

The Effect of the Jordanian Exports to Selected Countries on the Economic Growth in Jordan

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Abstract: The purpose of this paper is to examine the effect of Jordanian exports to a number of selected countries on the economic growth in Jordan. The selected countries are United States, China, European Union, Arab countries, India, and Japan. A time series analysis was performed to evaluate the effect of exports on the economic growth in Jordan. The data was collected from the Central Bank of Jordan and the Jordanian Department of Statistics for the period of 1992 to 2017. The unit root test was performed for each of the variables. Then a cointegration test was performed for each of the amounts of the Jordanian exports to the selected countries with both the Jordan Real GDP per capita. After completing these tests, a Granger Causality Test and the Dynamic Least Squares (DOLS) regression method were performed for the cointegrated variables. The time series analysis found that exports to Arab countries had a positive effect on the GDP per capita. Thus, the rest of the exports had no impact on the Real GDP per capita.

Keywords: *Dynamic Least Square Method; Jordanian Economic Growth; Jordanian Exports; Granger Causality.*



1. Introduction

Economic growth is the interest of macroeconomic policy makers, where nations strive to achieve a sustainable high level of economic growth. In the case of Jordan, the Jordanian economy had experienced high economic growth rates during the period extending from 2004 to 2008. It had averaged an 8 percent growth rate per year (Muhtaseb, 2015).

Nations pay special attention to international trade due to its effects on economic growth and the well being of a nation's economy. International trade increases the level of competition for domestic firms and forces them to increase productivity (Melitz, 2003). Finally, International trade prompts the increase in the market size which allows firms to experience economies of scale (Alesina, Spolaore, & Wacziarg, 2005) Finally, international trade aids in the diffusion of knowledge across borders (Grossman & Helpman, 2015). Empirical statistical studies in economic literature do support the claim that there is a positive relationship between trade openness and productivity growth (Edwards, 1998). Therefore an empirical test finds a significant positive relationship between Foreign direct investment (FDI) and foreign trade in the short run as well as in the long run. (NPG Samantha, 2018)

In order to benefit from the positive relationship between trade openness and productivity growth, Jordanian economy had transformed from a protected, government subsidized, and dependence on comparative advantage economy to a free market economy. The current Jordanian economy is based on the free market economy, increase productivity, and improving the competitiveness of the private sector. In order to integrate Jordan into the world economy; move away from the reliance on domestic markets; attract foreign investment; and create partnerships to have better access to foreign markets; the Jordanian governments had adapted an ambitious strategic program. This program is aimed at fixing the trade system, removing restrictions on the flow of financial capital and Foreign Direct Investment (FDI) since the year 1989 (Abu-Lila & Jdaitawi, 2015, p. 4).

The strategic program had included signing a number of trade agreements with some Arab countries in 1998, the European Union countries in 2000, and the United States in 2000. In addition, the Jordanian government had

created a number of Qualified Industrial Zones (QIZ) in different locations in Jordan, and joined the World Trade Organization (WTO) in 1999 in an attempt to increase exports (Abu-Lila & Jdaitawi, 2015, p. 4).

In 1994, the Jordanian trade balance was -1367401.3 JD, where the total exports were 335181.2 JD and imports 2362582.5 JD. The trade balance had reached -1912822.2 JD in the year 2000, where total exports 1346581.5JD and imports 3259403.7JD. The negative trade balance had continued to rise reaching -9220572.2JD, where total exports were 5333147.7JD and imports 14553719.9JD in the year 2017 (Department of Statistics of Jordan, 2017).

The purpose of this paper is to examine the effects of Jordanian exports to the selected countries on the economic growth in Jordan, where the economic growth is measured by the real GDP per capita, the top five Jordanian export destinations are USA, Saudi Arabia, India, Iraq and UAE. The table below -Table 1- shows the amount of Jordanian exports to the selected counties. We notice that the top five recipients of Jordanian exports are included in the selected countries.

**Table (1): Amount of Jordanian Exports to Selected Countries for the Period of 1992 to 2017
(In Thousands of Jordanian Dinars)**

	USA	China	India	Arabs	EU	Japan	Totals
Year	Exports	Exports	Exports	Exports	Exports	Exports	Exports
1992	4176	14005	96372	222416	19314	12050	633755
1993	7265	16472	65891	285350	28271	9839	691282
1994	8920	8210	88058	336975	40824	12562	793919
1995	14676	13331	114110	451573	63011	13121	1004534
1996	13774	9572	81700	485345	86247	12300	1039801
1997	4911	13592	98571	554284	77752	12732	1067164
1998	5598	11551	116982	466422	69032	10063	1046382
1999	9319	25243	180547	426700	60921	10623	1051353
2000	44848	32999	172240	431287	35475	9277	1080817
2001	164552	29547	145322	680864	53970	9105	1352371
2002	304393	32438	159744	740794	50246	8433	1556748
2003	468564	25530	141025	691867	74954	9576	1675075
2004	722203	24307	178393	946296	80639	12154	2306626
2005	790204	28756	246368	1095797	100299	18638	2570222
2006	907768	24517	279961	1248771	107731	29836	2929310
2007	874971	51082	332515	1393494	110539	47234	3183707
2008	736156	78191	916076	1849305	182164	111732	4431113
2009	612019	27428	484069	1846571	107014	105248	3579166
2010	655850	78610	550935	2127715	155616	40698	4216949
2011	733785	141323	645949	2262199	220067	33522	4805873
2012	788540	132372	510460	2307031	215828	28591	4749570
2013	847551	73634	350930	2571718	171426	28744	4805234
2014	929944	131272	459849	2656370	216488	22966	5163029
2015	1002055	149673	418129	2444034	121465	16169	4797583
2016	1041193	87271	347067	2141905	116741	16142	4396514
2017	1112529	97319	367094	2072204	124287	18439	4474223

Source: Central Bank of Jordan, website www.cbj.gov.jo

Looking at table 2, we notice that the biggest market for Jordanian exports are the Arab countries with 2,072,204,000JD; followed by the US with 1,112,529,000JD; India with 367,094,000JD; EU with 124,287,000JD; China with 97,319,000JD; and Japan with 18,439,000JD in 2017.

The Jordanian efforts to the united states had seen an overall upward trend; meanwhile the Jordanian exports to the Arab countries had seen a fluctuation over time where there was a decrease since 2015. None the less the market for the Jordanian products and services had seen a fluctuation trend between the years 1992-2017. However, the Jordanian exports to the EU did not flow an overall upward trend where there was a sharp decrease in 2009 and 2013. Finally, the Jordanian commodity and services had failed to gain a significant share in both the Chinese and Japanese markets. In the Japanese market the Jordanian exports had more or less remained constant where the value of exports in 1992 was 12,500,000JD and 18,439,000JD in 2017.

We will measure the economic growth in Jordan in terms of the GDP per capita. The table below shows the GDP per capita in Jordan for the period from 1992 to 2017.

Table (2): Jordanian GDP Per Capita at Constant Prices (Base Year 2016) for the Period from 1992-2017 in JD.

Year	Real GDP Per Capita
1992	2608.4
1993	2582.5
1994	2612.3
1995	2701.0
1996	2673.5
1997	2696.5
1998	2710.3
1999	2720.7
2000	2771.7
2001	2812.5
2002	2906.9
2003	2944.5
2004	2975.4
2005	3107.6
2006	3272.0
2007	3422.5
2008	3545.7
2009	3591.7
2010	3572.4
2011	3516.9
2012	3381.8
2013	3168.2
2014	3019.1
2015	2852.3
2016	2840.3
2017	3000.3

Source: Jordanian Department of Statistics.

The table above shows that the real GDP Per Capita continued to increase till 2009 where it reached its maximum of 3591.7 JD, it then continued to decrease till 2017 reaching 3000.3 JD. The paper will proceed as follows; the next section will be a brief literature review; methodology; results; and conclusion.

2. Literature Review

The current account of a nation acts as an important indicator for macroeconomic policies and the behavior economic agents. Current account plays an important role in the global economy; it is a crucial international economic variable for lenders and borrowers. A constantly increasing current account deficit indicates the risk of bankruptcy to creditors (Aric, Tuncay, & Sek, 2017). Thus, it is important for a country not have a constantly increasing deficit.

The Jordanian policy makers adapted an openness approach by joining the WTO, signing the General Agreement on Trade Services (GATS) signing a number of bilateral trade agreements, and creating industrial zones. Economic literature suggests three main channels in which openness can affect a domestic economy. One of these channels is international trade, where the exchange in goods is the major mechanism in the theory of international trade. The theory indicates that international trade increases productivity because nations can specialize in the production of commodities that they have a comparative advantage. Comparative advantage can be obtained by experiencing economies of scale, or differences in technological or resource endowments. In addition, international trade increases competition in the tradable goods sector. Melitz (2003) claimed that an increase in exports may raise domestic productivity, due to the fact that international trade reallocates resources towards the more productive firms.

Talafhah (1989) had found an important statistical relationship between imports and income, meanwhile imports were not sensitive to the exchange rate in Jordan. Raw materials and consumer commodities make up most of the Jordanian imports, which is affected negatively by the exchange rate of the Jordanian Dinar. The study had also found that exports were inelastic to the exchange rate.

Abu-Lila and Jdaitawi (2015) calculated the price and income elasticities for the Jordanian foreign trade with major trading partners –Arab countries, China, India, and USA. The study had found a high price elasticity of Jordanian exports with the trading partners, and the Jordanian imports from Arab countries and India are sensitive to a change in relative prices. The income elasticity of Jordanian imports is less than one; and the income elasticity of Jordan exports to Arab countries is less than one, meanwhile, the income elasticity of Jordan exports to China and India is greater than one.

Muhtaseb (2015) had examined the impact of Jordanian service imports of the Jordanian economic growth for the period 1990 to 2012. The study had showed that the coefficient of total imports –including both services and manufacturing- is significant and positive. Meanwhile, coefficient of imports for services was significant and negative.

Since exports are considered as a credit or an injection to an economy, in this paper we will investigate its effect on the Jordanian real GDP per capita.

3. Methodology

In a stochastic time, series models the ϵ_t represents the unexpected new changes or innovations in the level of y_t which will influence the new levels of y_{t+n} in a time series.

The concept of stationary allows for the possibility of the prediction of future values, i.e. this property makes it possible to predict future values. This is why it is important to determine whether the variable is stationary.

The roots of the Autoregression polynomial are vital to determine whether a series is stationary or not. The modulus of the roots is calculated by $\lambda = a \pm bi$. The modulus is equal to the $(a^2+b^2)^{1/2}$. If λ is real, then $b = 0$ and the modulus is equal to the absolute value of a . The Unit Root Rule for stationarity states the following,

If the modulus of any roots of $\beta(L) \leq 1$ then the series is nonstationary. Thus for the series to be stationary all the roots of $\beta(L)$ should lie outside the unit root circle in the complex plane (Greene, 1995, p. 556).

To achieve this, (Hendry & Juselius, 2000) indicated that when the data is non-stationary purely due to the reason of a unit root (integrated once, I(1)), taking the first difference can bring it back to stationary. Thus here we are looking at the change that occurs from one period to the next, thus the quantity of $Y_t - Y_{t-1}$. When the first difference produces a stationary process, we say that the series Y_t is integrated of order one, and represented by I (1). That is, a series is integrated of order d and denoted by I(d), i.e. the series becomes stationary after being differenced d times (Greene, 1995, p. 559).

The Augmented Dickey-Fuller test will be used to determine whether the variables are stationary or non-stationary. This will be done using the unit root for the null hypothesis that a variable has a unit root against the alternative hypothesis that the variable has no unit root. Using $\alpha = 0.05$ and the p-value of the t-test for the Augmented Dickey-Fuller test thus $\alpha > p$ -value, we reject the null hypothesis and thus there is no unit root at the first difference.

Generally, if two variables are integrated to different orders, the linear combinations of the two variables will have an order of the higher of the two orders. Thus, if y_t is I (1) and x_t is I (0) then the linear combination given by regressing y_t on x_t represented by $e_t = y_t - bx_t$ will be I (1). If two independent variables y_t and x_t are non-stationary but there exists a stationary linear combination of the integrated variables, then the two variables are cointegrated. In this case, there exists a long-run relationship between the two variables were the two variables drift together. This relationship is distinguished from the short-term dynamics that is measured by the relationship between the deviations of y_t from its long-term trend and deviations of x_t from its long-term trend. Nonetheless, cointegration test does not determine the direction of the causality (Greene, 1995, p. 567).

A common question that frequently manifests in time series analysis is whether one economic variable can assist in forecasting another economic variable. Granger (1969) and popularized by Sims (1972) had utilized F-tests to test for causality. He tested whether lagged information on a variable Y provides any statistically significant information on regarding another variable X in the presence of lagged X . There are many methods in order to implement Granger causality test (SAS, n.d.). Hence, the Granger Causality test will be used to determine the direction of the causality between the cointegrated variables. The Pairwise Granger Causality Test, will be used to test the null hypothesis that one variable does not Granger cause another variable; against the alternative hypothesis that one variable does Granger cause another. Using $\alpha = 0.05$ and the p-value of the f-test – thus $\alpha > p$ -value, we reject the null hypothesis.

Finally, the Dynamic Least Squares (DOLS) Method will be used to determine the sign of the Granger Causality relationships. The DOLS deals basically with regressing any I(1) variables with any I(1) variables with another I(1) variables, any I(0) and leads and lags of the first differences of I(1) variables.

The DOLS includes past, present, and future values of the change in X_t ; (Stock and Watson, 2015, 706) (Introduction to Econometrics)

$$Y_t = \beta_0 + \theta X_t + \sum \delta_j \Delta X_{t-j} + \epsilon_t$$

Where Y : Dependent variable, β_0 : Beta coefficient, X_t : Independent variable, θ : Coefficient
 δ : standard Deviation, j : Index Variable, ϵ_t : Error term.

4. Data

The data was collected from the Central Bank of Jordan and the Jordanian Department of Statistics for the period of 1992 to 2017. The Eviews software was used to perform the different statistical analysis.

5. Results

The unit root test was performed to the amount of Jordanian exports in Jordanian Dinars to the United States (USAEX), China (CHEX), European Union (EUEX), India (INEX), Arab countries (ARABEX), and Japan (JAEX). We also ran the ADF unit root tests for Real GDP per Capita (RGDPPC) for Jordan in JD and results are given below (Phillips-Perron unit root test results are qualitatively similar):

Table (3): Augmented Dickey Fuller (ADF) test results

Variable Name	Unit Root
USAEX	Non-Stationary at 1 st difference
RGDPPC	Stationary at 1 st difference
CHEX	Stationary at 1 st difference
EUEX	Stationary at 1 st difference
INEX	Stationary at 1 st difference
ARABEX	Stationary at 1 st difference
JAEX	Stationary at 1 st difference

After getting individual variable groups as unit root free we tested for possible long-term relationships among variables of the group using cointegration technique in the spirit Johansen. Thus, we will have the results in the table below.

Table (4): Bivariate Johansen Cointegration test results

Variables	Numbers of Cointegrating relationship
RGDPPC, CHEX	Two
RGDPPC, ARABEX	Two
RGDPPC, EUEX	Two
RGDPPC, INEX	Two
RGDPPC, JAEX	Two

This leads us to the Pairwise Granger Causality Test; unfortunately, there was no causality between the variables.

Table (5): Results of Granger Causality Tests

Variables	Causality (lag)	Causality (direction)
CHEX, RGDPPC		None
ARABEX, RGDPPC	2	Bidirectional
EUEX, RGDPPC	2	EUEX Granger causes RGDPPC
INEX, RGDPPC	2	RGDPPC Granger causes INEX
JAEX, RGDPPC		None

To find the sign of the relationship we will use the FMOLS. The results are presented in table 6.

Table (6): Results of Dynamic OLS (DOLS) regression

Variables	Relationship
DARABEX	Positive (0.000623)

6. Conclusion

Our time series analysis indicated that only Jordanian exports to Arab countries affect the performance of the Jordanian economy positively, where Arab exports granger causes Real GDP Per Capita. Our Dynamic least squares regression model showed Jordanian exports to Arab countries positively affect Real GDP Per Capita, although the beta was relatively small.

Thus our analysis had demonstrated the insignificant effect of the Jordanian exports to the economic growth of the Jordanian economy.

Exports usually play a crucial role in the economic growth process of a nation's economy. In the case of Jordan our time series analysis had indicated that the exports are providing an extremely minimal roll as an injection to the Jordanian economy.

The contribution of the exports to the standard of living of the Jordanian individual is close to zero. Since the exports act as an injection to the economy -while the imports act as a leakage from the economy- we were only interested in determining the effects of the exports on the economic situation of the Jordanian economy.

It's extremely important for the Jordanian policy makers to try and aid the Jordanian exports to become more competitive in the global markets since Jordan is located in a region where a number of Arab countries are struggling with high levels of unemployment, high inflation rates, and large percentage of unemployed educated people (Samarah, 2017). Thus increasing the amount of Jordanian exports would contribute dramatically to a reduction in the unemployment rate and impact more significantly the Real GDP per capita and thus the economic growth of the Jordanian economy.

The Jordanian government should legislate more rules and regulations to enforce good governance practices. This will aid in local firms being both more competitive and productive, and encourages Foreign Direct Investment. Thus good governance contributes positively to economic growth (Samarah, 2018). Finally, more bilateral trade agreements may aid in boosting the Jordanian exports, economic growth, and the standard of living of the Jordanian population.

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