

## **The Causal Relationship between Exports and Economic Growth in Jordan**

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### **Abstract**

*This study aims to examine the causal relationship between economic growth and exports in Jordan using the Granger methodology in order to determine the direction of the relationship between the two variables during the period 2000-2012. The study found that there is a causal relationship going from the economic growth to Export, and not vice versa. Based on the outcome of causality tests, the changes in the economic growth help explain the changes that occur in the Export.*

**Key Words:** exports, economic growth, the causal relationship, GDP, Granger, Jordan.

### **1. Introduction**

Economic growth is one of the most important determinants of economic welfare. The relationship between exports and economic growth is a frequent topic of discussion, when economists try to explain the different levels of economic growth between countries. Exports of goods and services represent one of the most important sources of foreign exchange income that ease the pressure on the balance of payments and create employment opportunities.

The argument concerning the role of exports as one of the main deterministic factors of economic growth is not new. It goes back to the classical economic theories by Adam Smith and David Ricardo, who argued that international trade plays an important role in economic growth. The neoclassical approach emphasizes the importance of competitive advantages in international trade. Each country maximizes its welfare through the activities which are the most efficient regarding resource and production factors scarcity in of economy. In this case, the benefits of the trade are static and trade liberation and openness can't lead to increase in long run growth rate, but it influences income level.

Over the past years, an increasingly larger role granted to exports in rising domestic demand, the growth of exports increases technological innovation covers the domestic and foreign demand and also increases the inflows of foreign exchange, which could lead to greater capacity utilization and economic growth.

The study is carried out to examine the relationship between exports and growth in a small developing Economy, Jordan. To achieve this, the study is structured into 3 sections: section (1) deals with the literature review; section (2) discusses methodology and data; while analysis of results, conclusion and recommendations are presented in section (3).

### **2. Previous studie**

Several studies address the importance of exports on economic growth. The findings of these studies indicate that exports have a statistically significant positive impact on economic growth. We can summarize some of these studies that have addressed the issue of causality between exports and economic growth as follows:

Kalaitzi (2013) examined the relationship between exports and economic growth in the United Arab Emirates over the period 1980-2010. The study applied the two-step Engle-Granger cointegration test and the Johansen cointegration technique in order to confirm or not the existence of a long-run relationship between the variables. Moreover, this study applied a Vector Autoregression Model in order to construct the Impulse Response Function and the Granger causality test to examine the causality between exports and economic growth. The findings of this study confirmed the existence of a long-run relationship between manufactured exports, primary exports and economic growth. In addition, the Granger causality test showed unidirectional causality between manufactured exports and economic growth. Thus, further increase in the degree of export diversification from oil could accelerate economic growth in UAE.

Ahdi, and others (2013) investigated the dynamic causal link between exports and economic growth using both linear and nonlinear Granger causality tests. The study used annual South African data on real exports and real gross domestic product from 1911-2011. The linear Granger causality result showed no evidence of significant causality between exports and GDP. Accordingly the study turned to the nonlinear methods to evaluate Granger causality between exports and GDP. It used both Hiemstra and Jones (1994) and Diks and Panchenko (2005) nonlinear Granger causality tests. For the Hiemstra and Jones (1994) test, it found a unidirectional causality from GDP to exports. However, using the Diks and Panchenko (2005) test, the study found evidence of significant bi-directional causality.

Kim and Lin (2009) examined the impact of export composition on economic growth, indicated that not all exports contribute equally to economic growth. In particular, many developing countries depend on exports of primary products, which are subject to excessive price fluctuations. In most cases, this category of exports had negligible impact on economic growth, while manufactured exports had a positive and significant effect on economic growth.

Abu al-Foul (2006) investigated the export-led growth hypothesis in Jordan over the period 1976–1997. The empirical results indicated a unidirectional causation from exports to output. These findings supported the export-oriented growth strategy pursued by Jordan. In promoting faster economic growth, such government institutions as Free Zones Corporations, Jordan Investment Board and Jordan Export Development Corporation should continue pursuing their mission in attracting foreign investments and boosting exports.

Abou-Stait (2005) examined the export-led growth (ELG) hypothesis for Egypt, using historical data from 1977 to 2003. The paper employed a variety of analytical tools, including cointegration analysis, Granger Causality tests, and unit root tests, coupled with vector auto regression (VAR) and impulse response function (IRF) analyses. The paper set three hypotheses for testing the ELG hypothesis for Egypt, (i) whether GDP, exports and imports are cointegrated, (ii) whether exports Granger cause growth, (iii) whether exports Granger cause investment. The paper failed to reject the first two hypotheses, while it failed to accept that exports Granger causes investment.

Awokuse (2003) re-examined the export-led growth (ELG) hypothesis for Canada by testing for Granger causality from exports to national output growth using vector error correction models (VECM) and the augmented vector autoregressive (VAR) methodology developed in Toda and Yamamoto (1995). The empirical results suggested that a long-run steady state exists among the model's six variables and that Granger causal flow is unidirectional from real exports to real GDP.

Crespo, Cuaresma and Worz (2003) argued that exports of manufacturing products are less sensitive to the cyclical changes in the international market compare to exports of raw and intermediate goods. Hence, countries that depend on the exportation of manufactured products were less affected by the cyclical changes in the world economy. Indeed, a major problem facing most developing countries was the heavy dependency on the export of raw materials. Changes in the world economy affected its demand for primary products, which then affected the economic performance of less developed countries.

Burridge and Sinclair (2002) investigated the causal links between trade, economic growth and inward foreign direct investment (FDI) in China at the aggregate level. The integration and cointegration properties of quarterly data analyzed. Long-run relationships between growth, exports, imports and FDI are identified in a cointegration frame work, the study found bidirectional causality between economic growth, FDI and exports.

Economic development, exports and FDI appeared to be mutually reinforcing under the open-door policy.

Shan and Sun (1998) tested the export-led growth hypothesis using quarterly time series data for Australia by constructing a vector autoregression (VAR) model. The Granger no-causality procedure developed by Toda and Yamamoto was applied to test the causality link between tested real export growth and real manufacturing output growth. Two principle results emerged. First, no evidence was found for the export-led growth hypothesis in Australia; second, when applying a longer lag structure, the study found evidence of a one-way Granger causality running from manufacturing growth to exports growth.

Shan and Tian (1998) tested export-led growth hypothesis using monthly time series data for Shanghai and the Granger no-causality procedure developed by Toda and Yamamoto (1995) in a vector autoregression (VAR) model. This paper built on the existing literature in three distinct ways. This paper was the first study of the export-led growth hypothesis which employs a regional dataset (Shanghai). Second, the paper followed Riezman et al. (1996) in controlling for the growth of imports to avoid a spurious causality result; and finally, the use of the methodology by Toda and Yamamoto was expected to improve the standard F-statistics in the causality test process. The research found one-way Granger causality running from GDP to exports Sharma and Dhakal (1994) investigated the causal relationship between exports and output growth in 30 developing countries over the period from 1960 to 1988 in a multivariate framework. The study indentated a feedback causal relationship between exports and output growth in five countries, export growth caused output growth in another six countries; output growth caused export growth in a further eight countries; and no causal relationship was observed between export growth and output growth in the remaining 11 countries. It also found that in 15 countries the foreign exchange caused export growth, and that in 12 countries world output caused export growth. Ghartey (1993) tested Causal relationships between exports and economic growth for Taiwan, US and Japan. The method of Hsiao (1979) was employed in finding the direction of causation. Wald and likelihood ratio tests confirmed that exports growth in the US, and a feedback causal relationship existed in Japan.

Khan and NAJAM (1993) examined the relationship between exports and economic growth for a variety of countries. they examined the relationship between these two variables in a simultaneous equation framework and used 3SLS technique. They found Not only a strong positive association between exports performance and economic growth but more than 90 per cent of the contribution of exports to economic growth was indirect in nature.

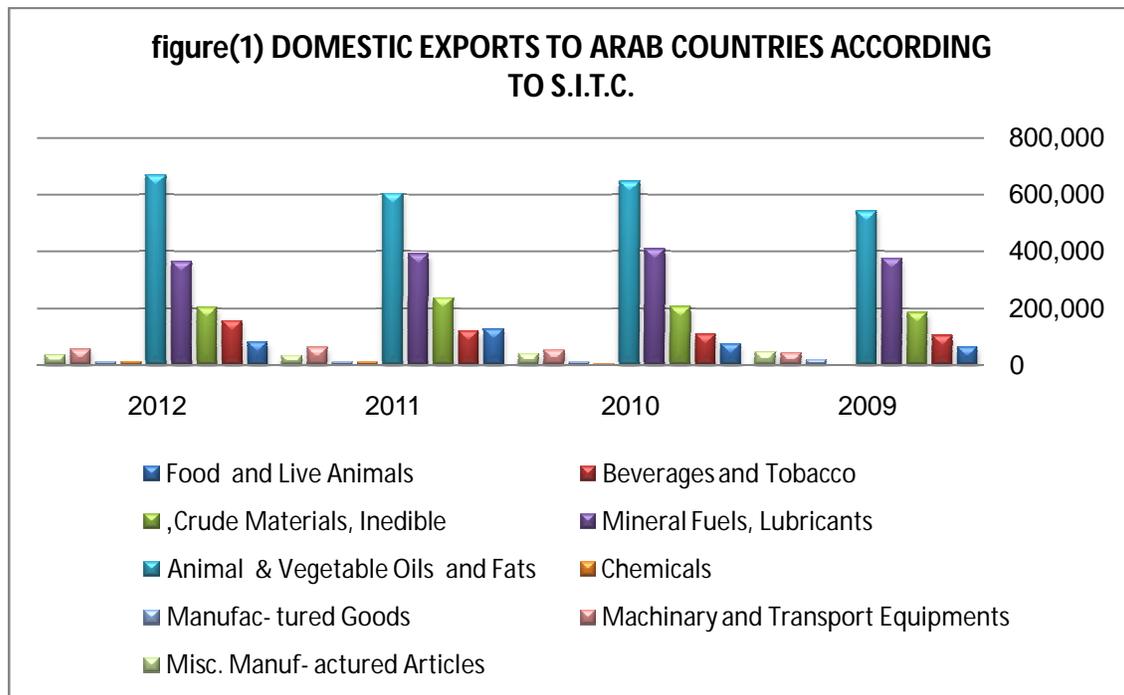
Fosu (1990) examined the extent to which export growth affects the rate of economic growth in less developed African countries as a subgroup, GDP growth of 28 less developed African countries was analyzed using a pooled cross-sectional time-series estimation of 1960–1970 and 1970–1980 as an average annual growth rates. Based upon the usual augmented production function that includes labor, capital formation, and exports, export growth was observed to exert a positive and significant impact on economic growth. While this export effect is somewhat smaller than that for non-African less developed countries, the difference was not statistically significant.

Chow (1987) investigated the causal relationship between export growth and industrial development in eight Newly Industrializing Countries (NICs). Results of causality test showed that for most of the NICs, there is a strong causality between the growth of exports and industrial development. These findings supported the export-led growth strategy in that expansion in exports not only promote the growth of national income but also lead to structural transformation of the developing countries.

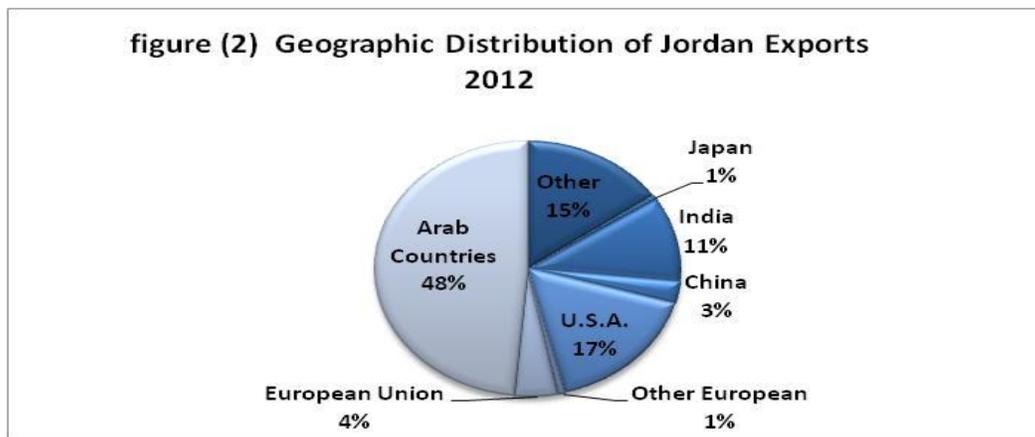
### **3. Exports in Jordan**

Jordan has witnessed a drastic jump in exports recently due to its continuous effort in trade liberalization and its on-going engagement in free trade practices. The volume of exports in 2012 reached 4749 million JD after having been 1080 million JD in 2000.

The extraordinary performance of exports in recent years has been primarily due to the partnership and free trade agreements signed with various countries. The geographic distribution of domestic exports reveals that Arab countries remain the major destination for Jordanian exports More than half of all Jordanian exports to Arab countries go to Iraq and Saudi Arabia. The Medical, pharmaceutical and vegetable products are the main exported items to the Arab countries as show in Figure 1.



On the other hand, exports to the US were ranked the highest growing from 44 million JD in 2000 to 788 million JD in 2012 .because In 2009, Jordan and the United States secured their business relation by a new trade agreement which was fully implemented on January 1, 2010; it allows products to enter USA market duty-free if manufactured in Jordan .In addition, India is considered one of the major importers of Jordanian crude phosphate, potash and fertilizers. Exports to India have increased recently from 172 million JD in 2000 to 510 million JD in 2012. shaw figure (2).



#### 4. Data and Methodology

##### 4.1Data

The data used for this study are basically time series data for Jordan covering the period 2000- 2012. The two economic variables included in this study are the Exports of goods and services and the change in Real Gross Domestic Product at Market Prices (GDP) is an indicator to measure economic growth. Data were sourced from The Central Bank of Jordan and The Department of Statistics.

##### 4.2Method

In this paper, the statistical properties of both economic growth and Export were investigated, using the unit root test. Causality among variables, using Granger causality test, was utilized to determine the directional causality between variables. Then, a long-term relationship was estimated, using Johansen cointegration test.

**4.3 The Unit Root Test**

Macroeconomic time series data are generally characterized by a stochastic trend which can be removed by differencing. Some variables are stationary on levels, others become stationary after one differentiation, and some may become stationary by more than one differentiation. To test for the stationary of the variables, the Augmented Dickey-Fuller (ADF) technique was utilized. The ADF equation was performed for the case when it includes intercept only in addition to the case when it includes both intercept and time trend.

The results indicate that both variables, the EX and the GR, are not stationary on their levels. In other words, they have a unit root. Then, we repeated the unit root test for the first difference for both variables. The results point out that the EX and GR became stationary after the first difference .Since the computed values (in absolute value) are greater than the critical values (in absolute value) at a 1% level of significance, the null hypothesis of the unit root or nonstationary variable can be rejected. (Shaw table (1))

**Table 1: Augmented Dickey-Fuller Test**

Variable	Critical values 1%	Critical values %5	Level ADF	First difference ADF	Second difference ADF
GR	-4.2	-3.2	-2.9	-6.5	-9.5
EX	-4.2	-3.2	-0.15	-4.5	-4.1

**4.4 Granger Causality Test**

The Granger causality test was developed by Granger and according to him, a variable (in this case export) is said to Granger cause another variable (GR) if past and present values of export help to predict GR.

A simple Granger causality test involving two variables, exports and GR is written as:

$$GR_t = \sum_{i=2}^n aiEX_{t-i} + \sum_{j=1}^n B_jGR_{t-j} + U_{1t}$$

$$EX_t = \sum_{i=2}^n \eta_iEX_{t-i} + \sum_{j=1}^n \delta_jGR_{t-j} + U_{2t}$$

Testing null hypothesis: H0:  $\alpha = 0$ : j=1..... p, this hypothesis mean that export does not Granger cause economic growth against the alternative hypothesis H1:  $\alpha \neq 0$ : j=1..... p, this hypothesis mean that export does Granger cause GR.

Similarly, testing H0:  $\eta = 0$ : j=1..... p, this hypothesis means that economic growth does not Granger cause exports against H1:  $\eta \neq 0$ : j=1..... p, this hypothesis means that GR does Granger cause EX. If none of the null hypotheses is rejected, it means we accept the claims that export does not Granger cause GR and economic growth also does not Granger cause exports. This indicates that the two variables are independent of each other. If the first hypothesis is rejected, it shows that exports Granger causes economic growth. Rejection of the second hypothesis means that the causality runs from GR to exports. If all hypotheses are rejected, there is bi-directional causality between exports and economic growth.

The below table show that there is a causal relationship between Export and growth rate but in one direction so that changes in the economic growth have effects on Export and not vice versa, where tests showed causal there was no effect of changes in Export on economic growth.

**Table (2) Granger Causality Test**

Prob.	F-Statistic	Obs	Null Hypothesis:
0.7797	0.08308	12	EX does not Granger Cause GR
0.1190	2.96889		GR does not Granger Cause EX

This means that an increase or a decrease in economic growth can affect and causes the Export at 15% significant level. On the other hand, Export does not seem to Granger Cause economic growth. This suggests that information about Export in past periods cannot explain the behavior of economic growth in the present time.

#### 4.5 Descriptive analysis of the variables of the study

Table (3) shows descriptive statistics for the variables of the study, the table shows that the variable GR does not far from the normal distribution using the test (Jarque-Bera), and to accept the null hypothesis that the data follow a normal distribution. As shown us from the results of the sprain values and through review of mean and median values, we find its close, so this indicating the absence of sharp fluctuations in the fluctuation of the economic growth data. In the other hand the Export is not normal distribution using the test Jarque-Bera .

**Table (3): Descriptive Analysis**

BD	GR	
2956.734	0.118829	Mean
2929.310	0.103168	Median
4805.873	0.285375	Maximum
1080.817	0.060864	Minimum
1326.113	0.063658	Std. Dev.
0.060692	1.503601	Skewness
1.610606	4.619877	Kurtosis
1.053623	6.319771	Jarque-Bera
0.590485	0.042431	Probability
13	13	Observations

#### 5. Conclusion

This paper has examined the role of export in the economic growth process in Jordan using causality tests for data over the period 2000 to 2012.

Granger causality was applied to test the causal relationship between Export and economic growth. The results show that there is evidence of uni-directional causality between export and economic growth in Jordan and the direction of causality runs strictly from economic growth to exports. In conclusion, this study provided support for growth-led export in case of Jordan. Thus effort should be direct towards policies that will enhance economic growth such as import substitution industrialization, in order to impact more on exports.

**References**

- Abou-Stait, F. (2005), Are exports the engine of Economic Growth? An application of Cointegration and Causality Analysis for Egypt 1997-2003, African Development Bank, *Economic Research working paper series*, No. 76.
- Abu Al- Foul, B. (2004), Testing the export-led growth hypothesis: Evidence from Jordan, *Applied Economics Letters*, No. 11, pp. 393-396.
- Ahdi N. Ajmi & Goodness C. Aye & Mehmet Balcilar & Rangan Gupta,( 2013). Causality between Exports and Economic Growth in South Africa: Evidence from Linear and Nonlinear Tests, Working Papers 201339, *University of Pretoria, Department of Economics*.
- Alimi, S. R. and Muse, B. O. (2013) “Export - Led Growth or Growth – Driven Exports? Evidence from Nigeria”. *British Journal of Economics, Management and Trade*. Vol. 3, no. 2, pp. 89-100.
- Awokuse TO. (2003).Is the Export-led growth hypothesis valid for Canada? *Canadian Journal of Economics*.;36(1):126-36.
- Chow, P.C.Y. (1987), “Causality between export growth and industrial development: Empirical evidence from the NICs, *Journal of Development Economics*, vol. 26
- Crespo-Cuaresma, J. and J. Wörz (2003) On Export Composition and Growth, *University of Vienna, Department of Economics*, Vienna, Austria; and Vienna Institute for International Economic Studies (WIIW), Vienna, Austria; available at :[http://www.wiwi.ac.at/pdf/crespo\\_woerz\\_etsg\\_2003.pdf](http://www.wiwi.ac.at/pdf/crespo_woerz_etsg_2003.pdf) .Liu, X., P. Burridge, and P.J.N. Sinclair. 2002. Relationships Between Economic Growth ,Foreign Direct Investment and Trade: Evidence From China. *Applied Economics* 34
- Dalkir, M. (2004) ,A New Approach to Causality in The Frequency Domain, *Economic Bulletin*, Vol. 3.
- Engle, R.E. and W.J. Granger (1987), Cointegration and Error-Correction: Representation, Estimation, and Testing”, *Econometrica*, Vol. 55, No .,pp 251 – 76.
- Fosu A. (1990).Exports and Economic Growth: The African Case. *World Development* vol. 18, 31-35.
- Ghartey. E. E. (1993). Casual Relationship between Exports and Economic Growth: Some Empirical Evidence in Taiwan, Japan and the US, *Applied-Economics*. (9).
- Kalaitzi .A.(2013). *Exports and Economic Growth in the United Arab Emirates*. Submitted to: RIBM Doctoral Symposium. Manchester Metropolitan University Business School
- Khan, Ashfaque H and Najam Saqib (1993), Exports and Economic Growth: The Pakistan Experience, *International Economic Journal*, 7(3), 53-64
- Kim, D. H. and Lin, S. C. (2009), Trade and Growth at Different Stages of Economic Development, *Journal of Development Studies*, Vol. 45, No. 8, pp. 1211–1224
- Obalade.L and Arora.N.(2012). A DESCRIPTIVE OVERVIEW OF THE IMPORT and EXPORT ENVIRONMENT IN JORDAN. *Academic Research International*. Vol. 3, No. 1, July
- Shan, J. and F. Sun (1998), “On the export – led growth hypothesis: the econometric evidence from China, *Applied Economics*, 30, 1055-65.
- Sharma, S. C. & Dhakal, D. (1994). Causal Analysis between Exports and Economic Growth in Developing Countries .*Applied Economics*, 26