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# The Trade Openness, Growth and Regional Inequalities Triangle: Case of Tunisia

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### Abstract

The 1980s were a crucial stage in the process of free trade, with numerous countries implementing reforms aimed at greater economic openness. Many of these countries also signed up to regional agreements, leading not only the unprecedented trade liberalization, but also capital flows, with an ever-increasing openness to FDI.

However, most countries observed that this process has gone hand in hand with a significant increase in inequalities, especially on the territorial level, with some regions benefiting more than others who have been left out and failed to reap the benefits of this economic integration.

Based on panel data for the period from 1990 to 2020, our analysis focuses on the Tunisian case highlighting that although trade opening has boosted growth, it has also contributed to regional inequalities, exacerbating the already deep-seated territorial divide between the coastal and the inland regions, leading to an unbalanced distribution of FDI, economic activities and development levels, bringing with it its share of economic, political and social distortions.

Keywords: Growth, regional inequality, trade openness, panel data, Tunisia

**JEL classification :** R11, R12, F10, O10, O55

### **1. Introduction**

Trade openness has dramatically expanded since the 1980, giving international interactions a new dynamic.

Economic integration and barrier dismantling have been among the most striking aspects of the last few decades in an expanding unified world market.

In a similar vein, the establishment of a free trade agreement is justified by the many advantages it offers

The IMF has also emphasized the significance of international integration, referring it as an effective pillar of economic growth and a tool for promoting the convergence of developing countries.

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However, many economists have expressed doubts about extending trade liberalization, following the failure of several structural adjustment policies, the emergence and spread of economic crises such as those in the Asian dragons or in Latin America, and even more alarming concerns about the consistent rise in inequality, affecting first and foremost the poorest populations in almost all countries.

This has led to several econometric studies looking closely at how openness, growth and, ultimately, inequality are related.

These interactions have been approached in different ways covering a multitude of specific analyses, giving rise to ambiguous and in some cases contradictory conclusions.

The aim of this paper is therefore to study the interactions between this triangle covering openness, growth and inequalities, especially regional ones in the Tunisian case, as we cannot talk today about economic recovery or convergence without referring to the inland regions catching up and reducing the regional disparities that have been plaguing the country for quite a few years and which have not ceased to damage the country's peace and social cohesion on many occasions.

Our aim in this paper is therefore to analyse how openness affects economic growth and, more importantly, how this can affect inequality dynamics and particularly regional ones in the Tunisian case.

### 2. Trade openness and regional inequalities

The last decades marked a turning point in the process of trade liberalization for developing countries, as many of them implemented reforms to open up their economies, which explains the growing number of these countries that have signed the General Agreement on Tariffs and Trade (GATT) and the considerable increase in their share of international exchange. Many developing countries have also committed to the process of regional agreements, which has resulted in an unprecedented liberalization of both their trade and capital flows, with an increasing openness to FDI.

However, it must be emphasized that this opening has been associated with an enhance in inequalities, especially territorial ones, with some regions benefiting from it over others that have been excluded and have not been able to take advantage of this openness benefits.

Several authors have also explored this topic, such as Chai (1996), Kanbur and Zhang (1999), Jones, Li and Owen (2003), Fu (2004), Catin and Van Huffel (2004), Gonzalez Rivas (2007), Ge (2009), Daumal and Ozynt (2011), Fajgelbaum and Redding (2014), Brulhart and al (2018), Ali Najeh (2015) and Jan Bakker (2019), Their research has shown that regions with a high concentration of innovative activities and a skilled workforce are often found along coastal areas, particularly in areas where foreign direct investment (FDI) is concentrated, regions benefit significantly from their proximity to the sea, as it reduces transportation costs, enables faster delivery of goods and transactions, and fosters greater external openness.

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To this end, the geographical economy, a component of the work register taking into account the gains and losses tied economic openness, has shown that the international trade benefits are not distributed equally among all the stakeholders. Peripheral areas are for the most part disregarded linked to the gains from the participation in this openness and carry more costs. More generally, the coastal regions gather the main markets, and the different suppliers of goods that are necessary to production. Coastal regions are also characterized by a developed infrastructure making them the propitious location for FDI.

In the same vein, Venables (2001) states that distance is a major factor in explaining inequalities as it creates costs relative to the search for a partner, transportation, and the time spent trading, all of which are carried by the periphery. Thus, distance creates a vicious circle where peripheral regions are negatively impacted due to their remoteness.

Indeed, Daumal (2009), looking at the brazilian case, has shown that trade openness always favors regions with a developed infrastructure and a favorable geographical location, pushing other less advantaged regions towards more traditional activities such as agriculture.

Similarly, Daumal (2013), in another study looked at the impact of openness on regional inequalities for Brazil and India, concluded that openness had increased inequalities between regions.

Additionally, public authorities can sometimes contribute to the aggravation of inequalities between regions by carrying out geographically targeted actions that favor certain regions over others, and this phenomenon has been particularly observed in China.

Indeed, the Chinese government has been involved in the aggravation of regional disparities as special economic zones (SEZ), particularly coastal cities, have been given preferential treatment in order to attract foreign investors, leading to significantly higher growth rates compared to other regions. This is confirmed by Jones, Li and Owen (2003), who showed in their analysis of 200 Chinese cities growth, that these SEZ had an average of 5% higher growth rate.

Kanbur and Zhang (1999) further support this finding, by studying the evolution of Chinese inequalities between cities and country sides and between coastal and inland areas, concluding that inequalities between coastal and interior areas have increased more strongly.

Foreign direct investment is not exempt from the accusation of exacerbating inequalities. Indeed, the latter is a phenomenon strongly associated with trade openness, which is commonly connected to economic growth, more efficient resource allocation, and higher wages, it also causes regional disparities. It should be emphasized that trade openness's advantages are mainly concentrated in coastal and industrialized cities, thus accentuating agglomeration effects.

Ge (2009), has shown that despite FDI positive effect on growth, it does not prevent the phenomenon of agglomeration and concentration within certain regions, thus causing territorial

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imbalances.

Wan and Chen (2004), looking at the Chinese case, concluded that trade openness had a positive influence on inequalities, particularly through FDI, and this impact has been intensifying over time.

On the other hand, it is widely acknowledged that multinational companies tend to offer higher wages compared to domestic firms, several studies have highlighted results confirming this trend.

Aitken and al. (1999), empirically demonstrated that multinational companies provided higher wages and better opportunities for skill development, and that these factors could have an amplifying impact on inequalities.

# 3. Empirical validation

### 3.1 Model specification

In the absence of an inequalities' theory, studies on this topic and particularly on regional inequalities, have evolved within an analytical framework that encompasses not only the contributions of the new international trade theory and those of endogenous growth but also the new geographical economy theory, thus shedding light on the various contemporary upheavals in trade within an increasingly integrated world economy.

Many authors have thus proposed to study how these different phenomena could interact with each other and whether openness, growth or technological progress and development was likely to have the greatest influence on regional inequalities.

Authors such as Young (1991), Grossman and Helpman (1991) and Rivera-Btaiz and Romer (1991), through the development of endogenous growth models, have been able to demonstrate that trade openness via phenomena such as intermediary trade, could generate productivity gains and subsequently influence economic growth.

We are particularly interested in the Solow's (1957) model of increased growth, and which has been taken up by many authors, such Lin and Liu (2000) and Jones, Li and Owen (2003), and it is presented in the following form

Annual income growth rate per capita =  $\beta_0 + \beta_1 \ln \text{Real income} + \beta_2 \ln \text{Saving rate} + \beta_2 \ln \ln \beta_2 \ln \beta$ 

 $\beta_3 + \beta_4 \ln \ln \ln \ln \arctan \operatorname{capital} rate +$ 

ε<sub>it</sub>

(1)

In our work, we have been inspired by the authors above studies, who adapted this model to assess the effect of openness and government strategies to increase the attractiveness of the country and then indirectly measure their effects on regional inequalities.

We will first adapt this model to empirically verify the impact of trade openness on economic

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(2)

growth for the Tunisian case, retaining a specific number of variables to consider both the different elements associated to openness and the country's macroeconomic policies.

We will use GDP as the dependent variable to measure economic growth.

We will also use three measures of trade openness, including export openness (EXP), import openness (IMP) and FDI openness. In fact, nowadays, a country's openness cannot be limited to international trade, but it is also characterized by its capacity to host FDI, which are crucial elements of contemporary international trade.

In order to capture the effect of the economic characteristics, we will include variables such the external debt (DEBT) as a measure of the country's indebtedness and the public expenditure (EXPEN) as a proxy for investment in physical capital.

Will have a model as follows.  $lnGDP_t = \alpha_0 + \alpha_1 lnEXP + \alpha_2 lnIMP_t + \alpha_3 lnFDI_t + \alpha_4 lnEXPEN_t + \alpha_5 lnDEBT_t + \varepsilon_t$ 

3.2 Methodology

For the estimations, we will use the Auto Regressive Distributed Lag model (ARDL), which is a combination of the AR models where we retain past values of the dependent variable among the explanatory ones, and the DL models where the explanatory variables include a certain number of variables and their past values.

$$Y_t = f(X_t, Y_{t-p}, X_{t-q})$$
(3)

Where

$$y_t = \beta_0 + \beta_1 y_{t-1} + \dots + \beta_k y_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \dots + \alpha_q x_{t-q} + \varepsilon_t$$
(4)  
 $y_t, x_t \ et \ \varepsilon_t$ , represent respectively the dependent variable, the explanatory variable and the error term.

This modeling is particularly efficient to test the cointegration between two or more time series, i.e. the long-term relations but also the short-term ones that may exist, especially when the series are not integrated in the same order.

This method is also based on a number of tests.

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### 3.2.1 Correlation matrix

### Table 1. Correlation matrix

	EXP	IMP	EXPEN	FDI	DEBT
EXP	1.000				
IMP	0.7134	1.0000			
EXPEN	0.3599	0.5811	1.0000		
FDI	0.4674	0.4231	0.7264	1.0000	
DEBT	-0.2067	0.4420	0.2675	-0.0742	1.0000

Note. Author's calculation based on STATA.

Our table shows that no correlation exceeds 0.8, which, according to Kennedy (1985), is the threshold beyond which concerns about potential multicollinearity issues may arise

#### 3.2.2 Specification tests

### 3.2.2.1 Stationarity tests

We will proceed to stationarity tests, using the two most common tests, namely the augmented dickey-fuller (1981) and the Phillips Perron (1988).

1 and 2. the augmented dickey-funct and the finnips ferron stationarity tests	Table 2. the a	lugmented dick	ey-fuller and	d the Phillip	s Perron	Stationarity	tests
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	ADF		PP		
In level	In first	Integration	In level	In first	Integration
	difference	order		difference	order
-0.028	-5.066	Integrated	0.018	-5.068	Integrated
(0.9939)	(0.0002)	1st order	(0.9944)	(0.0002)	1st order
-1.488	-5.385	Integrated	-1.428	-5.426	Integrated
(0.5394)	(0.0000)	1st order	(0.5686)	(0.0000)	1st order
-2.175	-4.760	Integrated	-2.257	-4.741	Integrated
(0.2156)	(0.0001)	1st order	(0.1861)	(0.0001)	1st order
-0.123	-4.717	Integrated	0.017	-4.694	Integrated
(0.9927)	(0.0007)	1st order	(0.9944)	(0.0007)	1st order
-3.726		Stationary	-3.709		Integrated
(0.0207)		at level	(0.0218)		1st order
-0.4	-4.239	Integrated	-0.607	-4.214	Integrated
(0.0860)	(0, 0039)	1st order	(0.9786)	(0.0043)	1st order
	In level -0.028 (0.9939) -1.488 (0.5394) -2.175 (0.2156) -0.123 (0.9927) -3.726 (0.0207) -0.4 (0.0060)	ADF           In level         In first difference           -0.028         -5.066           (0.9939)         (0.0002)           -1.488         -5.385           (0.5394)         (0.0000)           -2.175         -4.760           (0.2156)         (0.0001)           -0.123         -4.717           (0.9927)         (0.0007)           -3.726            (0.0207)         -0.4           -0.4         -4.239           (0.0920)         (0.0020)	ADF           In level         In first difference         Integration order           -0.028         -5.066         Integrated           (0.9939)         (0.0002)         1st order           -1.488         -5.385         Integrated           (0.5394)         (0.0000)         1st order           -2.175         -4.760         Integrated           (0.2156)         (0.0001)         1st order           -0.123         -4.717         Integrated           (0.9927)         (0.0007)         1st order           -3.726          Stationary           (0.0207)         at level         -0.4           -0.4         -4.239         Integrated	ADF         PP           In level         In first difference         Integration order         In level           -0.028         -5.066         Integrated         0.018           (0.9939)         (0.0002)         1st order         (0.9944)           -1.488         -5.385         Integrated         -1.428           (0.5394)         (0.0000)         1st order         (0.5686)           -2.175         -4.760         Integrated         -2.257           (0.2156)         (0.0001)         1st order         (0.1861)           -0.123         -4.717         Integrated         0.017           (0.9927)         (0.0007)         1st order         (0.9944)           -3.726          Stationary         -3.709           (0.0207)         at level         (0.0218)         -0.607           -0.4         -4.239         Integrated         -0.607	ADFPPIn levelIn first differenceIntegration orderIn level In levelIn first difference $-0.028$ $-5.066$ Integrated $0.018$ $-5.068$ $(0.9939)$ $(0.0002)$ 1st order $(0.9944)$ $(0.0002)$ $-1.488$ $-5.385$ Integrated $-1.428$ $-5.426$ $(0.5394)$ $(0.0000)$ 1st order $(0.5686)$ $(0.0000)$ $-2.175$ $-4.760$ Integrated $-2.257$ $-4.741$ $(0.2156)$ $(0.0001)$ 1st order $(0.1861)$ $(0.0001)$ $-0.123$ $-4.717$ Integrated $0.017$ $-4.694$ $(0.9927)$ $(0.0007)$ 1st order $(0.9944)$ $(0.0007)$ $-3.726$ $$ Stationary $-3.709$ $$ $(0.0207)$ at level $(0.0218)$ $-0.4$ $-4.239$ $-0.4$ $-4.239$ Integrated $-0.607$ $-4.214$

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3.2.2.2 The Co-integration Test of Pesaran and al (2001)

Also called Bounds test of Cointegration, it was initially developed by Pesaran and Shin (1998), this test is particularly useful to check the long run relationships known as Cointegration relationships, between one or more time series, especially when they are not integrated of the same order.

We can emphasize that our variables are not integrated of the same order and that none of them is integrated of the second order, thus supporting the use of the Cointegration test of Pesaran and al (2001).

However, before applying the cointegration test we must choose the most appropriate model by determining firstly the optimal lag structure to include in our ARDL model.

3.2.3 Determination of the optimal lag number of the ARDL model

We will use the Akaike Information Criteria (AIC) for the choice of the optimal lag structure to introduce in our model.

Model to estim	ate	GDP EXP IMP EXPEN FDI DEBT, maxlags (2) aic				
Optimal lag		Lags (2 2 2 2 1 1)			_	
F-statistic		3.107				
		significance	I0 Bound	I1 Bound		
Critical	Value	10%	2.26	3.35	_	
Bounds		5%	2.62	3.79		
		2.5%	2.96	4.18		
		1%	3.41	4.68		

Table 3. Determination of the optimal lag number of the ARDL model

Note. Author's calculation based on STATA.

#### 3.2.4 Estimation results

Table 4. Estimation results

VARIABLES	GDP
L.GDP	1.310***
	(0.279)
L2.GDP	-0.423
	(0.247)
EXP	0.135**
	(0.0438)
	· · · ·

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ΙΕΧΡ	-0.00707	
<b>L.L</b> / <b>M</b>	(0.0589)	
I 2 FYP	0.0892*	
	(0.0466)	
IMP	-0 169***	
11411	(0.0506)	
I IMP	-0.108	
	(0.0674)	
	(0.0074)	
	-0.0880	
EVDEN	(0.0498)	
EAPEN	0.0997*	
	(0.0550)	
L.EXPEN	0.0609	
	(0.0739)	
L2.EXPEN	-0.100	
	(0.0639)	
FDI	0.0289***	
	(0.00816)	
L.FDI	0.0197*	
	(0.00986)	
DEBT	0.734***	
	(0.202)	
L.DEBT	-0.196	
	(0.113)	
Constant	-0.205	
	(0.623)	
R-squared	0.999	

Note. Author's calculation based on STATA.

3.2.5 Model diagnostic tests

This step aims to confirm our estimated model validity, via the autocorrelation test, the heteroscedasticity test, the normality test and finally the stability test.

We will expose below the results of the different tests, which confirm that the residuals show all the desired properties, validating even more the robustness of our results.

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Breusch-Godfre	Breusch-Godfrey LM test for autocorrelation						
Estimation	Chi2	Prob chi2					
	0.083	0.7729					
Breusch-Pagan /	Breusch-Pagan / Cook-Weisberg test for heteroskedasticity						
Estimation	Chi2	Prob chi2					
	0.00	0.9611					
Skewness/Kurtosis tests for Normality							
Estimation	Chi2	Prob chi2					
	1.49	0.4755					

Table 5. Diagnostic tests

Note. Author's calculation based on STATA.

The CUSUM stability test also shows that the estimated parameters are stable over time, confirming the null hypothesis of relationship stability.

#### 3.3 Results discussion

Our results show that trade openness effect interacts with various factors that significantly influence economic growth and respond to the policies pursued by the state to improve access to investment and increase physical capital, highlighting even more the importance of macroeconomic policies to complement trade openness and enhance its impact on economic growth.

Many consider that international trade induces a better reallocation of resources leading to a redeployment of production factors from the less productive sectors to the more dynamic ones, leading thus to a greater factors productivity (Dowrick and al, 1991).

It can also contribute to the available goods enhance (Romer and Rivera Batiz, 1991) as well as to the transmission of new technologies and knowledge (Grossman and Helpman, 1991, Keller, 1996).

With regard to our estimations, the positive and statistically significant effect of exports can be explained by the fact that they are perceived today as excellent drivers of economic growth, they constitute opportunities for national production as well as a source of foreign currency inflows to compensate the effect of imports on the trade balance, and they constitute revenue for the state to finance local economies.

Indeed, it is agreed today that the exports participate actively in developing countries to reduce unemployment and poverty, boost public revenues and increase the import capacity of capital goods, thus increasing production and economic growth.

As for the negative and statistically significant effect of imports, this can be explained by the fact that today the country suffers from a trade balance deficit due in large part to imports that

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significantly exceed exports, the latter find their origins in the increase in imports of food products and consumer goods in relationship with the purchase of textiles and clothing or electrical and mechanical consumables.

It should also be emphasized that the on-going dinar devaluation has made these imports even more expensive, leading to an inflationary trend that is significantly affecting both the purchasing power and economic growth. (Kholis, 2012, Mogoe and al, 2014).

Regarding the positive and statistically significant effect of FDI, it further supports the results of a large number of studies that agree on the crucial role of FDI in the development process, often perceived as catalysts of economic growth bringing to host countries their lots of innovations, technologies, productions and opportunities for the local workforce.

In relation to public expenditure, our results support their positive effect. In fact, Tonzi and Zee (1997) suggest that public spending can have a positive impact on economic growth through at least two channels.

The direct one by the increase of the economy's physical capital stock via public investment complementary to private one.

Or indirectly by increasing production factors' marginal productivity through spending in education or health, which works towards human capital accumulation.

For its part, the variable representing the external debt has a negative and statistically significant effect on economic growth, this is consistent with the findings of many works such as those of Fosu (1999) or Bernardin and al (2018) who have shown that the increase in the external debt is harmful to the economic growth, for the Tunisian case, it has experienced an exceptional increase of its debt in recent decades to reach 100.9% of GDP in 2020.

These different results lead us to look at this economic growth, which is initiated by a set of factors linked to trade openness and the disparities that it can generate, particularly between regions.

Indeed, we start from the statement that trade openness participates largely to stimulate economic growth, however the fallout does not seem to reach and affect the different regions in the same way, having a contrasting effect on their development and being likely to increase the inequalities already well established in the territory.

The stylized facts clearly show that several factors have a positive impact on economic growth, especially at the regional level, such as openness to foreign trade, infrastructure development and human capital accumulation. However, what we can clearly notice, is that inequalities continue to grow at the regional level, with coastal regions monopolizing economic activity and benefiting from better integration into foreign trade, while inland regions are relegated to the background.

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Our model will therefore take the following form:

$$\begin{split} LRGDP_{it} &= \alpha_0 + \alpha_1 LFDI_{it} + \alpha_2 LWATER_{it} + \alpha_3 LELEC_{it} + \alpha_4 LSAN_{it} + \alpha_5 LCENT_{it} + \alpha_6 LEDU_{it} + \alpha_7 FTA_{it} + \varepsilon_{it} \end{split}$$

(3)

Table 6. variables designation

Variables	Designation
RGDP	Regional GDP
FDI	FDI per governorate
WATER	Water supply per governorate
ELEC	Connection to electricity per governorate
SAN	Connection to the sewerage system per governorate
CENT	Number of health care facilities per governorate
EDU	School enrolment rate per governorate
FTA	Free Trade Agreement per governorate

*Note.* All our data comes from the National Institute of Statistics, the World Bank, the Foreign Investment Promotion Agency and the Tunisian Electricity and Gas Company.

### 3.4 Methodology

We will use panel data econometrics to estimate our model.

However, our different specification tests related to this methodology showed that our model suffers from two major problems, namely an errors autocorrelation as well as a heteroscedasticity that can bias our results.

This leads us to use the FGLS method, developed by Parks (1967), which is a generalization of the ordinary least squares' estimator, it proves to be particularly effective in handling the problem of heteroscedasticity and errors autocorrelation.

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#### 3.5 Results discussion

Table 7. Estimation results

VARIABLE	(1) IRGDP	(2) IRGDP	(3) IRGDP
S			
LFDI	0.123***		0.116***
	(0.00908)		(0.00902)
LWATER	0.312***	0.370***	0.434***
	(0.0623)	(0.0594)	(0.0550)
LELEC	0.521***	0.706***	0.466***
	(0.112)	(0.106)	(0.0949)
LEDU	-0.0132	-0.105***	-0.0290
	(0.0264)	(0.0277)	(0.0225)
LSAN	0.321***	0.300***	0.292***
	(0.0262)	(0.0245)	(0.0236)
LCENT	0.0785***	0.113***	0.0465**
	(0.0274)	(0.0322)	(0.0229)
FTA	0.0103***	0.0127***	0.0133***
	(0.00371)	(0.00378)	(0.00308)
LDENS		0.753***	
		(0.0546)	
LDIST			-1.28e-
			10*
			(6.53e-11)
Constant	0.154	-1.380***	0.305***
	(0.119)	(0.149)	(0.115)
Observations	576	576	576
R-squared	0.999	0.998	0.999
Numb of country	24	24	24

Note. Author's calculation based on STATA.

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Wooldrige test for	autocorrelation	1	
	Chi2	Prob chi2	
	19.615	0.0002	
Breusch-Pagan / C	Cook-Weisberg	test for heteroskedasticity	
	Chi2	Prob chi2	
	16.90	0.0000	
Jarque-Bera norma	ality test		
	Chi2	Prob chi2	
	2.909	0.2335	

 Table 8. Diagnostic tests

*Note*. Author's calculation based on STATA.

Following our regressions, we note that both variables related to foreign trade openness, including the FDI density per governorate, and the free trade agreement with the European union (EU), proved to be statistically significant at the 1% threshold and had a positive effect on regional GDP, confirming once again the significance of foreign trade openness in boosting regional growth, This clearly shows the role that FDI plays in regional growth and development, as an excellent channel for relaying new technologies, knowledge, skills and innovations. On the other hand, FDI is an effective tool for absorbing labour demand, with the offshore sector creating more than 1,469 jobs in 2018, representing 83.2% of total jobs created. However, the only downside remains that most of the jobs created are mainly located in coastal regions, contributing to deepening the gap between coastal and inland regions, whose share is less than 10%.

The variables relating to amenities, such as health care centers per governorate, and infrastructure development, including connection to electricity, sewerage and potable water, all had a positive and statistically significant effect at the 1% level in almost all of our estimates, providing further support for maintaining the relevance of infrastructure development to regional growth.

This positive effect of infrastructure variables confirms their role as an asset in attracting firms, particularly FDI. This further emphasizes the crucial role of public investment for regional development and growth. However, it is well known that Tunisia has a long history of inadequate development, consistently favoring the capital and coastal areas, resulting in major territorial imbalances which have persisted for many years and have repeatedly compromised social cohesion.

In this respect particularly, Ali Najeh (2015), demonstrated that initial endowments and geographical position were the main reasons for regional disparities and divergences in Tunisia, and that growth, development and poverty reduction were more prevalent in the coastal regions following the country's economic liberalization.

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Thomas Farole (2013), in a study of 28 low- and middle-income countries in East Asia, Europe, Central Asia and Latin America, also points out the fact that the increase in regional inequalities following trade opening was more pronounced in countries already experiencing major interregional disparities, involving limited government assistance and weak public spending at regional level.

As regards the human capital variables, population density per governorate is statically significant at the 1% threshold and has a positive effect on regional GDP. In fact, this variable reflects, in particular, the accumulation of human capital within regions so as to indicate their productive capacity. In the Tunisian case, the population exodus from inland regions to coastal ones and the capital only accentuates the already well-established gap between the two regions groups.

Our results also tie in with those of Baylis (2009), which suggest higher growth in most populated regions following trade opening, with the latter benefiting from a greater productive force.

Daumal and Ozyurt (2011) also concluded that greater trade openness benefited the most highly endowed regions in terms of human capital capable of pursuing economic activities, especially technology-intensive ones.

On the other hand, the variable representing the education level showed a negative effect. This counter-intuitive outcome highlights the particular situation in Tunisia, where young graduates face significant challenges in entering the job market, as evidenced by an unemployment rate nearly double the national average.

This negative effect associated with a higher education enrollment rate has already been highlighted by several studies, such as Heo and al (2015), who found that trade openness was much more beneficial to individuals with low educational attainment levels, as job creation was much more oriented towards unskilled labour.

The effect of the distance variable was negative and significant at the 1% threshold.

In fact, the various costs generated by geographical distance have a major impact on economic activity location, particularly for FDI, resulting in a highly unequal allocation between regions. This is illustrated by the Tunisian map, with the eastern regions doing well, capturing nearly the whole economic activity thanks to their attractive geographical location and greater accessibility to the main foreign markets.

Meanwhile, Venales (2001), confirmed that distance can appear as an explanatory element in regional disparities.

Hanson (1998), has shown that the expansion of international trade encourages firms to establish themselves in regions with more attractive geographical locations and better access to ports in

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order to reach foreign markets.

Our results provide support for the findings of several studies on regional inequalities topic, such as Domecq and Regnault (1990), Figlio and Blonigen (2000), Teixeira (2002), Métral (2003), Mullen and Williams (2005), who concluded that regional openness to FDI enhances economic activity concentration in some regions over others. According to authors including El Bekri (2000), it is the coastal regions that attract the largest share of FDI due to various factors such as infrastructure development, accessibility and local potential, including human capital.

### 4. Conclusion

For a while Tunisia implemented a set of economic policies giving it the stature of being a very outward-looking country in the global economy, doing its best to overcome underdevelopment, with a growth rate approaching 5% for decades, significant progress in infrastructure and a significant incentive for investment, particularly from abroad, as well as a particular focus on investment in human capital. In the end, these achievements gave Tunisia a flourishing reputation in the North African region and made it one of the EU's privileged partners in this area. However, this image only lasted for a time, and the events of January 2011, which led to the popular revolt, tarnished it.

In fact, the country's economic progress has gone hand in hand with a development policy which clearly prioritized the capital and the coastal regions given their potential, particularly in terms of foreign trade. This has helped to create a major gap between the coast and the country's interior, a gap which has continued to expand in recent years between regions which have made significant progress in terms of developing their infrastructures and now monopolize most of the country's economic activity, and other ones which only capture a fraction of it and are suffering from a significant backwardness, They are often forced to turn towards more traditional activities, particularly agriculture.

Indeed, at the regional level, indicators clearly show a remarkable imbalance between the different regions, with coastal ones benefiting from greater involvement in national economic dynamics and a growing integration into the global market, being the first to collect the positive fallout, while inland regions are more likely relegated to the background.

They also reveal a flagrant difference in terms of infrastructure, education, healthcare and wealth.

Based on our empirical analysis, we have been able to demonstrate that while greater openness can boost economic growth, this effect is much more nuanced at regional level. Indeed, although regional openness to FDI in particularly might boost growth, the concentration of the latter in a few regions instead of others can only worsen the situation in relation to the spatial disparities already prevalent in the country. Today, it should be noted that the coastal regions are fully benefiting from the development of their infrastructure and their strategic location, leading them to polarize slightly less than 90% of private companies, especially foreign ones.

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As part of an economic policy aimed at enhancing openness and deeper integration into the global economy, the Tunisian government must address regional inequalities by fostering investment, especially foreign investment, in the country's interior. Additionally, it should prioritize the development of these regions by allocating more funds and a significant portion of public spending to support their growth and help them catch up.

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#### **Conflict of interest**

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#### References

Alesina A and Drazen A, (1991), Why are Stabilizations Delayed? American Economic Review, vol. 81, n° 5: 1170-1188.

- Alesina A and Perotti R, (1996), Income Distribution, Political Instability, and Investment, European Economic Review, 40: 1203-1228.
- Bakker J, (2019), International Trade and Regional Inequality, University of Oxford and CEP.
- Barro R and Lee J, (1994), Sources of Economic Growth, Carnegie-Rochester Conference Series on Public Policy, Vol.40, Issue 1, pp.1-46.
- Baylis K, Garduno-Rivera R and Piras G, (2009), The Distributional Effects of NAFTA in Mexico: Evidence from a Panel of Municipalities, Agricultural and Applied Economics Association, 2009 Annual Meeting, Milwaukee, Wisconsin 49463.
- Beck N and Katz J, (1995), What to do (and not to do) with Time Series Cross-Section Data, The American Political Science Review, Vol.89, N°3, pp.634-647.
- Benhabib J and Spiegel M, (1994), The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data, Journal of Monetary Economics, Elsevier, Vol.34, N°2, pp.143-173.
- Bernardin S and al, (2018), The effect of external debt on economic growth in Sub-Saharan Africa. International Journal of Business and Economic Sciences Applied Research (IJBESAR), Vol. 11, pp. 61-69.
- Brulhart M, Carrère C and Robert-Nicoud F, (2018), Trade and Towns: Heterogeneous Adjustment to a Border Shock, Urban Economics, Vol.105, pp.162-175.
- Catin M and Van Huffel C, (2004a), Ouverture Économique et Inégalités Régionales de Développement en Chine : Le Rôle Des Institutions, Mondes en Développement N°128 2004/4, pp.7-23.
- Catin M and Van Huffel C, (2004b), L'impact de l'Ouverture Économique sur La Concentration Spatiale dans Les Pays en Développement, Région et Développement, Vol.20, pp.123-158.

Chai J, (1996), Divergent Development and Regional Income Gap in China, Journal of

Vol. 9, No.04; 2025

ISSN: 2456-7760

Contemporary Asia, Vol.26, Issue 1.

- Chen J and Fleisher B M, (1996), Regional income inequality and economic growth in China, Journal of Comparative Economics 22(2), pp. 141-164.
- Connolly M, (2003), The Dual Nature of Trade: Measuring its Impact on Imitation and Growth, Journal of Development Economics, Vol.72, Issue 1, pp.31-55.
- Daumal M, (2009), The Impact of Trade Openness on Growth of Brazilian States, Working Paper, Laboratoire EQUIPPE.
- Daumal M, (2013), The Impact of Trade Openness on Regional Inequality: The Cases of India and Brazil, The International Trade Journal, Vol.27, N°3, pp.243-280.
- Domecq J and Regnault H, (1990), Tunisie : DIT, Développement Littoral, Stagnation Intérieure, Revue d'Économie Régionale et Urbaine, N°4, pp.523-533.
- Dowrick S and Gemmell N, (1991), Industrialisation, Catching Up and Economic Growth: A Comparative Study Across the World's Capitalist Economies, Economic Journal., 101 (405) (1991), pp. 263-275
- Durlauf, (1996), A Theory of Persistent Income Inequality. Journal of Economic Growth, 1: 75-93.
- El Bekri F, (2000), Disparités Régionales et Développement en Tunisie, Revue d'Économie Régionale et Urbaine, N°5, pp.887-914.
- Fajgelbaum P and Redding S, (2014), External Integration, Structural Transformation and Economic Development: Evidence from Argentina 1870-1914, National Bureau of Economic Research, Working Paper 20217.
- Farole T, (2013), Trade Openness and Regional Inequality, The Internal Geography of Trade, pp.33-63.
- Fazekas K, (2005), Effects of FDI Inflows on Regional Labour Market Differences in Hungary, Économie Internationale, Vol.102, pp.83-105.
- Fernandez R and D Rodrik, (1991), Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty. American Economic Review, vol. 81, n° 5: 1146-1155.
- Figlio D and Blonigen B, (2000), The Effects of Foreign Direct Investment on Local Communities, Journal of Urban Economics, Vol.48, Issue 2, pp.338-363.
- Fosu AK, (1996), The Impact of External Debt on Economic Growth in Sub-Saharan Africa, Journal of Economic Development, Vol. 21, No. 1 (June, 1996a), pp. 93-118.
- Fu X, (2004), Limited Linkages from Growth Engines and Regional Disparities in China, Journal of Comparative Economics, Vol.32, N°1, pp.148-164.
- Ge Y, (2009), Globalization and Industry Agglomeration in China, World Development, Vol.37, Issue 3, pp.550-559.
- Gonzalez Rivas M, (2007), The Effects of Trade Openness on Regional Inequality in Mexico, Annals of Regional Science, Vol.41, Issue 3, pp.545-561.
- Grossman G and Helpman E, (1991), Quality Ladders in the Theory of Growth, The Review of Economic Studies, Vol 58, N°1, pp.43-61.
- Hanson G, (1997), Increasing Returns, Trade and the Regional Structure of Wages, Economic Journal, Vol.107, Issue 440, pp.113-133.

Harrison Ann E and Aitken BJ, (1999), Do Domestic Firms Benefit from Direct Foreign

Vol. 9, No.04; 2025

ISSN: 2456-7760

Investment? Evidence from Venezuela, American Economic Review, vol. 89(3), pages 605-618, June.

- Henderson V and Kuncoro A, (1996), Industrial Centralization in Indonesia, The World Bank Economic Review, Vol. 10, No. 3 (Sep., 1996), pp. 513-540 (28 pages)
- Heo S and Oh J, (2015), The Effects of Trade Openness on Regional Inequality in South Korea, 55th Congress of the European Regional Science Association: World Renaissance: Changing Roles for People and Places, 25-28 August 2015, Lisbon, Portugal, European Regional Science Association (ERSA), Louvain-la-Neuve.
- Jones Derek C, Li Cheng and Owen Ann (2003), Growth and Regional Inequality in China during the Reform Era, China Economic Review, Vol.14,Issue 2, pp.186-200.
- Kanbur R and Zhang X, (1999), Which Regional Inequality? The Evolution of Rural-Urban and Inland-Coastal Inequality in China from 1983 to 1995, Journal of Comparative Economics, vol.27, N°4, pp.686-701.
- Karray Z and Driss S, (2009), Structure Industrielle, Économies d'Agglomération, Ouverture et Croissance Régionale en Tunisie, Programme de Recherche FSP (2005-2008) sur Les Dynamiques d'Agglomération des Activités Productives et Gouvernance Territoriale.
- Keller W, (1996), Trade and the Transmission of Technology, Development and Comp Systems 9609001, University Library of Munich, Germany.
- Kennedy, P. (2008). A guide to econometrics. John Wiley & Sons.
- Kholis M, (2012), Dampak foreign direct investment terhadap pertumbuhan ekonomi Indonesia; Studi makroekonomi dengan penerapan data panel. Jurnal Organisasi dan Manajemen, 8(2), 111-120.
- Krueger A and Lindahl M, (2001), Education for Growth: Why and for Whom? Journal Economic Literature, Vol.39, N°4, pp.1101-1136.
- Lin J and Liu Z, (2000), Fiscal Decentralization and Economic Growth in China, Economic Development and Cultural Change, Vol.49, N°1, pp. 1-21.
- Mankiw N, Romer D and Weil D, (1992), A Contribution to the Empirics of Economic Growth, The Quarterly Journal of Economics, Vol.107, Issue2, pp.407-37.
- Métral A, (2003), Forces Centrifuges et Forces Centripètes autour de La Métropole Tunisoise. Les Entrepreneurs Locaux, Acteurs de La Localisation Industrielle, Revue d'Économie Régionale et Urbaine, N°2, pp.267-290.
- Mogoe S, and Mongale P, (2014), The Impact of International Trade on Economic Growth in South Africa: An Econometrics Analysis. Mediterranean Journal of Social Sciences: Vol. 5 No. 14 july 2014
- Mullen J and Williams M, (2005), Foreign Direct Investment and Regional Economic Performance, Kyklos, Vol.58, N°2, pp.265-282.
- Najeh A, (2015), Aux Sources des Disparités Géographiques en Tunisie : La Contribution du Modèle de Développement Socio-Économique, de La Croissance Économique et du Facteur Institutionnel, Économies et Finances, Université Montpellier, Français, FFNNT : 2015MONTD062ff.
- Nelson R and Phelps E, (1966), Investment in Humans, Technological Diffusion, and Economic Growth, American Economic Review, Vol.56, pp.69-75.
- Ozyurt S and Daumal M, (2011), Trade Openness and Regional Income Spillovers in Brazil: A

Vol. 9, No.04; 2025

ISSN: 2456-7760

Spatial Econometric Approach, Papers in Regional Science, Vol.92, Issue 1, pp.128-215.

- Parks R, (1967), Efficient Estimation of a System of Regression Equations when Disturbances are both Serially and Contemporaneously Correlated, Journal of the American Statistical Association, Vol.62, N°318, pp.500-509.
- Pesaran MH and al, (2001), first conduct the bounds tests in the unrestricted model or namely an ARDL (p,p,p,p) model (see their paper, Equation 30), and secondly adopt the ARDL (p,q,r,s,v) approach to the estimation of the level relations.
- Pesaran MH and Shin Y, (1998), An Autoregressive Distributed-Lag Modelling Approach to Cointegration Analysis. Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium, 31, 371-413.
- Pritchett L, (2001), Where Has All the Education Gone? World Bank Economic Review, Vol.15, pp.367-391.
- Rivera-Batiz L and Romer P, (1991), Economic Integration and Endogenous Growth, The Quaterly Journal of Economic, Vol. 106, pp.531-556.
- Sala-i-Martin X, (2002), The World Distribution of Income (estimated from Individual Country Distributions), NBER Working Paper N°8933, Washington, D.C.
- Solow R, (1957), Technical Change and the Aggregate Production Function, The Review of Economics and Statistics, Vol.39, N°3, pp.312-320.
- Tanzi V and Zee H, (1997), Fiscal Policy and Long-Run Growth, IMF Staff Papers, Palgrave Macmillan, vol. 44(2), pages 179-209, June.
- Venables A, (2001), Cities and Trade: external trade and internal geography in developing economies. World Development report, Entering the 21st Century.
- Wan and Chen, (2004), The Role of Taiwanese Foreign Direct Investment in China: Economic Integration or Hollowing-Out? THE JOURNAL OF THE KOREAN ECONOMY, Vol. 5, No. 2, 207-231
- Young A, (1991), Learning by Doing and the Dynamic Effect of International Trade, The Quarterly Journal of Economics, Vol.106, N°2, pp.396-405.