neq 0 \text{ (unit root test does not exist or stationary)}$$

Therefore, Augmented Dickey Fuller (ADF) test is used in this test and methods as follows:

$$\Delta Y_t = \beta_0 + \sum_{r=1}^c \theta_r Y_{t-1} + \sum_{s=1}^d \phi_s Y_{t-1} + \mu_t \quad (2)$$

Without constant and linear trend:

$$\Delta Y_t$$

$$= \sigma Y_{t-1} + \varepsilon_t \quad (3)$$

Only constant:

$$\begin{aligned} \Delta Y_t &= \beta + \sigma Y_{t-1} \\ &+ \varepsilon_t \end{aligned} \tag{4}$$

Constant and linear trend:

$$\begin{aligned} \Delta Y_t &= \beta + \gamma T + \sigma Y_{t-1} \\ &+ \varepsilon_t \end{aligned} \tag{5}$$

Where, Y consider as dependent and independent variables, Δ is the first differentiation, μ_t and ε_t refer to random error. The Johansen co-integration is applied to see the long-run relationship between all variables. The equation for Johansen co-integration test as follows:

$$\begin{aligned} Y_t &= \alpha_1 + \alpha_2 X_t \\ &+ \varepsilon_t \end{aligned} \tag{6}$$

Then, the residual equation is:

$$\begin{aligned} \hat{\varepsilon}_t &= Y_t - \hat{\alpha}_1 \\ &- \hat{\alpha}_2 X_t \end{aligned} \tag{7}$$

Johansen co-integration test based on analysis of Vector Autoregressive (VAR) and the following analysis of VAR is

$$\begin{aligned} Y_t &= \beta_1 Y_{t-1} + \dots + \gamma_j Y_{t-j} + \alpha x_1 \\ &+ \mu_t \end{aligned} \tag{8}$$

VAR equation can also be written as follows:

$$\begin{aligned} \Delta Y_t &= \prod Y_{t-1} + \sum_{p=1}^{j-1} \prod \Delta Y_{t-1} + \alpha x_t \\ &+ \mu_t \end{aligned} \tag{9}$$

Next, the granger causality is conducted to investigate the causal relationship between two variables. The test is based on the equation below:

$$\begin{aligned} Y_i &= \beta_0 + \sum_{r=1}^a \beta_r Y_{t-r} + \sum_{s=1}^b \alpha_s X_{t-1} \\ &+ \varepsilon_t \end{aligned} \tag{10}$$

$$\begin{aligned} X_i &= \gamma_0 + \sum_{r=1}^a \gamma_r X_{t-r} + \sum_{s=1}^b \vartheta_s Y_{t-1} \\ &+ \sigma_t \end{aligned} \tag{11}$$

Where Y_i and X_i are the tested variables, ε_t and σ_t are the error terms, t refers to time period, r and s are numbers of lags. Thus, the null hypothesis is $\alpha_s = \vartheta_s = 0$ for all i. Then, the alternative hypothesis is $\alpha_s \neq 0$ and $\vartheta_s \neq 0$ for at least some if the coefficient α_s is significant but ϑ_s is not significant, it means that X is granger causal to Y. Meanwhile, if the both coefficients are significant means both variables have causality.

1.5 FINDINGS:

The results for the analysis are discussed in the article. First, we used the Augmented Dickey Fuller test to see if the model was stationary (e.g., to look at the fit of the model) with the results. When doing so, we then use Johansen co-integration test to make sure that all variables in the system are connected with each other in the long-run. Finally, the Granger causality was conducted to inquire to which the causal interaction is hypothesized to be contingent or separate.

Variables	Intercept		Intercept and Trend	
	Level	1 st difference	Level	1 st differences
K	-1.8348 (0.3574)	-9.0803* (0.0000)	-2.4886 (0.3310)	-9.0309* (0.0000)
EXP	-2.8987*** (0.0566)	-5.1218* (0.0002)	-2.8043 (0.2061)	-5.0725* (0.0015)
IMP	-1.9194 (0.3196)	-4.7987* (0.0005)	-1.8294 (0.6667)	-4.7792* (0.0030)
Y	-6.4049* (0.0000)	-7.0574* (0.0000)	-6.2758* (0.0001)	-6.9251* (0.0000)

Table 1. Unit Root Test (ADF)

Note: *, **, *** indicates significant level at 1%, 5%, 10%, respectively.

Table 1 reveals that all variables (capital, export, import, and economic growth) are significant and stationary in intercept and first differences. The null hypothesis is rejected and the alternative hypothesis is accepted. Thus, can proceed to Johansen co-integration.

Table 2 demonstrate the result of Johannsen co-integration test based on VAR. It shows that two co-integrating equations are found at 5% of level by using Max-Eigen test and trace test. Co-integration means to show how the relationship between various variable (capital, export and import) and economic growth in long-run. However, co-integration test not identify the direction of relationship among variables. Therefore, granger causality is conducted to determine the causality of all variables.

Table 2. Co-integration Test

Rank	Lag intervals 1 to 2			
	Max-Eigen Statistics	Critical Value (Eigen) at 5%	Trace Statistics	Critical Value (Trace) at 5%
r=0*	30.8920	27.5843	65.4964	47.5861
r ≤ 1*	20.6306	21.1316	34.6044	29.7971
r ≤ 2	10.6998	14.2646	13.9737	15.4947
r ≤ 3	3.2739	3.8415	3.2739	3.8415

L.R refers to two co-integrating equations at significant level 5%.

Table 3. Granger Causality

(Null hypothesis)	Obs	F-statistic	Prob.
-EXP does not Granger cause Y	31	0.0297	0.9708
-Y does not Granger cause EXP		0.2345	0.7926
-K does not Granger cause Y	31	0.8080	0.4566
-K does not Granger cause Y		0.6432	0.5338
-IMP does not Granger cause Y	31	1.2871	0.2931
-Y does not Granger cause IMP		1.2172	0.3124

Table 3 shows the pairwise granger causality between export, import, capital and economic growth. The results indicate there is no causality for export, import and capital with economic growth.

1.6 CONCLUSION:

The study aims, via data from 1986 until 2018, to discuss the link between exports, imports and economic development for the emerging power of Bahrain. World Bank and International Monetary Fund data have been collected (IMF). Co-integration and causality of Johansen and Granger for the analysis of data is used in our method. This research illustrates imports, exports and economic growth. The findings suggest that the driver of exports is economic growth. The highlights suggested finally that the intercepts and original inequalities were significant and set in all the variables (capital, exportation, imports and economic growth). Our analyses have demonstrated long-term results from the co-integration test based on VAR in Johansen. The Max-Eigen test and trace test demonstrate two jointly implemented equations at 5% of the point. The co-integration means demonstrating how the relationship is tied to long-term economic growth between the various variables (capital, exporting and importing). However, the co-integration measure does not determine how the relationship between variables is driven. Therefore, the causality of both causes is determined by granger causality, and by the effects of the globalization, the external trade environment varies day by day. Consequently, economists, analysts and decision-makers must continuously re-examine the relation between exports, imported goods and economic growth. In conclusion, however, this study shows that production and export promotion strategies should be consistently pursued, concentrating on sustainable and inclusive growth.

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