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RESEARCH ARTICLE

Trade Openness and Economic Growth: The Case of Tunisia

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Abstract

The contribution of trade openness in economic growth has been the subject of several theoretical and empirical studies in the economic literature. This paper analyzes the impact of trade openness on economic growth in the case of Tunisia using OLS method over the period 1975-2010. The results show that trade openness, foreign direct investment, and human capital represented by the enrollment of the school, as well as the ratio of the money taken as a proxy for financial development exert long-term positive and significant effects on economic growth.

Keywords: *Economic growth, OLS approach, Trade openness.*

JEL classification numbers: F41, O40, C10

Introduction

Rapid economic growth and economic development in general are the macroeconomic objective of developing countries into the medium and long-term. In recent years, a growing number of developing countries have adopted trade reforms. These reforms have been implemented to ensure greater integration into the global economy, and achieve acceptable economic performance. Based on a policy of opening to the outside, the Tunisian economy has been assigned to gradually integrate into the globalization game. In the mid-80 the government launched a program of economic stabilization and reform-oriented market economy. This orientation opens up interesting prospects for development and also raises enormous challenges as a large part of the economy becomes sensitive to external evaluations. Following the signing of international agreements, the increased trade and inflows of investment should lead to greater economic integration, while facilitating a resumption of economic growth in the critical region.

In recent years, trade has expanded greatly in the world thanks to the adoption of open policies. Traditionally, economic theory explains the development of trade through comparative advantage or resource abundance, but recent examples have shown the need to consider the mode of trade policy adopted by countries. Recent efforts, as part of dynamic analysis, provide a positive long-term level and the change in openness on growth. But the problem of empirical measure of trade openness remains. Pritchett [1] indicates that each measure has its merits when they are not correlated, so they do not capture the same aspects of trade policy. Several attempts have been made and most of them showed a positive relationship between trade openness and economic growth, Antoine & Andreas [2] and Claudia M. Buch & Toubel Farid [3].

According to Rodriguez & Rodrik [4], studies of the relation-opening growth suffer from several weaknesses in the methodology and statistical data, which makes the results very limited. For them, it is interesting to take a direct measure of trade policy by referring to the more direct indicators such as tariffs and non-tariff restrictions.

In some countries in Southeast Asia, the establishment of trade liberalization policies has led to higher economic growth rates. In other parts of the world, as in Sub-Saharan Africa or Latin America, despite an increase in open rates, economic growth has not reached expected levels. Also the objective of our research is to analyze the effect of foreign trade on economic growth in the Tunisian context. Specifically, the crucial question is what is the effect of openness on economic growth? This paper is organized as follows: in the first place we will present a literature review of the relationship between opening-economic growths. Subsequently, we will discuss our estimation method and present our empirical results.

Literature Review

Theoretical Review

An extensive theoretical review of literature has developed in this direction. It explores the relationship-opening economic growth. The analysis results are variable depending on the structure models, the origin of growth, endowments and initial conditions of countries according to whether technological knowledge are common to all countries or they are purely national.

Since 19th century, the author insists David Ricardo [5] in his theory of comparative advantage, each country has the right to have its free trade, but the only difference reports costs between countries. Indeed, the importance of openness contributes in redirect scarce resources to various sectors characterized by efficiency and improved the well being of the population.
Followed by, Heckscher-Ohlin [6] theorists of unequal endowments have confirmed the gains and added others related to the remuneration of production factors.

In fact, these traditional theories will not reach the definition of these various exchanges of identical countries, intra-industry and they have neglected the role of multinational firms. For this, this new theory of foreign trade, where the gains are also statistics, is proved by the presence of significant effects as imperfect competition and increasing returns to scale. So we call the theory of growth to get the dynamic gains.

Until the late 80s, models of neoclassical growth, from the Solow model [7] where he represents growth by exogenous factors and the impossibility of applying trade policies. In other words, for Solow, the long-term growth comes from technological progress. However, this technological progress is exogenous to the model, that is to say, it does not explain it but sees it as given (as a "windfall"). Drawing on theories of endogenous growth that we can find a solution to this problem.

From 90s, recent theories seek to make precisely this endogenous factor that is to say, to build models that explain its appearance. Based on the principles of increasing returns and economic growth, it appears the idea of a merger between the endogenous growth theory and the new international trade theory. These two principles are dependent on different means or there in the first place, the value of intra-industry and international trade in a second innovation and growth through creation of a new product or improvement of existing products then flows resulting profits of monopolies.

According to this merger, it is procreates growth in open economies. These models explain the causes of technological growth by three mechanisms. First, the "learning by doing": the more you produce, the more you learn to produce efficiently. Producing, especially one acquires experience, increases productivity. Second, growth favors the accumulation of human capital, that is to say, the skills possessed by the workforce and which depends on its productivity. Indeed, most growth is stronger, it is possible to increase the educational level of the workforce, including investing in the education system. In general, higher educational level of the population through public or private resources is beneficial. Third, growth can finance infrastructure (public or private) that stimulate it. The creation of effective communication networks favors, for example, productive activity.

Indeed, in practice patterns of growth, we must return to the initial state of a country to be able to know the nature of specialization in the long term purpose to determine the growth rate after the opening that shown by the authors [8-10]. This idea sign a negative effect on the specialization of a small economy when these studies emphasize advising trade policies to be responsible to challenge during the childhood of the industries represented by the protectionist policies.

By cons, there are works such as Rivera-Batiz and Romer [11-12], Grossman and Helpman [13-14], Feenestra [15] show the importance of innovation and they considered as a source on the encouragement of growth and political openness. Indeed, these authors explain the long-term gains noticed by scale effects conveyed through research and development. They reflect the variation in growth rate in two complete and partial integrations.

Thus, this work shows that the possibility to double the growth rate is derived by the full integration of two identical countries compared to those of autarky. However, in the partial integration the authors state in an environment characterized by two economies, developed and where there is an equal exchange of technological knowledge or property. First, the commonality between countries for commercial Grossman and Helpman [13] is a factor highlighted the links

between them to transfer various products existed. Otherwise good concise competition loses their principles between countries, taking into account the negative effect on trade. One result is that more open economies are growing at a faster rate than protectionist. Grossman and Helpman [13] emphasize the need for openness and its impact positively to increase imports to domestic goods and services that include new technologies where the initial state determines the nature of the country's specialization in term. Its presence allows the opening to specialize in an area of low growth that the country has protectionist policies during the early stages of its development, then insist on an appropriate open policies. Second, the General thought for Rivera-Batiz [11] results in setting the rate of economic growth remaining at the level of autarky. Feenestra [15] believe standardize two different effects on the results of the opening on growth.

First, the company embodies abundance in the market to encourage investment in openness. Moreover, because of the increased negative competitor, he recorded a decrease in innovation. Third, the exchange of knowledge and is well made a spot at the same time the growth rate is high by Rivera-Batiz and Romer [16] they found the same results as in the case of integration complete.

The study by Levine and Renelt [17], investment is the factor that explains the causal relationship between openness and growth. If openness to trade provides access to property investment, this will lead to long-term growth. Taking into account each country liberalizing its trade to attract foreign investment flows. However, the decline in domestic investment due to a stronger international competition, this idea was raised as a risk and then the net effect remains ambiguous. Other work, such as Grossman and Helpman [14] also argue that a country protecting its economy can stimulate growth where there is the possibility of cases where government intervention encourages domestic investment as the country's comparative advantages.

In this vein, the work of Rivera-Batiz and Romer [11-12] is consolidated by Aubin [18] showing that growth is represented by the opening gains are much greater when there is coordination of economic policies between countries. That is, government intervention, not seeking the optimum in economies taken separately but as part of the union of these economies. In this sense, market integration is not enough for optimal growth and must be accompanied by the integration of economic policies.

Empirical Review

Over 70 years, most empirical studies using cross-sectional regressions on a set of countries. Correlation coefficients were made either between export growth and GDP or between indices representing the opening or trade policies and long-term growth. Most of these studies have established a positive relationship between openness and growth.

Subsequently, the appearance of the new international trade theory and endogenous growth theory has led to focus empirical research on the channels through which openness may affect growth rate. In general, the effect of openness on growth through three channels: physical capital formation (investment-led growth and induced the opening), human capital (skills led growth and induced opening) and knowledge (technology-led growth and induced the opening).

Within this framework, Dollar [19], Barro and Sala-i-Martin [20], Sachs and Warner [21], Edwards [22] and Greenaway et al. [23], using cross-sectional regressions, found that the distortions caused by government intervention in trade led to low growth rates. Sach and Warner [22] have also shown that it is only in open economies that we could observe an unconditional convergence. Sach and Warner [22] found that countries with open political thought at a rate of 4.5% per year in the 1970s and 1980s, in contrast, relatively closed countries had a growth rate of only 0.7%. However, they note that a robust relationship is difficult to find and justify.

Study his work on a panel of 12 Latin American countries between 1950 and 1985 shows the strong link between the observed positive foreign direct investment and economic growth where the dual importance of domestic investment and FDI resulting in favorable case of education. The study conducted by Soltani Hassan and Ochi Anis [24] on a model of time series of annual data covering the period 1976-2009 for Tunisia. The results suggest that the significantly positive effect of FDI on a few variables engines of growth: human capital, trade openness and financial development.

Other work was carried out using cointegration techniques and showed growth driven by technology and driven by the opening. Indeed, Coe [25] find that trade and capital at large are

responsible for almost all of the growth recorded by the French economy for twenty years. Moreover, they showed that the positive effect of foreign R & D on TFP of a country depends on its degree of openness. R. Brecher, C. And Ehsan S. Lawrence [26] sought to show the link between the externality of R & D and TFP growth sectors in Canada and the United States. They showed that between 1961 and 1991, the effect of R&D conducted in the United States on Canadian productivity tends to be at least as strong as the effect on productivity of the United States.

In this vein, Lant Pritchett [1] brought together several indicators that have been often encountered in the literature. He studied the correlation between these indicators and found that most are not correlated. The explanation given is that each of these indicators expresses only part of the concept of openness. They are incomplete and thus do not synthesize an overall trade policy turned outwards.

Other studies of Rodriguez and Rodrik [27] came to criticize and question the results of four major studies. The authors established that the positive correlation between openness and growth found in the work of Dollar [19], Sachs and Warner [21] and Edward [22] were not robust. Their methodologies were also questioned, because the measurement indicators of trade openness could be heavily criticized and was missing important controllable variables that may have a determining effect on growth.

In this context, the question of whether greater trade openness increases growth has received considerable attention, see, eg, surveys Bladwin [28] and Rodriguez [29]. Estimate the effect of openness on growth is difficult because the degree of openness of a country is closely linked to income level and therefore potentially endogenous. To cope with the endogeneity of the openness variable, Dollar and Kraay [30] suggest to instrument by opening its lagged value. Unfortunately, their instrumentation strategy is not appropriate because the opening could be correlated over time. Alternatively, Frankel and Romer [16] suggested using the geographic component of trade as a real instrument; their result shows that the trade ratios have instrumented a positive and significant impact on economic growth. According to Rodriguez and Rodrik [27], this instrumentation strategy is still debatable, as trade may affect growth through, reporting for example, their health status or quality of institutions.

The internal conditions determine the outcome of the opening of a country. Indeed, if certain conditions are met, skilled human capital for example, the opening acts as a catalyst for growth by activating "the reaction of the economy" to external shocks. Finally, empirical works are able to demonstrate a positive impact of openness on growth, but their toughness is questioned. They face several econometric limitations, including the relevance of the choice of openness indicator.

Estimation and Interpretation of Results

In this section, we will attempt to evaluate the effect of certain macroeconomic variables on economic growth. To do this, we present firstly a model which we will estimate the variables and then we are going to use data sources. In the second place, there will be our estimate and we will try to draw some interpretations and comments.

Basis of Presentation and Data Model

There are many econometric models studying the effect of trade on economic growth. The choice of our model is based on the existence of variables, since we will try in this empirical part to study the effect of trade on economic growth in Tunisia. It refers back to the study done by Frank. H, Mei-Chu. H [31]. To conduct our analysis, we consider the following variables in logarithm between 1975-2011:

- The real gross domestic product (LGDP);
- The openness (measured by the sum of exports and imports relative to GDP), (LOPEN);
- The foreign direct investment inflows as a share of GDP (LFDIG);
- Human capital (measured by enrollment in secondary education), (LHK);
- The financial development (measured as the ratio of broad money to GDP), (LDF); Our series are annual and are mainly from CD-ROM World Bank (2011).

Descriptive Statistics

In this section, the analysis is done on the studied period between 1975-2009, its main interest is the evolution of real GDP, foreign trade, FDI, human capital and financial development. For the entire sample, measuring the average of each of these variables, in order to analyze their evolution.

The Real Gross Domestic Product (GDP)

The figure 1 represents the evolution of real GDP average across the sample during the study period from 1975 to 2009.

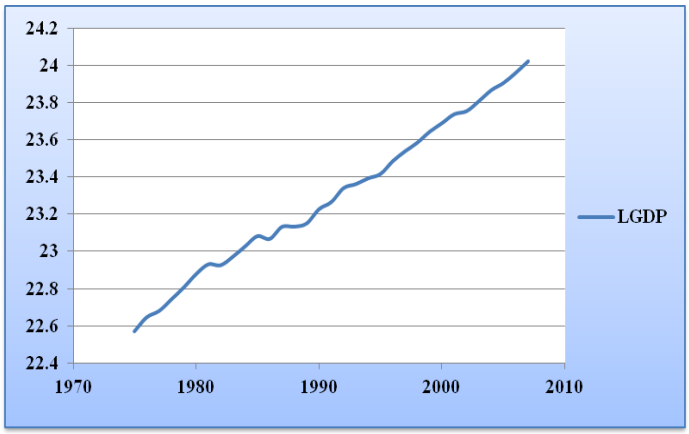

Fig. 1: Real GDP Tunisia (1975-2009 in %)

Over the period 1975-2009, the real average GDP Tunisia is in the range of 23.34%. However, this growth has known its peak in 1975 with 22.57% and 24.10% by 2009.

Trade Openness (OPEN)

The figure 2 represents the evolution of foreign trade of the total average during the studied period from 1975 to 2009, is defined by the ratio of trade openness (exports and imports of goods and services) to GDP. The inclusion of exports and imports in growth regressions was an important step towards understanding the text of the relationship between international trade and economic growth proposed by the new theories of trade and growth. While imports, exports are also important for economic performance. In fact, these two should be considered complementary to each other rather than alternatives

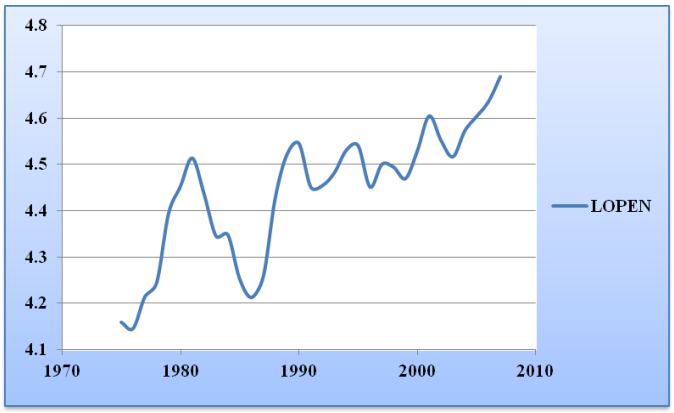

Fig. 2: Trade openness in Tunisia (1975-2009 in %)

It is clear that the indicator of foreign trade has followed a gradual journey from an average of 4.45%. So the trade in Tunisia has known since SAP (Structural Adjustment) in 1986, reaching a steady growth in 2009, 4.82%.

The Enrollment Rate in Secondary (HK)

Figure 3 represents the evolution of enrollment in secondary education (KH) average of the entire sample during the studied period from 1975 to 2009.The theoretical and empirical studies on human capital have shown its importance in economic growth with differences in results of its influence can be positive or negative. Education is a source of growth, if we invest in education, this factor will contribute to faster growth. By cons, a low level of education may handicap growth.

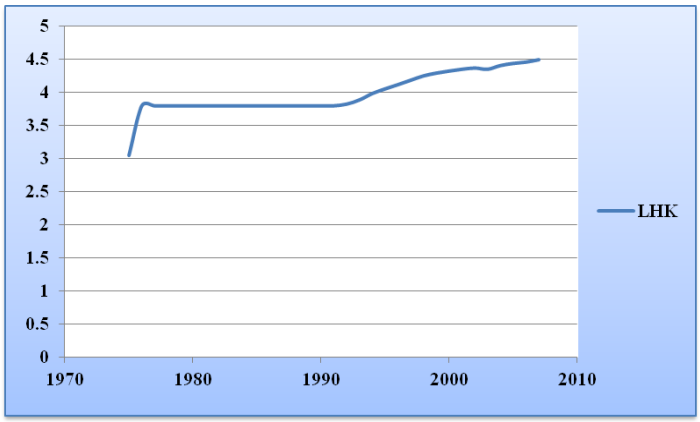

Fig. 3: The enrollment rate secondary (HK) in Tunisia (1975-2009 in %)

The enrollment rate secondary (HK) followed a regular trend between 1975-2009 at an average of 4.02%. In the early seventy-five this rate has been low levels of around 3.04% during the year 1990 the enrollment rate has seen a remarkable development, which reached 3.8%. So the evolution of enrollment rate secondary over a period of 35 years was recorded high levels of 4.5%.

Foreign Direct Investment (FDI)

The figure 4 represents the evolution of FDI averaged across the period studied from 1975 to 2009. The investment is the cornerstone of the production process: it has a lover in effect on employment (reduce unemployment and poverty) and a downstream effect on economic growth. The importance of the relationship FDI to economic growth has long been emphasized by economic analysis. FDI is the engine of economic growth, and therefore it had a positive influence.

Data specific to Tunisia show that FDI inflows followed an irregular path, around a mean of 0.71%. Over the period 1975-2009, has known its peak in 1988 with -0.51% and 2.35% in 2006.

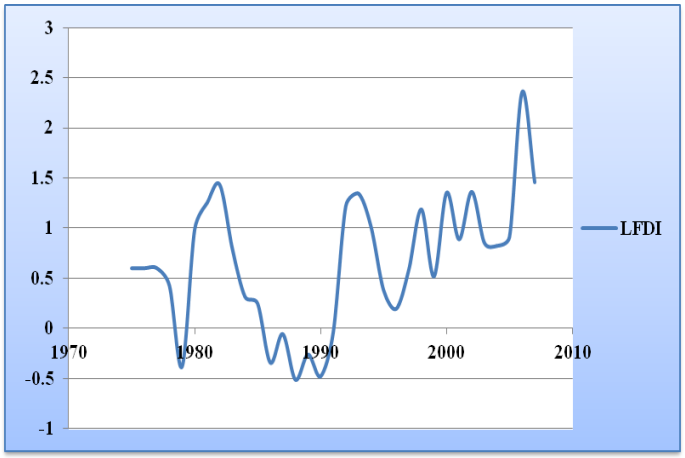

Fig. 4: The FDI inflows in Tunisia (1975-2009 in %)

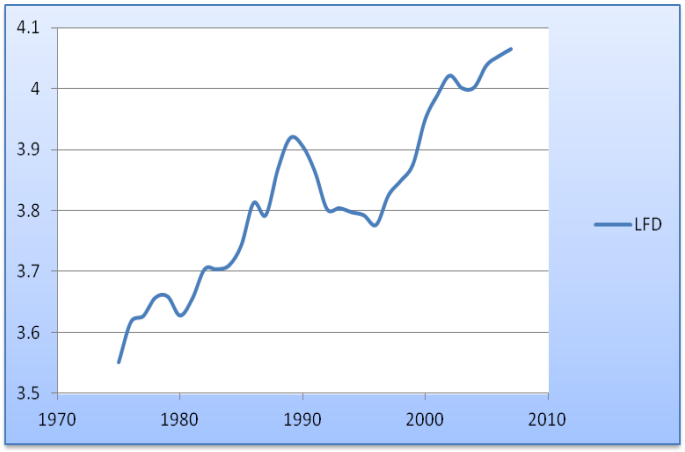

Fig. 5: Financial Development (FD) in Tunisia (1975-2009 in %)

Financial Development (FD)

The figure 5 represents the evolution of financial development averaged across the period studied from 1975 to in 2009.

The average of the evolution of financial development is 3.83% over the period 1975-2009. From one year to another, from the early sixties fifteen, financial development has known a steady growth, starting from a minimum of 3.55% in 1975 to a peak of 4.16% in 2009. Indeed the expected signs of variables are given by the following table:

Table 1: Summary of expected signs

Variables	Expected sign
The real gross domestic product: L(GDP)	+
Trade Openness: L(OPEN)	+
Foreign Direct Investment: L(FDIG)	±
Human Capital: L(HK)	+
Financial development: L(DF)	±

For the model to be meaningful, it is necessary that the model coefficient of determination (R2) is close to unity. The value of student test (which appears in brackets must be greater than or equal to 1.96 for the estimated coefficient is significant with 95% confidence).

Estimation Model

To empirically analyze the effect of trade on economic growth, we use the period from 1975 to 2011 for which data are available. The estimate is based on the method of ordinary least squares (OLS). The model to be estimated is:

$$LGDP_t = \alpha_0 + \alpha_1\ LOPEN_t + \alpha_2\ LFDIG_t + \alpha_3\ LHK_t + \alpha_4\ LDF_t + \varepsilon_t$$

Dependent Variable: *LGDP*

Explanatory variables: LOPEN, LFDIG, LHK, LFD

The real gross domestic product is estimated based on foreign trade, foreign direct investment, financial development and human capital. Indeed, the model estimation by the method of ordinary least squares (OLS) gives us the result below.

Table 2: Result of model estimation by OLS

Variable endogène : LGDP				
Exogenous variables	**Coefficient**	**Std error**	**Student's t**	**p. critical**
const	14,3467	0,6997	20,504	0,00001
LOPEN	0,334689	0,229061	1,4611	0,15437
LFDIG	0,0481944	0,0350533	1,3749	0,17935
LDF	1,44591	0,270133	5,3526	0,00001
LHK	0,477271	0,123177	3,8747	0,00054

The equation that relates the growth in function of the explanatory variables in this model is:

*LGDP=14,34+0,334*LOPEN+0,048*LFDIG+ 1,445*LDF + 0,477*LHK*

(0,699) (0,229) (0,035) (0,270) (0,123)

R^2 = 0, 8 (Standard deviations in parentheses)

Interpretation of Results

According to estimation results, we note that the results are quite acceptable. The R2 of around 94, this means that 94% of the variability of GDP is explained by the variables retained in the model. Indeed the opening (OPEN) to a positive (0.334) on economic growth. Through liberalization and openness, market size (economic growth) is improving and becoming more favorable for the relocation of foreign companies, because most companies take to market size and financial and tax advantages as main reasons for their locations. Well for economic growth, they prefer to the economic environment to make the most gains.

Similarly we find that the impact of FDIG on real GDP is positive (0.048). Investment thus favors economic growth, this can be explained by some political and economic factors are widely cited in the literature on FDI and enhance the natural interest of foreign investors in Tunisia. Indeed, Tunisia is investing a lot to improve the attractiveness of FDI and Tunisian legislation continues to encourage FDI by tax incentives and support by the state social insurance contributions.

The state provides substantial bonuses to export-oriented investments. From a tax perspective, foreign investors are fully exempted from income tax during the first ten years of their activities and a 50 for the next five years. Similarly, political stability in Tunisia also plays a key role in attracting FDI, this stability is synonymous with trust in the business.

Moreover, the coefficient of financial development in a positive sign (1.445) and significant. This can be explained that Tunisia to a stable macroeconomic environment (this condition implies in government deficits and a reasonable external low inflation).

Finally, economically there is a positive relationship (0.477) between human capital (HK) and economic growth. This variable is statistically significant in explaining the evolution of real GDP. This may be due to the national policy on human resource development is the improvement of skills and know-how to better exploit the technological potential. Two main orientations underlying: improving employability which should result in increased internal and external efficiencies of the education system and training and the development of the economy know with all the means it requires. It is based on these strategic objectives were defined what the reform process currently engaged and that affect all segments of the education system. This shows that Tunisia considers that human resources are its greatest asset and its greatest asset in economic development. This confirms the literature concerning the positive and significant impact of human capital.

Conclusion

For over twenty years, developing countries have undertaken economic reforms to restore their trade and budget balances. They, at the same time, opened their economic borders by lowering trade barriers.The openness-growth relationship is interesting to analyze empirically since most theoretical works have failed to resolve the positive or negative effect of openness on economic growth. By cons, It was found that the majority of empirical studies find a positive impact of trade on economic growth. These results are confirmed by the work of Rodriguez & Rodrik [4], Antoine & Andreas [2] and Claudia M. Buch & Toubel Farid [3]. There are other authors who predict that trade has no effect on economic growth as Mansouri. B [32]. Following is the empirical examination of the impact of trade openness on economic growth, it should be noted that trade policy adopted by Tunisia is characterized by its efficiency manifested through its openness to the outside [33-34].

This study by the OLS method revealed that trade openness positively affects economic growth, but remains weakly significant for the Tunisian economy is not fully liberalized. Thus, trade liberalization in Tunisia has played an important role in the process of economic growth. This due to the business strategy pursued by Tunisia as a gradual liberalization to full liberalization.

Table 3: Descriptive statistics for the study variables

	Max	Min	Average	Standard Deviation
Real GDP	24,1	22,57	23,34	0,44
OPEN	4,82	4,14	4,45	0,15
HK	4,53	3,04	4,02	0,32
FDI	2,35	-0,51	0,71	0,68
FD	4,16	3,55	3,83	0,15

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