The relationship between Export, Import, Domestic Investment and Economic Growth in Egypt: Empirical Analysis

Bakari, Sayef

Faculty of Economic Sciences and Management of Tunis (FSEGT), LIEI, University Of Tunis El Manar, Tunisia.

November 2016

The relationship between Export, Import, Domestic Investment and Economic Growth in Egypt: Empirical Analysis

Sayef Bakari

PhD Student, Department of Economics Science, LIEI, Faculty of Economic Sciences and Management of Tunis (FSEGT), University Of Tunis El Manar, Tunisia. Email: ***bakari.sayef@yahoo.fr***

Abstract:

This paper investigates the relationship between exports, imports, domestic investment and economic growth in Egypt. In order to achieve this purpose, annual data for the periods between 1965 and 2015 was tested by using Johansen co-integration analysis of Vector Auto-regression and the Granger-Causality tests. According to the result of the co-integration analysis, it was determined that there is no relationship between the four variables. The empirical results indicate that exports, imports and domestic investment have no effect on economic growth in Egypt. However, the result of causality test asserts that imports and domestic investment are the source of economic growth in Egypt.

KEYWORDS: Domestic Investment, export, import, economic growth, Egypt.

JEL Classification: C13, E22, F14.

I. Introduction :

Generally considered investing in various sectors essential factor in the advancement and accelerating economic growth, in addition to that, it will help reduce the unemployment rate and realize the well-being of individuals. It is well known, the proper investment positively affects the high productivity ratio, which leads in turn to achieve self-sufficiency in the country. With the self-sufficiency of the country, the proportion of exports going up due to the remaining productivity as a result of this output rise for investment.

Exports of goods and services are seen as an incentive of economic and social development out of their strength to manipulate economic growth and to reduce poverty. In the other hand, exports are also a fountain of foreign exchange outflows to transact with imports. Eventually, they shape a potent ingredient of State revenue through customs duties they may hatch or when they are toted out by public enterprises.

In some situations, imports are seen as substantial instrumentations for foreign technology and knowledge to ooze the national economy, as new technologies could be integrated into imports of intermediate goods such as machinery and equipment and labor productivity could rise over time as workers gain knowledge of the new incarnated technique.

Egypt's economy is the most diversified economies in the Middle East countries, where we found a lot of sectors like agriculture, industry, tourism and services. The average number of workforce in Egypt, about 26 million people, according to 2010 estimates, distributed in the service sector increased by 51%, and the agricultural sector by 32% and the industrial sector by 17%. The country's economy depends mainly on agriculture and Suez Canal revenues, tourism and taxation, cultural and media production and oil exports. But, and despite the geographical breadth of its turf and many excellent economic characteristics such as the enjoyment of a good climate, excellent natural resources and with demand, vast areas of agricultural and fertile... But she is suffering a lot of economic and social problems.

The general objective of this study is to investigate the relationship among domestic investment, export, import and economic growth in Egypt.

To achieve this objective, the paper is structured as follows. In section 2, we present the review literature concerning the nexus between domestic investment, export, import and economic growth. Secondly, we discuss the Methodology Model Specification and data used in this study in Section 3. Thirdly, Section 4 presents the empirical results as well as the analysis of the findings. Finally, Section 5 is dedicated to our conclusion.

II. Literature Survey

1) Exports, imports and economic growth

Mayasa Mkubwa Hamad & Burhan Ahmad Mtengwa & Stabua Abdul Babiker (2014) analyze the effect of trade liberalization on economic growth in Tanzania. The empirical findings indicated that trade openness had a positive and significant effect on economic growth in Tanzania.

Andrews (2015) examined the relationship between export, import and GDP for Liberia, using historical data from 1970 to 2011. The study confirmed the existence of bidirectional causation between GDP and imports and uni-directional causation between exports and GDP and exports and imports. The results showed that Liberia is not driven by exports alone but rather a mixture of exports and imports, with the latter having a long-run impact.

Saaed and Hussain (2015) found unidirectional causality between exports and imports and between exports and economic growth in Tunisia for the period from 1977 to 2012. According to them growth in Tunisia was propelled by a growth -led import strategy. Imports are thus seen as the source of economic growth in Tunisia.

Bader S.S. Hamdan (2016) analyzed the effect of exports and imports on economic growth in the Arab countries during the period 1995 to 2013. The study used panel data approach in 17 countries: (Jordan, United Arab Emirates, Bahrain, Tunisia, Algeria, Saudi Arabia, Sudan, Oman, Qatar, Kuwait, Lebanon, Egypt, Djibouti, Mauritania, Morocco, Yemen and Palestine). The outcome indicates that exports and imports have positive effect of economic growth.

Masoud Albiman Md and Suleiman NN (2016) investigated the nexus between exports, imports and economic growth in Malaysia, using annual data for the period 1967- 2010. Cointegration analysis, VAR and Granger causality tests were employed in the empirical analysis. The results show that there is a causal relationship from exports to economic growth and from exports to imports.

2) Domestic investment and economic growth

Sumei Tang, E. A. Selvanathan and S. Selvanathan (2008) investigate the causal link between foreign direct investment (FDI), domestic investment and economic growth in China for the period 1988-2003. The results show that while there is a bi-directional causality between domestic investment and economic growth, there is only single-directional causality from FDI to domestic investment and to economic growth.

Anis Omri and Bassem kahouli (2014) analyze the nexus among foreign investment, domestic capital and economic growth in 13 MENA countries by using a 'growth model' framework and simultaneous-equations models estimated by the Generalized Method of Moments (GMM) during the period 1990–2010. Empirical results show that there is bidirectional causal relationship between foreign investment and economic growth, between domestic capital and economic growth, and there is uni-directional causal relationship from foreign direct investment to domestic capital.

Njimanted G. Forgha, Mukete E. Mbella and Forbe H. Ngangnchi (2014) make a system estimation approach to analyze the nexus between external debt, domestic investment and economic growth in Cameroon for a period of 34 years (1980-2013), the results reveal that while domestic investment increases economic growth, external debt retards economic growth in Cameroon, revealing the influence of debt overhang.

Sakiru Adebola Solarin and Muhammad Shahbaz (2014) reinvestigate the relationship between natural gas consumption and economic growth by including foreign direct investment, capital and trade openness in Malaysia for the period of 1971–2012. The empirical results show that Natural gas consumption, foreign direct investment, capital formation and trade openness have a positive influence on economic growth in Malaysia.

Manamba EPAPHRA and John MASSAWE (2016) analyze the causal effect between domestic private investment, public investment, foreign direct investment and economic growth in Tanzania during the 1970-2014 periods. The empirical results show that the domestic private investment and foreign direct investment play an important role in economic growth in Tanzania.

III. Data and Methodology

1) The Data:

The analysis used in this study cover annual time series of 1965 to 2015 which should be sufficient to capture the relation between Export, Import, Fixed Formation Capital and economic growth in Egypt. The data set consists of observation for GDP, exports of goods and services (current US$), imports of goods and services (current US$) and Fixed Formation Capital (current US$). All data set are taken from World Development Indicators 2016.

Data	GDP	Domestic investment	Exports	Imports
1965	5111621013.54303	904325032.7654	605199000	933570000
1966	5339520612.99374	897690481.329592	605222000	1070650000
1967	5579168509.50907	804732419.283503	566122000	792120000
1968	6109112149.53271	771495327.102804	621667000	666080000
1969	6861743341.40436	889104116.22276	745039000	637790000
1970	7682491836.22206	1071590052.75057	761714000	786600000
1971	8266003570.51772	1093343534.81255	789314000	919770000
1972	8763960703.20579	1081437435.36711	825194000	898840000
1973	9616725366.34664	1264274886.30622	1120710000	915192000
1974	9015166839.80885	2025763557.03304	1516210000	2351370000
1975	11437965585.2696	3816308417.36081	1401950000	3933770000
1976	13360476861.9662	3793445878.84806	1521710000	3807270000
1977	14636028766.883	4269426241.01035	1708390000	4815440000
1978	14849909490.6004	4701333990.29715	1737140000	6726750000
1979	18150000571.4286	5961428428.57143	1839760000	3837140000
1980	22912500555.5556	6304166388.88889	3046000000	4860000000
1981	23405404729.7297	6906756891.89189	3233000000	8839000000
1982	25592365394.0887	7697044211.82266	3120000000	9078000000
1983	28137369499.4179	8083818393.48079	3215000000	10275000000
1984	30642873038.0563	8421844657.063	3140000000	10766000000
1985	34689560464.8728	9253480892.05319	3714000000	11104000000
1986	35880262675.3976	8506080636.10851	2934000000	11502000000
1987	40507934171.249	10565593401.414	4351000000	16225000000
1988	35044634014.7643	12237365190.2328	5706000000	23298000000
1989	39648442534.0768	12598099442.3792	5213000000	15112000000
1990	43130416913.4141	12427097711.9785	3477000000	12412000000
1991	36970555898.9698	7826520139.58126	3705000000	8052000000
1992	41855986519.4235	8154545180.99479	3063000000	8325000000
1993	46578631452.581	9243697478.9916	3105000000	8214000000
1994	51897983392.6453	10705812574.14	3476000000	10219000000
1995	60159245060.4542	12120318490.1209	3450000000	11760000000
1996	67629716981.1321	12264150943.3962	3539000000	13038000000
1997	78436578171.0914	13775811209.4395	3921000000	13211000000
1998	84828807556.0803	18240850059.0319	3130000000	16166000000
1999	90710704806.8416	19610734296.6676	3559000000	16022000000
2000	99838543960.0763	19521503008.9535	5275989139	14578358928
2001	97632008709.853	17827980402.8307	4824509821	13375954769
2002	87850683978.6691	15812659401.8085	5545895677	12769844225
2003	82924503942.6381	14002820426.2419	7407765566	12950000000
2004	78845185293.4964	13354778963.7861	9661403853	15950000000
2005	89685725230.2517	16121779391.4361	12912020000	22449030000
2006	107484034870.974	20132593224.173	16728100000	27300000000
2007	130478960092.499	27206474895.764	19224000000	37100000000
2008	162818181818.182	36454545454.5454	26223758000	48381500000
2009	188982374700.805	36266047726.1188	23061600000	44945700000
2010	218888324504.753	42685581597.8521	26437816000	52922828000
2011	236001858960.015	40363529958.5176	30527700000	58902800000
2012	276353323880.224	44774376511.8025	29409200000	69200200000
2013	286011230726.274	41013867775.2614	28493000000	59661700000
2014	301498960051.639	41683999139.3531	26366614138.438	71281834408.6082
2015	330778550716.746	47542521475.1487	19051258129.3195	65043934996.4578

Source: World Development Indicators 2016.

2) Methodology

We will use the most appropriate method which consists firstly of determining the degree of integration of each variable. If the variables are all integrated in level, we apply an estimate based on a linear regression. On the other hand, if the variables are all integrated into the first difference, our estimates are based on an estimate of the VAR model. When the variables are integrated in the first difference we will examine and determine the cointegration between the variables, if the cointegration test indicates the absence of cointegration relation, we will use the model VAR. If the cointegration test indicates the presence of a cointegration relation between the different variables studied, the model VECM will be used.

3) Model specification:

The augmented production function including domestic investment, exports and imports is expressed as:

$$\boldsymbol{GDP_t = f(exports, imports, domestic\ investment)} \quad \textbf{(1)}$$

The function can also be represented in a log-linear econometric format thus:

$$\boldsymbol{\log(GDP)_t = \beta_0 + \beta_1 \log(exports)_t + \beta_2 \log(imports)_t + \beta_3 \log(domestic\ investment)_t + \varepsilon_t} \quad \textbf{(2)}$$

Where:

- β_0 : The constant term.
- β_1: coefficient of variable (exports)
- β_2: coefficient of variables (imports)
- β_3: coefficient of variable (domestic investment)
- t: The time trend.
- ε: The random error term assumed to be normally, identically and independently distributed.

IV. EMPIRICAL ANALYSIS

Table 2: Tests for Unit Root: ADF

Null Hypothesis: D(LOG(GDP)) has a unit root			
Augmented Dickey-Fuller test statistic		t-Statistic	Prob.*
		-5.801350	0.0000
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	
Null Hypothesis: D(LOG(DOMESTIC_INVESTMENT)) has a unit root			
Augmented Dickey-Fuller test statistic		t-Statistic	Prob.*
		-4.836677	0.0002
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	
Null Hypothesis: D(LOG(EXPORTS)) has a unit root			
Augmented Dickey-Fuller test statistic		t-Statistic	Prob.*
		-6.013662	0.0000
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	
Null Hypothesis: D(LOG(IMPORTS)) has a unit root			
Augmented Dickey-Fuller test statistic		t-Statistic	Prob.*
		-5.842016	0.0000
Test critical values:	1% level	-3.571310	
	5% level	-2.922449	
	10% level	-2.599224	

Table 3: Lag order Selection Criteria

VAR Lag Order Selection Criteria						
Lag	**Log L**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	-79.04177	NA	0.000403	3.533692	3.691152	3.592945
1	**124.2674**	**363.3610***	**1.40e-07***	**-4.436910***	**-3.649613***	**-4.140644***
2	135.9789	18.93783	1.70e-07	-4.254423	-2.837288	-3.721145
3	142.3685	9.244450	2.67e-07	-3.845467	-1.798495	-3.075178
4	154.8941	15.99019	3.34e-07	-3.697622	-1.020813	-2.690321

Table 4: Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.316865	31.55945	47.85613	0.6363
At most 1	0.149983	12.88734	29.79707	0.8967
At most 2	0.094605	4.924900	15.49471	0.8167
At most 3	0.001123	0.055080	3.841466	0.8144
Trace test indicates no cointegration at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.316865	18.67211	27.58434	0.4403
At most 1	0.149983	7.962445	21.13162	0.9060
At most 2	0.094605	4.869820	14.26460	0.7582
At most 3	0.001123	0.055080	3.841466	0.8144
Max-Eigen value test indicates no cointegration at the 0.05 level				

Table 5: Vector Auto-regression Estimates

Vector Auto-regression Estimates				
Standard errors in ( ) & t-statistics in [ ]				
	LOG(GDP)	LOG(IMPORTS)	LOG(EXPORTS)	LOG(DOMESTIC INVESTMENT)
LOG(GDP(-1))	0.932058	-0.194249	-0.033814	-0.012934
	(0.05731)	(0.15542)	(0.12132)	(0.10710)
	[16.2620]	**[-1.24985]**	**[-0.27873]**	**[-0.12076]**
LOG(IMPORTS(-1))	0.037534	0.410918	-0.291507	0.057672
	(0.07045)	(0.19105)	(0.14913)	(0.13166)
	[0.53274]	**[2.15088]**	**[-1.95476]**	**[0.43805]**
LOG(EXPORTS(-1))	0.061344	0.371133	1.042434	0.111834
	(0.04423)	(0.11994)	(0.09362)	(0.08265)
	[1.38690]	**[3.09439]**	**[11.1347]**	**[1.35306]**
LOG(DOMESTIC_INVESTMENT(-1))	-0.031263	0.476076	0.298019	0.826651
	(0.09104)	(0.24687)	(0.19270)	(0.17013)
	[-0.34339]	**[1.92845]**	**[1.54653]**	**[4.85906]**
C	0.241535	-0.744366	-0.169896	0.561350
	(0.28522)	(0.77341)	(0.60371)	(0.53298)
	[0.84684]	[-0.96244]	[-0.28142]	[1.05322]
R-squared	0.995064	0.971603	0.976751	0.983121
Adj. R-squared	0.994625	0.969079	0.974684	0.981621

Table 6: Least Squares (Gauss-Newton/Marquardt steps)

Dependent Variable: LOG(GDP)				
Method: Least Squares (Gauss-Newton / Marquardt steps)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.932058	0.057315	16.26203	0.0000
C(2)	0.037534	0.070454	0.532741	0.5968
C(3)	0.061344	0.044231	1.386903	0.1723
C(4)	-0.031263	0.091041	-0.343392	0.7329
C(5)	0.241535	0.285220	0.846836	0.4016

Table 9: Pair-wise Granger Causality Tests

Pair-wise Granger Causality Tests			
Null Hypothesis:	Observations	F-Statistic	Prob.
DLOG(DOMESTIC_INVESTMENT) does not Granger Cause DLOG(GDP)	49	3.65531	**0.0621**
DLOG(GDP) does not Granger Cause DLOG(DOMESTIC_INVESTMENT)		1.66464	0.2034
DLOG(EXPORTS) does not Granger Cause DLOG(GDP)	49	0.01038	0.9193
DLOG(GDP) does not Granger Cause DLOG(EXPORTS)		0.11064	0.7409
DLOG(IMPORTS) does not Granger Cause DLOG(GDP)	49	2.15365	0.1490
DLOG(GDP) does not Granger Cause DLOG(IMPORTS)		2.09230	0.1548
DLOG(EXPORTS) does not Granger Cause DLOG(DOMESTIC_INVESTMENT)	49	5.74306	**0.0207**
DLOG(DOMESTIC_INVESTMENT) does not Granger Cause DLOG(EXPORTS)		0.15894	0.6920
DLOG(IMPORTS) does not Granger Cause DLOG(DOMESTIC_INVESTMENT)	49	4.22855	**0.0454**
DLOG(DOMESTIC_INVESTMENT) does not Granger Cause DLOG(IMPORTS)		0.55275	0.4610
DLOG(IMPORTS) does not Granger Cause DLOG(EXPORTS)	49	0.35799	0.5526
DLOG(EXPORTS) does not Granger Cause DLOG(IMPORTS)		10.9292	**0.0018**

The application of the stationary test ADF shows that all the variables are not stationary in level (the use of an estimate based on a linear regression is rejected). Otherwise, the stationary test ADF shows that all the variables are stationary in the first difference (since all the variables are stationary in first differences, the cointegration test will be applied after the choice of the number of delays to be used).

The choice of the number of delays is made using the following criteria (LR, FPE, AIC, SC, and HQ). The results of this test show that all the criteria prove the existence of a single number of lags (the number of lags = 1). The third step of our estimation is the practice of the cointegration test to approve whether there is cointegration or not between the different variables studied. If there is a cointegration relation, we will use the VECM model; on the other hand, if there is no cointegration relation, we will use the VAR model. The results of the cointegration test show the absence of the cointegration relations between these different variables, which guides us to use the VAR model. The estimation of the VAR model shows

that the variables of exports, imports and domestic investments have no effect on the variable that designates economic growth.

The final step of our estimation is the application of the Granger causality test. The objective of this test is to demonstrate whether there is a causal relationship between these different variables or not. The results of the causality test show that there is a causal relationship between domestic investment and GDP. On the other hand, it is found that there is no causal relationship that shifts from GDP to domestic investment.

Otherwise, the causality test shows the absence of a causal relationship between exports and economic growth. On the other hand, it is found that exports cause domestic investment and imports. Finally, and concerning imports, we note that they only cause domestic investment.

V. CONCLUSION

The aim of this study was to explain the nexus between exports, imports and economic growth of Egypt during the period 1965-2015. The cointegration, VAR model and Granger's causality tests are applied to investigate the relationship between these variables. The unit root properties of the data were examined using the Augmented Dickey Fuller test (ADF) after that the cointegration and causality tests were conducted. The result shows that there is no relationship between exports, imports, domestic investment and GDP. The empirical results indicate that exports, imports and domestic investment have no effect on economic growth in Egypt. This result comes mainly from weak domestic investment, this weakness leads to inadequate productivity, which expresses the incapacity of the value of exports to improve and refine economic growth. On the other hand, the results of the causality test show that domestic investment causes economic growth. Similarly, the causality test shows that exports and imports cause domestic investment. These results assert that imports and domestic investment are the source of economic growth in Egypt.

Reference:

Andrews, A. P. (2015). "Exports, Imports, and Economic Growth in Liberia: Evidence from Causality and Cointegration Analysis*". Journal of Management Policy and Practice*. 16(3), 95.

Bader S.S. Hamdan (2016) "The Effect of Exports and Imports on Economic Growth in the Arab Countries: A Panel Data Approach". *Journal of Economics Bibliography.* Vol.3. Issue.1.

Balassa, B., (1978) ''Export and Economic Growth: Further Evidence'', *Journal of Development Economics,* 5, 181 – 189.

Diamond, J. (1989). *Government Expenditure and Economic Growth: An Empirical Investigation*. International Monetary Fund, Fiscal Affairs Department.

Dickey, D. A. & W. A. Fuller (1979), "Distribution of Estimators of Autoregressive Time Series with a Unit Root," *Journal of the American Statistical Association*, 74, 427-31.

Dickey, D. A. & W. A. Fuller (1981) "Likelihood ratio Statistics for autoregressive time series with a unit root," *Econometrica*, 49(4):1057-72.

Engle, R. F. & Granger C. W. (1987), "Cointegration and Error Correction: Representation, Estimation and Testing," *Econometrica*, 55, 251-276.

Johansen, S. (1988), "Statistical Analysis of Cointegration Vectors," *Journal of Economic Dynamics and Control,* 12, 231-54.

Manamba EPAPHRA and John MASSAWE (2016). Investment and Economic Growth: An Empirical Analysis for Tanzania. Turkish Economic Review. Volume .3. December. 2016. Issue 4.

Masoud Albiman Md and Suleiman NN. (2016). The Relationship among Export, Import, Capital Formation and Economic Growth in Malaysia. *Journal of Global Economics*. Volume, 4, Issue 2, 1000186.

Mayasa Mkubwa Hamad & Burhan Ahmad Mtengwa & Stabua Abdul Babiker, (2014). "The Impact of Trade Liberalization on Economic Growth in Tanzania," *International Journal of Academic Research in Business and Social Sciences*, vol. 4(5), pages 514-532, May.

Saaed, A. A. J., & Hussain, M. A. (2015). "Impact of exports and imports on economic growth: Evidence from Tunisia". *Journal of Emerging Trends in Economics and Management Sciences.* 6(1), 13.

Sakiru Adebola Solarin and Muhammad Shahbaz (2014). Natural gas consumption and economic growth: The role of foreign direct investment, capital formation and trade openness in Malaysia. Renewable and Sustainable Energy Reviews 42 (2015) 835–845.

Sumei Tang, E. A. Selvanathan and S. Selvanathan (2008): "Foreign Direct Investment, Domestic Investment, and Economic Growth in China A Time Series Analysis ". Research Paper No. 2008/19.

Swaby, R. (2007). Public investment and growth in Jamaica. *Research and Economic Programming Division,* Bank of Jamaica, Kingston.