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February 2018

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Abstract:

The contribution of this paper is investigating the influence of agricultural exports and agricultural imports on economic growth in North Africa Countries since it's never been processed before. To endeavor this purpose annual data was collected for the period 1982 – 2016 and was tested by using correlation analysis and the static gravity model. Empirical analyses show that agricultural trade has a positive correlation with gross domestic product, but it appears that agricultural exports and gross domestic product have a weak correlation. The static gravity model estimation shows that agricultural exports have a positive on economic growth. However, agricultural imports have not any effect on economic growth. These results appear that agricultural exports are a fountain of economic growth in North Africa Countries. For this reason, it is very important to refine agricultural investment, and create more dynamic agricultural trade openness policies.

Keywords: Agricultural Exports, Agricultural Imports, Economic Growth, Correlation Analysis, Static Gravity Model, North Africa.

I.   Introduction:

Economic growth is currently one of the main goals that all countries seek to achieve, whether developed or developing, as economic development cannot be expected to achieve high and continuous rates of economic growth. Foreign trade in their import and export operations is of great importance in the process of economic growth as economists agreed on the importance of trade in driving economic growth and the main engine of economic development. They become however less evident when a distinction is made between diversify trade and economic growth.

However, very slight studies have examined simultaneously the influence of agricultural exports and agricultural imports for economic growth. Moreover, such an empirical pursuit has never been done before in the context of North African Countries.

In this article, we seek to make a bridge over these vacuums by inspecting the impact of agricultural exports and agricultural imports on economic growth in each of Algeria, Egypt, Morocco and Tunisia. Our methodology relies on Static Gravity Model for the period 1982 - 2016.

The rest of the article is organized as follows. Section 2 instituted on a survey of literature. Section 3 elucidates the data characterization and methodological structure. Empirical results and analysis are taken into account in next coming Section 4. Section 5 terminates the study along with recommendations.

II.   Literature survey

When we look at the historical ladder of studies and scientific research that focused on evaluating the impact of trade (exports and imports) on economic growth, we find many researches and many different results of creativity. Among the studies that have shown that an expansion of trade has a significant positive impact on economic growth are Michaely, (1977); Balassa, (1978); Savvides, (1995); Asmah, (1998); 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). In addition, and in another sense of economic thought, there are several studies that have talked about the importance of export and import diversification of economic growth as Vernon (1966); Krugman (1979); Agosin

(2007); Lederman and Maloney (2007). On the other hand, other studies have shown that the diversification of exports and imports are not a source of economic growth as Rodrik (2006). We will divide this section into two parts; the first describes the literature review that includes the relationship between exports, imports, and economic growth. On the other hand, the second describes the review of the literature which includes the relationship between the diversification of trade (exports and imports (agricultural, industrial, manufactured goods, etc.) and economic growth. On the other hand, we will choose a set of studies that are analyzed in the context of the developing country and especially in the context of African countries, as well as time series studies that are related to certain countries included in our sample.

1) Trade and economic growth

Abou-Stait (2005) examined the nexus between exports and economic growth in Egypt by using VAR Model and the Granger Causality Tests. To achieve his goal, he took two annual periods to make his analysis. In the first period (1977 – 2003) he found that there is unidirectional causality from export to economic growth. In the second period (1991 – 2003), he found that there is no causality between exports and economic growth. As conclusions and recommendations for the empirical analysis, he indicated that there remain a variety of issues that need to be addressed, including further trade liberalization, further tariff revisions, non-tariff barriers, exchange rate policies, the building up of an efficient service infrastructure. El Alaoui (2015) studied the nexus between exports, imports and economic growth for the Moroccan economy over the period 1980 – 2013. Empirical analysis shows that there is bidirectional causality between economic growth and imports but there is no-directional causality between economic growth and exports. Saaaed and Hussain (2015) studied the impact of exports and imports on economic growth in Tunisia over the period 1977 – 2012. By applying the cointegration analysis and the Granger Causality Tests, they found that exports and imports don't cause economic growth, however economic growth cause imports. As a conclusion, they indicated that only imports are seen as the source of economic growth in Tunisia; however exports are not robust factor to stimulate Tunisian's economic growth. Bakari and Mabrouki (2017a) investigated the nexus between exports, imports and economic growth in Panama for the periods between 1980 and 2015. Their empirical analyses (by using VAR Model) show that exports and imports cause economic growth. In their conclusion, they confirm that the reason of these results is the strong strategy in customs barriers, benefited by a lot of several international agreements and take advantage of its strategic location. Bakari

(2017a) search in another study the nexus between domestic investment and economic growth in Malaysia by using labor and exports as variables of control. He found that exports have a positive influence on economic growth in the long run. This result is explained by the strong investment and the higher quality of exports products in Malaysia. Bakari (2017b) examined empirically by using the VECM Model the relationship among exports, imports and economic growth in Tunisia. In the long run, he found that the total of exports affect negatively economic growth, however, he found that total of imports affect positively economic growth. As a recommendation in this study, Tunisia must refinish its strategy of trade opening and especially their exports by encouraging productivity in the agricultural sector because Tunisia exploit only30% of the agricultural land with traditional means and technology which are not innovating. Again Bakari (2017c) studied the nexus between domestic investment, exports, imports and economic growth in Egypt by using the same econometric technique and the same periods in the case of the study concerning Tunisia country. He found the same results which confirm that in the long run exports have negative impact on economic growth and imports have a positive impact on economic growth. The study had show and had explains that domestic investment and exports in Egypt suffer of a lot problem and poor economic strategy; however, imports are directed with effective strategies to stimulate economic growth. Bakari (2017d) examined the appraisal of trade potency on economic growth in Sudan, he found that only economic growth cause imports in the short run. However, there is no relationship between exports, imports and economic growth in the long run. Bakari (2017e) investigated the impact of exports on economic growth in the case of Gabon in the long run and the short run. The empirical results show that in the long run, investment and exports affect negatively on economic growth. However, in short run investment and export cause economic growth. These results provide evidence that investment and exports are necessary in Gabon's economy and are presented as an engine of growth since they cause economic growth in the short term. But they are not carried out and treated with a solid and fair manner. Bakari and Ahmadi (2018) search for the reason "why is South Africa still a developing country?" using annual data from 1960 -2015 and focusing on the impact of imports, exports and domestic investment on economic growth in the long run and the short. In the long run, empirical results show that exports have a positive effect on economic growth however; imports have a negative effect on economic growth. In the short run empirical result shows that there is no relationship between variables. As conclusions and recommendations, Bakari and Ahmadi (2018) induced and persuade that the reason who make South Africa still a developing country is the weakness of investment and exports in agricultural sector

(according to static making in their article only the contribution of the agricultural sector in GDP is 3%). Also they noted that the majority of imports are in the agricultural sector and are making in the consummation not for production like industrial exports which can encourage the production in investments.

2) Diversification of trade and economic growth

Torayeh (2011) investigated the impact of manufactured exports, export of textiles and clothing, exports of chemical products and exports of food products on economic growth in Egypt during the period 1980 – 2008 by applying cointegration and causality analysis. In the long run, he found that there is a relationship between all variables. And, in the short run, the Granger causality show that manufactured exports and exports of chemical product cause economic growth. Oluwatoyese and al (2016) examined the nexus between agricultural export, oil export and economic growth in Nigeria for the period between 1981 and 2014. In their analysis, they applied the cointegration analysis and Vector Error Correction Model to attempt their aim. Empirical analysis show that in the long run agricultural export and oil export cause economic growth, however, only oil export can cause economic growth in the short run. Mehrara and Baghbanpour (2016) examined the contribution of industry and agriculture exports to economic growth in 34 developing countries in the period 1970 – 2014 by using the static gravity model they found that agricultural exports have no effect on economic growth. However industry exports have a positive effect on economic growth. Uremadu and Onyele (2016) examined empirically the impact of total agricultural exports, exports of cocoa and exports of rubber on economic growth in Nigeria from 1980 to 2014. They found that only total agricultural exports have a positive effect on economic growth. Toyin (2016) examined the causality relationship between agricultural exports and economic growth in South Africa for the time period 1975 – 2012. By using VAR Model and the Granger Causality Test, he found that there is no existence of causality between the agricultural export and GDP. Bakari (2017f) looked for the impact of vegetables exports on economic growth in Tunisia for the periods 1970 – 2015. By using the cointegration analysis of Vector Error correction Model, he found that vegetables exports have a positive effect on economic growth in the long run and in the short run. In the same context of the impact of agricultural product exports in Tunisia, Bakari (2017g) investigated the impact of olive oil exports on economic growth; he found that olive oil exports have a positive incidence on Tunisian economic growth in the long term and in the short run. Still in the same context, Bakari (2018) analyzed the effect of citrus exports on economic growth for the periods 1970

and 2016, he found that citrus exports have not any influence on economic growth in the long run, but the results show that citrus exports have a positive effect on economic growth. His study provides that citrus exports are not seen as source of economic growth in Tunisia. Bakari and Mabrouki (2017b) searched for the effect of agricultural exports on economic growth in South Eastern Europe Countries for the period 2006 – 2016. By using correlation analysis and the static gravity model, they found that agricultural exports have a positive strong correlation with gross domestic product and have positive effect on economic growth. Elmakki and al (2017) investigated the nexus between industrial exports and economic growth in Tunisia for the period 1969 – 2015 by using Vector Error Correction Model. They found in their empirical analysis that there is a negative effect between industrial exports and economic growth in the long run. In the short run, empirical analyses provide the absence of a causal relationship between industrial exports and economic growth. These results are explained by the poor quality of the exported industrial products by the lack of technological innovations facing an international market characterized by a brutal competition exerted by the European exporters. Mahmood and Munir (2017) investigated the relationship between agricultural exports and economic growth in Pakistan by using Johansen co-integration and Engle–Granger causality tests for 45 time series annul observations from 1970 to 2014. Empirical results winds up that agricultural export have positive effect on economic growth, but this affect is insignificant. However, results show that economic growth have positive effect on economic growth. These may be explained by the inability of agricultural exports to compete in international markets because of the high competitiveness and low quality of exported agricultural products. Ahmed and Sallam (2018) examined the long and short run relationship between agricultural exports and economic growth in the agricultural sector for the period 1970 to 2013 by using cointegration analysis, error correction model (ECM) and generalized autoregressive conditional heteroskedasticity (GARCH) models. They found that there is a positive relationship between agricultural exports and economic growth in the long run and the short run.

In this section, we can conclude that according to the recent study which are making in the context of developing countries and especially in North Africa counties that exports generally have negative effect on economic growth. However it seen that imports have positive effect on economic growth. In addition, we can conclude that exports in the agricultural sector have a positive effect on economic growth however industrial exports have a negative influence especially in the case of Tunisia and Egypt. Finally, we can note the absence of studies

concerning the influence of agricultural imports on economic growth which support our contribution in this work by studying the nexus between diversification imports and economic growth.

III. Data, methodology and model specification

1) Data description

The selected countries respect the ranking and analysis of the World Bank. The sample includes the countries of North Africa depending on the availability of data. In total, our sample comprises 4 countries (Morocco, Algeria, Tunisia and Egypt), and the estimation period is from 1982 to 2016.

2) Variable and sources of Data

To Study the impact of agricultural trade for economic growth, we will apply a linear estimation of panel data that has 4 variables whose reason to clarify and properly determine this effect. The following table defines the variables and the data source of each variable.

Table 1: Description of variables

No	Variable	Description	Source
1	Y	Gross domestic product (constant US $)	The World Bank / Perspective Monde
2	K	Gross fixed capital formation (constant US $)	The World Bank / Perspective Monde
3	AX	Agricultural Exports (constant US $)	The World Bank
4	AM	Agricultural Imports (constant US $)	The World Bank

3) Model specification and empirical methodology

To determine the effect of impact of agricultural trade (agricultural export and agricultural import) for economic growth in our case, we will apply an estimate based on a production function that describes the situation of countries characterized by an open economy includes domestic investment, agricultural exports and agricultural imports. The basic model is written and modeled as follows:

$$Y = F\,(K, AX, AM)\ \ (1)$$

$$Y_{it} = A\,K^{\beta_1}\,AX^{\beta_2}\,AM^{\beta_3}\ \ (2)$$

$$Log(Y_{it}) = Log(A) + \beta_1 Log(K_{it}) + \beta_2 Log(AX_{it}) + \beta_3 Log(AM_{it}) + \varepsilon_{it}\ \ (3)$$

$$Log(Y_{it}) = \beta_0 + \beta_1 Log(K_{it}) + \beta_2 Log(AX_{it}) + \beta_3 Log(AM_{it}) + \varepsilon_{it}\ \ \ (4)$$

The augmented production function including all these variables is expressed in equation (2): {'A' show the level of technology utilized in the country which is assumed to be constant. The returns to scale are associated with capital (K), agricultural exports (AX) and agricultural import (AM), which are shown by β_1, β_2 and β_3 respectively}. In equation (3), we can see that all the variables are turned into logarithms in rhymester to invent linear the nonlinear form of Cobb-Douglas production. Finally, we keep the technology constant and which is expressed in equation (4).

In panel data, there are various manners to model individual heterogeneity, inclusive, utilizing the fixed effects model and the random effects model. The estimation of the first can be accomplished by MCO on a model corresponding to the divisions to the individual means. For the second, the MCO estimator is not efficient, whereas the MCG estimator is good. To pick out between the two models, we will involve the Hausman test, which is a test for the lack of correlation of specific effects and regresses.

IV. Analyses and results

The correlation between the dependent and independent variables is presented in Table 2. The correlation coefficient of all variables suggests that there is a positive correlation between the dependant variable and the independent variables. The correlation between agricultural exports and growth is low, but the correlation between agricultural imports and economic growth is strong. It should also be noted that the correlation between domestic investment and economic growth is strong. We estimate equation (4) which including our variables by using the static gravity model. The results of the estimation of Fixed Effect Model are presented in the table 3 which indicates that domestic investment and agricultural exports have a positive influence on economic growth. However, agricultural imports have any effect on economic growth. Table 4 present the results of the estimation of Random Effect Model, which indicate that all variables have a positive effect on economic growth. In table 5 we will apply the Hausman Test. This technique is the most important in our empirical analysis. The aim of the Hausman Test is to state and choose our most appropriate model, whether fixed or random. If the probability of the Hausman Test is minimal than 5%, in this case the fixed-effect model is significant and will be kept. However, if the probability of the Hausman Test is major than 5%, in this case the random effect model is significant and will be possessed. In our case, we have the probability of the Hausman Test is less than 5% to a value equal to 0.00%. This denotes that the fixed effect model is significant and will be retained.

Table 2: Correlation between the various variables

	Y	AX	DI	AM
Y	1			
AX	0.3587	1		
DI	0.8220	0.1061	1	
AM	0.9463	0.2659	0.8545	1

Table 3: Estimation of Fixed Effect Model

Dependent Variable: LOG(Y)				
Method: Panel Least Squares: Fixed Effect				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.958597	0.630912	11.02943	0.0000
LOG(DI)	0.561520	0.054953	10.21828	0.0000
LOG(AX)	0.219865	0.024378	9.018959	0.0000
LOG(AM)	0.010079	0.061562	0.163723	0.8702
R-squared	*0.968294*	*Durbin-Watson stat*	*0.334180*	
Adjusted R-squared	*0.966864*	*Prob(F-statistic)*	*0.000000*	

Table 4: Estimation of Random Effect Model

Dependent Variable: LOG(Y)				
Method: Panel EGLS (Cross-section random effects)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.856107	0.399243	9.658557	0.0000
LOG(DI)	0.407999	0.041819	9.756251	0.0000
LOG(AX)	0.059982	0.008984	6.676494	0.0000
LOG(AM)	0.466020	0.040268	11.57293	0.0000
R-squared	*0.943477*	*Prob(F-statistic)*	*0.000000*	
Adjusted R-squared	*0.942230*	*Durbin-Watson stat*	*0.296854*	

Table 5: Hausman Test

Correlated Random Effects - Hausman Test				
Test cross-section random effects				
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		104.105211	3	0.0000
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
LOG(DI)	0.561520	0.407999	0.001271	0.0000
LOG(AX)	0.219865	0.059982	0.000514	0.0000
LOG(AM)	0.010079	0.466020	0.002168	0.0000

According to the results of our estimation (based on the output of the estimation of the Fixed Effect Model), it seen that agricultural exports have a positive on economic growth (a 1% increase in agricultural exports lead to a 0, 21% increase in economic growth). Also, our final results indicate that agricultural imports don't have any effect on economic growth. Finally to

justify the robustness of our empirical analysis, we must check diagnostic tests. These indicate that the results of our estimate are acceptable because the R^2 coefficient of determination is greater than 60% with to a value of 96, 6864 % and Fisher's statistic probability is less than 5% because it is equal to 0.00%.

V. Conclusion

In this study, we inspected the influence of agricultural exports and agricultural imports on economic growth for North Africa Countries (Morocco, Algeria, Tunisia and Egypt) in the period 1982 – 2016. To attempt this objective, we use correlation analysis and estimation based on static gravity model which include Fixed Effect Model, Random Effect Model and the Hausman Test. Empirical results confirm that agricultural exports and agricultural imports have positive correlation with economic growth, but the correlation between agricultural imports and economic growth are very strong that agricultural exports and economic growth. In addition the results of the estimation model prove that agricultural exports have a positive effect on economic growth, however, agricultural imports have not any effect on economic growth. Despite the low correlation between agricultural exports and economic growth, these results provide on evidence that agricultural exports seen as a source of economic growth in the 4 North Africa Countries. From the results presented in this paper, it can be argued that:

- There is a need to better encourage and develop investment and exports in the agricultural sector to cover the value of imports (especially industrial imports).
- Eliminating and abandoning unnecessary agricultural imports because they hurt only economic growth and the trade balance
- Creation of new strategies to develop agricultural trade and investments.
- Increase the share of gross fixed capital formation in the agricultural sector.
- Break the new means and equipments in agricultural investments since these are exercised by means and techniques very traditional.
- For higher profitability in agriculture sectors, states must privatize more farmland.
- Attract foreign direct investment to invest in the agricultural sector with the need to seek to establish commercial contracts that are aimed at improving the agricultural sector in the long term.
- Encouraging scientific research in combating desertification, drought and desert encroachment.
- Establishing environmental reserves and spreading environmental awareness.

- Try to use and exploit renewable energy sources as an alternative to the use of fuel wood.
- Avoiding agricultural practices that harm the environment and adhering to methods that help restore the natural balance between soil and communities.
- Encourage banks to finance agricultural investments
- Use of seawater in agriculture and production of saline-loving plants.[1]
- Exploitation of flood waters in agriculture and construction of dams to try to reduce the strength of floods.
- Improve the effectiveness and efficiency of policies, including rural policies.
- Reduction of the costs of the factors of production.

The countries of North Africa are still developing countries and in need of several robust development strategies and sound economic policies. According to our analysis of the literature survey and our empirical analysis, it is clear that agricultural exports are among the most effective solutions for improving the economic situation at this time and in the future.

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