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The Contribution of the Agricultural Sector to Economic Growth: A cointegration analysis for Morocco

La contribution de l'agriculture à la croissance économique : Une analyse de cointégration pour le cas du Maroc

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Abstract

This article aims to determine the contribution of agricultural sector to the economic growth and the causal links between the latter and other sectors namely industry and services in Morocco, through a theoretical and empirical discussion. We use for our investigation, the ARDL cointegration approach and the Toda Yamamoto approach to empirically test the causal relationship. The results show that the agricultural sector has a positive and significant effect on the growth rate of real GDP per capita in the short and long run, but its effect is lower than that of the other sectors considered in this study. Causal analysis shows the existence of a two-way causal relationship between the agricultural sector and economic growth. Moreover, we found one-way causal relationship from the service sector to both the agricultural growth rate and the GDP per capita. Based on the results obtained, we propose to strengthen the links between agriculture and the other sectors to increase the impact of agricultural growth on the development of all sectors. In this regard, Morocco must develop strong competitive advantages, particularly in research and development in the agro-industrial productive system.

Keywords: Agricultural sector ; Economic Growth ; Causality ; Cointegration ; ARDL.

Résumé

Cet article vise à déterminer la contribution du secteur agricole à la croissance économique et les liens de causalité entre ce dernier et les autres secteurs, à savoir l'industrie et les services au Maroc, à travers une discussion théorique et empirique. Nous utilisons pour notre investigation, l'approche de cointégration ARDL et l'approche Toda Yamamoto pour tester empiriquement les liens de causalités. Les résultats montrent que le secteur agricole a un effet positif et significatif sur le taux de croissance du PIB réel par habitant à court et à long terme, mais son effet est plus faible que celui des autres secteurs considérés dans cette étude. L'analyse causale montre l'existence d'une relation de causalité bidirectionnel entre le secteur agricole et la croissance économique. De plus, nous avons trouvé une relation causale unidirectionnel entre le secteur des services et le taux de croissance agricole et le PIB par habitant. Sur la base des résultats obtenus, nous proposons de renforcer les liens entre l'agriculture et les autres secteurs afin d'augmenter l'impact de la croissance agricole sur le développement de tous les secteurs. A cet égard, le Maroc doit développer des avantages compétitifs forts, notamment en matière de recherche et développement dans le système productif agro-industriel.

Mots clés : Secteur agricole ; Croissance Économique ; Causalité ; Cointégration ; ARDL.

Introduction

The agricultural sector has a very important role to play as an engine of economic and social growth. According to several studies carried out by the World Bank, the agricultural sector has a more attractive and rapid reaction behavior compared to other sectors and structural adjustment programs. According to 2019 figures from the World Bank, agriculture is considered a main source of income for 80% of the poor population worldwide.

Indeed, agriculture plays a key role in reducing poverty and food insecurity. According to (Castaneda, et al., 2016) agriculture is their main source of income for 65% of working poor adults. From a theoretical standpoint, agriculture has always been a subject of debate among economists. There is a consensus among some economists on its importance from the vision of Quesnay and the physiocrat, to the contemporary authors. The theoretical analysis of the agricultural contribution to economic growth offers several angles to understand its importance. During the 20th century, several authors namely (Rosenstein-Rodan, 1943; Lewis & others, 1954; Scitovsky, 1954; Hirschman, 1958; Johnson, 1997; Ranis & Fei, 1961) analyzed agriculture as a source of resources for the development of industry and other non-agricultural sectors. In addition, the analysis focused on the capacity of agriculture to transfer surpluses to the industrial sector. We are talking here about dualistic models, where the industrial sector being more productive than agriculture, resources should be transferred from the second to the first in order to modernize the economy and increase total national production. From a different point of view, (Kuznets & others, 1968; Kalecki, 1971; Mellor, 1976; Singer, 1979; De Janvry, 1984; Ranis, 1984; Vogel, 1994) have shed light on the existing interdependence between agricultural development and industrial development, as well as the capacity of agriculture to stimulate industrialization.

Since its independence in 1956 Morocco's objective was to reintegrate all of its economic structures. Among the sectors that were subject to this modernization is the agricultural sector. It occupies a primordial place in the Moroccan economic and social fabric. Indeed, the agricultural sector contributes significantly to the gross domestic product with a proportion that varies from 13% to 20%, depending on the year. In addition, it is an important source of currency through exports, in 2018 the sector generated 1.8 billion euros. Moreover, the agricultural sector fulfills the role of the main employer for 1.5 million farmers, almost 40% of employment and source of income for 74.5% of the rural population. This special place of agriculture in the Moroccan economy justifies the interest of this article.

Throughout this article, we will try to clarify the following question: has Moroccan agriculture achieved the objectives formalized and set for decades as an engine of growth? We will focus on determining the contribution of the agricultural sector to Moroccan economic growth, as well as investigate the existence of causal links between agriculture and the rest of the economy, in order to measure to what degree economic growth is accelerated through the application of agricultural policies. The rest of the article is structured as follows: Section 2 is devoted to the foundations of the theoretical and empirical literature. In Section 3, we approach the research methodology and the data used. Then in Section 4 we present the econometric analysis and the interpretation of the results. Finally, Section 5 concludes the paper and reveals main findings, as well as economic policy recommendations.

1. Literature review

According to (Lewis & others, 1954), one of the pioneers of development economics, agriculture will play a central role but will soon after become ambiguous. He drew attention to the resulting growth of non-agricultural sectors and that the agricultural sector has low productivity. To help the development of the industrial sector, characterized by high productivity, the agricultural sector must provide the necessary elements such as freedom of labor and sources of capital formation for such development. This theory justifies the importance given to industrialization. Thus, investment in the agricultural sector is not a priority for further economic development. (Jorgenson, 1961) was among the first economists who considered that agriculture plays an important role in the development process. According to him, the economy is divided into two sectors: the first being modern and capable of generating maximum profit and accumulation of physical capital and the second sector is more traditional. For this author, the agricultural sector can be a lever for the development of modern sectors, particularly industry, through the transfer of surplus labor from the traditional sector to the modern sector without the risk of falling into a decline in agricultural production. (Timmer & others, 2009) confirms, during the beginning of the 21st century, that the relative degradation of agriculture is certain and inevitable, whatever the chosen development strategy. He emphasizes the seemingly contradictory need to invest in agriculture especially at the early stages of development. For this author, the importance is not in the share of agricultural GDP, but how it is effectively mobilized for the benefit of the economy as a whole. Thus, agriculture plays the role of "first engine" of economic growth. In the first stage, growth is very low and agriculture occupies the majority of labor.

Therefore, priority must be given to strategies to improve agricultural productivity in order to generate the surplus and the labor that can be mobilized by other sectors (Lewis's intuition). In the later stages, the industry imposes itself because agriculture plays a limited role in growth and employment.

There is a vast literature on the relation of agriculture and economic development. Most of the empirical work analyzes the sectoral causal links in economic development and determines the existence of a long-term relationship between the different sectors of activity. For example, (Yao, 1994; Yao, 1996; Yao, 2000) examined the case of China using the cointegration method. He finds that agriculture has a positive impact and sees it as an engine of growth for other sectors. On the other hand, the non-agricultural sectors did not lead to the growth of the agricultural sector. (Tiffin & Irz, 2006) , emphasized the direct relationship between agricultural value added per worker and real GDP per capita on a sample of 85 developed and developing countries through the application of Granger causality tests. The result in developing countries shows unidirectional causality from agricultural value added to real GDP per capita. And the direction of causality in developed countries is not very clear. (Akrout & Khadimallah, 2017) studied the contribution of agriculture to economic growth and modernization in Africa. Through the study of the impact of these explanatory variables: industrialization, human capital, economic openness and the quality of institutions. They found that the quality of human capital has an accelerating effect on the added value of the agricultural sector. Overall, the results showed the need for the modernization of agriculture to face challenges such as: low levels of productivity, technical knowledge and the fragility of agricultural policies.

(Doukkali & Guèdègbé, 2018) sought to understand the evolution of agricultural performance in Morocco during the period from 1981 to 2014 through an inter-sectoral and inter-country comparative evaluation. According to this study, Morocco has a great potential to improve productivity in the agricultural sector but a potential that is poorly exploited. The other sectors of activity made a weak contribution to the absorption of the surplus of labour. The results showed that in the absence of a real improvement and contribution from other sectors in the process of structural economic transformation, Morocco may fall into a situation of job market imbalance in the future. (Chatri, Maarouf, & Ezzahid, 2015) used the Input Output methodology to verify whether the performance of the agricultural sector promotes the acceleration of the process of structural transformation of the Moroccan economy.

The result shows the limit of structural transformation in the Kingdom, a poor orientation of economic activity towards the productive sectors and also a weak integration of the agricultural sector in the economy. The agricultural sector is more associated with other factors: dependence on climatic conditions, low mechanization, land fragmentation and low irrigated areas in total arable land. These factors do not allow agriculture to modernize and increase its productivity compared to other productive sectors. (Mehdi, Marguerite, & Sidi, 2021) used a comparative analysis of three Maghreb countries Algeria, Morocco and Tunisia to study the effects of national strategies for the modernization of the agricultural sector in the three countries over the period from 2010 to 2016. The overall result shows that Morocco is experiencing a greater increase in GDP and higher than the other two countries. In terms of the percentage of agricultural land, Algeria had the lowest rate in the allocation of agricultural land. In terms of the percentage of employees, Morocco had the highest rate of the three countries.

2. Data and research methodology

This study will be carried out over the period starting from 1981 to 2018 and the data has an annual frequency. We will use a single data source for the variables all the series come from T (The World Bank, 2020). The choice of variables is justified by two main points: the availability of the data collected and modeling the performance of the agricultural sector requires examining the growth of the country in relation to the growth of agriculture and other sectors. To develop this study, four variables are selected :

Table 1: Variable notation

Variables	Notation
GDP per capita growth rate (%)	Y_t
Agricultural sector GDP growth rate (%)	X_{1t}
Industrial sector GDP growth rate (%)	X_{2t}
Service sector GDP growth rate (%)	X_{3t}

Source: The Word Bank

In our model, the explained variable is the growth rate of the GDP per capita and the explanatory variables are selected on the basis of several empirical and theoretical works already discussed in the literature review section. The function proposed for the estimation of the ARDL model is as follows:

$$Y_t = f(X_{1t}, X_{2t}, X_{3t}).$$

Faced with criticisms of stationarity and cointegration approaches in time series, (Pesaran, 1997; Peresan, Shin, & Smitih, 2001) have developed a new procedure called terminal cointegration test or staggered delay cointegration test for integrated series with different orders. This is the cointegrated ARDL specification. It is less restrictive than the other techniques. Bounds test is an alternative to the (Engle & Granger, 1987) and (Johansen, 1988) cointegration tests. The strength of this test resides in its flexibility and less restrictive character. It is a new technique which makes it possible to jointly analyze the long-term dynamic relationship and the short-term adjustment. First, we can mention three essential advantages of the ARDL cointegration procedure: First, the procedure is not interested in the stationarity in first difference of the regressors. It can be applied independently to any purely I(0), purely I(1) or mixed degree variables. Secondly, the ARDL method avoids the problem of small samples (Cheung & Lai, 1993). Other methods require a minimum number of observations. Finally, the approach corrects the problems of endogeneity and correlation. With the appropriate increase in the order of the independent variables in the series. ARDL models combine features of both autoregressive (AR) and step lag (DL) models, and are called step or distributed lag autoregressive models. The general form is as follows:

$$Y_t = \phi + \sum_{i=1}^{P} a_i\, Y_{t-i} + \sum_{i=1}^{P} b_i\, X_{t-i} + e_t.$$

We note that b_0 translates the short-run effect of X_t on Y_t, we calculate the long-run effect of X_t on Y_t (i.e. λ) starting from the following long-run or equilibrium relation:

$$Y_t = k + \lambda X_t + u$$

The specific representation of the ARDL econometric model in our case is presented as follows:

$$Y_t = a_0 + \sum_{i=1}^{P} a_{1i}\, Y_{t-i} + \sum_{i=1}^{q} a_{2i}\, X_{1,t-i} + \sum_{i=1}^{q} a_{3i}\, X_{2,t-i} + \sum_{i=1}^{q} a_{4i}\, X_{3,t-i} + \epsilon_t.$$

The (Peresan, Shin, & Smitih, 2001) cointegration test verifies the existence of a cointegration relationship between the variables in an ARDL model. As seen above the ARDL model is more favorable for small samples and allows the analysis of long-run dynamics and short-un adjustments at the same time.

It takes the form of an error correction model or a VECM:

$$\Delta Y_t = A\Delta Y_{t-1} + \sum_{i=1}^{p} B_i \Delta Y_{t-i} + U_t.$$

With ΔY_t vector of stationary variables under study, B_i matrix whose elements are parameters associated with ΔY_{t-1}, A matrix of the same dimension as ΔY_t and Δ the first difference operator. The model that serves as the basis for the test of cointegration by the staggered delays when studying the dynamics between two series Y_t and X_t is the following cointegrated ARDL specification:

$$\Delta Y_t = \pi_0 + \pi_1 + \sum_{i=1}^{p} a_i \Delta Y_{t-i} + \sum_{j=0}^{q-1} b_j \Delta Y_{t-j} + \theta\mu_{t-1} + \epsilon_t$$

Where θ is the error correction term or adjustment coefficient. After estimating the above model, we will conclude that there is a cointegration relationship between Y_t and X_t if and only if $0 < |\hat{\theta}| < 1$ and θ is statistically significant.

3. Empirical results

For the ARDL procedure it is necessary that all the variables be integrated of order I(0) or I(1). Otherwise, the terminal cointegration test can no longer be validated and we may fall into the case of spurious regression. We will use two tests to verify the order of integration of the variables which are the Augmented (Dickey and Fuller 1981) test (ADF) and the (Perron and Phillips 1987) test (PP). The results of both tests are presented in the following table:

Table 2: Results of unit root tests

	ADF test			PP test		
Variables	At level	At first difference	Order	At level	At first difference	Order
Y_t	-2.50	-12.16	I(1)	-12.10	-37.49	I(0)
X_{1t}	-13.44	-10.591	I(0)	-24.02	-22.72	I(0)
X_{2t}	-8.79	-7.75	I(0)	-8.94	-51.32	I(0)
X_{3t}	-4.63	-9.52	I(0)	-4.63	-24.69	I(0)

Source: Produced by the author

Table 2 makes it possible to conclude that all the variables respect the standards under which the application of the ARDL is valid. The results obtained from the unit root test indicate the possibility of the existence of a long-run cointegration relationship proposed by (Peresan, Shin,

& Smitih, 2001) between the variables concerned since all the series are integrated with a maximum order I (1).

Before performing the cointegration test a preliminary step is the determination of the optimal delay that avoids any invalid specification of the dimension of our model. The latter is characterized by a minimization of the Akaike (AIC) and Schwarz (SIC) criteria. However, we base our selection on the AIC criterion, as recommended by by (Peresan, Shin, & Smitih, 2001) because it is more parsimonious.

Table 3: Determination of the optimal delay

Log L	AIC	BIC	HQ	Adj. R-sq	Specification
-30.592	2.270	2.629	2.392	0.967	ARDL (1, 1, 0, 2)
-29.805	2.282	2.686	2.420	0.967	ARDL (1, 1, 1, 2)
-31.091	2.299	2.658	2.421	0.966	ARDL (1, 1, 1, 1)
-32.793	2.340	2.655	2.447	0.964	ARDL (1, 0, 0, 2)

Source: Produced by the author

According to the results displayed in Table 3 for lags p ranging from 0 to 4, among the twenty best models in our evaluation the ARDL (1,1,0,2) model is the optimal choice. The model obtained through the AIC and SIC criterion offers the smallest value of the criterion with a minimal number of parameters. Table 4 reports the values of the Bounds test. The null hypothesis of the test corresponds to the absence of cointegration with the alternative hypothesis which corresponds to the existence of the cointegration relationship.

Table 4: Cointegration results (ARDL bounds tests)

Model	Value	
F-statistic	19.237	
Significance level	Critical values	
	Lower bounds I(0)	Lower bounds I(1)
10% level	2.37	3.2
5% level	2.79	3.67
2.5% level	3.15	4.08
1% level	3.65	4.66

Source: Produced by the author

Based on the result of the Bound test above, the Fisher statistic which takes the value of 19.237 exceeds the first upper bound for the four significance thresholds 1%, 2.5%, 5% and 10%. This leads us to reject the hypothesis of the non-existence of cointegration and to accept the alternative hypothesis of the existence of a cointegration relationship between the variables. The existence of cointegration relationship leads us to the estimation of long and short run relationships in the ARDL model. To confirm that the estimates give relevant results, we will use various diagnostic tests to check several hypotheses on the errors, namely: heteroscedasticity test, autocorrelation test of errors and stability test of the coefficients of the model, the hypotheses of the normality of the residuals and the functional form of Ramsey (RESET). In order to validate the model, to avoid falling into a spurious regression all tests are performed at the 5% threshold.

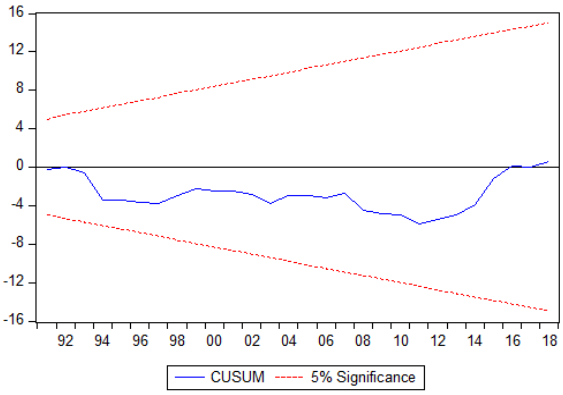
The results displayed in Table 5 show that we can accept the hypothesis of homoscedasticity of the errors, the null hypothesis of non-autocorrelation, the residuals follow a normal distribution and all the coefficients of the model considered are stable during the period of the estimate. In addition, for the 5% confidence threshold, the stability test for the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) presented in Figure 1, we note that the residues remain within the limits. This is why the model is considered as globally stable over time. Thus, it can be the subject of an economic discussion. Therefore, our ARDL (1,1,0,2) model is statistically validated. Thus, we can analyse and interpret the long and short run estimation results.

Table 5: Diagnostic tests results

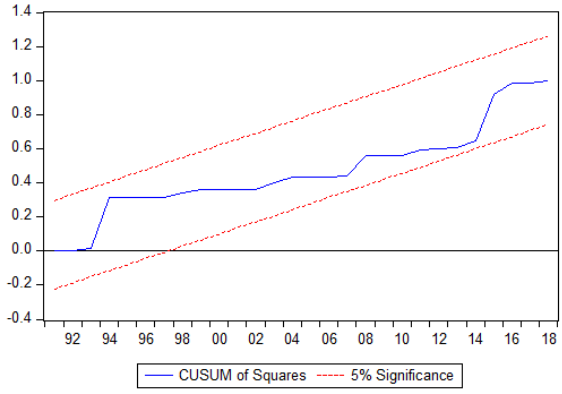
Test	Value	P-value
Breusch-Godfrey for serial correlation	0.772	0.473
Ramsey for model specification	1.942	0.126
Jarque-Bera normality test	0.717	0.698
Heteroskedasticity test: ARCH	0.241	0.626
Heteroskedasticity test: Breusch-Pagan-Godfrey	1.256	0.626

Source: Produced by the author

Figure 1: Plots of CUSUM and CUSUMSQ for the estimated ARDL model



(a) Recursive CUSUM test



(b) Recursive CUSUM of squares test

Source: Produced by the author

3.1 Long-run estimation results

The results of the estimation of the coefficients of the ARDL(1,1,0,2) model are presented in the following table:

Table 6: Estimation of the long-run coefficients

Variables	Coefficients	Std.error	T-statistic	P-Value
(Intercept)	-1.742	0.635	-2.745	0.01
X_{1t}	0.134	0.016	8.223	0.000
X_{2t}	0.301	0.09	3.329	0.002
X_{3t}	0.641	0.138	4.616	0.000

Source: Produced by the author

The long-run equation is:

$$EC = Y_t - (0.134X_{1t} + 0.301X_{2t} + 0.641X_{3t} - 1.742).$$

The empirical results show that all the coefficients are positive for our long-run estimate. This result is consistent with theoretical and empirical literature. There is a positive relationship between the per capita growth rate and the other variables. We can say that there is a long-run relationship between the different variables studied. Regarding the agricultural sector, the sign of the coefficient is positive and statistically significant. This result confirms the role played by agriculture in stimulating economic growth in Morocco. An increase in the agricultural growth rate by one point, tends to increase the growth rate of the GDP per capita in Morocco by 0.134. This result highlights the key role of the agricultural sector in the process of long-run growth. The growth rate of the industrial sector has a positive effect on economic growth, the coefficient

is statistically significant. An increase in the growth rate of the industrial sector by one point, tends to increase the growth rate of the GDP per capita by 0.301. The contribution of the industrial sector to economic growth exceeds that of agriculture. This leads us to question the industrial integration of Moroccan agriculture to enhance agricultural production and reduce the deficit of the latter in the long run. We are talking here about the agro-industrial sector with an objective of promoting the agricultural sector at the national and global levels.

Regarding the growth rate of the service sector, it takes the lion's share in contributing to economic growth. A one-point increase in the growth rate of the service sector leads to a 0.641 increase in economic growth. This corresponds to a tertiarization of the economy. The importance of the service sector is due to the fact that certain activities increasingly include service companies. In addition, tertiarization is also caused by a change in the behavior of agents due to technical progress in the production of services. Since industry is on the way to development and agriculture is linked to climatic hazards, the tertiary is considered a panacea. Although agriculture and industry have made remarkable progress in recent years, their growth rates remain somewhat volatile and below expectations.

3.2 Short-run estimation results

The short-run estimation results of the coefficients of the ARDL(1,1,0,2) model are presented in the following table:

Table 7: Estimation of the short-run coefficients

Variables	Coefficients	Std.error	T-statistic	P-Value
ΔX_{1t}	0.137	0.003	49.944 0	.000
ΔX_{3t}	0.504	0.058	8.672 0	.000
$\Delta^2 X_{3t}$	-0.140	0.062	-2.262	0.031
ECT(-1)	-0.735	0.07	-10.485	0.000

Source: Produced by the author

All the coefficients are significant at the 5% level. Indeed, the agricultural growth rate has a positive effect in short-run on economic growth. An increase of 1% in the growth rate of the agricultural sector accelerates growth by 0.13%. This means that the agricultural sector reacts immediately to economic changes. The growth rate of the service sector has also a positive effect on economic growth.

The growth rate of the delayed service sector displays a significant negative coefficient, which means that the growth rate of the delayed service sector plays unfavorably and negatively affects economic growth but only in the long run. The effect of this variable is mixed, it takes a year for the service sector to stimulate economic growth. In addition, we note that the industrial growth rate has no short-run impact. This result may be due to the policy pursued by Morocco, such as the *Industrial Acceleration Plan 2014 – 2020*. The coefficient of the restoring force towards equilibrium, ECT(-1), is negative and statistically significant at the 1% level. This confirms the existence of an error correction mechanism. So, we can say that the error correction model is validated in our case. The negative sign and the significance confirm that there is a cointegration relationship between economic growth and the other variables. This explains the expected convergence process in the long-run dynamics. In fact, around 73% of last year's imbalances are corrected in the current year and the degree to which the growth rate will be pulled back towards the long-run target suggests a rapid speed of adjustment following a shock during the last year. This can be explained by the instability of growth over the years due to shocks, whether internal or external.

3.3 Causality analysis

The Toda-Yamamoto causality test makes it possible to overcome certain limitations of traditional causality tests. In particular that of (Granger, 1980), since the Granger test is only applicable to stationary series. (Toda & Yamamoto, 1995) proposed non-sequential procedures to test causality between series whether they are integrated with I(0), I(1) or I(2), cointegrated or not and for any order of integration the test could apply. The test results are presented in the Table 8. The results show that there is a unidirectional and bidirectional causality relationship: a bidirectional causality between the economic growth rate and the agricultural growth rate. A unidirectional causality, the growth rate of the GDP per capita is caused by the growth rate of services sector. There is also another one-way causality, where the agricultural growth rate is caused by the service sector growth rate.

Table 8: Causality test results

	Y_t	X_{1t}	X_{2t}	X_{3t}
Y_t	-	4.47 (0.09)	0.1 (0.94)	.10.47 (0.005)
X_{1t}	5.36 (0.06)	-	1.17 (0.55)	7.77 (0.02)
X_{2t}	0.17 (0.91)	1.01 (0.60)	-	0.89 (0.64)
X_{3t}	0.82 (0.66)	1.3 (0.52)	0.04 (0.97)	-

Source: Produced by the author

Conclusion

The question at the center of this study is whether the agricultural sector positively impacts economic growth and other sectors, namely industry and services. Based on the results obtained, this hypothesis is verified for the case of Morocco. According to the estimation of the model, it was found that the growth rate of the agricultural sector has a positive and significant effect on the growth rate of the GDP per capita in the short and long run. This result explains the importance of the contribution of agriculture to economic growth and the improvement of the standard of living of the population. Furthermore, the existence of a causality from agriculture to economic growth has been verified. This underlines the primordial role of the agricultural sector in the process of growth. Moreover, the causality of GDP per capita towards agriculture has been confirmed. The result is a two-way relationship between economic growth and the agriculture sector growth rate. This dynamic of the agricultural sector is mainly the result of the efforts made by the government to increase its prosperity. The results obtained also confirm what has been presented by the theoretical literature, that the growth of agriculture can lead to economic growth. Thus, agriculture in Morocco could be an economic lever if the favorable conditions for its growth are available. These conditions can be summarised as a structural transformation centered on the expansion of the sector and its integration with other sectors of activity, in particular industrial sectors.

The other variables, namely the growth rate of the industrial sector and services show positive and significant signs in the long run. Both sectors take the lion's share of the impact on economic growth. Also, we have established causal links between the three sectors and GDP per capita. It was found that only the service sector caused the agricultural growth rate and GDP per capita. The contribution of the industrial sector to economic growth has exceeded that of agriculture. This leads us to question the industrial integration of Moroccan agriculture to enhance agricultural production and reduce the deficit in the long run. We are talking here about the agro-industrial sector for a global and favorable vision of the agricultural sector at the national and global levels. Policy makers should therefore pay attention to the integration of the two sectors in order for the economy to better adapt to global economic transformations. Based on the data of this study, we also propose to strengthen the links between agriculture and other sectors to increase the impact of the growth of agriculture on the growth of all sectors.

A structural transformation is needed, i.e., the migration of productive resources from agriculture to industry and services. In this regard, Morocco must develop strong competitive

advantages, rather than comparative advantages in its industrial branches, particularly in research and development in the agro-industrial productive system.

This research, however, presents some limitations. To begin with, some important sectors such as mining and tourism weren't included in the study, even though they are some of the main contributors to economic growth in Morocco. As a result, future research aims to address these issues by using panel data to investigate on one hand the relationships between the different sectors in the economy and on the other hand to compare their contribution to economic growth between different countries.

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