

EXPORT-LED GROWTH: TIME SERIES APPROACH ANALYSIS “CASE OF JORDAN, KUWAIT, AND EGYPT “

Hussam-Eldin Daoud

Assistant Professor , Economics, Business & Finance Department,
Economic and Business Administration College, Mutah University, Jordan

Mazen Basha

Assistant professor / Head of Economics Department, Faculty of Economics
and Administrative Sciences, Zarqa University, Jordan

Abstract

This study examines the export-led growth (ELG) for three Arab countries (Jordan, Kuwait, and Egypt); through cointegration and Granger causality tests. During 1976 to 2013; strong support for a long-run relationship between exports and real output for these countries. There is bi-directional causality between GDP and export for Jordan and unidirectional causality from export to GDP for Kuwait and Egypt. The results suggest that Jordan, Kuwait, and Egypt can expand its limited domestic market by exporting more in order to increase economic growth, and export in Jordan can be promoted by increasing economic growth.

Keywords: Export-led Growth, Economic Growth, Cointegration, Granger Causality Test

Introduction

It is widely accepted among economists that export is one of the main determinants of growth. It holds that the overall growth of countries can be generated not only by increasing the amounts of labor and capital within the economy, but also by expanding exports. According to its advocates, exports can perform as an “engine of growth”.

Many studies have sought to test empirically the hypothesis that export promotion strategies accelerate economic growth, what has become known as the export-led growth (ELG) hypothesis. Early work on the ELG hypothesis generally affirmed its validity because the export variable and the output variable are highly correlated. Recent empirical estimations have tended to focus attention on the direction of causality between exports and economic growth using Granger causality test. Advocates of the ELG

hypothesis point to several beneficial aspects of promoting exports on overall economic activity.

This study investigates the relationship between economic growth presented by (GDP) and exports based on the experiences of three countries; Jordan, Kuwait, and Egypt. The objective is to assess whether the data provide support for the ELG hypothesis.

A few studies have made this distinction in their attempt to identify a possible causal relationship between exports and economic growth. In addition, causality is tested for by applying cointegration tests and error correction models for all the countries in the sample.

The study proceeds as follows: Section II contains a literature reviews. Section III contains a description of data and methodology. Section IV empirical results and conclusions remarks.

Literature Reviews

Exports play an important role in achieving economic growth. Many studies have used models that use exports as a main factor to have an efficient role on economic growth. Kindleberger (1961) had presented a model that assumes expansion in international trade stimulates economic growth. He looked at export sector as a leader sector; an increase in foreign demand on local goods, in case of full employment, causes an increase in exports via reducing cost and investing more and re inversion in production process. But, in the case of unemployment, an increase in foreign demand causes increasing export via redirecting production resources from sector with less productivity to sectors with high productivity. This in turn causes increasing benefits from trade and causes an increase in income, saving, and investment.

In theory, the expansion of exports can spur economic growth through several channels (Eduardo et al., 2009):

- Trade openness shifts goods to sectors in which the economy has a comparative advantage, increasing efficiency.
- In developing countries, these sectors are often intensive in unskilled labor; their expansion will create job opportunities and improve equality.
- Trade liberalization opens the economy to greater inflows of FDI and technology transfers.

If we look from another angle, exports play an important role in shifting the capital formation up. Capital formation is affected by local saving and by the international trade activities (Daoud, 2001). Because of the imbalances of production structure in developing countries, these countries cannot cover or provide the market by its needs of goods especially capital goods (Daoud, 2001). Capital formation in these countries depends on the

ability to import; where that ability is determined mainly by the revenues obtained from exports.

Moreover, exports allow greater competition with foreign products. This high competition forces some countries to specialize in some products. The benefit of specialization is improvement in quality of the products and to decrease costs, this goal is achieved by increasing worker's skills and by using all available advanced technology. Now, exports are playing a positive effect on growing the industry sector of the supply side. This is according to the external effect hypothesis related with production in the export sector. In addition, exports create an incentive to work and produce more throw the Demonstration Effect (Feder, 1982).

Empirically, Lamfalussy (2002) presented a model that depends on Kindleberger's model. The idea behind this model is that an increase in local income as a result of economic growth causes imports. Then, exports should increase in an appropriate amount to keep balance with the external sector. In this case, government avoids a policy that aims to cut local demand, which causes a reduction in employment level and economic growth level. Lamfalussy continues that countries should follow a stimulative policy to encourage local investment. Exports can play that role and increase investment and the economies production capacity. Therefore, these models insist on the role of exports to finance importing materials that are necessary to accelerate development. That is because an increase in exports increases investment and then economic growth. It should be notice that export revenues are the primary source for many developing countries to support the ability for importing durable and non-durable goods. In addition, exports are the straight way to defeat any imbalance in the balance of payments for any country.

The above result was confirmed by many empirical studies. Balassa (1978), studied 11 developing countries using an econometric model and found that an increase in exports by 1 % causes an increase in the growth of GDP by 0.04 %. Tyler (1981) explains when studying the economies of 55 developing countries that an increase of 1% in total exports would cause growth to raise by 0.057%. Moreover, Ram (1987) concluded that exports play a positive role on economic growth in developing countries but this positive role will decrease in the poor countries.

These results were not far from what found by Kwasifosu (1990) when he measured the effect of exports on economic growth for a sample of 28 African developing countries, compared with other non-African countries .The result of that study was that an increase of 1% in exports will result in an economic growth of 0.123% and 0.149% for the African countries and non-African countries, respectively.

Ricardo et al. (2015) study the Brazilian growth experience after trade liberalization by testing both the export-led growth (ELG) and the growth-led exports (GLE) hypotheses through econometric tests between exports and gross domestic output (GDP). Although the paper provides further evidence that after openness neither ELG nor GLE hypotheses can satisfactorily explain the Brazilian growth experience, when disaggregated data is adopted it is possible to identify some sectors such as intermediate goods, commodities, and manufactured products whose performance is strongly correlated with real GDP. These results suggest that a disaggregated approach enhances their understanding of the Brazilian growth experience after trade liberalization.

In that regard, it's worth mentioning one conclusion of the world Bank Report which was: if a developing country achieved a yearly economic growth of 6%, imports should grow at a yearly percent of 7 - 8 % , and that requires exports to grow at the same percent (Daoud, 2001).

However, the recent evidence from time series analysis fails to unequivocally support a robust exports-economic growth nexus. Jung and Marshal (1985), for instance, based on Granger causality tests, analysed the relationship between export growth and economic growth for 37 developing countries, and found evidence for export-led growth in only four countries.

From a review of the literature we find that the empirical evidence regarding the relationship between exports and economic growth is not robust, and although the results of the study suggest that exports have a positive effect on the overall rate of economic growth and could be considered an “engine of growth” as the ELGH advocates, their impact was quantitatively relatively small, in both the short and the long-run

The above studies clearly show that the results are inconclusive, therefore; this study examines the export-led growth (ELG) for three Arab countries (Jordan, Kuwait, and Egypt) during 1976 to 2013; through cointegration and granger causality tests.

Data and Methodology

Data and definitions of variables

The annual data were drawn from the IMF's International Financial Statistics. The exports and GDP of the three countries were converted into real terms using the respective consumer price index. The variables used in this study and their definitions are the following: LGDP is the natural logarithm of real GDP; LX is the natural logarithm of real total exports. The sample used includes the following countries for the specified periods: Jordan (1976-2013), Kuwait (1976-2013), and Egypt (1976-2013).

Methodology

The objective of this study is to investigate the relationship between real GDP and exports. For the examination of the long run relationship among two variables, we used unit root and cointegration tests. For examining causality, we used the granger causality test.

The Unit Root Test of Stationary

The unit root test is important because it allows to examine whether a time series is stationary or not. Since the Augmented Dickey Fuller (ADF) test is used in this study, which requires that the error correction model to be individually independent and homogeneously distributed, the purpose of the unit root test is to determine whether the series is consistent with an I (1) process with a stochastic trend, or if it is consistent with an I (0) process that is stationary with deterministic trend

Table (1) provides the results of the Augmented Dickey-Fuller "ADF". The results indicate that for all the countries, all two variables, LGDP, and LX have unit roots in their levels. However, all variables for all the countries are stationary in their first difference I (1).

Table (1): Unit root test

Country	Variables	ADF (level)	ADF (1.st difference)*
JORDAN	GDP	-1.925480	-4.509799
	EXPORT	-2.796903	-4.981373
KUWAIT	GDP	-2.465839	-5.126083
	EXPORT	-2.635899	-5.721452
EGYPT	GDP	-1.512908	-5.584386
	EXPORT	-2.066382	-4.972391

Cointegration Test

The second step is to test for cointegration among the variables of each country applying Engle granger test and the Johansen maximum likelihood cointegration tests.

From Table 2 we can be seen that the variables are cointegrated in the cases of Jordan, Kuwait, and Egypt. Once cointegration has been identified for a country the ECM is applied in order to detect possible causal relationships. Applying the preceding steps a researcher for the following results.

Table (2):Unit root for residual		
Country	Residual	ADF TEST
JORDAN	$\Delta(U)$	-2.9958782*
KUWAIT	$\Delta(U)$	-2.9689295*
EGYPT	$\Delta(U)$	-3.2092865*

* significant at 5% critical value

It is clear from the results that the previous τ^* calculated for the three countries more than the critical value at the level 5% ,10% therefore reject the null-hypotheses, and thus the residuals series U_t will be stationary and each of the two series GDP, EXPORT are characterized by the cointegration.

There is a more comprehensive and complex test, which is Johansen approach, this test is used in the case of multiple simultaneously equation models of the formula of VAR.

Table(3): Johansen Cointegration Test

COUNTRY	Hypothesized No. of CE(s)	Likelihood ratio	Eigenvalue	0.05 Critical Value
JORDAN	None	21.44162	0.305044	20.04
	At most 1	7.233959	0.089497	6.65
KUWAIT	None	16.06816	0.374676	15.41
	At most 1	4.331034	0.159065	3.76
EGYPT	None	21.81423	0.388490	15.41
	At most 1	9.518632	0.316648	3.76

From the above we reject the null hypothesis of no cointegration between GDP, exports at a 5% significant level for Jordan, Egypt, and Kuwait.

Error Correction Model and Granger Causality

The purpose of this section of the analysis is to test export Granger cause GDP in Jordan, Kuwait, and Egypt for the period 1976 to 2013.

The following error correction model includes a Granger's causality used in selected the direction of the relationship between economic variables and determine whether the causal relationship going from X to Y or from Y to X.

$$\Delta Y_t = a_1 + \sum_{j=1}^M \beta_{1j} \Delta Y_{t-j} + \sum_{j=1}^N \delta_{1j} \Delta X_{t-j} + \Theta E_{1t-j} + z_{1t}$$

$$\Delta X_t = a_2 + \sum_{j=1}^P \beta_{2j} \Delta X_{t-j} + \sum_{j=1}^Q \delta_{2j} \Delta Y_{t-j} + \Theta E_{2t-j} + z_{2t}$$

Whereas:

E_{1t-j}, E_{2t-j} : the correction error terms and has to be obtained from estimating the following two relationship between Y_t and X_t

$$Y_t = a_1 + b_1 X_t + E_{1t}$$

$$X_t = a_2 + b_2 Y_t + E_{2t}$$

Where M, N, P, Q , is the number of lags.

The steps to determine the optimal size of the lag are as follows:

1. We started assess the following simple relationship to obtain the residuals (U_t)

$$Y_t = a + \beta X_{t-1} + U_t$$

2. We estimate the formula No ,(1) .by letting .n = zero ,and then testing sizes (....,1,2,3,4) of the lag M with accounting final prediction error (FPE) for each formula and testing the formula that will be when FPE at the minimum and then M^* will be the optimum size of the lag .

3. We pegged M^* then we estimate the formula number (1) again by testing the sizes (1,2,3,4,...) of the lag N and accounting in every time ($FPE_{(m^*,n)}$), and then we choose the scale, which hit the final prediction error to a minimum and to be the optimum size of the lag N^* .

4. the better version for equation No. (1) Become, which is hit in it shadows the ERROR of predict the final level $FPE_{(m^*, n)}$

. If $FPE_{(m^)}$ more than $FPE_{(m^*,n)}$ could say that X_t cause Y_t

. If $FPE_{(m^)}$ less than $FPE_{(m^*,n)}$ could say that X_t not cause Y_t

5. We are repeating the same steps prior to the equation No. 2 get in the end $FPE_{(P^*,Q^*)}$ and $FPE_{(P^*)}$ we can compare whether Y_t cause X_t or not.

. If $FPE_{(P^)}$ more than $FPE_{(P^*,Q^*)}$ then Y_t cause X_t

. If $FPE_{(P^)}$ less than $FPE_{(P^*,Q^*)}$ then Y_t not cause X_t

The first null hypothesis is that exports (X) do not Granger cause GDP (Y); by applying the preceding steps for (FPE), researchers concluded:

First: the optimal size of the lag time on the set, as shown in Table (2)

Table (4)

Country	LAGS			
	M^*	N^*	P^*	Q^*
Jordan	2	1	2	3
Kuwait	1	5	3	1
Egypt	5	1	3	5

Secondly: the better version for the differential no. (1,2), it became apparent to us that :

1. For Jordan:

. $FPE_{(m^=2)}$ more than $FPE_{(m^*=2,n^*=1)}$. Therefore, we can be said that the growth in exports caused growth in the GDP.

. $FPE_{(P^=2)}$ more than $FPE_{(P^*=2,Q^*=3)}$.Therefore, we can be said that GDP growth caused the growth in exports.

2. For Kuwait:

. $FPE_{(m^=1)}$ more than $FPE_{(m^*=1,n^*=5)}$. Therefore, we can be said that the growth in exports caused growth in the GDP.

. $FPE_{(P^=3)}$ less than $FPE_{(P^*=3,Q^*=1)}$.Therefore, we can be said that GDP growth does not cause the growth in exports.

2. For Egypt:

. $FPE_{(m^=5)}$ more than $FPE_{(m^*=5,n^*=1)}$. Therefore, we can be said that the growth in exports caused growth in the GDP.

. $FPE_{(P^=3)}$ less than $FPE_{(P^*=3,Q^*=5)}$. Therefore, we can be said that GDP growth does not cause the growth in exports.

Previous results also reflected through the Granger causality test as in the table No (5)

Table(5) : Granger causality between exports and GDP (1977-2003)

COUNTRY	Null Hypothesis	Obs	F-Statistic	Probability
JORDAN	LOG(X) does not Granger Cause LOG(GDP)	25	0.39928	0.39928
	LOG(GDP) does not Granger Cause LOG(X)		2.05349	0.15448
KUWAIT	LOG(X) does not Granger Cause LOG(GDP)	25	2.42333	0.11419
	LOG(GDP) does not Granger Cause LOG(X)		2.88804	0.07909
EGYPT	LOG(X) does not Granger Cause LOG(GDP)	25	1.77286	0.19551
	LOG(GDP) does not Granger Cause LOG(X)		3.73985	0.04170

Case of Jordan: we cannot reject the hypothesis that export does not Granger cause GDP and we cannot reject the hypothesis that GDP does not granger cause EXPORT. Therefore, Granger causality runs two-way from GDP to X and the other way.

Case of Kuwait and Egypt we cannot reject the hypothesis that export does not Granger cause GDP. However, we do reject the hypothesis that GDP does not granger cause EXPORT. Therefore, Granger causality runs one-way from X to GDP and not the other way.

Result and Conclusion

1- RESULT

1- The results of unit roots test for level and first difference of ADF indicate that all variables chosen for the purpose of this paper are stationary of I (1), and have no deterministic trend.

2- One of the main objectives of this research is to test whether GDP, exports are cointegrated. The Johansen cointegration test for (Ln GDP), (Ln exports) fail to reject the null hypothesis of no cointegration between GDP, exports, at a 5% significant level

3- The result indicates that we cannot reject the null hypothesis that exports Granger causes GDP at the 5% level of significance for all three countries. The purpose of this study was to test the applicability of the export led growth (ELG) hypothesis for the case of Jordan Kuwait Egypt during 1976 to 2013.

There is a significant two-way relationship between GDP and export for Jordan and one-way relationship between GDP and export for Kuwait and Egypt from export to GDP.

Conclusion

This paper has examined the role of export in the economic growth process in Jordan Kuwait Egypt during 1976 to 2013 using causality tests within an error-correction framework. The empirical results indicate a cointegrating relationship. The results indicate that export is the leading variable in the cointegration between GDP and export.

The causal relationship is, furthermore, bi-directional for Jordan but unidirectional from export to GDP for Kuwait and Egypt from export to GDP. The results suggest that Jordan, Kuwait, and Egypt can expand its limited domestic market by exporting more in order to increase economic growth, and export in Jordan can be promoted by increasing economic growth. Thus, the result that export causes growth render support to the export-led growth hypothesis in accordance with a large body of previous research on both industrial and developing countries. Hence, the findings lend support to an export-oriented growth strategy in promoting an enhanced growth potential in the countries such as a liberal and market-oriented strategy avoiding the use of regulatory and restrictive policy measures. Policy makers in Jordan , Kuwait, and Egypt should continue to promote and implement policies aimed at expanding export in order to accelerate economic growth and development.

References:

- Ahmad, J. and Harnhirun, S. (1996), 'Cointegration and Causality between Exports and Economic Growth: Evidence from the ASEAN Countries', *Canadian Journal of Economics*, vol. 29, pp. 413- 416.
- Ahmad, J. and Kwan, A.C.C. (1991), 'Causality between Exports and Economic Growth, *Economics Letters*, vol. 37, pp. 243 - 248.
- Balassa, B. (1978), 'Exports and Economic Growth: Further Evidence', *Journal of Development Economics*, vol. 5, pp. 181 - 189.
- Bodman, P.M. (1996), 'On Export-Led Growth in Australia and Canada: Cointegration, Causality and Structural Stability', *Australian Economic Papers*, vol. 35, pp. 282 - 299.
- Chow, P. (1987), 'Causality between Export Growth and Industrial Development: Evidence from the NICs', *Journal of Development Economics*, vol. 26, pp. 55 - 63.
- Daoud, Hussam (2001), *The Role of Jordan's international trade on Manufacturing Sector*, Master Thesis, Egypt.
- Dickey, D.A. and Fuller, WA. (1981), 'Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root', *Econometrica*, vol. 49, pp. 1057 - 1072.
- Dollar, D. (1992) Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976-1985, *Economic Development*

and Cultural Change, 40, 523-44.

Eduardo Zepeda, Aldo Caliari, Otaviano Canuto, Marco James Kassaja, James Kiiru, Jorge Mattar, Terry McKinley, Luciana Mermet (2009), *Export-Led Growth as a Tool for Financing Development: Is the Financial Crisis Revealing its Limits?*, Carnegie Endowment for International Peace, Washington, june 29, 2009.

Engle, R. and Granger, C. (1987), 'Cointegrating and Error Correction: Representation, Estimation and Testing', *Econometrica*, vol. 55, pp. 251 - 277.

Esfahani, H.S. (1991), 'Exports, Imports and Economic Growth in Semi-Industrialized Countries', *Journal of Development Economics*, vol. 35, pp. 93 -116.

Feder, G. (1983) On exports and economic growth, *Journal of Development Economics*, 12, 59-73.

Giles, J. A. and Williams, C. L. (2000), Export-led growth: a survey of the empirical literature and some non-causality results. Part 1, *Journal of International Trade and Economic*

Glasure, Y. U. and Lee, A. (1999) The export-led growth hypothesis: the role of the exchange rate, money, and government expenditure from Korea, *Atlantic Economic Journal*, 27,260-72.

Granger, C. W. J. (1969) Investigating causal relations by econometric models: cross spectral methods, *Econometrica*, 37, P424-38.

Granger, C.(1988),'Some Recent Developments in a Concept of Causality', *Journal of Econometrics*, vol. 39, pp. 199 - 211.

Johansen, S.(1988),`Statistical Analysis of Cointegrating Vectors', *Journal of Economic Dynamics and Control*, vol. 12, pp. 231 - 254.

Jung, W.S. and Marshall, PJ. (1985), 'Exports, Growth and Causality in Developing Countries', *Journal of Development Economics*, vol. 18, pp. 1 - 12.

Khan, M.S. and Knight, M.D. (1988), 'Import Compression and Export Performance in Developing Countries', *Review of Economics and Statistics*, vol. 70, pp. 315 - 321.

Kormendi, R. C. and Meguire, P. G. (1985) Macroeconomic determinants of economic growth: cross-country evidence, *Journal of Monetary Economics*, 16, 141-63

Kugler, P. and Dridi, J. (1993) Growth and exports in LDCs a multivariate time series study, *International Review of Economics and Business*, 40, 759-67.

Lamfalussy (2002), International finance and open-economy macroeconomics

Marin, D. (1992) Is the export-led growth hypothesis valid for industrialized countries?, *The Review of Economics and Statistics*, 74, 678-88.

- Phillips, P. C. B. and Perron, P. (1988) Testing for a unit root in time series regression, *Econometrica*, 75, 335-46.
- Pomponio, X. Z. (1996) A causality analysis of growth and export performance, *Atlantic Economic Journal*, 24, 168-76.
- Ram, R. (1987), 'Exports and Economic Growth in Developing Countries: Evidence from Time Series and Cross-Section Data', *Economic Development and Cultural Change*, vol. 36, P51-72.
- Ricardo Azevedo Araujo and Joaílio Rodolpho Teixeira and Cristiane Soares (2015), Export-led growth vs growth-led exports: what matters for the Brazilian growth experience after trade liberalization?, *Review of Keynesian Economics*, vol 3 (1), pp.108-128.
- Riezman, R. G., Summers, P. M. and Whiteman, C. H. (1996) The engine of growth or its handmaiden? A time series assessment of export-led growth, *Empirical Economics*, 21, P 77-113.
- Serletis, A. (1992) Export growth and Canadian economic development, *Journal of Development Economics*, 38, P133-45.
- Sharma, S.C. and Dhakal, D. (1994), 'Causal Analysis between Exports and Economic Growth in Developing Countries', *Applied Economics*, vol. 26, pp. 1145 - 1157.
- Toda, H. Y. and Phillips, P. C. P. (1993) Vector autoregression and causality, *Econometrica*, 61, 1367-93.
- Toda, H.Y. and Yamamoto, T. (1995), 'Statistical Inference in Vector Autoregressions with Possibly Integrated Processes', *Journal of Econometrics*, vol. 66, pp. 225 - 250.
- Tyler, W.B. (1981), 'Growth and Export Expansion in Developing Countries', *Journal of Development Economics*, vol. 9, pp. 121 - 30.
- World Bank (1998) World Development Indicators, World Bank, Washington, DC.