Which is the best for Tunisian Economic Growth: Urbanization or Ruralization?

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Abstract: A country's economic growth determines its degree of national economic integration and into global value chains. This study aims at examining the effect of urbanization and ruralization for the Tunisian case using annual data expanded from 1965 to 2019. The results of the estimation of an autoregressive distributed lag model and an error correction model show that urbanization has a negative effect on Tunisian economic growth. However, ruralization boosts it. Thus, Tunisia would not be at the stage of urban saturation. Urbanization without industrialization would therefore have reached its limits. Accordingly, Tunisia was built without development and therefore no longer appears as a privileged place but sometimes even excluded. Sometimes the only response to the urban crisis is “the urban exodus”.

Keywords: Tunisian economic growth, Urbanization, Ruralization, ARDL, ECM

JEL Classification : R01 ; R03 ; O44 ; 047 ; O55

1. Introduction

Although it is recognized that in the history of developed countries urbanization versus ruralization and economic growth in general have interacted, the phenomena of urbanization and ruralization in developing countries seem to be different. In fact, developing countries experienced a well-known phenomenon as the urban explosion from the end of World War II and decolonization movements. Therefore, urbanization, which is a movement that describes the development and lengthening of cities and the so-called urbanized areas, through an increase in the number and size of cities and their populations, but also changes in rural areas through the spread of behaviors, adoption of cultural methods, references, and urban values. What economic growth in one or longer periods of time, the sustainable development of the economy, defined by the inconspicuous interventions. We no longer speak of the 1980s as third worlds, but as third worlds, emphasizing the different ways in which developing countries were performed. Ruralization and urbanization are two ambiguous concepts that convey a certain number of ideological presuppositions when they are used. One of the important questions to which we try to respond on the relationship between urbanization versus ruralization and economic growth of this article is: What affects the two phenomena (urbanization and ruralization) on Tunisian economic growth? Do they have the same effects?

Urbanization is a historical movement to transform forms of society that can be defined as an increase in the population of a city relative to the population. So, it is the process of developing cities and concentrating the population in them. The spatial-temporal urbanization process occurs differently depending on the country and city. Several historical, political, social, and cultural factors can explain the increasing urbanization: (i) Mass migration from the countryside and the development of an industry and service-oriented society have made urban centers the main source of wage employment. The cultural and political attraction of cities, especially capitals, encourages the arrival of new residents, despite chronic increases in rents and land prices. This price encourages the intensification of construction and the exploitation of the basement (parking lots, garages and sometimes shops). (ii) Political decisions on land use planning frame the development of existing cities or the creation of new cities from scratch. Recently a local land use plan or urban planner together with the sustainable planning and development project in Tunisia are the main tools that allow communities to implement these policies. Urban planning techniques direct space occupation in cities over the long term, and elected officials and technicians also face numerous contradictory pressures from residents, shopkeepers, industrialists, planners, etc. (iii) The

tourist attraction of some very sunny areas, or near the sea, has led to the development of dense houses. We speak of urban sprawl or urban sprawl, or even coastal formation to describe a progressive and inevitable occupation of some valleys and coasts.

The challenge of rural population declines and the need for rural communities to become more attractive places to live and work are of concern to both rural populations and policymakers. With fewer people to serve, the decline could threaten the development or preservation of services such as public transport and health care. It also makes new services such as providing broadband less economically sustainable to develop the supporting infrastructure creating a digital divide. The downward trend can also lead to age disparity, with rural demographics dominated by older rather than younger populations. The age profile of farmers is an issue as they approach retirement. Limited opportunities for work and education with a social landscape lacking the liveliness of cities can make rural areas not only unattractive, but an unrealistic option for young people. A downward spiral begins to emerge regarding depopulation. However, when young people leave rural areas, it is not necessarily for good, but the ambition to return can usually only manifest if there are business or employment opportunities necessary for livelihoods. Agriculture as an option for rural youth faces challenges. Becoming a farmer can be unattractive compared to other higher paying jobs that offer a better work-life balance. But even beyond these considerations, high farmland prices require a large capital investment to access it. Entering agriculture through family farming is the most realistic option, but it also has its challenges, as many developing countries have persistent inheritance and succession problems. However, despite these problems, rural areas have many qualities that can attract newcomers, such as lower house prices, a clean environment, and plenty of places to connect with nature. This can appeal to urban travelers and seasonal residents, for whom rural areas offer a second home or a high quality of life. This is especially true in scenic rural areas or near cities. However, this brings challenges and some controversies, because people in rural areas are less interconnected, which erodes the strength of social bonds within the community. In areas where housing is scarce, it can also make life less viable for current residents. For entrepreneurs, while living in rural areas can have similar benefits to those mentioned above, doing business in rural areas can be difficult. Access to highly qualified personnel can be a barrier. Networks are essential for doing business, whether it's working directly with others or accessing important advice and information by being around other people doing similar things. Digital connectivity can help overcome this problem, but broadband quality in rural areas can be an issue.

In fact, Tunisia's economic growth in 2018 increased slightly to 2.5% from 2017's 2% in 2017, helped by the agricultural and service sectors (including tourism, which has picked up a significant rebound) and by mechanical and electrical industries. On the applications side, growth was again fueled by increases in exports and investment. At the same time, private consumption is mandated according to the World Bank, which envisages an average growth of 3% in 2020 and a potential of around 4% in the medium term, provided that the reforms are aimed at improving the investment atmosphere, which is the situation of security and social stability achieved. This study aims to examine the Tunisian economic growth between 1965 and 2019 between 1965 and 2019, in particular (1) the economic urbanization-growth-growth - the economic growth-growth connection. It's not only about testing these two reports, but also about expressing its impact. To do this, we will first proceed to a critical reading of a series of works, making decisions not based on their importance in contemporary literature, but based on the practical consequences they have in the development of policies and strategies regarding the development of policies and strategies have the dimension space. of economic growth. Second, we will try to get an answer to our problem by applying the two econometric models: ARDL (Autoregressive Distributed Lag) model and EC (Error Correction) model.

2. Literature Survey

In this section, we will search for studies that examined the link between urbanization and economic growth and the link between ruralization and economic growth. Likewise, it will be noted that due to the lack of work examining these relationships, we will inspire work that examines the impact of the agricultural sector and the industrial sector on economic growth, the aim of which is to reach a close approximation of our case study.

2.1.Urbanization and economic growth

Urbanization is a historical movement of transformation of the forms of society which can be defined as the increase in the number of inhabitants in the city in relation to the total population. It is therefore a process of the development of cities and the concentration of populations in them. The spatial-temporal process of urbanization takes place differently in different countries and cities. Large cities face many environmental and ecological problems associated with urbanization, including poor quality housing, pollution, crime, and overload. At the same time, urbanization offers enormous opportunities for economic and institutional

innovation and cultural development. According to Henderson (2003), the level of urbanization is closely related to economic growth. In fact, people often accept that economic growth is conducive to the development of modern industry and the growth of urban population. Urbanization has also promoted economic growth. For Friedmann (2006), after active urbanization in developing countries, policies aimed at promoting economic growth have been actively pursued. Likewise, it should be noted that the world is changing rapidly in terms of urbanization, and the pace of change in the past three decades has been faster than before. At the same time, the focus of the urbanization process has shifted from developed countries to developing countries.

According to Cuberes (2009), urbanization is an important factor in demographic change. More urbanized countries experience an earlier demographic transition, and economies that underwent an early demographic transition (before 1950) are much wealthier than those that lagged, implying that urbanization plays a more important role than income early in the growth process. However, Bloom et al. (2008) found no evidence that the degree of urbanization influences the rate of economic growth. Their findings undermine the logic of encouraging or discouraging urbanization as part of an economic growth strategy. In another study, based on cross-sectional and chronological analyses, Abdel-Rahaman et al. (2006) state that while urbanization is an inevitable product of economic development, the urbanization process is best achieved when urbanization is controlled and gradual. Historical series and cross-sectional analyzes indicate a negative relationship between urbanization and urban primacy and economic growth. However, a more detailed cross-sectional analysis shows that all industrialized countries are highly urbanized. The dichotomy is because urbanization is inevitable with economic growth, but the pace and character of urbanization is also important.

Lewis (2014) examined the nexus between urbanization and economic growth in Indonesia. In this research, he applied time series from 1960 to 2009 and panel data from various regions in Indonesia. The results show that urbanization is positively correlated with economic growth, but the rate of urbanization change has a negative impact on economic growth. The committee's assessment results also show that the non-economic impact of urban population growth is related to insufficient local public infrastructure spending. Regional governments need to increase investment in infrastructure to better beat with the negative impact of rapid urbanization on economic growth. Arouri et al. (2014) searched the impact of urbanization on economic growth in Africa. By using dynamic panel regression with African data, the regression estimation result based on African data shows that the level of urbanization has

increased by about 73%, after which the high level of urbanization is related to the decline in per capita GDP.

Leitão (2013) studied the relationship between urban accumulation and economic growth in Europe, the United States, Japan, New Zealand, and Mexico during the period 1990 to 2008. Empirical results indicate that urban accumulation is conducive to economic growth. Specifically, the 1% growth accumulated by the city translates into a 3.19% growth in per capita GDP. Also, and in the case of Tunisia, Bakari et al (2018) examined the impact of industrial investment on economic growth in the long run for the period 1969 – 2015. In their analysis, they applied cointegration analysis and error correction model. Empirical analysis proved that industrial investment has a negative effect on economic growth in the long run. As a conclusion in their research, they encouraged the application of strategies based on the green economy.

2.2.Ruralization and economic growth

According to our research in this area, we confirm that there are no studies that study the impact of ruralization on economic growth. For this reason, we will inspirit some works that focus on the nexus between rural development and economic growth.

For the case of Northern Cyprus and over the period 1975 - 2002, Katircioglu (2006) concluded that the agricultural sector still had an impact on the economy of the northern part of Cyprus. For the Case of Thailand, Jatuporn et al. (2011) also found a positive impact of agriculture on economic growth over the period 1961-2009; similarly, Yusuf (2014) provide evidence that an important contribution of the agricultural sector to economic growth. In the context of Balkans countries, Bakari and Mabrouki (2017) founds that agricultural trade has a positive effect on economic growth for the period 2006 – 2016. Also, Bakari and Mabrouki (2018) indicate that agricultural development has a positive incidence on economic growth for the case of North Africa Countries by using statistic gravity model.

Bakari and Tiba (2020) searched the impact of agricultural investment on economic growth in China for the period 1984 – 2008 by using ARDL model. They found that investment in agricultural sector and the rural development have a positive effect on economic growth in the long run. In addition, and in the same context, Bakari and Tiba (2019) found that agricultural trade is presented as source of economic growth in China, they indicated in their interpretations that authorities must make new strategies to stimulate rural development in

China. Chandio et al (2019) examined the linkage between foreign direct investment in agricultural sector and economic growth in Pakistan over the period from 1991 to 2013. By employing autoregressive distributed lag (ARDL) approach, dynamic ordinary least squares (DOLS), fully modified ordinary least square method (FMOLS) and the canonical cointegration regression (CCR), they found that FDI in agricultural sector causes economic growth in the long run and in the short run.

In the context of our case, there are a few studied that studied the nexus between rural development and economic growth in Tunisia. For example, Chabbi (2010) studied the impact of agriculture on the economic growth of the Tunisian economy during the period 1961-2007. He found that agriculture plays a key role as a determinant of economic growth. In addition, Abdelhafidh and Bakari (2019) investigated the impact of agricultural investment on economic growth in the case for Tunisia during the period 1965 – 2016. By using VECM model and Granger Causality Tests, they found that domestic investment in the agricultural sector has a positive effect on economic growth in the long run. Also, Bakari and Abdelhafidh (2018) found that investments in fruit trees, investment in livestock farming, investment in agricultural irrigation and investment in studies, extension and research in the agricultural sector have a positive incidence on economic growth in Tunisia for the period 1990 - 2016. Further, Bakari (2016) noted that agricultural exports have a positive effect on economic growth in Tunisia for the period 1988 – 2014. He recommended that state officials should continue to support rural development through irrigation and rural roads programs. Likewise, he recommended that Tunisia should continue to improve living standards in rural areas (access to electricity and drinking water, hospitals, schools, etc.).

3. Data and Methodology

This investigation investigates the impact of urbanization and ruralization on economic growth in Tunisia by a comparison between the ARDL Model and the ECM Model. It applied the annual time series data of Tunisia economy from 1965 to 2019. Annual data used in this study includes Economic growth (GDP), Domestic Investment (K), Urbanization (URB) and Ruralization (RUR). All variables are collected from the World Bank's World Development Indicators. To examine the impact of urbanization and ruralization on economic growth in Tunisia by putting domestic investment as variable of control, we develop the following model:

$$\mathbf{Ln(GDP)_t = \alpha_0 + \alpha_1 Ln(K)_t + \alpha_2 Ln(URB)_t + \alpha_3 Ln(RUR)_t + \varepsilon_t} \quad \mathbf{(1)}$$

Where, GDP, K, URB, RUR and ε_t represent real GDP per capita, domestic investment per capita, urbanization, ruralization and error term, respectively. All data are converted into natural logarithm to avoid the problem associated with the distributional properties of the data series. Equation (1) can be written in the ARDL Model form as:

$$\mathbf{\Delta LnGDP_{(t)} = \mu_1 + \sum_{i=1}^{m} \beta_{1i} \Delta LnGDP_{(t-i)} + \sum_{i=0}^{n} \beta_{2i} \Delta Ln\ K_{(t-i)} + \sum_{i=0}^{o} \beta_{3i} \Delta Ln\ URB_{(t-1)} + \sum_{i=0}^{p} \beta_{4i} \Delta Ln\ RUR_{(t-1)} + \delta_1 Ln\ K_{(t-1)} + \delta_2 Ln\ URB_{(t-1)} + \delta_3 Ln\ RUR_{(t-1)} + \varepsilon_{(t)}} \quad \mathbf{(2)}$$

Where μ_1 is the intercept; m, n, o and p are the lags order; Δ is the difference operator; and ε_{1t} is the error terms in the equation. The null hypothesis of no cointegration between is H_0: $\delta_1 = \delta_2 = \delta_3 = 0$ against the alternative hypothesis H_1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq 0$.

Also, Equation (1) can be written in the ECM Model form as:

$$\boldsymbol{\Delta Ln(GDP)_{(t)} = \sum_{(i-1)}^{k} \beta_0\, \Delta Ln(GDP)_{t-i} + \sum_{(i-1)}^{k} \beta_{(1)} \Delta Ln(K)_{(t-i)} + \sum_{(i-1)}^{k} \beta_{(2)} \Delta Ln(URB)_{(t-i)} + \sum_{(i-1)}^{k} \beta_{(3)} \Delta Ln(RUR)_{(t-i)} + Z_{(1)} ECT_{(t-1)} + \varepsilon_{(t)}} \quad \mathbf{(3)}$$

Where Δ is the difference operator; k is the number of lags, $\beta_0, \beta_1, \beta_2$ and β_3 are the short run coefficients to be estimated; $EC1_{t-1}$ is the error correction term derived from the long-run cointegration relationship; Z_1 is the error correction coefficients of $EC1_{t-1}$ and ε_{1t} is the error terms in equation.

4. Empirical analysis

As we mentioned before, we will apply the ARDL model and ECM model to detect the impact of urbanization and ruralization on economic growth in Tunisia. In fact, the objective of applying two empirical models is to verify the robustness of our results. The approach of our methodology consists in first examining the stationarity of the variables, and in the second step the analysis of cointegration between the variables. In fact, if the variables are stationary and if there is a cointegration relationship between the variables, this means that the ARDL model and the ECM model will be retained. We begin with analyzes of the stationarity of the variables.

4.1.Stationarity analysis

Unit root tests identify the presence of unit root in a series. A time series is stationary if it has no trend or seasonality. The Phillips-Perron test {Phillips and Perron (1988)} will be used for this purpose. The general form of the PP test is estimated by the following regression:

$$\Delta\omega_t = \alpha + \beta\Delta\omega_{t-1} + \varepsilon_t \qquad (4)$$

For the variables to be stationary, the following two conditions must be observed:

- ✓ PP statistical test > Critical test at the 1%, 5% or 10% levels
- ✓ The probability value must be less than 5%

With:

- **Δ:** is the first difference operator
- ***ω***: is a time series
- **t:** is a linear time trend
- **α:** is a constant
- ***ε*:** is the random error term.

Table 1: Results of PP Test

Variables		Ln (GDP)	Ln (K)	Ln (RUR)	Ln (URB)
At Level					
With Constant	t-Statistic	-1.7923	-1.2267	-3.3458	-5.7517
	Prob.	0.3804	0.6565	0.0175**	0.0000***
With Constant & Trend	t-Statistic	-1.6339	-2.3122	-0.8696	0.0304
	Prob.	0.7662	0.4203	0.9519	0.9957
Without Constant & Trend	t-Statistic	5.5240	1.2074	3.2024	6.4134
	Prob.	1.0000	0.9400	0.9995	1.0000
At First Difference					
With Constant	t-Statistic	-7.3292	-5.3351	-1.6802	-0.5203
	Prob.	0.0000***	0.0000***	0.4353	0.8787
With Constant & Trend	t-Statistic	-7.6185	-5.2651	-2.0589	-2.5669
	Prob.	0.0000***	0.0004***	0.5561	0.2965
Without Constant & Trend	t-Statistic	-5.0721	-5.1645	-1.6995	-1.0410
	Prob.	0.0000***	0.0000***	0.0843*	0.2649
*MacKinnon (1996) one-sided p-values.					

Source: Authors' calculations using EViews 10 software

From Table 1, it is evident that all variables are stationary in first difference. We deduce then that all variables are integrated of order 1 I (1). There for ARDL Model and ECM Model can be returned.

4.2.Cointegration analysis

Before applying estimates based on the ARDL model and the ECM model, we are forced to check the cointegration between the variables included in our model. To achieve our goal, we will apply the most appropriate test which is the Bounds Test.

Indeed, the cointegration test is constructed predominately on the Fisher test (F-stat) for the joint significance of the coefficients of the lagged level variables, i.e., H0: $\delta_1 = \delta_2 = \delta_3 = 0$, which indicates no cointegration, against the alternative H1: $\delta_1 \# \delta_2 \# \delta_3 \# 0$, which indicates that there is integration. After comparing the F-stat value with asymptotic critical value bounds calculated by Pesaran et al. (2001), the null hypothesis of no cointegration is rejected when the value of the F test protrudes the higher critical bounds value, embroilment that there is a cointegration relationship between the elaborated variables.

Table 2. Bounds Test

F-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	13.78272	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Authors' calculations using Eviews 10 software

We harness the (Bounds Tests) to ascertain if there is a cointegration relationship in our model or not. Otherwise, to carry out this verification, we will pursue two hypotheses. If the value F-statistic is not higher than any bound value I1, then we indicate that there is no cointegration between these variables. However, if the value F-statistic is higher than any bound value I1 then, we confirm that there is cointegration between these variables.

Table 2 indicates that our test value F (13.78272) is higher than the bound I1 Bound critical value of the 5% threshold (3.67). Therefore, a cointegration relationship exists between the variables of the model. This makes it workable to look into the impact of urbanization and ruralization on economic growth in the long term by using ARDL Model and ECM Model.

4.3.Long run estimations

Since the analyses of stationarity indicate that our variables are stationary in first differences and the Bounds test indicates the existence of a cointegrating relationship between the long-term variables. It will now be possible to estimate the impact of urbanization and ruralization on economic growth in Tunisia. We first start by applying an estimate based on the ARDL model.

4.3.1. Estimation of the ARDL Model

The long-term equilibrium equation according to the estimation of the ARDL model:

$$\mathbf{Ln\,(GDP)} = \mathbf{-0.9532} + \mathbf{0.0930\,Ln(K)} + \mathbf{0.1700\,Ln(RUR)} - \mathbf{0.0992\,Ln(URB)(5)}$$

The equation of the long run relationship of ARDL Model shows that ruralization (RUR) has a positive effect on economic growth (GDP); that is, a 1% decrease in ruralization leads to a 0.1700% decrease in economic growth. Also, this equation shows that urbanization (URB) has a negative effect on economic growth (GDP), that is, a 1% decrease in urbanization leads to a 0.0992% increase on economic growth. To attest that this long-term relationship is equitable or not, we must test the significance of these variables by estimating the ARDL Model.

We can say that the equilibrium cointegration equation is significant and that there is a long-term relationship between the variables when the Error Correction Term has a negative coefficient and a negative probability.

Table 3. Estimation of ARDL Model in the long run

Dependent Variable: DLOG (GDP, 2)				
Selected Model: ARDL (2, 0, 1, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG (GDP (-1), 2)	0.177149	0.112164	1.579373	0.1214
DLOG(RUR)	-1.424180	0.923262	-1.542552	0.1301
DLOG(URB)	-2.594736	0.377757	-6.868793	0.0000
ECT	-1.451534***	0.167410	-8.670551	0.0000
R-squared	0.727436	Mean dependent var	0.000362	
Adjusted R-squared	0.710400	S.D. dependent var	0.044911	
S.E. of regression	0.024168	Akaike info criterion	-4.533737	
Sum squared resid	0.028037	Schwarz criterion	-4.383642	
Durbin-Watson stat	2.091177	Hannan-Quinn criter.	-4.476194	
**** denotes significances at 1% level*				
ECT: Error Correction Term: the cointegration equation of long-term equilibrium				

Source: Authors' calculations using Eviews 10 software

Table 3 shows that the error correction term has a negative coefficient (-1.451534) and a probability less than 5% (0.0000) in this case, we can say that the equilibrium cointegration equation is significant and that there is has a long-term relationship between the variables. So, we can prove that in the long run, ruralization has a positive effect on economic growth and urbanization has a negative effect on economic growth. According to the results of the estimation of the ARDL model, ruralization and domestic investment are also essential factors for the economic growth in the long run.

4.3.2. Estimation of the ECM Model

The long-term equilibrium equation according to the estimation of the ECM model:

$$\mathbf{Ln\,(GDP)} = \mathbf{-0.1719} + \mathbf{0.1845\,Ln(K)} + \mathbf{0.0734\,Ln(RUR)} - \mathbf{0.0591\,Ln(URB)}$$

The equation of the long run relationship of ECM Model shows that ruralization (RUR) has a positive effect on economic growth (GDP); that is, a 1% decrease in ruralization leads to a 0.0734% decrease in economic growth. Also, this equation shows that urbanization (URB) has a negative effect on economic growth (GDP), that is, a 1% decrease in urbanization leads to a 0.0591% increase on economic growth. To attest that this long-term relationship is equitable or not, we must test the significance of these variables by estimating the ECM Model.

We can say that the equilibrium cointegration equation is significant and that there is a long-term relationship between the variables when the Error Correction Term has a negative coefficient and a negative probability. Table 4 shows that the error correction term has a negative coefficient (-1.353285) and a probability less than 5% (0.0007) in this case, we can say that the equilibrium cointegration equation is significant and that there is has a long-term relationship between the variables. So, we can prove that in the long run, ruralization has a positive effect on economic growth and urbanization has a negative effect on economic growth.

Table 4. Estimation of ECM Model in the long run

Dependent Variable: D(DLOG(GDP))				
Method: Least Squares (Gauss-Newton / Marquardt steps)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1): ECT	-1.353285	0.367134	-3.686079	0.0007
C(2)	0.127685	0.268106	0.476248	0.6364
C(3)	0.036036	0.168680	0.213633	0.8319
C(4)	-0.131312	0.064110	-2.048238	0.0470
C(5)	-0.094436	0.054726	-1.725629	0.0919
C(6)	-1.843494	3.112939	-0.592204	0.5570
C(7)	0.173283	3.480508	0.049787	0.9605
C(8)	-3.878610	3.813116	-1.017176	0.3150
C(9)	2.699782	3.554958	0.759441	0.4519
C(10)	0.038009	0.017437	2.179836	0.0351
R-squared	0.577888	Mean dependent var		-0.001528
Adjusted R-squared	0.485229	S.D. dependent var		0.043217
S.E. of regression	0.031007	Akaike info criterion		-3.935279
Sum squared resid	0.039420	Schwarz criterion		-3.556489
Log likelihood	110.3496	Hannan-Quinn criter.		-3.790532
Prob(F-statistic)	0.000017	Durbin-Watson stat		2.031056
**** denotes significances at 1% level*				
ECT: Error Correction Term: the cointegration equation of long-term equilibrium				

Source: Authors' calculations using Eviews 10 software

According to the results of the estimation of the ECM model in Table 4, we confirm that ruralization and domestic investment are also essential factors for the economic growth in the long run. Finally, and to verify the robustness of our results from both ARDL and ECM models, it is preferable to apply a set of diagnostic tests and stability tests. we start with the diagnostic tests.

4.4.Diagnostics tests

To explore the robustness of our model and our results, we utilize a set of diagnostic tests. These are the heterodasticity tests (Breusch -Pagan-Godfrey / Harvey / Glejser / ARCH) and the Breusch-Godfrey Serial Correlation LM Test. The diagnostic tests show that the estimation results are acceptable because the probabilities of heterodasticity tests and the Breusch-Godfrey Serial Correlation LM test are greater than 5% (See Table 5 and Table 6).

Table 5. Diagnostics tests of ARDL Model

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.972817	Prob. F(7,44)	0.4628
Obs*R-squared	6.969248	Prob. Chi-Square(7)	0.4321
Scaled explained SS	12.31452	Prob. Chi-Square(7)	0.0907
Heteroskedasticity Test: Harvey			
F-statistic	1.049888	Prob. F(7,44)	0.4113
Obs*R-squared	7.442357	Prob. Chi-Square(7)	0.3843
Scaled explained SS	7.326816	Prob. Chi-Square(7)	0.3957
Heteroskedasticity Test: Glejser			
F-statistic	1.271671	Prob. F(7,44)	0.2864
Obs*R-squared	8.749968	Prob. Chi-Square(7)	0.2711
Scaled explained SS	10.10134	Prob. Chi-Square(7)	0.1829
Heteroskedasticity Test: ARCH			
F-statistic	0.050188	Prob. F(1,49)	0.8237
Obs*R-squared	0.052183	Prob. Chi-Square(1)	0.8193
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.600315	Prob. F(2,42)	0.2139
Obs*R-squared	3.682089	Prob. Chi-Square(2)	0.1587

Source: Authors' calculations using Eviews 10 software

Table 6. Diagnostics tests of ECM Model

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.560180	Prob. F(14,36)	0.8775
Obs*R-squared	9.122846	Prob. Chi-Square(14)	0.8231
Scaled explained SS	13.02798	Prob. Chi-Square(14)	0.5243
Heteroskedasticity Test: Harvey			
F-statistic	1.215974	Prob. F(14,36)	0.3065
Obs*R-squared	16.37393	Prob. Chi-Square(14)	0.2911
Scaled explained SS	13.02976	Prob. Chi-Square(14)	0.5242
Heteroskedasticity Test: Glejser			
F-statistic	0.734120	Prob. F(14,36)	0.7272
Obs*R-squared	11.32645	Prob. Chi-Square(14)	0.6602
Scaled explained SS	11.68151	Prob. Chi-Square(14)	0.6319
Heteroskedasticity Test: ARCH			
F-statistic	1.445652	Prob. F(1,48)	0.2351
Obs*R-squared	1.461859	Prob. Chi-Square(1)	0.2266
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.656163	Prob. F(2,39)	0.5245
Obs*R-squared	1.660252	Prob. Chi-Square(2)	0.4360

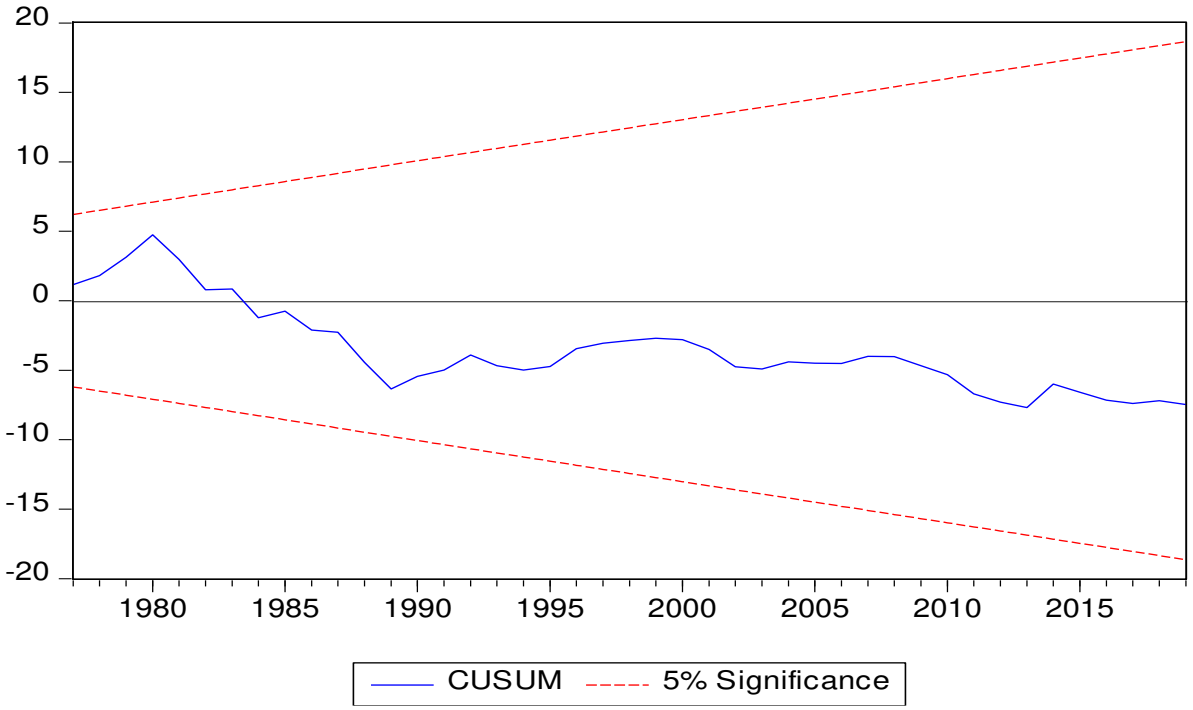
Source: Authors' calculations using Eviews 10 software

4.5.Stability tests

Brown and al. (1975) have suggested that the parameter stability can be examined with a CUSUM Test. This last indicates the stability of long-run parameters. Fig. 1 and Fig 2 show

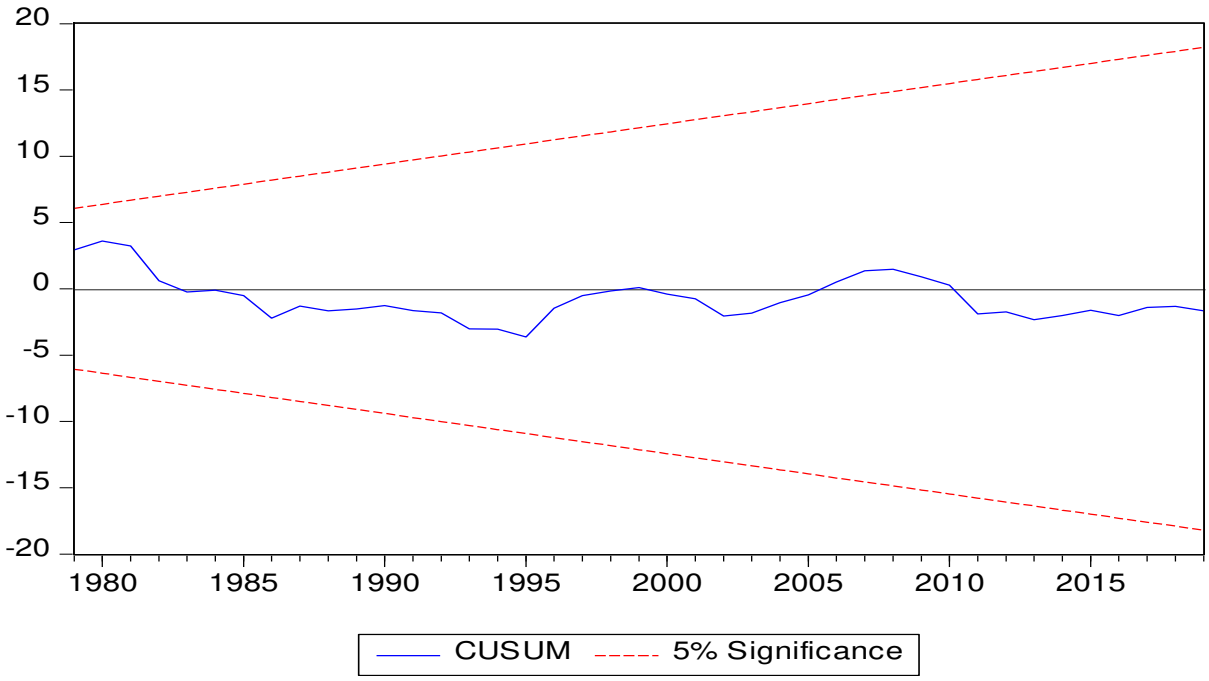
the results of the CUSUM Test, which indicates that the ECM model and ARDL model used in the study are well established. Consequently, the two models are stable and estimated results are well respected for policy practices.

Fig 1. CUSUM test of ARDL Model



Source: Authors' calculations using Eviews 10 software

Fig 2. CUSUM test of ECM Model



Source: Authors' calculations using Eviews 10 software

5. Conclusion

This study investigated the effect of urbanization and ruralization on Tunisian economic growth between 1965 and 2019, using World Bank data. To do this, we applied the ARDL model and the EC model. The estimation of these two models led to similar results. Specifically, the findings indicate that urbanization has a negative effect on Tunisian economic growth. Ruralization, on the other hand, has a favorable effect. This can be explained by the following argument: Faced with increased food demand in cities, Tunisia, through its practice of prices and exchange rates, favors imports to the detriment of domestic production. The "urban bias" would thus disrupt the major macroeconomic balances and therefore economic growth. Thus, urbanization is not always at the service of economic growth and can have harmful effects. Elements such as controlled urbanization, industrialization, tertiarization and openness to the world are necessary conditions for economic growth and development. Elloumi (2006) has seen through previous economic policy developments that Tunisia's rural development experience is old and varied. These policies, supported by regional and agricultural development, have had an undeniable impact on living and working conditions in rural areas. Even if we do not see full convergence, many indicators show a significant improvement in living and working conditions in rural areas. On the other hand, the improvement of living conditions in rural areas without real diversification of the economic fabric, especially in low-lying rural areas, has put greater pressure on natural resources. These pressures have led to the overexploitation of these resources and even their degradation in some areas. However, the loss of protection for the agricultural sector threatens to further weaken the rural world, as does the impact of liberalization on employment, which calls into question the complementarity between agricultural activity and the activities of other economic sectors. The development of rural areas must therefore be confronted with the following equation: increasing production and productivity while at the same time ensuring sustainable use of resources. In this context, new approaches to rural development are often proposed, emphasizing globalism or multi-sectorality, partnership or participation and finally the territoriality of development to provide solutions to these challenges. However, even if these approaches may lead to some improvement in the effectiveness of interventions in rural areas, in the case of Tunisia they need to be contextualized. Even if the political will that is manifesting and aimed at implementing such an approach is very real, its implementation may face some difficulties. The completeness and diversification of activities is offset by the difficulty of promoting activities other than agriculture in some rural areas. This difficulty is

both the result of the history of these areas and their peripherality, it is also the result of an extroverted development oriented towards niches that mostly respond to an external question that is not easily identifiable. The implementation of this new approach requires both a qualitative leap in the design and implementation of projects, considering the necessary integration between the different economic sectors and between the rural area and its wider territory, increasingly based on an associative fabric. Partners in society, whose empowerment remains one of the priorities for action in this area. Also, and according to Bakari et al (2018), Tunisian industry has been growing in different directions with the pace of modernization and upgrading in different regions, sectors, and industries. However, the industrial sector, which continues to play a key role in our economic development, has not yet taken advantage of all current and future opportunities. There are more avenues to explore and scope for expansion. It is about making the right decisions, choosing the best sectors, playing a decisive role in research and innovation, further improving the competitiveness of industrial products, vigorously opening to the foreign market, diversifying our industrial fabric, and expanding it into sectors place that have established comparative advantages, constant adaptation to the ever-changing international situation that is unpredictable. These are some of the areas that need to be considered in any industrial strategy.

Finally, Tunisia shows that the urbanization process is slowing down. Indeed, the evolution of urbanization in Tunisia depends on the role that the country will play in the world economy. Adjustment policies should, in principle, encourage productivity in both rural and urban areas in the long run and thus promote the development of an industrial sector. The consequence of renewed ruralization could be a revival of the urbanization process, because of the agglomeration economies that cities allow. Thus, policymakers are called upon to recognize the catalytic role of small towns and cities as a link between urban and rural areas and their ability to not only provide farmers with numerous opportunities to market their products but also to share the benefits of economic growth.

References

Abdel-Rahman, A. N., Safarzadeh, M. R., & Bottomley, M. B. (2006). Economic growth and urbanization: A cross-section and time-series analysis of thirty-five developing countries. Rivista Internazionale di Scienze Economiche e Commerciali, 53(3), 334-348.

Abdelhafidh, S & Bakari, S (2019). "Domestic Investment in The Agricultural Sector and Economic Growth in Tunisia," International Journal of Food and Agricultural Economics

(IJFAEC), Alanya Alaaddin Keykubat University, Department of Economics and Finance, vol. 7(2), April.

Arouri, M., Ben Youssef, M., Nguyen Viet Cuong and A. Soucat (2014), "Effects of Urbanization on Economic growth and human capital formation in Africa", PGDA Working Paper No.119.

Bakari, S (2016). 'L'impact des Exportations Agricoles sur la Croissance Économique en Tunisie Durant la Période 1988 – 2014,' MPRA Paper 80655, University Library of Munich, Germany

Bakari and Abdelhafidh (2018). "Structure of Agricultural Investment and Economic Growth in Tunisia: An ARDL Cointegration Approach". The Economic Research Guardian – Vol. 8(2)2018

Bakari, S and Mabrouki, M (2017). "The Effect of Agricultural Exports on Economic Growth in South-Eastern Europe: An Empirical Investigation Using Panel Data". Journal of Smart Economic Growth. Volume 2, Number 4, Year 2017.

Bakari, S., Mabrouki, M., (2018). The Impact of Agricultural Trade on Economic Growth in North Africa: Econometric Analysis by Static Gravity Model. MPRA Paper 85116, University Library of Munich, Germany.

Bakari, S., Mabrouki, M., & Elmakki, A. (2018). The Impact of Domestic Investment in the Industrial Sector on Economic Growth with Partial Openness: Evidence from Tunisia". Economics Bulletin, 38(1), 111-128.

Bakari, S & Tiba, S (2019). "Does Agricultural Trade promote Chinese economic growth? ARDL Approach," MPRA Paper 94614, University Library of Munich, Germany.

Bakari, S & Tiba, S, (2020). "Does Agricultural Investment Still Promote Economic Growth in China? Empirical Evidence from ARDL Bounds Testing Model," International Journal of Food and Agricultural Economics (IJFAEC), Alanya Alaaddin Keykubat University, Department of Economics and Finance, vol. 8(4), October.

Bloom, D. E., Canning, D., & Fink, G. (2008). Urbanization and the wealth of nations. Science, 319(5864), 772-775.

Chabbi, H.E. (2010). Agriculture and economic growth in Tunisia. China Agricultural Economic Review 2, 63-78.

Chandio, A. A., Mirani, A. A., & Shar, R. U. (2019). Does agricultural sector foreign direct investment promote economic growth of Pakistan? Evidence from cointegration and causality analysis. World Journal of Science, Technology and Sustainable Development.

Cuberes, D. (2009), Early and Late Demographic Transitions: The Role of Urbanization. Mimeo

Dickey, D. A. and Fuller, W.A (1979), "Distribution of Estimators of Autoregressive Time Series with a Unit Root," *Journal of the American Statistical Association*, 74, 427-31.

Dickey, D. A. and Fuller W.A (1981) "Likelihood ratio Statistics for autoregressive time

Elloumi, M. (2006). Les politiques de développement rural en Tunisie : Acquis et perspectives. Options Méditerranéennes, 55-65.

Friedmann, J. (2006), "Four theses in the study of China's urbanization", International journal of urban and regional research, 30: pp. 440–451

Henderson, V. (2003), "The urbanization process and economic growth: The so what question",Journal of Economic Growth, 8: pp. 47–71.

Jatuporn, C., Chien, L.H., Sukprasert, P., and Thaipakdee, S. (2011), "Does a long-run relationship exist between agriculture and economic growth in Thailand?"International Journal of Economics and Finance, 3(3), 227-233.

Katircioglu, S. T. (2006), "Causality between agriculture and economic growth in a small nation under political isolation: A case from North Cyprus", International Journal of Social Economics, Vol. 33 (4), pp. 331-343.

Leitão, N.C. (2013), "A panel data modelling of agglomeration and growth: cross-country evidence", Theoretical and Empirical Research in Urban Management, 8(1): pp. 67-77.

Lewis, B.D. (2014), "Urbanization and Economic Growth in Indonesia: Good News, Bad News and (Possible) Local Government Mitigation", Regional Studies, 48 (1): pp. 192-207.

Pesaran, M.H., and Yongcheol,S. (1999). "*An Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis.*" In Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium, ed. Steinar Strøm, 371-413. Cambridge: Cambridge University Press.

Pesaran, M, H., Yongcheol, S and Richard J. S. (2001). "Bounds Testing Approaches to the Analysis of Level Relationships." *Journal of Applied Econometrics*, 16(3): 289-326.

Yusuf, S. A. (2014). "Role of Agriculture in Economic Growth and Development: Nigeria Perspective."*MPRA Munich Personal RePEc Archive.* Accessed via https://mpra.ub.unimuenchen.de/55536/1/MPRA_paper_55536.pdf