The Contribution of Domestic Investment, Exports and Imports on Economic Growth: A Case Study of Peru

Bakari, Sayef and Fakraoui, Nissar and Mabrouki, Mohamed

Department of Economics Sciences, Faculty of Economic Sciences and Management of Tunis, University of Tunis El Manar, (Tunisia), Department of Economics Sciences, Higher Institute of Companies Administration, University of Gafsa, (Tunisia)

1 January 2020

The Contribution of Domestic Investment, Exports and Imports on Economic Growth: A Case Study of Peru

Sayef Bakari

Department of Economics Sciences, Faculty of Economic Sciences and Management of Tunis, University of Tunis El Manar, (Tunisia)

Email: bakari.sayef@yahoo.fr

Nissar Fakraoui

Department of Economics Sciences, Higher Institute of Companies Administration, University of Gafsa, (Tunisia)

Email: fakraoui.nissar@yahoo.com

Mohamed Mabrouki

Department of Economics Sciences, MaCMA, Higher Institute of Companies Administration University of Gafsa, (Tunisia)

Email: mabroukimed@gmail.com

Abstract:

This article has examined the contribution of domestic investment, exports and imports on economic growth in Peru. To achieve this objective, annual data for the period between 1970 and 2017were used and tested based on Johansen co integration analysis and the vector error correction model. According to the results of the analysis, it has been determined that domestic investment, exports and imports have not any effect on economic growth in the short run and in the long run. These outcomes manifest that trade openness and domestic investments are not beholden as a provenance of economic growth in Peru over this extended period and suffer from many issues and a miserable economic organization.

Keywords: Domestic investment, Imports, Exports, Economic Growth, Peru

JEL Classification: E22, F14, O16, O47, O54.

1. Introduction

Domestic investment is an economic process used to meet the increase in aggregate demand as a result of the increase in the population and the improvement of income and living standards and meet their desires to the acquisition of luxury goods and tourism, and this requires more investments to meet the growing need in aggregate demand. It is one of the most important determinants of economic development because it is working to increase the productive capacity of the country through the production of new productive goods and develop them to be more efficient production over time. If domestic investment stops, aggregate demand decreases and the balance between aggregate demand and aggregate supply are disturbed. Investment moves a country's economy from recession to economic prosperity. The economic importance of investing in society comes not only through physical productive investment, but also through the social effects of investment. Of obsolete traditions and becomes more socially open.

On the other hand, international trade is considered one of the most important elements of the success and prosperity of the economy for all countries of the world; it shows its importance in its role which supports the benefit of each country from the advantages provided by other countries; These resources, if used in good ways, for export to countries of the world. International trade is a direct means of promoting international relations because of its role in connecting countries together. It contributes to the provision of many services and goods based on the principle of specialization that provides products at the lowest prices. It also supports marketing capacity by creating many new markets for diverse products. In addition, it helps to raise the welfare rate in society by providing many products that lead to a variety of individual choices for consumption and investment.

In the late 1980s, Peru was engulfed in a deadly political crisis, high financial debt and hyperinflation. To stabilize her economy and get out of this situation, she took the path of the International Monetary Fund (IMF) to borrow a large sum of money. In return, the country was forced to implement an economic strategy based on austerity to reduce spending and open the economy to trade. Unfortunately, these strategies and policies have killed the industrial and service sectors, which are leading to a worsening of unemployment rates. Annual GDP growth increased from -5% in 1990 to 5% in 1993. In 1997 and after 2002, GDP growth increased steadily from 6.5% a year. However, economic growth does not bring prosperity because the government is not able to correctly allocate wealth. This has led to

social conflict in many parts of the country. Given the dire economic situation in which Peru is facing. It is clear to us that domestic investment and trade openness are among the most essential solutions to subsidize the advancement of the country and to minimize the majority of these disasters.

In particular, this article tempts to empirically find out a response to the matter of whether there is a nexus between domestic investment, exports, imports and economic growth in Peru. The rest of the paper is organized as follows: Section 2 focuses on a review of literature on the link between domestic investment, trade openness and economic growth. Section 3 discusses the analytical framework and some methodological issues. Section 4 summarizes our empirical results. Section 5 concludes the paper.

2. Literature Survey

Trade openness and domestic investment are considered to be one of the most important macroeconomic variables for a country's growth. Many empirical and theoretical studies have attempted to explain the relationship between domestic investment, exports, imports and economic growth. Some of them have shown a positive link between them. Others say the impact is not significant, and a third group finds the effect of investment and trade openness on growth to be negative. The objective of this section is to provide an overview of the main studies that have examined the impact of domestic investment, exports and imports on economic growth based on their results.

2.1.Domestic investment and economic growth

Bakari and Tiba (2019) examined the impact of domestic investment on economic growth for the case of 24 Asian economies over the time span 2002-2017 through the use of the fixed and random effect models. They found that domestic investment positively influences economic growth. Bakari (2017a) investigated the impact of domestic investment on economic growth in Gabon for the period 1980 – 2015 by implanting co integration analysis and error correction model. Empirical analysis show that domestic investment cause economic growth in the short run however, he found that domestic investment has a negative effect on economic growth in the long run. Bakari et al (2019a) searched the effect of domestic investment on economic growth in the case of Brazil during the period 1970 – 2017. By using Vector Error Correction Model, empirical analysis show that domestic investment has a positive influence on economic growth in the short and the long terms. Bakari (2018)

explored the impact of domestic investment on economic growth in Algeria for the period 1969 – 2015. He used co integration analysis and error correction model. Empirical results indicated that domestic investment has a negative impact in the long run. But in the short run results proved that domestic investment cause economic growth. Bakari (2017b) looked for the contribution of domestic investment on economic growth in Malaysia during the period 1960 – 2015. To attempt his target, he use co integration analysis and error correction model. He reached that in the long run, domestic investment affects positively economic growth. Bakari et al (2018a) examined the nexus between domestic investment and economic growth in Nigeria by applying Vector Error Correction Model for the period 1981 – 2015. The empirical results indicate that there is no relationship between domestic investment and economic growth in the short run and in the long run. It is the same results founded by Bakari et al (2019b) for the case of Uruguay in the long run and in the short by using the same technique for the period 1960 – 2017. Fakraoui and Bakari (2019) investigated the impact of domestic investment on Indian's economic growth during the period 1960 – 2017. To attempt their aims, they applied co integration analysis and Vector Error Correction Model as empirical methodology. Empirical results show that in both short and long terms, there is no relationship between domestic investment and economic growth. For the case of Cameroon, Forgha et al (2014) studied the effect of domestic investment on economic growth. Based on Two Stage Least Squares as an estimation technique for a period of 34 years (1980-2013), the results reveal that domestic investment increases economic growth. Omri and Kahouli (2014) searched the relationship between domestic investment and economic growth in 13 MENA countries by using Generalized Method of Moments Model during the period 1990 – 2010. Findings show that there is bidirectional causality between domestic investment and economic growth. Mbulawa (2017) examined the impact of domestic investment on economic growth for the case of Botswana during the period 1985 -2015. By using co integration analysis, vector error correction model and ordinary least square, he found that domestic investment affect positively economic growth in the long run. Nayebyazid (2017) found that domestic investment has a positive effect on economic growth for the case of 18 Muslim Countries of MENA region during the period 2008 – 2014 by applying spatial econometric models. Again Bakari (2019) searched the relationship between domestic investment, taxes and economic growth in the case of France for the period 1972 – 2016. As econometric technique, he applied Sims's model (1980). Empirical results indicated that there is a negative relationship between domestic investment, taxes and economic growth in the long run. Similarly, Gungor and Ringim (2017) looked for the impact of domestic investment on economic growth for the

case of Nigeria and for the period of 1980 – 2015. They used Johansen co integration test, vector error correction model (VECM) and the Granger Causality Tests as estimation methods. Empirical analysis of VECM denoted that domestic investment has a negative effect on economic growth in the long run. However, the results of the Granger Causality tests proved that there is no relationship between domestic investment and economic growth in the short run. By applying the Auto-Regressive Distributive Lags (ARDL) approach, Bouchoucha and Bakari (2019) analyzed the impact of domestic investment on economic growth in Tunisia during the period 1976 – 2017. They discovered that domestic investment has a negative effect on economic growth in the long run. However, in the short run, they found that domestic investment has a positive effect on economic growth. Saibu (2013) examined the impact of private and public investments on economic growth in Nigeria for the period 1970 – 2010. By applying ordinary least square, he found that private and public investments on economic growth. Adams (2009) analyzed the impact of domestic investment on economic growth in Sub-Saharan Africa for the period 1990 – 2003. By employing OLS and fixed effects estimation, he found that domestic investment has negative on economic growth.

2.2.Exports and economic growth

Sooreea-Bheemul and Sooreea (2013) studied the impact of exports on economic growth for the period 1980 and 1998. They found that there is positive bidirectional causality between exports and economic growth in the short and long terms. For the case of India, Hussaini et al (2015) found that there is positive bidirectional causality between exports and economic growth in the long run during the period 1980 – 2013. They used as econometric techniques co integration analysis, VECM model and the Granger Causality Tests. Riyath and Jahfer (2016) used the same technique of Hussaini et al (2015) but for the case of Sri Lanka and for the period 1962 – 2015. They found that exports cause economic growth in the short run and in the long run. Faisal et al (2017) investigated also the nexus between exports and economic growth in the Saudi Arabia during the period 1968 – 2014. They applied co integration analysis and ARDL model. Empirical results prove that exports cause economic growth in the long run. Ozkan and Dube (2018) studied the relationship among foreign direct investment, export and economic growth of Ethiopia during the period 1970 – 2016. In their research, they used co integration analysis, Vector Auto Regression and the Granger Causality tests. They found that there is no co integration between all series in the long run. However, results of the Granger causality test indicated that export causes economic growth. Sunde (2017) used co integration analysis, ARDL model, VECM model and the Granger Causality tests to look into

the nexus between exports and economic growth in the case of South Africa during the period 1990 – 2014. Empirical results indicated that exports have a positive impact on economic growth in the short and the long terms. Stilling with the case of South Africa, Bakari and Ahmadi (2018) applied co integration and VECM model during the period 1960 – 2015, and they found that exports have a positive impact on economic growth only in the long run. Gokmenoglu et al (2015) searched the nexus between exports and economic growth in the case of Pakistan for the period 1976 – 2013 by employing co integration analysis and the Granger Causality tests. They denoted that there is no relationship between these two variables. Bakari (2017c) searched the nexus between exports and economic growth in Tunisia for the period 1965 – 2016. He employed co integration analysis, VECM model and the Granger Causality Tests. Empirical analysis indicated that exports have a negative effect on economic growth in the long run. However, there is bidirectional causality between exports and economic growth in the short run.

2.3.Imports and economic growth

Bakari (2017d) examined the nexus between imports and economic growth for the case of Sudan during the period 1976 – 2015. Results of co integration analysis and vector error correction model indicated that there is no relationship between imports and economic growth in the short run and in the long run. Bakari (2017e) investigated the impact of imports on economic growth in Egypt for the period 1965 – 2015. By involving co integration analysis and vector error correction model, he found that imports are seen as source of economic growth in the long and the short terms. Hamdan (2016) searched the nexus between imports and economic growth in 17 Arab Countries using the Gravity Statistic Model during the period 1995 – 2013. He discovered that imports have a positive incidence on economic growth. Bakari and Mabrouki (2017a) searched the nexus between imports and economic growth in Panama during the period 1980 – 2015. In order to achieve their goal, they applied co integration analysis, Vector Auto Regression Model and the Granger Causality Tests. Results showed that there is a unidirectional causality from imports to economic growth. Rai and Jhala (2015) found that there is positive bidirectional causality between imports and economic growth by using co integration analysis and the Granger Causality tests. Kartikasari (2017) analyzed the effect of import on economic growth in Riau Islands Indonesia during the period 2009 – 2016. By using fixed and random effect model, he found that imports have a negative impact on economic growth. Fannoun and Hassouneh (2019) investigated the relationship between imports and economic growth for the Palestinian economy over the

period 2000 – 2018, using quarterly data. They employed co integration analysis and vector error correction model. Finding confirmed the presence of bidirectional causality between imports and economic growth in the long run. Further, imports are found to Granger cause economic growth. By using the same empirical methodology and In the case of Tunisia, Bakari et al (2018b) examined the impact imports on economic growth. He discovered that imports have positive impact on economic growth in the short run and in the long run. Bakari and Mabrouki (2017b) examined the effect of imports on economic growth in Albania, Bosnia, Bulgaria, Croatia, Greece, Macedonia and Romania for the period 2006 – 2016. They employed the static gravity model as empirical methodology. Empirical outputs denoted that import has a negative incidence on economic growth.

3. Data, methodology and model specification

3.1.Data

The examination applied in this etude wrap annual time series of 1980 to 2017 or 38 observations which should be good enough to recapture the link between domestic investment, exports, imports and economic growth in Peru. The data set entails of observation for Gross domestic product (Constant US$), exports of goods and services (constant US$), imports of goods and services (constant US$) and Domestic Investment (Constant US$). All data set is collected from World Development Indicators 2018.

3.2.Methodology

We will involve the most suitable process which entails in the first place of establishing the grade of integration of each variable. If the variables are all integrated in level, we clench an estimate predicated on an ordinary linear square (OLS). On the other hand, if the variables are all integrated in the first difference, our estimates are based on an estimate of the Sims model. When we will apply the SIMS Model we will examine and determine the co integration between the variables, if the co integration test indicates the absence of co integration relation, we will use the model VAR. If the co integration test indicates the presence of a co integration relation between the different variables studied, the model VECM will be retained.

3.3.Model specification

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

$$\mathbf{Y_t = f(X, M, DI)} \quad \mathbf{(1)}$$

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

$$\mathbf{\log (Y)_t = \beta_0 + \beta_1 \log (X)_t + \beta_2 \log (M)_t + \beta_3 \log (DI)_t + \varepsilon_t} \quad \mathbf{(2)}$$

Where:

- ✓ β_0 is the constant term;
- ✓ $\beta_1$is the coefficient of variable (Exports);
- ✓ $\beta_2$is the coefficient of variables (Imports);
- ✓ $\beta_3$is coefficient of variable (Domestic Investment);
- ✓ t is the time trend;
- ✓ $\varepsilon$is the random error term assumed to be normally, identically and independently distributed.

4. Empirical analysis

4.1. Unit root tests

Augmented Dickey-Fuller (ADF) unit root test is used to examine the stationary properties for the long-run relationship of time series variables. Augmented Dickey-Fuller (ADF) test is based on the equation given below:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{j=1}^{k} d_j \Delta Y_{t_j} + \varepsilon_t \qquad (3)$$

Where;

- ✓ ε_t is pure white noise error term;
- ✓ Δ is first difference operator;
- ✓ Y_t is a time series;
- ✓ α_0 is the constant and;
- ✓ k is the optimum numbers of lags of the dependent variable.

The Augmented Dickey-Fuller (ADF) test determines whether the estimates of coefficients are equal to zero. The ADF test provides a cumulative distribution of ADF statistics.

Table 1: Unit Root Test

Variables	ADF Test		
	Constant	***Constant and Trend***	***None***
Y	(0.545061)	(2.452485)	(1.751293)
	[3.748500]***	[4.151035]**	[3.228003]***
DI	(0.316225)	(3.356704)*	(0.860157)
	[4.218579]***	[4.427504]***	[4.148668]***
M	(0.339699)	(2.375395)	(2.134502)
	[4.713352]***	[4.950966]***	[4.436780]***
X	(0.642905)	(2.431496)	(3.324264)
	[6.204946]***	[6.371356]***	[1.279507]

*****; ** and * denote significances at 1%; 5% and 10% levels respectively**
( ) denotes stationarity in level
[ ] denotes stationarity in first difference

Source: Calculations done by authors based on the Eviews 9 software

Table 1 shows the results of the Augmented Dickey-Fuller (ADF) test for the variables by level and at first difference. None of the variables are stationary at level but are stationary at first difference. Therefore, the Sims Model is suitable for the estimation of this study.

4.2.Co integration analysis

In order to choose the optimal lag length, we tested the general 5 lags system. The AIC and the HQ criteria suggested the same VAR order, as can be observed in Table 2; the AIC criterion and the HQ criteria suggest that the optimum lag is 5. However; SC criteria suggests that the optimum lag is 0. We concluded that 5 is the best choice for the lag length.

Table 2: Lag Order Selection Criteria

VAR Lag Order Selection Criteria						
Lag	Log L	LR	FPE	AIC	SC	HQ
0	174.7357	NA	2.73e-10	-10.67098	-10.48776*	-10.61025
1	186.7540	20.28095	3.53e-10	-10.42213	-9.506042	-10.11847
2	210.0182	33.44223	2.36e-10	-10.87614	-9.227184	-10.32956
3	225.3727	18.23350	2.82e-10	-10.83579	-8.453974	-10.04629
4	244.9640	18.36681	3.00e-10	-11.06025	-7.945560	-10.02782
5	290.7553	31.48151*	8.12e-11*	-12.92220*	-9.074647	-11.64685*

*** 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

Source: Calculations done by authors based on the Eviews 9 software

To check the existence of co integration relationships among domestic investment, exports, imports and economic growth, we will apply the Johansen's test. The following table presents the results of the latter test.

Table 3: Johansen Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value 0.05	Prob.**
None *	0.900778	123.0421	47.85613	0.0000
At most 1 *	0.639106	51.41965	29.79707	0.0001
At most 2 *	0.471013	19.82539	15.49471	0.0104
At most 3	0.002733	0.084847	3.841466	0.7708
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
*** denotes rejection of the hypothesis at the 0.05 level**				
****MacKinnon-Haug-Michelis (1999) p-values**				

Source: Calculations done by authors based on the Eviews 9 software

The findings in Table 3 evinces that the trace test denotes the existence of three cointegration relationships between the variables.

4.3.Estimation of the VECM model

4.3.1. Determination of the equation of long-term equilibrium

The equation of long-run equilibrium is introduced as follows:

$$\mathbf{Log(Y) = -0.174761 - 3.114725Log(DI) + 0.444532Log(X) + 5.452676Log(M)} \quad \mathbf{(4)}$$

According to this equation, we note that there is (i) a negative relationship between domestic investment and economic growth (a 1% increase in domestic investment leads to a decrease of 3.114725% of GDP), (ii) a positive relationship between exports and economic growth(a 1% increase in exports leads to an increase of 0.0.444532% of GDP), and (iii) a positive relationship between imports and economic growth (a 1% increase in imports leads to an increase of 5.452676% of GDP).

In order to prove the currency of the long-run equilibrium equation, we will pull out the equations of the vector error correction model and we will estimate the by applying the method of Gauss-Newton to check the significance of all variables in the long run. Also, we will verify the significance of variables in the short run by using a test of WALD.

4.3.2. Representation of the equations of the vector error correction model

The equations of the vector error correction model are depicted as follows:

$$D(DLOG(Y)) = C(1) * (DLOG(Y(-1)) - 0.444532267087 * DLOG(X(-1)) - 5.45267564164 * DLOG(M(-1)) + 3.1147249473 * DLOG(DI(-1)) + 0.174760712723) + C(2) * D(DLOG(Y(-1))) + C(3) * D(DLOG(Y(-2))) + C(4) * D(DLOG(Y(-3))) + C(5) * D(DLOG(Y(-4))) + C(6) * D(DLOG(Y(-5))) + C(7) * D(DLOG(X(-1))) + C(8) * D(DLOG(X(-2))) + C(9) * D(DLOG(X(-3))) + C(10) * D(DLOG(X(-4))) + C(11) * D(DLOG(X(-5))) + C(12) * D(DLOG(M(-1))) + C(13) * D(DLOG(M(-2))) + C(14) * D(DLOG(M(-3))) + C(15) * D(DLOG(M(-4))) + C(16) * D(DLOG(M(-5))) + C(17) * D(DLOG(DI(-1))) + C(18) * D(DLOG(DI(-2))) + C(19) * D(DLOG(DI(-3))) + C(20) * D(DLOG(DI(-4))) + C(21) * D(DLOG(DI(-5))) + C(22) \quad \textbf{(5)}$$

$$D(DLOG(X)) = C(23) * (DLOG(Y(-1)) - 0.444532267087 * DLOG(X(-1)) - 5.45267564164 * DLOG(M(-1)) + 3.1147249473 * DLOG(DI(-1)) + 0.174760712723) + C(24) * D(DLOG(Y(-1))) + C(25) * D(DLOG(Y(-2))) + C(26) * D(DLOG(Y(-3))) + C(27) * D(DLOG(Y(-4))) + C(28) * D(DLOG(Y(-5))) + C(29) * D(DLOG(X(-1))) + C(30) * D(DLOG(X(-2))) + C(31) * D(DLOG(X(-3))) + C(32) * D(DLOG(X(-4))) + C(33) * D(DLOG(X(-5))) + C(34) * D(DLOG(M(-1))) + C(35) * D(DLOG(M(-2))) + C(36) * D(DLOG(M(-3))) + C(37) * D(DLOG(M(-4))) + C(38) * D(DLOG(M(-5))) + C(39) * D(DLOG(DI(-1))) + C(40) * D(DLOG(DI(-2))) + C(41) * D(DLOG(DI(-3))) + C(42) * D(DLOG(DI(-4))) + C(43) * D(DLOG(DI(-5))) + C(44) \quad \textbf{(6)}$$

$$D(DLOG(M)) = C(45) * (DLOG(Y(-1)) - 0.444532267087 * DLOG(X(-1)) - 5.45267564164 * DLOG(M(-1)) + 3.1147249473 * DLOG(DI(-1)) + 0.174760712723) + C(46) * D(DLOG(Y(-1))) + C(47) * D(DLOG(Y(-2))) + C(48) * D(DLOG(Y(-3))) + C(49) * D(DLOG(Y(-4))) + C(50) * D(DLOG(Y(-5))) + C(51) * D(DLOG(X(-1))) + C(52) * D(DLOG(X(-2))) + C(53) * D(DLOG(X(-3))) + C(54) * D(DLOG(X(-4))) + C(55) * D(DLOG(X(-5))) + C(56) * D(DLOG(M(-1))) + C(57) * D(DLOG(M(-2))) + C(58) * D(DLOG(M(-3))) + C(59) * D(DLOG(M(-4))) + C(60) * D(DLOG(M(-5))) + C(61) * D(DLOG(DI(-1))) + C(62) * D(DLOG(DI(-2))) + C(63) * D(DLOG(DI(-3))) + C(64) * D(DLOG(DI(-4))) + C(65) * D(DLOG(DI(-5))) + C(66) \quad \textbf{(7)}$$

$$D(DLOG(DI)) = C(67) * (DLOG(Y(-1)) - 0.444532267087 * DLOG(X(-1)) - 5.45267564164 * DLOG(M(-1)) + 3.1147249473 * DLOG(DI(-1)) + 0.174760712723) + C(68) * D(DLOG(Y(-1))) + C(69) * D(DLOG(Y(-2))) + C(70) * D(DLOG(Y(-3))) + C(71) * D(DLOG(Y(-4))) + C(72) * D(DLOG(Y(-5))) + C(73) * D(DLOG(X(-1))) + C(74) * D(DLOG(X(-2))) + C(75) * D(DLOG(X(-3))) + C(76) * D(DLOG(X(-4))) + C(77) * D(DLOG(X(-5))) + C(78) * D(DLOG(M(-1))) + C(79) * D(DLOG(M(-2))) + C(80) * D(DLOG(M(-3))) + C(81) * D(DLOG(M(-4))) + C(82) * D(DLOG(M(-5))) + C(83) * D(DLOG(DI(-1))) + C(84) * D(DLOG(DI(-2))) + C(85) * D(DLOG(DI(-3))) + C(86) * D(DLOG(DI(-4))) + C(87) * D(DLOG(DI(-5))) + C(88) \quad \textbf{(8)}$$

4.3.3. Long-term and short-term results

The table 4 tables the final results of the estimation of the four equations of the vector error correction model.

Table 4 : Résultats à long terme et à court terme

	Y (5)	**M (6)**	**X (7)**	**DI (8)**
Y		(0.1740)	(0.2064)	(0.2091)
M	(0.7193)		(0.0252)**	(0.8105)
X	(0.2281)	(0.2751)		(0.6471)
DI	(0.7123)	(0.2939)	(0.0215)**	
ECT	[-0.021371]	[0.888672]*	[0.499938]*	[0.407122]

*****; ** and * indicate significance at 1%, 5% and 10%, respectively**

( ) denotes the value of the probability of the variables in the short term

[ ] denotes the significance of long-term co-integration equations

Source: Calculations done by authors based on the Eviews 9 software

4.3.3.1.Short run relationships:

To regulate the short-run linkage between economic growth, domestic investment, exports and imports in the vector error correction model, we will apply the WALD test. The econometric principle illustrates: (i) if the probability of the WALD test is less than 5%, then in that case we can say that the independent variable cause the dependent variable, and (ii) if the probability of the WALD test is greater than 5%, then in that case we can say that the independent variable don't cause the dependent variable.

In our condition, we observe that domestic investment, exports and imports don't cause economic growth. Only domestic investment and imports cause exports.

4.3.3.2.Long run relationships:

To check the significance of long-run relationships between the variables. The econometric principle illustrates that the coefficient of the error correction term (ECT) must be negative and have a probability of less than 5%

In our case, we note that:

For equations (5), (6), (7) and (8), the ECT is not significance. So we can say that there is no relationship between domestic investment, exports, imports and economic growth in the long run.

4.3.4. Diagnostic tests

To explore the robustness of our model and our results, we utilize a set of diagnostic tests. These are the heterodasticity tests (Breusch -Pagan-Godfrey / Harvey / Glejser / ARCH) and the Breusch-Godfrey Serial Correlation LM Test. The diagnostic tests show that the estimation results are acceptable because the probabilities of heterodasticity tests and the Breusch-Godfrey Serial Correlation LM test are greater than 5%.

Table 5: Diagnostic tests of equation (5)

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.003142	Prob. F(2,7)	0.9969
Obs*R-squared	0.027806	Prob. Chi-Square(2)	0.9862
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.407048	Prob. F(28,2)	0.5001
Obs*R-squared	29.50232	Prob. Chi-Square(28)	0.3874
Scaled explained SS	2.060526	Prob. Chi-Square(28)	1.0000
Heteroskedasticity Test: Harvey			
F-statistic	1.765071	Prob. F(28,2)	0.4261
Obs*R-squared	29.79429	Prob. Chi-Square(28)	0.3731
Scaled explained SS	30.84120	Prob. Chi-Square(28)	0.3242
Heteroskedasticity Test: Glejser			
F-statistic	1.747533	Prob. F(28,2)	0.4293
Obs*R-squared	29.78266	Prob. Chi-Square(28)	0.3737
Scaled explained SS	9.254681	Prob. Chi-Square(28)	0.9997
Heteroskedasticity Test: ARCH			
F-statistic	0.856911	Prob. F(1,28)	0.3625
Obs*R-squared	0.890855	Prob. Chi-Square(1)	0.3452

Source: Calculations done by authors based on the Eviews 9 software

Table 6: Diagnostic tests of equation (6)

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.329575	Prob. F(2,7)	0.3240
Obs*R-squared	8.534254	Prob. Chi-Square(2)	0.0140
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.636122	Prob. F(28,2)	0.7746
Obs*R-squared	27.87049	Prob. Chi-Square(28)	0.4713
Scaled explained SS	3.590925	Prob. Chi-Square(28)	1.0000
Heteroskedasticity Test: Harvey			
F-statistic	5.131266	Prob. F(28,2)	0.1760
Obs*R-squared	30.57440	Prob. Chi-Square(28)	0.3363
Scaled explained SS	34.79294	Prob. Chi-Square(28)	0.1760
Heteroskedasticity Test: Glejser			
F-statistic	0.951000	Prob. F(28,2)	0.6372
Obs*R-squared	28.83429	Prob. Chi-Square(28)	0.4210
Scaled explained SS	10.53636	Prob. Chi-Square(28)	0.9989
Heteroskedasticity Test: ARCH			
F-statistic	0.061507	Prob. F(1,28)	0.8059
Obs*R-squared	0.065756	Prob. Chi-Square(1)	0.7976

Source: Calculations done by authors based on the Eviews 9 software

Table 7: Diagnostic tests of equation (7)

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.304640	Prob. F(2,7)	0.7467
Obs*R-squared	2.482187	Prob. Chi-Square(2)	0.2891
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.364603	Prob. F(28,2)	0.5105
Obs*R-squared	29.45805	Prob. Chi-Square(28)	0.3896
Scaled explained SS	2.107675	Prob. Chi-Square(28)	1.0000
Heteroskedasticity Test: Harvey			
F-statistic	2.097371	Prob. F(28,2)	0.3743
Obs*R-squared	29.97903	Prob. Chi-Square(28)	0.3642
Scaled explained SS	20.38529	Prob. Chi-Square(28)	0.8500
Heteroskedasticity Test: Glejser			
F-statistic	1.797863	Prob. F(28,2)	0.4204
Obs*R-squared	29.81544	Prob. Chi-Square(28)	0.3721
Scaled explained SS	8.803841	Prob. Chi-Square(28)	0.9998
Heteroskedasticity Test: ARCH			
F-statistic	1.506661	Prob. F(1,28)	0.2299
Obs*R-squared	1.531852	Prob. Chi-Square(1)	0.2158

Source: Calculations done by authors based on the Eviews 9 software

Table 8: Diagnostic tests of equation (8)

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.185056	Prob. F(2,7)	0.8350
Obs*R-squared	1.556755	Prob. Chi-Square(2)	0.4592
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.057756	Prob. F(28,2)	0.5994
Obs*R-squared	29.03904	Prob. Chi-Square(28)	0.4105
Scaled explained SS	1.982197	Prob. Chi-Square(28)	1.0000
Heteroskedasticity Test: Harvey			
F-statistic	3.319626	Prob. F(28,2)	0.2577
Obs*R-squared	30.34702	Prob. Chi-Square(28)	0.3468
Scaled explained SS	36.45008	Prob. Chi-Square(28)	0.1315
Heteroskedasticity Test: Glejser			
F-statistic	1.559429	Prob. F(28,2)	0.4658
Obs*R-squared	29.64226	Prob. Chi-Square(28)	0.3805
Scaled explained SS	8.177270	Prob. Chi-Square(28)	0.9999
Heteroskedasticity Test: ARCH			
F-statistic	0.681595	Prob. F(1,28)	0.4160
Obs*R-squared	0.712926	Prob. Chi-Square(1)	0.3985

Source: Calculations done by authors based on the Eviews 9 software

5. Conclusion

This article examined the contribution of domestic investment exports, imports on economic growth in Peru. To achieve this objective, annual data for the period between 1980 and 2017 were used and tested based on Johansen co integration analysis and the vector error correction model.

According to the results of the analysis, it has been determined that there is no relationship between domestic investment, exports, imports and economic growth in the long run. Also, and based on the results of the WALD test, we noted that domestic investment, exports, and imports don't cause economic growth in the short run.

These results provide evidence that domestic investment, exports and imports have not been a cause of economic growth in Peru in the long and the short terms run. These results are in line with those of some of the literature examined in this article. They do not have to be interpreted to underestimate the role of trade and domestic investment in growth, which is, we argue, fundamental. However, they question the effectiveness of trade openness and domestic investment in Peru, and involve several possible explanations.

Some areas in Peru have been associated with poor economic performance due to lack of infrastructure, such as roads, railway networks, transportation, communications, public services, electricity, water supply, etc., which makes it difficult to invest in these areas.

In addition, the lack of effective government institutions to protect new investments and direct new wealth to society, the lack of human resources to enable these projects, and the lack of social organizations capable of exercising a counterweight to public and private affairs, are some of the reasons why investment and foreign trade are not reflected in indicators Economic growth. All these can be summarized by adopted economic policies, corruption and the lack of entrepreneurial spirit.

The results acquired command us to inspire the following recommendations in order to reinforce economic growth in Peru: (i) The government should propel more heed to the structure of trade and the nature domestic investment; (ii) The government should orient the trade openness and the domestic investment to more productive and intelligent projects in order to foster economic growth; (iii) The government must improve good governance policies in order to reduce institutional inefficiencies; (iv) The government must create new

strategies in order to eliminate the risks and uncertainty associated with capital investment, exports and imports; (v) and one of the best solution of Peru is domestic investment in the agricultural sector. Peru must increase the productivity of its agricultural sector, which provides for her food security, the increase of labor productivity in the rural economy, the creation of economies for the processes of urbanization and industrialization, and the progressive elimination of poverty. All these results can make a good base for the performance of trade and domestic investment to stimulate growth.

CONFLICTS OF INTEREST AND PLAGIARISM: The authors declare no conflict of interest and plagiarism.

References

Adams, S. (2009) 'Foreign Direct Investment, Domestic Investment, and Economic Growth in Sub-Saharan Africa', Journal of Policy Modelling, 31, 939–49.

Bakari, S. (2017a). The long run and short run impacts of exports on economic growth: Evidence from Gabon. The Economic Research Guardian. 7(1), 40-57.

Bakari, S. (2017b). The Impact of domestic investment on economic growth: New evidence from Malaysia. Journal of Smart Economic Growth, 2(2), 105- 121.

Bakari, S. (2017c). The Three-Way Linkages Between Export, Import and Economic Growth: New Evidence from Tunisia. Journal of Smart Economic Growth, 2(3), 13-53.

Bakari, S. (2017d). "Appraisal of Trade: Potency on Economic Growth in Sudan: New Empirical and Policy Analysis." Asian Development Policy Review, vol. 5, no. 4, pp. 213-225.

Bakari, S (2017e). "The Relationship between Export, Import, Domestic Investment and Economic Growth in Egypt: Empirical Analysis." EuroEconomica. Issue 2(36)/2017.

Bakari, S. (2018). The Impact of Domestic Investment on Economic Growth: New Policy Analysis from Algeria. Bulletin of Economic Theory and Analysis, 3(1), 35-51.

Bakari, S (2019). "If France Continues This Strategy, Taxes Will Destroy Domestic Investment And Economic Growth," Journal of Smart Economic Growth, , vol. 4(1), pages31-45, Mars.

Bakari, S and Ahmadi, A (2018). “Why is South Africa Still a Developing Country?”.International Academic Journal of Economics, Vol. 5, No. 2, 2018, pp. 1-19. ISSN 2454-2474.

Bakari, S & Fakraoui, N & Tiba, S (2019a). Domestic Investment, Export, Import and Economic Growth in Brazil: An Application of Vector Error Correction Model. Journal of Smart Economic Growth. Vol 4 No 2 (2019): 4-2-2019.

Bakari, S., & Mabrouki, M. (2017a). Impact of exports and imports on economic growth: new evidence from Panama. Journal of Smart Economic Growth, 2(1), 67-79.

Bakari, S and Mabrouki, M (2017b). "The Effect of Agricultural Exports on Economic Growth in South-Eastern Europe: An Empirical Investigation Using Panel Data". Journal of Smart Economic Growth. Volume 2, Number 4, Year 2017.

Bakari, S., Mabrouki, M., Elmakki, A, (2018b). The Impact of Domestic Investment in the Industrial Sector on Economic Growth with Partial Openness: Evidence from Tunisia," Economics Bulletin 38(1), 111-128.

Bakari, S & Mabrouki, M & Othmani A (2018a). "The Six Linkages between Foreign Direct Investment, Domestic Investment, Exports, Imports, Labor Force and Economic Growth: New Empirical and Policy Analysis from Nigeria". Journal of Smart Economic Growth, Volume 3, Number 1, Year 2018.

Bakari, S & Tiba, S., (2019). The Impact of Trade Openness, Foreign Direct Investment and Domestic Investment on Economic Growth: New Evidence from Asian Developing Countries. Economic Research Guardian 9(1), pages 46-54.

Bakari, S & Tiba, S & Fakraoui, N (2019b). "Does Domestic Investment Contribute to Economic Growth in Uruguay? What did the Empirical Facts Say?," MPRA Paper 95594, University Library of Munich, Germany.

Bouchoucha, N & Bakari, S, (2019). "The Impacts of Domestic and Foreign Direct Investments on Economic Growth: Fresh Evidence from Tunisia," MPRA Paper 94816,University Library of Munich, Germany.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of estimators of autoregressive time series with a unit root. Journal of the American Statistical Association, 74, 427-31.

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

Fakraoui, N & Bakari, S (2019). "Tie Among Domestic Investment, Exports And Economic Growth: Empirical Analysis From India," Journal of Smart Economic Growth, , vol. 4(1),pages 1-15, Mars.

Faisal F., & Tursoy., T & Resatoglu., N.G (2017). Is Export-Led Growth Hypothesis Exist in Saudi Arabia? Evidence from an ARDL Bounds Testing Approach. Asian Journal of Economic Modelling,2017, 5(1): 110-117.

Fannoun, Z & Hassouneh, I (2019). The Causal Relationship between Exports, Imports and Economic Growth in Palestine. Journal of Reviews on Global Economics, 2019, 8, 258-268.

Forgha, N. G., & Mbella, M. E., & Ngangnchi, F. H. (2014). External debt, domestic investment and economic growth in Cameroon: A system estimation approach. Journal of Economics Bibliography,1(1), 3-16.

Gokmenoglu., K.K. & Sehnaz., Z. & Taspinar., N (2015). The Export-Led Growth: A Case Study of Costa Rica. Procedia Economics and Finance. 25: 471-477.

Gungor, H., Ringim, S.H. (2017), Linkage between foreign direct investment, domestic investment and economic growth: Evidence from Nigeria. International Journal of Economics and Financial Issues, 7(3), 97-104.

Hamdan., B. S. S. (2016). The Effect of Exports and Imports on Economic Growth in the Arab Countries: A Panel Data Approach. Journal of Economics Bibliography. Volume 3 March 2016 Issue1.

Hussaini., S.H. & India., C & Abdullahi., B.A & India., C (2015). Exports, Imports and Economic Growth in India: An Empirical Analysis. Proceedings of the International Symposium on Emerging Trends in Social Science Research(IS15Chennai Symposium), 3-5 April 2015 Paper ID: C542.

Johansen, S. (1988). Statistical analysis of cointegration vectors. Journal of Economic Dynamics and Control, 12(2–3), 231 – 254.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in gaussian vector autoregressive models. Econometrica, 59, 1551-1580.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration, with applications to the demand for money. Oxford Bulletin of Economics and Statistics, 52, 169-210.

Kartikasari, D (2017). The Effect of Export, Import and Investment to Economic Growth of Riau Islands Indonesia. International Journal of Economics and Financial Issues, 2017, 7(4), 663-667.

Mbulawa, S. (2017). The impact of economic infrastructure on long term economic growth in Botswana. Journal of Smart Economic Growth, 2(1), 15-33.

Omri, A & Kahouli, B.(2014). The nexus among foreign investment, domestic capital and economic growth: empirical evidence from the MENA region, Research in economics,Vol.68; Issue 3,pp.257-263.

Ozkan., B & Dube., A.K (2018) Export, Foreign Direct Investment (FDI) and Economic Growth in Ethiopia: VAR Analysis. Open Access Journal of Agriculture Research. Volume 2018; Issue 03.

Rai., S. K. & Jhala,. P. (2015). Impact of Exports and Imports on Growth Rate of India: An Empirical Enquiry. Pacific Business Review International. Volume 8 issue 6 December 2015.

Riyath,. M.I.M & Jahfer,. A (2016). Exports, Imports and Economic Growth in Sri Lanka: Evidence from Causality and Co-Integration Analysis. 5th Annual International Research Conference-2016. Faculty of Management and Commerce-SEUSL.

Saibu O.M. (2012). Energy Resources, Domestic Investment and Economic Growth: Empirical Evidence from Nigeria, Iranica Journal of Energy & Environment 3(4): 321-329.

Sims, C. A. (1980). Macroeconomics and Reality. Econometrica, 48(1), 1-48.

Sooreea-Bheemul, B., & Sooreea, R. (2013). Missing causality links between foreign direct investment, exports, domestic investment and economic growth. International Journal of Business and Emerging Markets, 5(4),322–340. http://dx.doi.org/10.1504/IJBEM.2013.056713

Sunde, T (2017). "Foreign direct investment, exports and economic growth: ADRL and causality analysis for South Africa," Research in International Business and Finance, Elsevier, vol. 41(C), pages 434-444.