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Tunisia's Accession the Common Market for Eastern and Southern Africa (COMESA): Determinants of Exports and Estimating Trade Potential

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Abstract— *Tunisia has just joined the Common Market for Eastern and Southern Africa (COMESA) on July 18, 2018. Tunisia has joined the 19 African countries that have signed a free trade agreement since 1994. The purpose of this article is to explain the determinants of exports and to estimate the trade potential between Tunisia and COMESA member states.*

To achieve this, we conduct an econometric study using the gravity model to identify the determinants of exports. We will use the results obtained to estimate the trade potential. We have shown the existence of trade potential between Tunisia and 10 COMESA countries namely: Malawi, Zimbabwe, Eritrea, Sudan, Uganda, Kenya, Swaziland, Burundi, Libya and Egypt. We have also revealed that GDP, GDP per capita, geographical proximity, the lowering of tariff barriers and the sharing of linguistic and historical links, make it possible to boost Tunisian exports to these countries. We therefore recommend that Tunisia, should comply with the legal, political and commercial provisions in order to successfully complete the process of its integration of this market.

Keywords— *Regional integration, trade potential, gravitational model, Africa*.
JEL Codes: *F15, F14, C51, O55*

I. INTRODUCTION

Since the independence of African states and the creation of the African Union (AU), African policymakers have intensified their efforts to boost cooperation and promote regional integration.

Thus, the creation of the Regional Economic Communities (RECs) has significantly contributed to the development of intra-African and international trade, particularly through the removal of obstacles that hinder the free movement of people, goods and services.

According to the Economic Commission for Africa (ECA), the reasons for a country's membership in a regional organization or community are of three types: political and strategic reasons, economic reasons and reasons cultural and geographical.

Tunisia's interest in Africa has accelerated in recent years in light of the slowdown in its economy with Europe and also the growth potential of African markets.

With the aim of catching up with the political and commercial backwardness of this market, the country is recovering to strengthen its regional integration in the continent, hence its particular interest in joining the Common Market for Eastern and Southern Africa (COMESA) and conclude a preferential agreement with the Economic Community of West African States (ECOWAS).

COMESA is the largest regional economic organization in Africa, a market straddling three regions: Southern Africa, East Africa and North Africa. It now represents 500 million consumers and generates a potential gross domestic product (GDP) of 700 billion US dollars. It is also characterized by a young and growing active population as well as a growing middle class and urbanization.

However, no scientific study has considered the analysis of Tunisia's trade potential following its accession to COMESA. Thus, we try to answer the following problematic:

What are the determinants of Tunisian exports and what is the trade potential between Tunisia and the COMESA countries?

Throughout our study, we will focus on the implications for Tunisia's accession to COMESA, identifying the determinants of Tunisia's exports to this market and estimating the trade potential between Tunisia and its 19 member countries.

Our work is structured as follows, the second section focuses on the characteristics of exports from Tunisia to COMESA countries. The third section focuses on an empirical study of the determinants of Tunisian exports to COMESA via an application of the Gravity model. In a fourth section, we study the potential of Tunisia's trade with the COMESA countries. The fifth section is devoted to the conclusion and recommendations.

II. CHARACTERISTICS OF TUNISIA'S EXTERNAL TRADE WITH COMESA

A- Tunisia Exchanges with COMESA

The review of the evolution of Tunisia's external trade in goods with COMESA shows that they remain modest in that the share of the latter represents, on average over the decade 2007-2016, only about 5.6% and 2.5% respectively of total Tunisian exports and imports. This share becomes even smaller, if we exclude Egypt and Libya.

In addition, the evolution of trade between Tunisia and COMESA ended in 2009 with a trade surplus, against a deficit in previous years.

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TABLE 1: Evolution of Tunisia's trade with COMESA (in millions of dollars and in %)

Année	Export	%	Import	%	Solde
2007	841060	5.55	871315	4.56	-30255
2008	1105042	5.72	1351805	5.49	-246763
2009	992742	6.87	749146	3.92	243596
2010	933025	5.68	475045	2.14	457980
2011	1014897	5.69	217985	0.91	796912
2012	1020356	6.00	579248	2.37	441108
2013	1027187	6.02	671669	2.77	355518
2014	834222	4.98	283428	1.14	550794
2015	683928	4.86	183838	0.91	500090
2016	560948	4.13	220920	1.13	340028
2007-2016	**102035.6**	**5.55**	**28342.8**	**2.53**	

Source: Trademap, author's compilations

Tunisian exports to the COMESA market reached $ 560 million in 2016, representing only 0.4% of COMESA's total imports, which reached $ 141 billion in the same year. While imports did not exceed $ 220 million in 2016.

Moreover, the geographical structure of Tunisia in this area shows that there is a concentration of trade in two markets namely Libya and Egypt with respective shares of 80.5 and 9.2% for exports and 45.8 and 49.5 % for imports. It should be noted that at the level of exports, Ethiopia is positioned as the third destination market with an average share of 8.1% over the period 2007-2016.

TABLE 2: Share of COMESA countries in Tunisia's trade during 2007-2016 (in %)

Pays	Export	Import
Libya	80.5	45.8
Egypt	9.2	49.5
Ethiopia	8.1	0.3
seychelles	0.6	0.2
Madagascar	0.3	0.1
Mauritius	0.1	0.2
Rwanda	0.5	0.0
Zambia	0.0	0.1
Djibouti	0.1	0.0
Comoros	0.0	0.0
Democratic Republic of Congo	0.0	0.0
Kenya	0.2	0.2
Uganda	0.0	1.2
Burundi	0.0	0.0
swaziland	0.0	0.0
Eritrea	0.0	0.0
Malawi	0.0	0.7
Zimbabwe	0.0	0.2
Sudan (before 2012)	0.3	1.5
COMESA	**100.0**	**100.0**

Source: Trademap, author's compilations

As for the main products exported by Tunisia to COMESA, they are dominated by food products with a total value of 78 533 million dollars. These are mainly vegetable oils ($ 27,301 million), pasta ($ 26,928 million) and cane sugar ($ 24,356 million). Sanitary products come in second place with a value of $ 46,680 million. Tunisia mainly records exports of sanitary napkins, diapers and baby wipes.

Finally, phosphate fertilizers are in third place with a value of $ 28,789 million.

The main products imported by Tunisia are divided into three categories; the first category concerns petroleum products represent ¼ of the total imports with a value of 50,260 million dollars.

The second category concerns cotton fabrics with a value of $ 19.313 million. The third category concerns food preparations including coffee, tea, cocoa, etc., valued at $ 17.253 million.

B - Trade Intensity Index between Tunisia and COMESA

The Trade Intensity Index (CSI) is the ratio of two parts of exports that is used to determine whether a country exports to a destination more than the average of the world's exports to that destination. In other words, it is the ratio between the share of the destination in the exports of the studied country and the share of the destination in the exports of the whole world.

The trade intensity index is calculated according to Balassa (1965) based on the following formula:

$$\text{Trade Intensity Index (TII)} = \frac{X_{im} / X_{iw}}{X_{wm} / X_{ww}}$$

Or :

X_{im}: represents exports from country i to country / region m

X_{iw}: represents the total exports of the country i

X_{wm}: represents the total imports of the country / region m

X_{ww}: represents the total exports of the world.

If the value of the IIC is greater than 1, it means the existence of trade potential between country i and country / region m.

Based on UN COMTRADE data, we calculated the trade intensity index between Tunisia and COMESA over the period 2002-2016. (see table 3 in the appendix).

According to the results obtained in Table 3, the trade intensity index is greater than 1 in all years, which means the existence of trade potential between Tunisia and COMESA.

In the next section, we will empirically verify the existence of trade potential between Tunisia and COMESA member states and identify the determinants of Tunisian exports to these countries.

III. Determinants of Tunisian exports to COMESA: Gravity Model

Review of the Empirical Literature

Several empirical studies have used the gravity model to explain the potential of trade within regional trading blocs. Although most of this empirical work has been done for European, Latin American and Asian countries, some studies have been done in Africa.

Among the works that have shown a positive correlation between a country's export performance and its regional integration are (Ajayi 2005, Carrère 2004, Musila 2005).

Using the gravity model, Ajayi (2005) attempted to determine the prospects for further integration in West Africa. His empirical results concluded that ECOWAS monetary union membership can improve intra-regional trade. However, the challenges of political instability and the maintenance of

fiscal resources remain major concerns that hinder the creation of a single monetary zone in West Africa.

Musila (2005) applied the gravity model to estimate the intensity of trade creation or diversion in the three regional communities: COMESA, ECCAS and ECOWAS. The study found that the intensity of trade creation or diversion varies from region to region. Indeed, the empirical results argue that the intensity of trade creation in the ECOWAS zone is the highest in Africa, followed by COMESA, which ranks second. The effect of trade creation in the ECCAS area has not been empirically proven.

The empirical results of Musila (2005) confirm that size factors (level of GNP and population) and resistance factors (distance and language) play a key role in determining the flow of international trade.

Carrère (2004) used a gravity model by the Hausman-Taylor method (1981) to assess the impact of regional agreements on member countries' trade in sub-Saharan Africa. The results showed that African regional trade agreements have generated export growth among member countries.

Chauvin and Gaulier (2002) assessed the trade potential of the South African Development Community (SADC) using the gravity model. They found that South Africa is the largest member in terms of exports and plays an important role in promoting intra-regional trade in the SADC region.

Ebaidalla and Yahia (2014) examined the performance of intra-COMESA trade integration in relation to the integration of the Association of Southeast Asian Nations (ASEAN). Using the gravity model, the latter claimed that COMESA countries are far from their potential trade level, implying an unfavorable performance of regional trade integration among COMESA members.

A- Model Estimation and Data Sources:

Presentation of the gravity model:

The gravity model is often used as a standard tool for modeling international trade (Fontagné et al., 1999). Inspired by Newton's universal attraction law, this type of model is used to explain the determinants of a country's trade potential.

In its basic form, the gravity model assumes that exports between two countries are proportional to their GDP and inversely proportional to the distance between them (Karamuriro, 2012).

The gravitation equation is for any pair of countries (i, j) as follows:

$$T_{ij} = A.\left(Y_i Y_j\right)^{\alpha_1} \Big/ \left(D_{ij}\right)^{\alpha_2}$$

Or:

i and j represent the two countries; exporter and importer.

T_{ij}: represents the value of bilateral trade between country i and country j.

Y: represents the gross domestic product (GDP).

D: represents the distance that separates the two countries.

A, α**1**and α**2**: represent coefficients associated with the explanatory variables.

A few years later, Linnemann (1966) increased the gravity model by including the population as an explanatory variable in the equation. Empirically, the gravity model is often estimated using the logarithmic formulation (Ghazi, Msadfa, 2016). Thus the log-linear form of this model is as follows:

$$\ln T_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln POP_i + \beta_4 \ln POP_j + \beta_5 \ln D_{ij}$$

Or:

P_i, P_j: are the respective populations of countries i and j,

β_0: a constant,

β_1; β_2; β_3; β_4 and β_5: the coefficients associated with the variables Y_i, Y_j, P_i, P_j and D_{ij}.

Specification of the model and expected signs of the variables:

Our job is to estimate the determinants of trade and calculate the trade potential between Tunisia and COMESA on the basis of an augmented form of the gravity model. In our work, our estimated model is inspired by that of Linnemann (1966), it takes the following form:

$$\ln X_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln GDPC_{it} + \beta_4 \ln GDPC_{jt} + \beta_5 \ln POP_{it} + \beta_6 \ln POP_{jt} + \beta_7 \ln Dist_{ij} + \beta_8 \ln Area_j + \beta_9 OffLang_{ij} + \beta_{10} commBor_{ij} + \beta_{11} PolStab_{jt} + \beta_{12} prefTarif_{jt} + \beta_{13} MFNTarif_{jt} + \varepsilon_{ijt} + \mu_{ij}$$

Or :

i: means Tunisia

j: designates the partner country belonging to COMESA

t: a dimension of time.

β_0 is the constant, β_1; β_2; β_3; β_4; β_5; β_6; β_7; β_8; β_9; β_{10}; β_{11}; β_{12} and β_{13} are the coefficients respectively associated with the explanatory variables GDP_i; GDP_j; $GDPC_{it}$; $GDPC_{jt}$; POP_i; POP_j; $Dist_{ij}$; $PoStabl_{jt}$; $prefTarif_{jt}$ and $MFNTarif_{jt}$; $Area_j$; $OffLang_{ij}$; $commBor_{ij}$;

As variables of our model, we have:

The variable explained:

InX_{ijt}: represents the logarithm of Tunisian exports to country j.

The explanatory variables:

$InGDP_{it}$ and $InGDP_{jt}$: represent the GDPs taken in logarithm respectively in Tunisia and in the country j

$InGDPC_{it}$ and $InGDPC_{jt}$: represent GDP per capita taken in logarithm respectively in Tunisia and in country j.

$InPOP_{it}$ and $InPop_{jt}$: represent the populations taken in logarithm respectively in Tunisia and in country j.

$InDist_{ij}$: represents the distance taken in logarithm between Tunisia and country j.

$prefTarif_{jt}$: represents the preferential customs tariff applied by the country j.

$MFNTarif_{jt}$: represents the MFN customs tariff applied by the country j.

$PoStabl_{jt}$: it is a continuous variable which represents the political stability in the country j.

$InArea_j$: represents the area of the country in logarithm.

$OffLang_{ij}$: it is a dummy variable which represents the common official language between Tunisia and the country j,

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it takes the value 1 if Tunisia has a common official language with the country j, if not, it takes the value 0.

$commBor_{ij}$: is a dummy variable that represents the common border between Tunisia and country j, it takes the value 1 if Tunisia has a common border with country j, otherwise it takes the value 0.

ε_{ijt}: represents the residues.

μ_{ij}: represents the individual effects specific to pairs of countries.

From the theoretical and empirical bases, the expected signs of the main variables of the gravity model are:

GDP is included in the model to capture factors associated with the level of economic development (Fränkel, 1997). GDP is an indicator of the economic size of the two partner countries, the higher the GDP, the greater the exchange opportunities available to both countries. As a result, the coefficients of the GDP variables should be positive.

As for the GDP per capita variable, it represents an indicator that reflects the level of development in the exporting country as well as the purchasing power in the importing country. The higher the GDP per capita, the more the potential supply of products in the exporting country increases and the purchasing power in the importing country increases. Thus, the coefficients of the per capita GDP variables should be positive.

With regard to the population variable, it represents one of the indicators of the potential size of the market, the more the population increases, the more it acts positively on the bilateral trade between the two countries. Thus, the coefficients of the population variables should be positive.

The distance variable, which acts as a resistance factor in the gravity model, negatively influences trade because the greater the distance between the exporting country and the importing country, the higher the cost of transporting the goods. Thus, the coefficient of the distance variable should be negative.

As for the area variable, it plays in the same direction as the distance variable, countries with a larger area should have a higher cost of transport, "ceteris paribus" than countries with smaller areas, which may affect negatively the volume of trade (Yamarik and Ghosh, 2005). Thus the coefficient of the area variable should be negative.

Sharing a common official language between two partner countries helps to reduce cultural and linguistic barriers to trade. The ease of communication has a positive impact on foreign trade (Melitz, 2007). Therefore, the coefficient of the common official language variable should be positive.

Obstfelld and Rogoff (2000) emphasize the impact of borders on trade flows. Having a common land border between two countries allows them to increase bilateral trade because of the proximity and ease of land transport. Thus, the coefficient of the common border variable should be positive.

With respect to the political stability variable, according to Singh et al (2011) and Chauvin and Gaullier, (2002), political stability can encourage trade. Thus the coefficient of the political stability variable should be positive.

For the tariff variables (preferential and MFN), Frankel and Wei (1995) and Romalis (2005) argue that the increase in tariffs leads to a decrease in trade. Thus, the coefficients of the variables of preferential rates and MFN tariffs should be negative.

Presentation of the data:

We have developed a comprehensive panel model that covers a sample of 19 COMESA member countries based on data primarily from the COMSTAT statistical platform and spanning a period of 15 years from 2001 to 2016. (See Table 4 in Appendix)

B- Model Estimates and Results:

Gravity models are difficult to estimate for two main reasons, first, because of their three-dimensional specification since the gravitational equations are estimated in cross section (N countries, N partners, at a given date), (Avom and Mignamissi, 2013), then the estimation of gravity models can be confronted with certain problems such as heteroskedasticity, the endogeneity of the variables and especially the presence of zero bilateral trade (equal to zero).

The first estimation technique to use is the ordinary least squares (OLS) method that applies to stacked data. On the other hand, this technique does not take into account the heterogeneity of the panel, which has led some researchers to propose solutions that can circumvent this econometric difficulty.

To deal with this problem, some researchers, namely: Rose, (2000); Bangake and Eggoh (2009) and Camara (2013) used panel modeling while specifying the nature of the effects. Other researchers, such as Avom and Gbetnkom (2005) and Afesorgbor (2012) have called for the adoption of the TOBIT estimation technique in order to better control the censoring of the dependent variable for which only positive values, an approach may already lead to problems with the robustness of the estimator. It can be concluded that with these estimation techniques, there is a risk of biased estimators because of the invariance and endogeneity of some explanatory variables.

Hausman and Taylor (1981) proposed an estimator that takes into account the endogeneity and constancy of some modeled variables in the severity equation. However, this estimator raises several issues, including the choice, number and validity of instruments (Avom and Mignamissi, 2013).

In turn, Santos Silva and Tenreyro (2006) have tried to emphasize the issue of robust estimators. Thus, they recommended the use of the pseudo-Poisson maximum likelihood method and justified its relevance for the gravity model since it intervenes to solve the problems related to log transformation, heteroscedasticity and the question zeros in the dependent variable.

Martinez-Zarzoso (2013) states that this method is robust to heteroskedasticity and is suitable when the proportion of zero trade is high and this method will be adopted in our study.

Results obtained

In our work, we conduct our estimates using the maximum likelihood method on the panel data. The results will then be discussed. The estimates reveal the significance of several variables in relation to their expected signs, according to the literature. (see table 5 in the appendix).

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The coefficient of the variable "lnGDP$_i$" is positive and significant, this is clear in regressions 4,5 and 6. Indeed, the GDP of Tunisia is positively correlated with its bilateral trade with partner country j. This implies that an increase in Tunisia's national income as an exporting country encourages its trade flow to the importing country.

To this end, the estimation of the results of this variable proves that a 1% increase in Tunisia's GDP leads to an increase from 1.077% to 1.651% of its bilateral exports to its partners j.

Likewise, the coefficient of the variable "lnGDP$_j$" displays a positive and significant sign stronger than that of the variable "lnGDP$_i$". Regressions 4, 5, 6, 7 and 8 show that a 1% increase in the country's GDP gives rise to an increase in Tunisia's exports to that country, which varies between 1.11% and 2.13%. These results are consistent with those found by Carrillo and Lee, (2002), Chauvin, (2002) and Cassim, (2001).

As for the coefficient of the variable "lnGDPC$_i$", it bears a positive sign and significant, this proves that any increase in GDP per capita in Tunisia positively impacts the volume of bilateral trade of the country with partner j. Also, the coefficient of the variable "lnGDPC$_j$" displays a positive and statistically significant sign, which implies that the country j is commercially able to import more products from the exporting country. This result is consistent with the work of Achay (2006).

As for the coefficients relating to the variables "lnPOP$_i$" and "lnPOP$_j$", they display a sign that is both insignificant and negative. Thus, the populations of the importing and exporting countries have an insignificant effect on trade flows between trading partners during the period considered. These results are consistent with those established by Chauvin, (2002), Cassim, (2001) and Evans, (1997).

The coefficient of the variable "lnDist$_{ij}$" gave us the expected sign with its negative significance. For an increase of one unit of distance, the volume of exports from country i to country i is deteriorating between -4.98% and -3.52%. Thus a growing distance causes a decline in exports between country i and partner country j. This result confirms those found by Avom (2005), Gbetnkom and Avom, (2005), Gbetnkom, (2006), Avom and Mignamissi, (2013).

As for the coefficient of the variable "lnArea$_j$", it displays a sign that is not significant, positive at the level of regressions 1 and 2, and negative at the level of regressions 3, 4, 5, 6,7 and 8. This non-significance shows that the importing country has no impact on the volume of trade. This result is consistent with the work of Yamarik and Ghosh, (2005).

The coefficient of the "OffLang$_{ij}$" variable displays a positive sign in regressions 4 and 5. Thus, the sharing of a common official language between country i and partner country j promotes exchanges between them. This result is consistent with the work of Melitz, (2007), Achay, (2006), Eita and Jordaan, (2007), Foroutan and Lant, (1993), Martinez-Zarzoso and Nowak-Lehmann (2003) and Ram and Prasad, (2000) who proved that linguistic and historical links boost trade.

At the level of the coefficient of the variable "commBor$_{ij}$", the result of the common border effect did not give a significant positive sign. Unlike Mc Callum, (1995), Ekanayake, Mukherjee and Veeramacheneni, (2010), Obstfelld and Rogoff, (2000), Anderson and Van Wincoop, (2003), Helliwell, (1996), Anderson and Smith (1999), Nitsch , (2000) and Head and Mayer, (2000) who have shown that sharing a common border promotes bilateral trade between partner countries.

Regarding the coefficient of the variable Political stability, it did not give the expected sign as to the significance, it displays positive but not significant results. Thus, political stability does not influence trade between partner countries. This result is not consistent with those found by Chauvin and Gaullier, (2002) and Kaufmann, Kraay and Mastruzzi, (2011) who concluded that political stability favors trade between countries.

Finally, the coefficients of the variables "prefTarif" and "MFNTarif" show us a sign highly significant and negative, so any reduction in customs tariff that is preferential or MFN, leads to an increase in the level of Tunisian exports to COMESA countries. This result is consistent with the work of Frankel and Wei, (1995) and Romalis, (2005), who have shown that lowering tariffs has a positive impact on trade. Unlike Mayda and Steinberg, (2009) who have shown that tariff reduction or even liberalization has not increased Uganda's trade with COMESA member countries.

IV. Estimation of the Commercial Potential of Tunisia with COMESA

It should be recalled that the overall objective of our work is to provide statistical information on the untapped business opportunities of Tunisia with the COMESA countries. This goal will be achieved based on the results of the estimation of our random effects gravity model (see Table 5 in the appendix).

On the basis of regression 3 of our gravity model:

$$\ln X_{ijt} = 1{,}126 \ln GDP_{it} + 1{,}086 \ln GDP_{jt} + 0{,}633 \ln POP_{it} + 0{,}978 \ln POP_{jt} - 3{,}52 \ln Dist_{ij} - 0{,}584 \ln Area_j$$

We propose to estimate the commercial potential of Tunisia with the COMESA countries for the year 2016. It is calculated in% based on the following formula:

$$Trade\ potential = \frac{estimated\ \exp orts}{observed\ \exp orts} * 100$$

• If this ratio exceeds 100%, it means that there is a commercial potential not exploited by Tunisia;

• If this ratio is below 100%, we can say that the country is outperforming its trade potential or that there is no positive trade potential for Tunisia

The results of this calculation are shown in Table 6 below. We can classify COMESA member countries into four main groups: (see table 6 in the appendix).

1- Countries with a very strong commercial potential, such as Malawi, Zimbabwe, Eritrea, Sudan These are the countries with which Tunisia did not have any commercial relations in 2016.

2- Countries with a strong commercial potential, where the trade potential ratio exceeds 2%, it is a list of 4 countries namely: Uganda, Kenya, Swaziland and Burundi.
3- Countries with medium trade potential, where the ratio of trade potential does not exceed 2%, these are mainly Egypt and Libya.
4- Countries with no commercial potential where the Tunisian exports observed exceed the estimated exports. Nine (9) countries make up this group: Seychelles, Ethiopia, Madagascar, Mauritius, Djibouti, Comoros, Rwanda, DRC and Zambia.

In this part, we will dig deeper into the specificities of each of the groups mentioned above:

Countries with a very strong commercial potential for Tunisia:

This group of countries is made up of Malawi, Zimbabwe, Eritrea and Sudan. These are the COMESA member countries with which Tunisia does not maintain commercial relations, especially with regard to exports.

In 2016, Tunisia did not export to these countries, according to estimates, Tunisian exports could have reached the value of 92,000 USD to Malawi, 124,000 USD to Zimbabwe, 615,000 USD to Eritrea and around 3 millions of dollars to Sudan.

This untapped export potential is due to a lack of knowledge of these markets which show a very good economic performance with sustained growth of around 3% in the 4 countries. Table 7 below shows more details on each country's imports as well as their main suppliers. Sudan and Zimbabwe top the list of import values. All countries source from the same suppliers, and imported products are similar from one country to another.

Registration at local colleges, 2005. (see table 7 in the appendix).

Countries with strong commercial potential for Tunisia

This group of countries is made up of Uganda, Kenya, Swaziland and Burundi. These are the COMESA member countries with which Tunisia has only 20% of its market share. The estimated exports show the existence of an export potential that could have been in 2016: to reach the value of 900,000 USD to Uganda, to exceed 1 million USD to Kenya and 100,000 USD to Swaziland and 200,000 USD to Burundi.

We take the example of Kenya and Uganda where the ratio of export potential has reached 7% and 5% respectively. Kenya is a country with a GDP growth rate of around 6% in 2016, characterized by a very young population (70% under 35) and a middle class is growing and growing thanks to the evolution of GDP per capita, which has increased by 89% between 2000 and 2015.

As for Uganda, the projections of the African Development Bank (AfDB) estimate that the country will achieve a growth rate of around 6% in 2018; this increase is expected to be driven mainly by investments in public infrastructure, the recovery of manufacturing and construction sectors, and improvements in services, particularly financial and banking, commercial, transportation and information technology, and of communication.

Countries with medium commercial potential for Tunisia

It is a group of two countries for which there is an average trade potential, we are talking about Libya and Egypt, the two countries to which 88% of Tunisian exports to COMESA countries with worth $ 493 million. At the level of this group, Tunisia manages to exploit a good part of its market share which exceeds 64% for Egypt and 67% for Libya.

According to the rating agency Moody's, Egypt is expected to record the strongest growth in the MENA region with GDP forecast to reach 5% in 2019 and 5.5% in 2021. This growth is expected to benefit FDI and net exports which were stimulated by the depreciation of real exchange rates after liberalization.

Egypt's main export partners are the EU, which accounts for more than a third of total trade, and the United States. These two countries account for nearly 60% of Egyptian exports. Egypt exports mainly fuel, oil, cotton, iron and steel. It imports mainly electronic products and capital goods, nuclear reactors and boilers, cereals, foodstuffs and chemicals.

Countries without commercial potential for Tunisia

At the level of this group consisting mainly of nine (9) countries namely: Seychelles, Ethiopia, Madagascar, Mauritius, Djibouti, Comoros, Rwanda, Congo DRC and Zambia, we speak of countries with no commercial potential for Tunisia Since Tunisian exports in 2016 far exceed the estimated exports, the potential is widely exploited.

V. Conclusion and Main Recommendations

Regional integration is one of the priorities of African countries in their development strategies to improve their trade and boost their economic growth.

Join a regional economic community is to comply with the charter of this group and adopt a number of laws and regulations specific to the free movement of goods, services, capital and people.

This is the case of Tunisia, which has joined the Common Market for Eastern and Southern Africa (COMESA) after obtaining observer status. It is in this perspective that our research work fits, thus, we sought to examine the implications of Tunisia's accession to COMESA, to identify the determinants of its exports to this market and to estimate its commercial potential. with each member country of this region.

To answer the problematic, we conducted a study of the determinants of exports by constructing a gravity model. We dedicated the second part to the estimation of the trade potential between Tunisia and the COMESA member countries.

Our work has shown that the common market of Eastern and Southern Africa, which represents the largest regional economic organization in Africa through its economic, demographic and commercial assets, is a promising market for Tunisia. Also, we have highlighted the commercial and legal implications of Tunisia's membership in this economic grouping. Thus, and with a view to finalizing the process of its integration, the country should comply with political and legal commitments such as promulgation of laws that will facilitate the implementation of the provisions of the COMESA treaty, start negotiations on the terms and conditions, and the conditions for the free movement of goods and services

originating in the COMESA zone and the abolition of all tariff and non-tariff barriers.

As for the trade implications, the country must also ensure the complete elimination of all tariff and non-tariff barriers, align its rules of origin with those applied in the common market, and commit itself to respect the provisions of the customs union through the adoption of the Common External Tariff and the Harmonized Customs Nomenclature of COMESA.

Through our empirical research results, we find that, according to the results obtained by Carrillo and Lee, (2002), Chauvin, (2002) and Cassim, (2001), the GDP variable acts positively on the volume of trade between Tunisia and the partner country COMESA member.

Also, we confirm the outputs of the Purchasing work, (2006) by proving that any increase in the value of the GDP per capita variable in the two partner countries has a positive impact on the volume of bilateral trade between them.

We join Chauvin, (2002), Cassim, (2001) and Evans, (1997) to assert that the population variable has a negative effect on trade flows between the two partner countries.

According to results found by Avom, (2005), Gbetnkom and Avom, (2005), Gbetnkom, (2006), Avom and Mignamissi, (2013), increasing the value of the variable distance results in a decrease in the flows commercial. Any increase in tariff barriers leads to a drop in exports.

We consolidate the work of Yamarik and Ghosh (2005) on the significance of the importing country area variable, which has a negative impact on the export volume of the exporting country.

We validate the results of Melitz, (2007), Achay, (2006), Eita and Jordaan, (2007), Foroutan and Lant (1993), Martinez-Zarzoso and Nowak-Lehmann, (2003) and Ram and Prasad, (2000)) who have shown that sharing linguistic and historical links boosts trade between countries.

However, our result did not give the expected sign for the common border variable and the political stability variable.

We have also demonstrated the existence of trade potential between Tunisia and 10 COMESA member countries namely: Malawi, Zimbabwe, Eritrea, Sudan, Uganda, Kenya, Swaziland, Burundi, Libya and Egypt.

Recommendations

• Through joining COMESA, Tunisia must comply with the political and legal principles of integration within COMESA.
• Of 19 Member States in this market, only nationals of 4 countries (Libya, Comoros, Mauritius and Seychelles) can enter Tunisia without a visa, as far as Tunisians are concerned, they can only move freely in 3 countries (Libya , Mauritius and Seychelles). This emphasizes the importance of liberalizing the movement of people in order to facilitate the movement of capital and economic operators.
• The country needs to strengthen its diplomatic presence in the COMESA region, currently the eastern and southern part of Africa is not well served, out of 19 countries, Tunisian diplomatic missions are only present in 6 countries (Kenya, Libya, Egypt, Congo DRC, Ethiopia and Sudan).
• The accession of Tunisia to COMESA represents an excellent opportunity for a country seeking to rebalance the deficit of its trade balance. If the country wants to increase the share of its exports to Africa which represents 10% of the total of Tunisian exports, it must first fill its information deficit due to a lack of knowledge and a bad estimate of the African market.
• Tunisia's accession to the COMESA Free Trade Area calls for harmonization at the level of the rules of origin, a priori the country, given its various bilateral and multilateral agreements could be easily confirmed to the provisions of the rules of origin. origin of COMESA based on five independent criteria8. It should be noted that all goods that will be exported from Tunisia as part of the Free Trade Area must be accompanied by a COMESA Certificate of Origin.
• Tunisia's accession to COMESA means its integration, in the near future, the COMESA customs union, which will push the country to harmonize its customs legislation with COMESA customs instruments through a transposition of projects of the common tariff nomenclature (NTC) of the Common External Tariff (CET) and the COMESA Customs Code.
• Based on the results obtained in the estimation of the commercial potential of Tunisia with the COMESA countries, it is strongly recommended to carry out studies of commercial opportunities for each country of the two groups presenting respectively a very strong and a strong commercial potential. These studies will analyze the market of each country identified in order to identify a better position to avoid competition.
• It would be preferable to continue this research work by focusing on a sectoral approach to identify Tunisia's product offer, which will best meet the needs and expectations of consumers in the target countries and develop plans. action to improve access to these markets.

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Appendix

TABLE 3: Trade Intensity Index between Tunisia and COMESA

Years	2002	2005	2008	2011	2014	2016
Exports from Tunisia at COMESA	358427	527953	1105042	1014897	834222	560948
Total value of the exports from Tunisia	6871228	10493620	19319957	17846965	16759748	13575131
Total import value of COMESA	59100,807	82148,2451	140314,125	152963,51	181855,359	190490,118
Total export value of the world	8018001	12833376	19751940	22367073	23799132	20580211
Trade Intensity Index (TII)	7,07683472	7,85981922	8,05157782	8,31531894	6,51402122	4,46432648

Source: Authors' calculations based on UN Comtrade data

TABLE 4: Définition et sources des variables

Variable	Définition et mesure de la variable	Source	Signe attendu
X_{ij}	Tunisian exports to COMESA country j. The variable is measured by lnXij	UN Comtrade	
GDP_i	Gross domestic product of Tunisia. The variable is measured by lnGDPi	www.comstat.comesa.int	+
GDP_j	Gross domestic product of country COMESA member. The variable is measured by lnGDPj	www.comstat.comesa.int	+
$GDPC_{it}$	Gross domestic product per capita in Tunisia. The variable is measured by lnGDPCi	www.comstat.comesa.int	+
$GDPC_{jt}$	Gross domestic product per capita in COMESA country. The variable is measured by lnGDPCj	www.comstat.comesa.int	+
POP_i	Population in Tunisia. The variable is measured by lnPOPi	www.comstat.comesa.int	+
POP_j	Population in country COMESA member. The variable is measured by lnPOPj	www.comstat.comesa.int	+
$Dist_{ij}$	Distance that separates Tunis from the capital of the country j. The variable is measured by lnDistij	www.calculerlesdistances.com	-
$Area_j$	Area of the country j. The variable is measured by lnAreai	www.comstat.comesa.int	-
$OffLang_{ij}$	Common official language. Indicator variable = 1 if both countries share the same official language	www.comesa.int	+
$PoStabl_{jt}$	Political stability of the country j. It ranges from (-4: less political stability) to 2 (more political stability)	Worldwide Governance Indicators (Banque Mondiale)	+
$commBor_{ij}$	Common border. Indicator variable = 1 if both countries have a common border	Atlas Géographique	+
$prefTarif_{jt}$	Average preferential tariff applied by country j to Tunisia	www.macmap.org	-
$MFNTarif_{jt}$	Average MFN tariff applied by country j to Tunisia	www.macmap.org	-

Table 5: Results of the regressions estimated by the method of Maximum likelihood in panel data

Variable lnXij	*Reg1*	*Reg2*	*Reg3*	*Reg4*	*Reg5*	*Reg6*	*Reg7*	*Reg8*
$lnGDP_i$				1.638 (0.076)*	1.651 (0.072)*	1.077 (0.000)***	1.56 (0.114)	1.547 (0.118)
$lnGDP_j$				1.052 (0.007)***	1.058 (0.006)***	1.148 (0.068)*	1.161 (0.006)***	1.151 (0.006)***
$lnGDPC_{it}$	2.135 (0.026)**	2.116 (0.028)**	1.126 (0.079)*					
$lnGDPC_{jt}$	1.149 (0.007)***	1.137 (0.008)***	1.086 (0.000)***					
$lnPOP_i$			0.633 (0.265)			-0.469 (0.727)	-0.882 (0.600)	-0.875 (0.605)
$lnPOP_j$			0.978 (0.038)**			-0.120 (0.826)	-0.184 (0.784)	-0.173 (0.798)
$lnDist_{ij}$		-4,983 (0,007)***	-3,52 (0,000)***	-4,039 (0,029)**	-4,069 (0,027)**	-3,878 (0,018)**	-4,414 (0,02)**	-4,382 (0,022)**
$lnArea_j$	0,281 (0,309)	0,279 (0,314)	-0,584 (0,119)	-0,384 (0,133)	-0,386 (0,129)	-0,482 (0,183)	-0,336 (0,445)	-0,340 (0,442)
$OffLang_{ij}$	0,626 (0,191)	0,624 (1,193)		0,785 (0,094)*	0,788 (0,092)*	0,508 (0,219)	0,759 (0,113)	0,757 (0,115)
$commBor_{ij}$	-3,535 (0,064)*	-3,480 (0,069)*		-1,541 (0,398)	-1,582 (0,385)	-1,058 (0,541)	-2,115 (0,309)	-2,060 (0,322)
$PoStabl_{jt}$	0,166 (0,273)	0,176 (0,248)		0,230 (0,12)	0,223 (0,130)	0,120 (0,196)	0,211 (0,165)	0,219 (0,150)
$prefTarif_{jt}$		-0,027 (0,059)*		-0,023 (0,106)				-0,024 (0,082)*
$MFNTarif_{jt}$	-0,028 (0,046)**				-0,024 (0,081)*		-0,025 (0,063)*	
μ_{ij}	0,786	0,788	0,729	0,732	0,731	0,669	0,738	0,739
ε_{ijt}	0,590	0,591	0,606	0,588	0,587	0,604	0,587	0,588
rho	0,639	0,640	0,591	0,608	0,608	0,550	0,612	0,612

Source: Compilations of the author, estimate on the STATA software

TABLE 6: Trade potential of Tunisia to COMESA countries

Pays	Exportations observées (mille dollars)	Exportations estimées (mille dollars)	Potentiel de commerce
Egypt	52033	81959,2	1,57
Libya	442725	655541,1	1,48
Uganda	127	892,9	7,03
seychelles	6338	794,8	0,12
Malawi	0	92,0	++[1]
Zimbabwe	0	124,2	++
Ethiopia	49979	1983,7	0,03
Madagascar	3106	33,7	0,01
Mauritius	1757	1284,4	0,73
Kenya	199	1131,9	5,68
swaziland	31	138,4	4,46
Djibouti	819	365,1	0,44
Comoros	479	114,6	0,23
Rwanda	1563	927,1	0,59
Congo DRC	375	325,0	0,86
Burundi	84	257,2	3,06
Eritrea	0	615,9	++
Sudan	0	3639,3	++
Zambia	1333	144,4	0,10832873

Source: author's calculation

TABLE 7: Imports from countries with high trade potential for Tunisia

Pays	Valeur des importations en 2016	Principaux produits importés	Principaux fournisseurs
Sudan	14.3 milliards USD	Produits chimiques, produits végétaux, textile, médicaments	Chine, Inde, Arabie Saoudite, Égypte
Zimbabwe	11.5 milliards USD	Produits minéraux, produits chimiques, produits alimentaires	Afrique du Sud, Chine, Inde, Zambie
Malawi	2.34 milliards USD	Médicaments, machines électriques, produits minéraux et textile	Afrique du Sud, Chine, Inde, Émirats arabes unis
Eritrea	340 millions USD	Produits électriques, produits alimentaires, produits végétaux	Égypte, Chine, Afrique du Sud, Turquie

Source: Trademap and UNCTADSTAT data

[1] La significativité (++) est expliquée par le fait qu'on ne peut pas diviser par 0 et que le résultat du potentiel du commerce tendra vers l'infini.