Analysis of Intra-Algeria-Tunisia Trade Performance Standard Study(2000-2021)

تحليل معيار الأداء التجاري بين الجزائر و تونس (*2000–2021*)

Tarek YALOULI [1]
Faculty of Economics, Commerce and Management Sciences, Badji Mokhtar University-Annaba - Algeria
yalouli.tarek@univ-annaba.org

Fayza JALLOULI
Higher Institute of Industrial Management of Sfax (ISGI),Faculty of Economics and Management of Sfax -Tunisia
fayzajallouli@gmail.com

Elhadi LARBAA
Faculty of Economics, Commerce and Management Sciences, Badji Mokhtar University-Annaba - Algeria
elhadi.larbaa@univ-annaba.dz

Abstract:

This study aimed to analyze the factors affecting the performance of intra-trade between Algeria and Tunisia, based on data from the World Bank for Algeria and Tunisia during the period (2000-2021). The impact of some macroeconomic indicators on the structure of exports and imports of Algeria and Tunisia was measured using the gravity model and the IVOZ program with the panel data analysis approach, where the data of these variables were collected after conducting various necessary tests. The exchange between Algeria and Tunisia negatively affects the exports and imports of the two countries, while the rest of the variables have a positive impact on exports and imports. This necessitates the need for Algeria and Tunisia to pay attention to addressing the problem of the structure of trade products and the mutual exchange rate index, and to reduce its negatives, in exchange for stimulating and encouraging various efforts.

Key words: *gravity model, Student test, Filer test, EVIEWS software, intra- trade*

ملخص:

هدفت هذه الدراسة إلى تحليل العوامل المؤثرة في أداء التجارة البينية للجزائر وتونس، بالاعتماد على بيانات البنك الدولي للجزائر وتونس خلال الفترة (*2000–2021*). تم قياس أثر بعض مؤشرات الاقتصاد الكلي على هيكل الصادرات والواردات للجزائر وتونس باستخدام نموذج الجاذبية و برنامج ايفوز مع منهج تحليل بيانات البانل ، حيث تم جمع بيانات هذه المتغيرات بعد إجراء مختلف الإختبارات اللازمة، توصلت النتائج القياسية لهذا النموذج إلى أن هيكل منتجات التجارة ومؤشر سعر الصرف المتبادل بين الجزائر وتونس يؤثران سلبا على صادرات والواردات البلدين، أما بقية المتغيرات فأثرها إيجابي على الصادرات والواردات.وهو ما يلزم ضرورة إهتمام الجزائر وتونس بمعالجة مشكلة هيكل منتجات التجارة ومؤشر سعر الصرف المتبادل ، والحد من سلبياتها، مقابل تحفيز وتشجيع مختلف الجهود.

الكلمات المفتاحية: نموذج الجاذبية، اختبار الطالب، اختبار الملف، برنامج *EVIEWS*، التجارة البينية.

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1. Literary review

The rise of liberal ideas in the post-World War II era, which called for detente in international relations, especially economic ones, unfolded in a series of large-scale developments the world economy produced a new phenomenon which n 'was not previously known, which is "intra-Community trade". That is, trade between a specific group of countries within a specific geographical area, or linked by agreements or some kind of economic integration, such as a customs union, common market, etc.[1]

Some economics literature describes economic integration as a process and a state. As a process, it includes on measures to eliminate discrimination between economic units belonging to different countries, such as the removal of barriers to trade at the state level, but as a case, it is the disappearance of forms of discrimination among national economies.[2]

In light of the current global economic changes, Arab countries need to strengthen their relations in particular, which is still below the level of ambition, for several reasons as well as intra-economic exchanges. Of which the similarity in the export structures of the majority of Arab countries, where the countries share the Arab world as a group insofar as its exports of natural raw materials account for a significant share of total exports and national income, and therefore any fluctuations in the world prices of these goods will depend on whether the Arab economies as a group are negatively reflected. Furthermore, the new economic reality imposes on Arab countries the importance of achieving deep economic integration so that these countries can develop their regional value chains and then further integrate into global value chains. [3]

Hence the importance of the study, because in these circumstances the importance of supporting intra-community exchanges between them. On the contrary, it has become a necessity dictated by the challenges of regional blocs, including the Arab region, which is no longer an option New World System.

2. INTRODUCTION

When a case of trade integration occurs between a group of countries, we are faced with an integration, a collective economic entity composed of a newly created economic entity that results from the process of combining several of the national economies with the other integrative synergy. As a result of the mutual supply process between the states party to the integration process, integration is generated. Productivity between the structures of national economies and it is integration on the supply side, and the integration is also generated commercialization on the demand side, where the internal markets are formed by a common market with the ability to large capacity d 'absorption. Thus creating a great economic entity with new data favorable to the generation of enormous development and social development benefits for the parties to integration, and becomes capable of the integrated parties must rise to a level of collective self-sufficiency. And that since that would lead to the realization of a set of benefits for the States Parties at all levels, namely: to which have occurred and have been obtained - according to economists - in the countries which have undertaken the integration economic.[4]

The volume of Algerian-Tunisian trade amounts to 1.7 billion dollars, including 1.3 billion dollars of Algerian exports to Tunisia, mainly hydrocarbons and their derivatives, and 400 million dollars of Tunisian exports to Algeria, which are electrical equipment and mechanical equipment, according to figures revealed by the Tunisian Embassy in Algeria to the media.[5]

In this context and on the basis of our deep awareness of the importance of inter-Arab trade and its central role. In achieving the desired Arab economic development came the deep desire to choose this study, because we found the need to shed light on the volume of trade between the two countries, Tunisia and Algeria, by researching the reality of this exchange and the prospects for its development in the light of global and regional developments.

3. A standard study of intra-trade according to the gravity model

3.1. Introduction

Business performance can be assessed using a number of standard methods, including the gravity model. Who has shown consistency in the interpretation of several types of flows, such as migration and mobility (Gravity Model) and tourism and maritime transport of goods and bilateral trade flows, and in particular the equations can The logarithm linear can explain the flow from a source point (x) for example to a destination point (y), for example, by factors. The economy related to these two points, and other economic factors that stimulate or hinder the movement of a source to the other destination,[6] What sets the gravity model apart is that it does not base its interpretation of binary trading on any assumptions made. By deriving it theoretically, but rather to a kind of intuitive approximation, which has been explained by some economists such as: Sanso and , In addition, studies that have adopted the method of (Sanso, Guairan and Sanz) The gravity model to explain bilateral trade has generally been successful, which rarely happens in Economic studies.[7]

The gravity model is of great importance in the international economic literature. Its basic form (trade flow forecasts are based on the distance between countries and the interaction between the economic sizes of these countries, so this model simulates Newton's law. Gravity is also considered as the distance and the physical volume between two masses.

In order to understand the determinants of trade flows between countries, the gravity model takes the form The base assumes the importance of the distance and the economic sizes of the two countries, and sets the base model equal to j (Fij) of the country i for the attractiveness of trade flows (exports or imports) from the country Divided by the distance Mj and Mi is the product of each country's GDP[8].

And this definition can be written in the form of a technical equation like G between them and the expression is normalized with a constant as follows:

$$f\text{ij} = \frac{G \times Mi \times Mj}{Dij} \tag{1}$$

When the flow of commercial exports or imports from country i to or from country j (J.E.Anderson, 1979)

Constant = Fij G

Mi Mj = They express the economic size of the two countries i and j, as measured by the gross domestic product of the two states.

Dij = The distance in kilometers or miles between the two countries, which is an indicator of the cost of trade.

And this equation (equation 2) can be transformed into a linear form for purposes of economic analysis from where

$$Ln(Fij) = \beta0 + \beta1\,ln(Mit) + \beta2\,ln(Mjt) - \beta3\,ln(Dij) \tag{2}$$

The equation is represented in its linear form as follows 3 by the use of the logarithm.

When noted in this linear equation the interpretation of the logarithm of trade flows from exports or imports, which here is the dependent variable as a function of three dependent variables represented by the logarithm. The size of the economy of the exporting country and the size of the economy of the importing country and the logarithm of the distance between them, The model parameters can be used β_1 and β_(2) and β_3 as a measure of l elasticity oftrade flows Explain the level of size of countries' economies or the distance between them[9].

The applied results indicate that the basic variables of the model explain a small part of the change in trade flows, so many people have worked to introduce many additional variables that take into account the heterogeneity of two countries.

Table 1. Information on the Tunisian State (2000-2021)

Year	Exports	Imports	GDP	POP	INF	TOT	CER	CST	RER
2000	61540000 000	74450000 000	2147326 1837	9 708 347	2,96	142650 524,4	75,34	5,83023	3,28
2001	75790000 000	81350000 000	2206603 1834	9 793 915	1,98	227185 244	77,82	6,65077	3,91
2002	89020000 000	89340000 000	2314215 3760	9 871 261	2,72	318831 399,9	79,72	6,85668	2,28
2003	1,0354E+11	1,1885E+11	2745300 7373	9 945 282	2,71	504082 020,5	72,61	7,7493	2,68
2004	1,0885E+11	3,408E+11	3118305 9012	10 022 278	3,63	497630 741,2	72,61	9,37914	3,35
2005	1,8284E+11	99930000 000	3227300 7554	10 106 778	2,02	660627 948,9	73,38	10,0943	4,18
2006	1,8796E+11	1,0624E+11	3437731 0293	10 201 211	3,23	674355 406,3	71,16	11,37	3,83
2007	2,8664E+11	9991000 0000	389140 78352	10 304 729	2,97	263007 539,7	66,83	14,7919	2,13
2008	4,0522E+11	8,5572E+11	448609 69077	10 414 425	4,35	528928 593,9	71,18	18,6278	6,34
2009	4,5E+11	4,5123E+	434549	10 525	3,66	149484	72,7	13,9694	3,02

Year	Exports	Imports	GDP	POP	INF	TOT	CER	CST	RER
		11	35940	691		504,8	3		
2010	4,7E+11	6,241E+11	46206091938	10 635 245	3,34	4293001838	74,94	15,8493	9,47
2011	4,6596E+11	7,025E+11	48122744708	10 741 872	3,24	3033771133	76,06	17,1613	4,57
2012	4,8466E+11	9,915E+11	47311159485	10 846 993	4,61	2123515199	78,1	16,2982	4,66
2013	4,8594E+11	1182690000	48684187850	10 952 949	5,32	214263285,2	78,15	17,0437	4,50
2014	6,1498E+11	1554320000	50271072628	11 063 195	4,63	382899592,2	87,9	16,6456	4,66
2015	5,5797E+11	8,9921E+11	45780128467	11 179 951	4,44	0	107,13	14,0688	-6,46
2016	6,6417E+11	6,0325E+11	44360614525	11 303 942	3,63	409358311,1	110,53	13,5738	4,93
2017	4,6738E+11	7,77E+11	42164007605	11 433 438	5,31	435703406	114,93	14,2259	4,71
2018	4,2328E+11	1123220000	42685972269	11 565 203	7,31	845133293,4	118,29	15,4665	7,92
2019	3,9675E+11	1336050000	41772900763	11 694 721	6,72	780099779,7	119,16	14,9519	7,07
2020	2,949E+11	8,4943E+11	42514151614	11 818 618	5,63	826662607,2	132,13	13,7689	6,88
2021	3,789E+11	9,5263E+11	46840042941	11 935 764	5,71	121916121,3	130.29	0	5,93

Source: Arab Monetary Fund, Economic Database, https://www.amf.org.ae/ar/arabic_economic_database

Table 2. Data on the Algerian State (2000-2021)

Year	Exports	Imports	GDP	POP	INF	TOT	CER	CST	RER
2000	74450000000	61540000000	54790392746	31 042 238	0,34	3,00643E+12	1,39	21,7136	75,26
2001	81350000000	75790000000	54744712815	31 451 513	4,23	3,14458E+12	1,47	19,1364	77,22
2002	89340000000	89020000000	56760355865	31 855 110	1,42	3,34116E+12	1,33	18,8387	79,68
2003	1,1885E+1	1,0354E+	6786382	32 264	4,26	3,2132	1,21	24,9	77,39

	1	11	8413	159		2E+12		625	
2004	3,408E+11	1,0885E+11	85332581189	32 692 153	3,96	3,06743E+12	1,2	31,2 842	72,06
2005	99930000000	1,8284E+11	1,03198E+11	33 149 720	1,38	2,07991E+12	1,36	46,0 48	73,28
2006	1,0624E+11	1,8796E+11	1,17027E+11	33 641 007	2,31	1,21313E+12	1,3	54,5 488	72,65
2007	99910000000	2,8664E+11	1,34977E+11	34 166 976	3,68	1,44078E+12	1,22	59,1 738	69,29
2008	8,5572E+11	4,0522E+11	1,71001E+11	34 730 604	4,86	1,109E+12	1,31	79,2 798	64,58
2009	4,5123E+11	4,5E+11	1,37211E+11	35 333 882	5,73	2,42066E+12	1,32	45,1 883	72,65
2010	6,241E+11	4,7E+11	1,61207E+11	35 977 451	3,92	1,16056E+12	1,44	57,0 638	74,39
2011	7,025E+11	4,6596E+11	2,00013E+11	36 661 438	4,52	7,29223E+11	1,5	73,4 119	72,94
2012	9,915E+11	4,8466E+11	2,09059E+11	37 383 899	8,89	0	1,55	71,8 886	77,54
2013	1182690000	4,8594E+11	2,09755E+11	38 140 135	3,25	950010850 16	1,65	64,3 201	79,37
2014	1554320000	6,1498E+11	2,1381E+11	38 923 688	2,91	3,96854E+11	1,86	59,9 726	80,58
2015	8,9921E+11	5,5797E+11	1,65979E+11	39 728 020	4,78	1,94741E+12	2,03	34,3 901	100,6 9
2016	6,0325E+11	6,6417E+11	1,60034E+11	40 551 398	6,4	2,67222E+12	2,34	29,0 867	109,4 4
2017	7,77E+11	4,6738E+11	1,70097E+11	41 389 174	5,59	2,0287E+12	2,48	34,9 25	110,9 7
2018	1123220000	4,2328E+11	1,74911E+11	42 228 415	4,27	1,38333E+12	2,99	48,6 525	116,5 9
2019	1336050000	3,9675E+11	1,71767E+11	43 053 054	1,95	1,44269E+12	2,8	0	119,3 5
2020	8,4943E+11	2,949E+11	1,45009E+11	43 851 043	2,42	2,02118E+12	2,7	0	126,7 8
2021	9,5263E+11	3,789E+11	1,67983E+11	44 616 626	7,23	1,20181E+12	2.99	0	135,0 6

These variables reflect the level of

TRAD: Trade between the two countries as exports + imports is the dependent factor Y.

GDP: The gross domestic product of the country.

POP: This is the population of the two countries.

INF: Inflation Indicator

TOT: Commercial rate

RER: Exchange rate

CST: Index of the structure of commercial

productsCER: Cross exchange rate index

β_0: They denote the fixed variables, which are a set of economic, cultural and institutional variables for the two countries, which change but have no effect on the dependent variable in the model.

β_1 β_7 : Represent the model parameters (coefficients).

$TRAD_{ijt}$: Trade between the two countries i and j in time t as exports + imports is the dependent factor Y.

GDP_{it}: It is the product of the gross domestic product of the two countries i and j in time t.

POP_{it}: It is the result of multiplying the population of the two countries i and j in time t.

INF_{it}: This is the result of multiplying the inflation indicator of the two countries i and j in timet.

TOT_{it}: It is the product of the trade rate of the two countries i and j in time t.

RER_{it}: It is the product of the exchange rate of the two countries i and j in time t.

CST_{it}: It is the result of the index multiplication of the structure of trade products of the two countries i and j in time t.

CER_{it}: This is the result of the multiplication of the cross exchange rate index of the two countries i and j in time t.

3.2. Estimation of the equation

Estimation of the gravitational equation through what has been mentioned, we will try to put the desired mathematical equation to estimate within the framework of our study of the case according to the list of variables that we assume, which are the following:

According to the following equation

$$\log(TRAD_{ijt}) = Q_0 + Q_1 \log(GDP_{it}GDP_{jt}) + Q_2 \log(POP_{it}POP_{jt}) + Q_3 \log(INF_{it}INF_{jt}) + Q_4 \log(TOT_{it}TOT_{jt}) + Q_5 \log(RER_{it}RER_{jt}) + Q_6 \log(CST_{it}CST_{jt}) + Q_7 \log(CER_{it}CER_{jt})$$
(3)

Accordingly, we will try in the next requirement to address the results of our estimation of the standard function and try to analyze our results.

4. Results and projections of the standard study

Using an EVIEWS program, and after entering the data, we obtained the results presented inthe table below, which we will discuss in detail while analyzing these data.

4.1. Standard study results using the EVIEWS program

Table 3. The results of the standard study of the first model using the EVIEWS program

Dependent Variable : TRAD				
Method : Least Squares				
Date : 11/09/22 Time : 09:19				
Sample : 2000 2021				
Included observations : 22				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-9.987786	47.04810	-1.912678	0.0765
CER	-2.039538	1.046837	-1.948285	0.0717
CST	-0.343281	0.307017	-1.118117	0.2823
GDP	0.191895	0.635048	0.302174	0.7670
INF	0.282669	0.209696	1.347990	0.1991
POP	6.892682	3.912623	1.761653	0.0999
RER	0.449017	0.471652	0.952009	0.3572
TOT	0.042417	0.105950	0.400353	0.6949
R-squared	0.782011	Mean dependent var		11.78385
Adjusted R-squared	0.673016	S.D. dependent var		0.393721
S.E. of regression	0.225140	Akaike info criterion		0.131095
Sum squared resid	0.709630	Schwarz criterion		0.527838
Log likelihood	6.557950	Hannan-Quinn criter.		0.224556
F-statistic	76.174764	Durbin-Watson stat		1.660592
Prob (F-statistic)	0.000934			

Source: Prepared by the author with assistance from Eviews

The results of the estimation of the parameters of the model are as follows, according to the following data:

Estimation Command:

=========================

LS TRAD C CER CST GDP INF POP RER TOT

Estimation Equation:

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TRAD = C(1) + C(2)*CER + C(3)*CST + C(4)*GDP + C(5)*INF + C(6)*POP + C(7)*RER + C(8)*TOT

Substituted Coefficients:

=========================

TRAD = -9.98778583364 - 2.03953777141*CER - 0.343281007832*CST + 0.191894658905*GDP + 0.28266854054*INF + 6.89268191305*POP + 0.449016794881*RER + 0.0424174553696*TOT

Source: Prepared by the author with assistance from Eviews

4.2. Evaluation of the first model

From an economic point of view

We find through the formula of the multiple linear regression model that the inter-trade relationship between the two countries, Tunisia and Algeria, with each of them as The gross domestic product of the country, The population of the two countries, Indicator inflation, trade rate and finally the exchange rate is a direct relationship and this is consistent with the gravity model. But its relationship of trade product structure index and cross exchange rate index is an inverse relationship and this is inconsistent with the model under study. Because we notice from the regression formula that the value of the fixed parameter, which represents the amount (-9.98778583364) of intra-trade, which is independent of the explanatory external variables, has a negative sign, and this in turn is not acceptable from an economic point of view, so this model is rejected from an economic point of view and does not need to pass for a standard study.

4.3. Second model

And after making several attempts each time deleting for a negative or insignificant variable. We got a model in the last one where we removed the trade commodity structure index and the cross exchange rate index. To get the formula for a five-variable linear regression model that explains the volume of trade in terms of like, the gross domestic product of the country, the population of the two countries, inflation indicator, trade rate and finally the rate of changes and this pattern can be expressed mathematically as follows:

$$\log(RAD_{ijt}) = Q_0 + Q_1 \log(GDP_{it}\,GDP_{jt}) + Q_2 \log(POP_{it}\,POP_{jt}) + Q_3 \log(INF_{it}\,INF_{jt}) + Q_4 \log(TOT_{it}\,TOT_{jt}) + Q_5 \log(RER_{it}\,RER_{jt}) \tag{4}$$

A. Results

The results of the evaluation are presented in the table 4

Table 4. The results of the standard study of the second model using the EVIEWS program

Dependent Variable : TRAD				
Method : Least Squares				
Date : 11/09/22 Time : 09:25				
Sample : 2000 2021				
Included observations : 22				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	5.902855	24.83072	7.237724	0.0003
GDP	0.468406	0.303746	8.542101	0.0426
INF	0.407698	0.220036	8.852870	0.0324
POP	0.419236	1.834462	2.228534	0.0221
RER	0.162732	0.472953	2.344077	0.0353
TOT	0.025381	0.115752	2.219267	0.0092
R-squared	0.700575	Mean dependent var		11.78385
Adjusted R-squared	0.607005	S.D. dependent var		0.393721
S.E. of regression	0.246821	Akaike info criterion		-0.266696
Sum squared resid	0.974731	Schwarz criterion		-0.564253
Log likelihood	3.066349	Hannan-Quinn criter.		0.336791
F-statistic	79.487150	Durbin-Watson stat		1.271932
Prob(F-statistic)	0.000000			

Source: Prepared by the author with assistance from Eviews.

The results of the estimation of the parameters of the model are as follows, according to the following data:

Estimation Command:
=========================
LS TRAD C GDP INF POP RER TOT

Estimation Equation:
=========================
TRAD = C(1) + C(2)*GDP + C(3)*INF + C(4)*POP + C(5)*RER + C(6)*TOT

Substituted Coefficients:
=========================
TRAD = 5.90285492469 + 0.468406301647*GDP + 0.407698084912*INF + 0.419236249865*POP +0.162732174536*RER + 0.0253805854287*TOT

Source: Prepared by the author with assistance from Eviews

$$\log(RAD_{ijt}) = Q_0 + Q_1 \log(GDP_{it}\, GDP_{jt}) + Q_2 \log(POP_{it}\, POP_{jt}) + Q_3 \log(INF_{it}\, INF_{jt}) + Q_4 \log(TOT_{it}\, TOT_{jt}) + Q_5 \log(RER_{it}\, RER_{jt}) \tag{5}$$

B. Model evaluation

From an economic point of view

We note through the simple linear regression formula for the volume of trade in terms of grossdomestic product of the country, the population of the two countries, inflation indicator, trade rate and finally the exchange rate that there is a direct relationship between them, and this is consistent with the economic model.

In addition, the constant parameter that represents the amount of independent trade volume of gross domestic product of the country, the population of the two countries, inflation indicator, rate trade and finally the exchange rate. It has a positive value (5.90285492469). This is also in line with economic theory, so it is necessary to study this model from a standard point of view.

C. From an economic point of view

C.1. The coefficient of determination R^2

Based on the estimation results presented in Table 4, this model is explained. By 70.06% and it is within the acceptable moral limits, because it explains more than 50% of the economic phenomenon.

C.2. Probability value for interpreted variables

According to the results presented in the same table N°4 we statistically accept the capacity of the parameter of the GDP, because its probability is lower than 5%. And we also accept each of the gross domestic product variables of the country because its probability is less than 5%, the population of the two countries because its probability is of value (0.0221), inflation indicator of value (0.0324) trade rate because its probability is less than 5% and finally the exchange rate because its probability is less than 5%.

C.3. Statistical significance of the model parameter estimators (Student test)

Student's test

Statistical inference is the part of statistics which, unlike descriptive statistics, does not content itself with describing observations, but extrapolates the findings made to a larger set and allows hypotheses to be tested on this set as well than making decisions. A statistical test is a mechanism that makes it possible to decide between two hypotheses in view of the results of a sample. Let H0 and H1 be two hypotheses (H0 is called null hypothesis, H1 alternative hypothesis), of which one and only one is true. The decision consists in retaining H0 or H1.[10]

(C) Constant parameter: Where we make the following two assumptions

H_0 : C=0
H_1 : C>0
Preference is made based on a comparison between Student, arithmetic and tabular values. And we have (n=2) and a level of significance (α=5%) the tabular value of Student is (4.3027) As for the arithmetic value of Student according to table n°4 it is (7.237724) and it is greater than the tabular value, so we accept H_1 and reject H_0 i.e. C at statistical significance is statistically acceptable.

C.4. GDP parameter capacity

The arithmetic value of the Student value of the capacity of the parameter GDP (8.542101) as shown in Table No. 4 is greater than the Student's tabular value (2.1788) Therefore, we therefore accept H_1, and reject H_0 i.e. say that the capacity of the GDP parameter is statistically acceptable.

C.5. The capacity of the population parameter

The arithmetic value of Student's value of capacity of parameter population (2.228534) as shown in table 4 is greater than Student's tabular value (2.1788) Therefore, so we accept H_1, and reject H_0 i.e. say that the capacity of the population parameter is statistically acceptable.

C.6. The capacity of the inflation rate parameter

The arithmetic value of the Student value of the capacity of the inflation rate parameter (8.852870) as shown in table 4 is greater than the Student tabular value (2.1788) Therefore, so we

accept H_1, and reject H_0 that is that is, the ability of the inflation rate parameter is statistically acceptable.

C.7. The capacity of the commercial rate parameter

the arithmetic value of the student value of the capacity of the trade rate parameter (2.219267) as shown in table 4 is greater than the Student tabular value (2.1788) Therefore, therefore, we accept H_1, and reject H_0 that is say that the capacity of the commercial rate parameter is statistically acceptable.

C.8. The capacity of the exchange rate parameter

The arithmetic value of the Student value of the capacity of the exchange rate parameter (2.344077) as shown in table 4 is greater than the student tabular value (2.1788). Therefore, we therefore accept H_1 and reject H_0 i.e. The capacity of the exchangerate parameter is statistically acceptable.

C.9. The global significance test of the model (Fisher test)

Fisher's test

This is a statistical test to compare the dispersion of two samples or two sets of measurements (at the mathematical level: their variance). One calculates the ratio of these two dispersions, then one checks if it exceeds a certain theoretical value, which one seeks in the table of Fisher. If the calculated ratio is greater than the theoretical value, then we can definitively reject the hypothesis of equality of the two dispersions. But if it is lower, we cannot come to a conclusion: the two dispersions may be identical, but it is also possible that we lack values to see the difference[11]. We have at the significance level α=5% and n=22 then the Fisher table value is (4.351)[12] ($F\ n-2$, $K-1=$ $F\ 22-2$, $2-1=4.351$) and from table 4 equal to (79.487450). And we extract the value Fisher arithmetic which is (79.487150) which is greater than the tabular value, and therefore at least one of the simple linear regression parameters is estimated to be non-zero.

Where and comparing (F_0) the favoritism with the tabular value (F_t), it appears from the table (F) is equal to (4.351). And just like F_t < F_0, this means that the relationship assumed in our model is significant and that there is a positive effect of one or more independent variables on the dependent variable (Y) which here represents the level of commercial exchange between the two parts. The trade relationship (i-j) It should be noted that the basic data that we used to estimate the parameters of the model are included in the appendix of the study. And we will differentiate in the poverty of the conclusions of the study, the conclusions based on the results of the standard assessment, for the model to which we have deviated.

4.4. Conclusions and projections

The most important thing that hinders the conclusions and blind evidence resulting from the standard model and the estimation of the psychological function of the case of our study was the following:

The derived variables that had an impact, as shown by the illiteracy of the standard estimate of the behavior equation for the model in our study, are consistent with the basic assumption of the standard model, i.e. that it had a positive effect on the variable (y) depending on the following was:

A. The GDP variable for both sides of the trade relationship, where the estimated parameter of this variable was equal to (0.468406). What explains this intangible value that occurs in foreign trade so that a 1% increase in gross domestic product, per year will cause an increase in volume Foreign trade is estimated at a rate of (46.84%), which as it can be seen is a high positive value that reflects the strength of the relationship between the two countries. A country can only be active in its foreign trade relations if it indicates a GDP with positive growth rates as affirmed by the theories of international trade analysis, even indirectly, starting with the theory of absolute advantage from Adam Smith to Hecksher's theory.

B. Population variable on both sides of the trade relationship (POP) where the estimation of the parameter recorded a value equal to (0.419236) and this value reflects the positive impact of the size of the population on the flows of the foreign trade, where the question of the fact that the large number of the population can allow the availability of hands This is in accordance with the economic theory of Hecksher Olin through the intensity of labor.

C. The exchange rate movements (RER) variable, where the standard parameter estimate for this variable recorded a positive value of (0.162732). But as we see here a somewhat low value in the case of our study, because the two countries are economies that enjoy relative stability in the exchange rates of their currencies, and this is what gave the value this low level, but that does not prevent the variable from having an exaggerated impact on the foreign trade flows of two countries in general.

D. Among the results of this model, we find the coefficient of determination R^2 whose value refers to (70.06%) which means that the explanatory external factors explain and determine this model with this ratio (70.06%) and it is considered a very acceptable ratio, as for the remaining percentage, which is estimated to be (29.94%) so it accounts for other factors and variables not included in this program due to the fluctuation of their data.

5. Conclusion

Against the background of the agreement of all studies of the global economy on the importance of intra-regional trade and its effects on the economy and society, this research paper was devoted to studying the analysis of intra-regional trade in Algeria and Tunisia during the period (2000-2021) by measuring the effects of: GDP, inflation, exchange rate and exchange rate The study found that the structure of commercial products and the exchange rate index between Algeria and Tunisia negatively affect the exports and imports of the two countries, while the rest of the variables GDP, inflation, exchange rate and the rate of trade exchange, population, have an impact. Positive on exports and imports of the two countries

In this context, it is necessary to present some recommendations to be adopted, which are:

- ➢ Activating the role of institutions concerned with economic cooperation between the two countries;
- ➢ Activating the differential trade agreement between Algeria and Tunisia signed on December 04, 2008, with the date of entry into force on March 01, 2014;
- ➢ As a result of the economic disparity of the two countries (Algeria depends on extractive industries and Tunisia on manufacturing industries), the establishment of a free trade zone;

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