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## **The Relationship between Export, Import, Domestic Investment and Economic Growth in Egypt: Empirical Analysis**

**Sayef Bakari<sup>1</sup>**

**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 Error Correction Model to explore the long run and the short run relationships between these variables. The empirical results indicate that in the long run domestic investment and exports have negative impact on economic growth, however imports have positive effect on economic growth. In the short run, empirical analyses show that only imports cause economic growth. These findings present the critical situation of Egypt, which requires an entry of urgent economic reforms.

**Keywords:** Domestic Investment; Export; Import; Economic Growth; VECM; Egypt

**JEL Classification:** F43

### **1. 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

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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.

## 2. Literature Survey

### 2.1. Trade and Economic Growth

Among the studies that have shown that an expansion of trade has a significant positive impact on economic growth are Michaely, (1977); Balassa, (1978, 1989 & 1995); Rahman (1993); Savvides, (1995); Edward, (1998); Ram, (1987). On the other hand, others have concluded that the positive relationship between international trade and economic growth does not exist during certain periods for certain countries (Tyler (1981), Helleiner (1986), Ahmad and Kwan (1991).

**Table 1. Empirical studies concerns the nexus between exports, imports and economic growth**

No	Authors	Country	Methodology	Results
		Period		
1	Azeez et al (2014)	Nigeria	OLS	X => Y (+)
		2000 - 2012		M => Y (+)
2	Zaheer et al (2014)	Pakistan	Cointegration Analysis	X => Y: LR (+)
		2000 - 2010	VECM	M => Y: LR (-)
				X => Y: SR (+)
				X # M: LR and SR
3	Adeleye et al (2015)	Nigeria	OLS	X => Y: LR (+)
		1988 - 2012	Cointegration Analysis	M => Y: LR (-)
			ECM	X # M: LR and SR
4	Andrews (2015)	Liberia	Cointegration Analysis	M <=> Y (+)
		1970 - 2011	Granger Causality Tests	X => M (+)
5	Gokmenoglu et al (2015)	Pakistan	Cointegration Analysis	X # Y
		1967 - 2013	Granger Causality Tests	Y => M (+)
				M => X (+)
6	Hussaini et al (2015)	India	Cointegration Analysis	X <=> Y (+)
		1980 - 2013	VECM	M <=> Y (+)
			Granger Causality Tests	X => M (+)
7	Tahir et al (2015)	Pakistan	Cointegration Analysis	M => Y: LR (-)
		1977 - 2013	ARDL	M => Y: SR (-)
			ECM	
8	Albiman and Suleiman (2016)	Malaysia	Cointegration Analysis	X => M (+)
		1967 - 2010	VAR	
			Granger Causality Tests	
9	Riyath and Jahfer (2016)	Sri Lanka	Cointegration Analysis	X => Y: LR (+)
		1962 - 2015	VECM	M => Y: LR (-)
			Granger Causality Tests	X => Y: SR (+)
				M # Y: SR
			M # X: LR and SR	
10	Bakari and Krit (2017)	Mauritania	Cointegration Analysis	X => Y: LR (+)
		1960 - 2015	VECM	M # Y: LR
			Granger Causality Tests	M <=> Y: SR (+)
11	Bakari and Mabrouki (2017)	Panama	Cointegration Analysis	X => Y: (+)
		1980 - 2015	VAR	M=> Y: (+)
			Granger Causality Tests	

12	Berasaluce and Romero (2017)	Korea	Cointegration Analysis	M $\Leftrightarrow$ Y: (+)
		1980 - 2016	VECM	X # Y
			Granger Causality Tests	
13	Chaudhry et al (2017)	Pakistan	Cointegration Analysis	X $\Leftrightarrow$ M: (+)
		1948 - 2013	ARDL	
			VECM	
			Granger Causality Tests	
14	Faisal et al (2017)	Saudi Arabia	ARDL	X $\Rightarrow$ Y: (+)
		1968 - 2014	Granger Causality Tests	M # Y
15	Ofeh and Muandzevara (2017)	Cameroon	Correlation Analysis	X $\Rightarrow$ Y: (+)
		1980 - 2013	OLS	M $\Rightarrow$ Y: (-)

Note: X means Exports, M means Imports, Y means Economic Growth, LR means Long Run, SR means Short Run, (+) means Positive Effect and (-) means Negative Effect.

### 2.2. Domestic Investment and Economic Growth

Obtainable literature, including recent extensions of the neo-classical growth model as well as the theories of endogenous growth has emphasized the role of domestic investment in economic growth. Among these studies we can cite Romer (1986); Lucas (1988); Barro (1991); Rebelo (1991); Fischer (1993). Other studies prove that domestic investment may not necessarily have a favorable impact on economic growth Khan (1996); Devarajan (1996) and among others.

**Table 2. Empirical studies concerns the nexus between domestic investment and economic growth**

No	Authors	Country	Methodology	Results
		Period		
1.	Altaee et al (2016)	Saudi Arabia	ARDL	DI $\Rightarrow$ Y: LR (+)
		1980 - 2014	ECM	DI $\Rightarrow$ Y: SR (+)
2.	Andrew and Bothwell (2016)	South Africa	cointegration analysis	DI $\Leftrightarrow$ Y: LR (-)
		1994 - 2014	VECM	DI $\Leftarrow$ Y: SR (+)
			Granger Causality Tests	
3.	Pegkas and Tsamadias (2016)	Greece	cointegration analysis	DI $\Rightarrow$ Y: SR (+)
		1970 - 2012	VECM	DI $\Rightarrow$ Y: LR (+)
4.	Adams et al (2017)	Senegal	ARDL	DI $\Rightarrow$ Y: LR (+)
		1970 - 2014		
5.	Bakari (2017a)	Gabon	Cointegration Analysis	DI $\Rightarrow$ Y: LR (-)
		1980 - 2015	ECM	DI $\Rightarrow$ Y: SR (+)
6.	Bakari (2017b)	Malaysia	Cointegration Analysis	DI $\Rightarrow$ Y: LR (+)
		1960 - 2015	ECM	DI # Y: SR
7.	Bakari (2017c)	Sudan	Cointegration Analysis	DI # Y: LR
		1976 - 2015	ECM	DI $\Leftarrow$ Y: SR (+)
8.	Epaphra and Mwakalasya (2017)	Tanzania	OLS	DI $\Rightarrow$ Y (+)
		1990 - 2015		
9.	Idenyi et al (2017)	Nigeria	ARDL	DI $\Rightarrow$ Y: SR (+)
		1986 - 2016	Granger Causality Test	
10.	Keho (2017)	Cote D'Ivoire	ARDL	DI $\Leftrightarrow$ Y: LR (+)
		1965 - 2014	Granger Causality Tests	DI $\Leftrightarrow$ Y: SR (+)
11.	Khobai et al (2017)	South Africa	Cointegration Analysis	DI $\Rightarrow$ Y: LR (+)
		1985 - 2014	ARDL	DI # Y: SR
12.	Jibiry and Abdu (2017)	Nigeria	Cointegration Analysis	DI # Y: LR
		1970 - 2014	VECM	DI $\Leftarrow$ Y: SR (+)
			Granger Causality Test	
13	Mbulawa (2017)	Botswana	OLS	DI $\Rightarrow$ Y (+)

		1985 - 2015	VECM	
14	Sahoo and Sethi (2017)	India	Cointegration Analysis	DI => Y: LR (+)
		1990 - 2014	VECM Granger Causality Test	DI <=> Y: SR (+)
15	Siddique et al (2017)	Pakistan	ARDL	DI # Y
		1975 - 2015		

Note: DI means Domestic Investment, Y means Economic Growth, LR means Long Run, SR means Short Run, (+) means Positive Effect and (-) means Negative Effect.

### 3. Data, Methodology and Model Specification

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, domestic investment and economic growth in Egypt. All data set are taken from World Development Indicators 2016. 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, we will use the model of Sims. 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. The augmented production function including domestic investment, exports and imports is expressed as:

$$Y = F(DI, X, M) \tag{1}$$

Where Y, DI, X, and M depict, respectively real GDP growth, real domestic investment, real exports, and real imports

Generally, the equation of the production function is written as follows:

$$Y = A DI^{\alpha_1} X^{\alpha_2} M^{\alpha_3} \tag{2}$$

The returns to scale are enclosed with domestic investment, exports and imports which are exposed by  $\alpha_1$ ,  $\alpha_2$  and  $\alpha_3$  respectively. In addition “A” denotes the level of technology involved in the country and which is feigned to be constant.

All the series are relocated into logarithms in order to process linear the nonlinear form of Cobb–Douglas production. The Cobb–Douglas production function is carved in linear functional form as follows:

$$\text{Log}(Y_t) = \text{Log}(A) + \alpha_1 \text{Log}(DI_t) + \alpha_2 \text{Log}(X_t) + \alpha_3 \text{Log}(M) + \varepsilon_t \tag{3}$$

The linear model acting the influence of Domestic investment, exports and imports on economic growth after maintaining technology constant can be recorded as follows:

$$\text{Log}(Y_t) = \alpha_0 + \alpha_1 \text{Log}(DI_t) + \alpha_2 \text{Log}(X_t) + \alpha_3 \text{Log}(M_t) + \varepsilon_t \tag{4}$$

Where  $\varepsilon$  is error term and  $t$  is time index.

#### 4. Empirical Analysis

##### 4.1. Test for Unit Root

To determine the order of integration of each of the variables studied in our study, stationarity tests are generally applied. In our case we will practice the most adopted test in the analysis of time series which is the Augmented Dickey- Fuller test (1979).

**Table 3. Test for unit root ADF**

<b>Null Hypothesis: D(Log(Y)) has a unit root</b>		
<i>Augmented Dickey-Fuller test statistic</i>		<i>t-Statistic</i>
		-5.801350
<b>Test critical values:</b>	1% level	-3.571310
	5% level	-2.922449
	10% level	-2.599224
<b>Prob.*</b>		
0.0000		
<b>Null Hypothesis: D(Log(DI)) has a unit root</b>		
<i>Augmented Dickey-Fuller test statistic</i>		<i>t-Statistic</i>
		-4.836677
<b>Test critical values:</b>	1% level	-3.571310
	5% level	-2.922449
	10% level	-2.599224
<b>Prob.*</b>		
0.0002		
<b>Null Hypothesis: D(Log(X)) has a unit root</b>		
<i>Augmented Dickey-Fuller test statistic</i>		<i>t-Statistic</i>
		-6.013662
<b>Test critical values:</b>	1% level	-3.571310
	5% level	-2.922449
	10% level	-2.599224
<b>Prob.*</b>		
0.0000		
<b>Null Hypothesis: D(Log(M)) has a unit root</b>		
<i>Augmented Dickey-Fuller test statistic</i>		<i>t-Statistic</i>
		-5.842016
<b>Test critical values:</b>	1% level	-3.571310
	5% level	-2.922449
	10% level	-2.599224
<b>Prob.*</b>		
0.0000		

The application of the ADF test proves that all the variables are stationary in the same order and exactly in the first difference.

##### 4.2. Lag Order Selection

The selection of the number of the lag is very important role in the conception of a VAR model. This lag length is often selected tapping a fixed statistical criterion such as the HQ, FPE, AIC or SIC.

**Table 4. Lag order selection**

<b>VAR Lag Order Selection Criteria</b>						
<b>Lag</b>	<b>Log L</b>	<b>LR</b>	<b>FPE</b>	<b>AIC</b>	<b>SC</b>	<b>HQ</b>
<b>0</b>	-79.04177	NA	0.000403	3.53	3.69	3.59
<b>1</b>	124.2674	363.3610*	1.40e-07*	-4.43*	-3.64*	-4.14*
<b>2</b>	135.9789	18.93	1.70e-07	-4.25	-2.83	-3.72
<b>3</b>	142.3685	9.24	2.67e-07	-3.84	-1.79	-3.07
<b>4</b>	154.8941	15.9	3.34e-07	-3.69	-1.02	-2.69

\* indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level). FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion. HQ: Hannan-Quinn information criterion.

It is very clear according to the results of the table above that all the criterion of selection of the number of the retired show that the number of the optimal delays in our model is equal to 1.

### 4.3. Cointegration Analysis

As soon as the order of integration and the number of delays are determined. We will go directly to the next step which consists in determining the verification of a cointegration or non-cointegration relation between the different variables in our econometric analysis. In this situation, the Johanson test is applied, which is the most efficient, including the determination of the number of cointegrated equations.

**Table 5. Johanson test**

<b>Unrestricted Cointegration Rank Test (Trace)</b>				
<i>Hypothesized No. of CE(s)</i>	<i>Eigenvalue</i>	<i>Trace Statistic</i>	<i>0.05 Critical Value</i>	<i>Prob. **</i>
<b>None *</b>	0.500173	91.48151	47.85613	0.0000
<b>At most 1 *</b>	0.429652	58.19380	29.79707	0.0000
<b>At most 2 *</b>	0.353612	31.24138	15.49471	0.0001
<b>At most 3 *</b>	0.193060	10.29629	3.841466	0.0013
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

the analysis of cointegration proves the existence of four cointegration relations in this case we will apply an estimate based on the VECM model, which will determine the relationship between domestic investments, exports, imports and economic growth in the long run and the short run.

### 4.4. VECM Estimations

On the basis of the unit root and cointegration test outcomes, the following Vector Error-Correction Model (VECM) is anticipated to fulfill the nature of the short-run and long-run relationships between the variables. VECMs representations would have the following form, in equations:

$$D(DLOG(Y)) = C(1) * ( DLOG(Y(-1)) + 0.67 * DLOG(DI(-1)) + 0.5 * DLOG(X(-1)) - 1.17 * DLOG(M(-1)) - 0.07 ) + C(2) * D(DLOG(Y(-1))) + C(3) * D(DLOG(DI(-1))) + C(4) * D(DLOG(X(-1))) + C(5) * D(DLOG(M(-1))) + C(6) \quad (5)$$

$$D(DLOG(DI)) = C(7) * ( DLOG(Y(-1)) + 0.67 * DLOG(DI(-1)) + 0.5 * DLOG(X(-1)) - 1.17 * DLOG(M(-1)) - 0.07 ) + C(8) * D(DLOG(Y(-1))) + C(9) * D(DLOG(DI(-1))) + C(10) * D(DLOG(X(-1))) + C(11) * D(DLOG(M(-1))) + C(12) \quad (6)$$

$$D(DLOG(X)) = C(13) * ( DLOG(Y(-1)) + 0.67 * DLOG(DI(-1)) + 0.5 * DLOG(X(-1)) - 1.17 * DLOG(M(-1)) - 0.07 ) + C(14) * D(DLOG(Y(-1))) + C(15) * D(DLOG(DI(-1))) + C(16) * D(DLOG(X(-1))) + C(17) * D(DLOG(M(-1))) + C(18) \quad (7)$$

$$D(DLOG(M)) = C(19) * ( DLOG(Y(-1)) + 0.67 * DLOG(DI(-1)) + 0.5 * DLOG(X(-1)) - 1.17 * DLOG(M(-1)) - 0.07 ) + C(20) * D(DLOG(Y(-1))) + C(21) * D(DLOG(DI(-1))) + C(22) * D(DLOG(X(-1))) + C(23) * D(DLOG(M(-1))) + C(24) \quad (8)$$

**Table 6. VECM results**

Independent Variables	Y	Dependent variables		
		DI	X	M
<b>Y</b>	-	0.2554	0.6135	0.2439
<b>DI</b>	0.1570	-	0.5984	0.6823
<b>X</b>	0.3545	0.1912	-	0.5738
<b>M</b>	0.0018	0.9012	0.4397	-
<b>Lagged ECT</b>	[-0.2665*]	[-0.0466]	[0.1334]	[1.020]

The results of VECM estimation show that there is only unidirectional causality relation from imports to economic growth in the short run. However in the long run, we can see that domestic investment and exports have negative effect on economic growth but we can see that imports have positive effect on economic growth.

### 5. Conclusion

This paper is one of very few studies that have empirically analyzed the relationship between domestic investment, exports, imports and economic growth in a large country rich in natural and human resources in Egypt during the period 1965 - 2015. The properties of the unit root of the data were closely observed using the Augmented Dickey Fuller (ADF) test after the cointegration and the error correction vector model was performed. The empirical results show that all variables are stationary in the first differences. The application of the cointegration test indicates the existence of co-integration relations, which obviously forces us to apply the vector model of error correction. The estimation of our model shows that in the long term, domestic investment and exports negatively affect economic growth. However, in the short term, imports lead to economic growth. The security chaos and the continuation of terrorist acts carried a message to the world that Egypt is not on the path of stability, which led to heavy losses in investment in the tourism sector, causing a lot of bankrupt tourism projects. Other reason for this is hindered by the scarcity of land, poor infrastructure, lack of electricity and industrial drainage networks, and the bureaucracy in extracting project licenses for various sectors of investment, industrial, tourism or residential. Government bureaucracy is also one of the most serious investment hurdles in Egypt. It is characterized by tedious routine and complex procedures that are only useful in delaying and complicating transactions. In light of the high population, most of these obstacles and problems make it impossible for local investment to achieve prosperity and economic growth. As for exports, it also suffers from many obstacles, including reasons related to the political and economic turmoil in the surrounding countries, which is one of the most important countries that export the Egyptian state's production, as well as the low exchange rates of the most important and largest countries. In addition, the non-compliance with specifications and standards and procedures of quality control and high production costs compared to developed countries because of the low level of technology and productivity in Egypt and the high level of competition in international markets. There are also reasons for the policies of the state that negatively affect the economies of operation as expressed by the complaints of exporting companies, such as the high cost of storage, transport and shipping, the bureaucracy in the work procedures, slow decision making, and the lack of full data to the regulatory and government bodies to help them make sound decisions, imports for up to a month, which delays meet the needs of factories, high fines for containers and land, and the accumulation of goods. For imports, the situation is very different, because it has a positive impact on long-term and short-term economic growth. This is simply explained by the content of these imports, which carry equipment developed and advanced technological machinery commonly used in production, which encourages investment by its ability to produce more at low costs and in short time frames. Egypt's economy is



characterized by extreme diversity. The economy is based on different pillars of agriculture, industry, tourism and services. The main element of the economy is agriculture, followed by Suez Canal income, taxation, tourism, and remittances of workers abroad. The Egyptian economy has gone through many stages, which cannot be mentioned, but Egypt's economic philosophy has changed from one regime to another. It has been behind the socialist system and once again it is behind the capitalist system and once again feels that the economy was without an identity. A great deal of corruption and randomness in taking a lot of economic decisions and as a result of directing a lot of attention to the service activity, tourism and media and the total neglect of the agricultural sector, the Egyptian economy is in a critical situation and Egypt has become importing almost 90% of wheat, the Egyptian invasion, and in light of the global inflation and the global economic crisis and in the absence of social support just for the poor in Egypt has become the people of Egypt is suffering severe suffering. The Egyptian countries should reconsider economic policies by seeking to secure and stimulate national capital to invest in the homeland by achieving security and security for it and protecting it from extortion and aggression by bribery, nepotism, bureaucracy and unfair taxation and giving it more incentives. In addition, officials should enact investment strategies that seek to preserve the natural resources and resources from all forms of abuse and exploitation, and to activate their control systems. These resources include: Nile water, sea water, mineral wealth, agricultural and desert land, waterways, Protect those wealth. Finally, the country must exploit its population inflation to strengthen investment and economic growth and apply a rule: not gain without effort, and effort without gain.

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