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Abstract:

This paper analyzes the relationship between economic growth, export and import in Morocco. VAR modeling techniques and Granger causality are used in empirical work. The study showed a causal effect ranging from economic growth in exports. Evidence shows that economic growth favors exports. However, there is no effect that goes for export to growth. In addition, there is no relationship between imports and economic growth.

Keywords: Economic growth, Exports, Imports, VAR, Causality, Morocco.

JEL classification: F10, F13, F14.

I.   Introduction :

Exports of goods and services are seen as a driver and a fundamental source of economic and social development through their power (i) to influence economic growth (ii) to reduce poverty (iii) to constitute a source of foreign exchange inflows to cope with imports, (iv) and

to constitute a potential component of government revenue through the customs duties that they may generate.

In some cases, imports of goods and services can also consider as an important factor to stimulate economic growth. If new technologies are incorporated into imports of intermediate goods such as machinery and equipment, the national economy can have a rapid and innovative productivity, which can achieve long-term sustainable economic growth.

Since its independence, Morocco has been characterized by a liberalization of foreign trade; this liberalization has become more remarkable and more flamboyant since the beginning of the 80s. This policy tries to reach mainly to integrate the Moroccan economy in the economic world and to participate in the fortifications of the multilateral trading system.[1]

For this reason, Morocco has achieved a number of free trade agreements to consolidate and strengthen the process of economic liberalization and integration into the global economy. Among these are the Association Agreement with the European Union, the Free Trade Agreement with the United States and Turkey, the European Free Trade Association (EAFT), the Regional Agreement Free-), Bilateral Free Trade Agreement with Jordan, Tunisia and Egypt, Extended Arab Free Trade Agreement (GAFTA) and Preferential Trade Agreements (PTA) with Saudi Arabia, Algeria, Libya, Mauritania, the Republic of Guinea and Chad.[2]

All these agreements are a great opportunity for Morocco to develop its exports and imports mainly: agricultural products and textiles. They have also enabled Morocco to benefit from direct investment and to benefit from strong domestic demand from these countries.

The general objective of this study is to look into the tie among exports, imports and economic growth in Morocco. To get at this objective, this article is constructed as follows. In section 2, we tabulate a literature survey that focuses on the link between exports, imports and economic growth. Second, we will discuss the specification of the methodological model and the data used in this paper in Section 3. Third, Section 4 presents the empirical results as well as the analysis of the results. Finally, section 5 is devoted to our conclusion.

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[1] Elbehri, A and T. Hertel, (2004), "A Comparative Analysis of the EU-Morocco FTA vs. Multilateral Liberalization", GTAP Working Paper No. 30
[2] Invest in Morocco: http://www.invest.gov.ma

II. Literature Survey

In this section, we will debate the empirical studies that concentrate on the relationship between imports, exports and economic growth in the case of developing countries and of time series analysis.

Table n°1: Empirical studies concerns the nexus between exports, imports and economic growth

No	Authors	Countries	Periods	Econometrics Techniques	Keys Findings
1	Alavinasab (2013)	Iran	196 - 2010	OLS Cointegration Analysis	X => Y M => Y (-)
2	Velnampy and Achchuthan (2013)	Sri Lanka	1970- 2010	OLS	X => Y M => Y
3	Cambazoglu and Karaalp (2014)	Turkey	1980- 2010	VAR	X => Y M # Y
4	Gokmenoglu et al (2015)	Pakistan	1967-2013	Cointegration Analysis Granger Causality Tests	X # Y M <= Y
5	Altaee and al (2016)	Saudi Arabia	1980- 2014	Cointegration Analysis VECM	X => Y M # Y
6	Bakari (2017a)	Sudan	1976- 2015	Cointegration Analysis ECM Granger Causality Tests	X # Y: LR M # Y: LR X # Y: SR M # Y: SR
7	Bakari (2017b)	Tunisia	1965- 2016	Cointegration Analysis VECM Granger Causality Tests	M => Y : LR X => Y : LR (-) X <= Y : LR M => Y : SR X <=> Y: SR
8	Bakari and Mabrouki (2017)	Panama	198 - 2015	Cointegration Analysis VAR Granger Causality Tests	X => Y M => Y
9	Bakari (2018)	Algeria	1969- 2015	Cointegration Analysis ECM Granger Causality Tests	X => Y: LR M => Y: LR X # Y: SR M # Y: SR
10	Bakari and al (2018)	Nigeria	1981- 2015	Cointegration Analysis VECM Granger Causality Tests	X # Y: LR M # Y: LR X # Y: SR M <=> Y: SR

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.

In the next section, we will identify our methodology and our model specification to examine the nexus between imports, exports and economic growth in Morocco which are inspired from the studies that clarified in our literature survey.

III.   Methodology

The procedure adopted in this methodology goes through three stages. First, it is necessary to study the stationary of time series using Dickey and Fuller's (1979, 1981) test strategy. Then, if all the series are stationary, we estimate a VAR model with "p" delays and apply the Granger causality test. The data used are from the World Bank's data bank and cover the period from 1960 to 2015.

The method adopted is to use a VAR model with three variables. Considering the time series of growth (G_t), exports (EX_t) and imports (IM_t) consider as endogenous. A model of simultaneous structural equations can be constructed to explain their behavior. Assuming that each variable depends on its delayed values and delayed values of the other three variables.

We can build the following VAR model:

$$
\begin{cases}
G_t = a_{10} + a_{11}G_{t-1} + ... + a_{1P}G_{t-P} + a_{21}EX_{t-1} + ... + a_{2P}EX_{t-P} + a_{31}IM_{t-1} + ... + a_{3P}IM_{t-P} + u_{1t} & (1) \\
EX_t = b_{10} + b_{11}G_{t-1} + ... + b_{1P}G_{t-P} + b_{21}EX_{t-1} + ... + b_{2P}EX_{t-P} + b_{31}IM_{t-1} + ... + b_{3P}IM_{t-P} + u_{2t} & (2) \\
IM_t = c_{10} + c_{11}G_{t-1} + ... + c_{1P}G_{t-P} + c_{21}EX_{t-1} + ... + c_{2P}EX_{t-P} + c_{31}IM_{t-1} + ... + c_{3P}IM_{t-P} + u_{3t} & (3)
\end{cases}
$$

These equations define a VAR model, because in general, such a model expresses the current values of the endogenous variables only as a function of constant and delayed values of the endogenous variables. The number of lagged values determines the order of the VAR model and the terminology implies that this model is an extension of the autoregressive process time series of order p (AR (P)) which can be explained by formulating the vector by the equation next:

$$
Y_t = \delta + \theta_1 Y_{t-1} + \theta_2 Y_{t-2} ...... + \theta p Y_{t-p} + V_t \qquad (4)
$$

The estimation of such a model supposes the stationarity of the different variables. This means that the random vector Yt has a constant expectation (E (Yt) = m) over time and the covariance matrices between Yt and Yt + h depends only on h and not on time (h = 0.1, ...), which means for h = 0, cov (Yt) does not change over time.

It should be noted that in practice these hypotheses mean that the time series do not have seasonal trends and patterns or the variances that change over time. To make these assumptions, or these conditions, some transformations on the data are necessary.

Table n ° 2: Results of the ADF stationarity test

Variable	Stationarity
$Log\ (G)$	Stationary difference first, at the threshold of 5%, with constant
$Log\ (EX)$	Stationary difference first, at the threshold of 5%, with constant
$Log\ (IM)$	Stationary difference first, at the threshold of 5%, with constant

Table n° 3: The Johanson cointegration test

Hypothesize No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Probability
r < 0	0.193191	21.39841	29.79707	0.3333
r < 1	0.140846	9.806331	15.49471	0.2959
r < 2	0.029353	1.608770	3.841466	0.2047

Table n ° 4: Lag order selection Criteria

Number of lag	Log L	LR	FPE	AIC	SC	HQ
0	-20.52222	NA	0.000505	0.922440	1.036077	0.965864
1	**155.6423**	**324.6954***	**7.19e-07***	**-5.633032***	**-5.178484***	**-5.459336***
2	162.5361	11.89513	7.84e-07	-5.550434	-4.754977	-5.246466
3	168.3007	9.268616	8.99e-07	-5.423557	-4.287189	-4.989317
4	175.0865	10.11222	1.00e-06	-5.336727	-3.859448	-4.772215
5	184.7335	13.24095	1.01e-06	-5.362099	-3.543910	-4.667315

Table n ° 5: Estimation of the VAR model

	$Log\ (G)$	$Log\ (EX)$	$Log\ (IM)$
$Log\ (G(-1))$	0.937314 (0.12581) **[7.45039]**	0.411544 (0.16340) [2.51866]	0.064521 (0.16240) [0.39730]
$Log\ (EX(-1))$	-0.060166 (0.10328) [-0.58253]	0.720908 (0.13415) **[5.37408]**	0.117170 (0.13333) [0.87883]
$Log\ (IM(-1))$	0.096467 (0.08943) [1.07872]	-0.081693 (0.11615) [-0.70336]	0.825029 (0.11544) **[7.14699]**
C	0.725702 (0.61236) [1.18508]	-1.627579 (0.79533) [-2.04641]	-0.117914 (0.79047) [-0.14917]
R^2	**0.993859**	0.992311	0.992921
R^2 adjusted	0.993497	0.991859	0.992505

Table n° 6: Granger causality test results

Hypothesis:	Observation	F-Statistic	Probability
Log (EX)does not Granger Cause Log (G)	55	0.03601	0.8502
Log (G) does not Granger Cause Log (EX)	55	6.27785	**0.0154**
Log (IM) does not Granger Cause Log (G)	55	0.87150	0.3549
Log (G) does not Granger Cause Log (IM)	55	1.44572	0.2347
Log (IM) does not Granger Cause Log (EX)	55	0.33361	0.5660
Log (EX)does not Granger Cause Log (IM)	55	2.08770	0.1545

IV. Interpretation and discussion of the results

The estimation results of the VAR models, prove the existence of a positive relationship between GDP growth and export, with a coefficient of 2.51866 (Table 5), statistically significant at the 5% threshold. In addition, the Granger test proves a causal effect that ranges from economic growth to export (equal probability 0.0154, (Table 6), which proves that economic growth favors export. There is no export-to-growth effect, and we note the lack of a statistically significant relationship between growth and imports.

Thus, exports do not play this role of anchoring economic growth. The absence of such an influence can be explained, among other things, by the effect that the growth of the Moroccan economy has been driven by domestic demand despite export promotion policies. According to the report of the Office of the High Commissioner for Planning (2005) the contribution of net exports to growth was in the order of -0.8 points for the period (1960 - 1971) and - 0.7 points for the period (1974 - 2004).

The same report explains these results from the loss of market shares following the fierce competition from competing countries. This proves the failure of the import substitution policy, the share of exports of goods and services in GDP remained almost stable at a level of 23% of GDP.

It should also be noted that Morocco's export growth rate declined in the 2000s and was on average lower than that of middle-income countries. According to a study by the Ministry of the Economy and Finance (2013), the underperformance of exports on the world market is explained by exports dominated by agricultural products, chemicals and textiles. In fact, the structure of Moroccan exports suffers from a lack of diversification, a low degree of sophistication and a specialization in low value-added products.

Also, lower level of external demand for Morocco has negatively affected exports. In addition, the considerable rise in commodity prices has contributed to the rise in imports. According to Vergne (2014), the Moroccan economy is characterized by a low qualification of human resources and a mismatch between supply and demand for work, which constitutes a major handicap for the competitiveness of the Moroccan productive fabric and impede the development of higher value-added value chains. In this context, imports are growing at a faster pace than exports. Thus, the rate of coverage of imports by exports has declined since the beginning of the 2000s.

V. Conclusion

In this work we have attempted to address the relationship between economic growth, export and import, using VAR modeling and Granger causality techniques. The study showed the existence of a causal effect that goes from economic growth to export, which proves that economic growth favors export. However there is no effect that goes from exporting to growth.

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