Journal of Operational Management & Marketing Strategies (OMMS)
Vol.1pp. 6-13

Financial Intermediation and Economic Growth in Tunisia: An econometric investigation

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***Abstract*— the objective of our work is to show the importance of a healthy institutional framework in the finance-growth relation. In terms macroeconomics, governance is defined as the traditions and institutions through which authority is exercised in a country. Then, we empirically test a model of growth of Solow increased by the human capital to treating the relation between financial intermediation, institutions and economic growth. The various estimates were made by Vector Autoregressive Method over the period of 1980 to 2011 for Tunisia. Following these estimates, it seems that the quality of the institutions is regarded as an important factor which must not be neglected in the study of the relation between the financial sphere and the real sphere.**

***Keywords*— financial intermediation, governance, economic growth, Vector AutoRegressive (VAR).**

I. INTRODUCTION

Before the fifties, the economic theory does not really incorporated banks and lending institutions that made the agents intervene decisively in the transmission of savings, investment and money creation.

The theory of financial intermediation was made in the late fifties from the study of a financial market economy. The work of *Gold Smith in 1955* and *Gurley Shaw in 1955* and *1956* discussed to the rise of the institutionalization of the process of financial intermediation in the American economy.

In approach less recent, *Gold Smith* questioned the reasons for the increasing complexity of financial systems in contemporary economies. However, this approach does not explain or justify the proliferation of financial intermediaries in the development countries.

This justification was also provided by *Gurley and Shaw (1960)* in "Money in a theory of finance" which for the first time analyzed them for financial institutions in relation to their intermediation function by questioning process financing of economic activity.

In fact, the concept of financial intermediation has undergone profound changes over time according to the definitions and interpretations of theorists and practitioners.

In general, economists have taken the Anglo-Saxon terminology developed by *Gurley and Shaw*, namely "intermediation", which is defined as the process of adjusting to the needs and financial capabilities through the intervention of a specific agent, the financial intermediary, whose role is to collect savings ultimate lenders by issuing indirect primary securities to finance the acquisition of the ultimate borrowers.

The financial intermediation model of *Gurley and Shaw* probably offered the most synthetic expression of the theoretical and conceptual framework intermediation; remains current and has attracted renewed interest with the development of markets. This framework is built on the distinction between direct and indirect finance.

In a long term, the evolution of financial structure of the economy seem marked by both a shift from direct to indirect finance from traditional bank lending and money creation (bank disintermediation) to benefit of collective management of savings.

However, the majority of theoretical and empirical work, the quality of institutions is analyzed independently of the relationship between the real economy and the financial sector. Therefore, in this work we try to show the relationship between financial intermediation and economic growth through the institutional aspect. Indeed, this new paradigm of thought shows that the financial system operates with a set of institutions. These institutions are responsible to monitor and control the transparency of markets and government activity. This has led many economists to measure institutions and introduce the concept of "governance", to show the importance of these variables as the main determinants of financial development, and the result of sustained economic growth.

Therefore, our problem is how good governance is seen as a key factor in the relationship between financial intermediation and economic growth. To address this problem, we adopt the following approach.

First, after introducing the concept of governance and presented its measures, we will show theoretically that the quality of institutions is considered as the main determinant of financial development. Then, we test empirically the Solow growth model augmented by human capital, on the relationship between financial intermediation, institutions and economic growth. This allows us to show the direct and indirect effects of financial intermediation on economic growth. The last part is devoted to the results of different estimates and their interpretations in order to draw conclusions and politico-economic recommendations.

II. INSTITUTIONAL POLICIES AND ECONOMIC GROWTH

In recent years, emerging economies have made significant macroeconomic performance. To enhance its performance, the authorities in these countries have undertaken a number of institutional reforms in the functioning of the economy in general. The main objective of these countries is to achieve the transition to the "good governance". Indeed, improving the quality of institutions becomes to achieve a level of sustainable development and achieve a high economic growth rate. From a theoretical and empirical view, several studies show the existence of a limited relationship between the institutional framework and the growth of gross domestic product per capita (Laurent Clerc and Hubert Kempf, 2006) relationship.

Different economists have argued, in recent years, one of the main reasons why growth rates differ between countries is that the quality of the economic environment in which agents operate is different. This environment includes laws, institutions, rules, government policies and regulations of the country.

Good institutions are characterized by structures and incentive laws that reduce uncertainty and support efficiency. They contribute to a stronger economic performance. Indeed, a favorable environment for growth is one that provides adequate protection for property rights and gives agents the incentive to produce, invest and accumulate skills.

Recognizing the importance of good governance in improving the business environment, competitiveness and attractiveness of the country as well as the efficient management of human capital, public authorities in emerging countries have registered, a package of reforms aimed at launching a new impetus to development of the country, to provide opportunities for the involvement of different stakeholders and of society and thus to lay the foundations for a new management development.

Measuring the quality of governance is a daunting task. The World Bank in 2003 has developed a set of indicators to assess the quality of various aspects of governance.

Today, the size and governance measures we take to explore the idea of distinguishing between governance at the macro level and micro-level governance.

In macroeconomic terms, governance means "the traditions and institutions through which authority is exercised in a country" (Kaufman, Kraay and Zoido-Lobaton, 1999 a and b). This definition emphasizes that the effective mobilization of resources, the formulation and implementation of appropriate policies depend on the ability of leaders. Governance is qualified as "good" or "bad" according to the mechanism of coordination between the government, the market and civil society. Good governance is defined by the credibility based on the availability and transparency of information, government accountability and participation in decision making for the collective society. Instead, poor governance is expressed by the lack of rule of law, the existence of corruption, asymmetric information, etc..

In terms microeconomics, "corporate governance" or corporate governance refers to "the set of organizational mechanisms that have the effect of defining the powers and influence management decisions, ie which» govern «their conduct and define their discretionary space "(Charreaux, 1997, p.1). According to this definition, ownership structure and various corporate partners play a crucial role in determining the scope and organizational rules.

This distinction seems difficult in the sense that the quality of corporate governance depends on the quality of the system of corporate governance that prevails in the country. Thus, the construction of an overall index of governance is not easy because, at the macroeconomic level, governance depends on several variables. Indeed, the diversity of indicators is due to the complex and multidimensional nature of governance.

The study of Kaufman et al. uses at least 250 indicators to measure the quality of institutions in a country. The information collected from twenty five different sources and are produced by eighteen international organizations. This database covers 199 countries for the years 1996, 1998, 2000 and 2002. Each country receives a score that varies between -2.5 and +2.5. A higher value is for a country corresponds to better governance.

In total, the study of Kaufman, Kraay and Mastruzzi (2003), the overall governance index is calculated as the average of the following six steps: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and corruption.

1 - Voice and Accountability: Measures the ability of a country's citizens to participate and choose the government. It is based on a number of indicators measuring various aspects of the political process, civil liberties and human and political rights;

2 - Political Stability: Measures the likelihood that the government will be destabilized or overthrown up by unconstitutional and / or violent means is threatened by public policy such as terrorism;

3 - Government Effectiveness: Measures aspects of quality and availability of public services, the bureaucracy, the competence of civil servants, the independence of the administration of political pressure and the credibility and transparency of the government's reform commitments and policies;

4 - Regulatory Quality: Focuses on the policies themselves, including measures of the impact of anti-market policies such as price controls or inadequate bank supervision and supervision as well as the perception of the blockage imposed by excessive regulation in areas such as foreign trade and business climate;

5 - Rule of Law: Includes several indicators that measure the confidence of citizens in accordance with the laws and rules of society. These include perceptions of the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability of legal contracts;

6 - Corruption: Measuring the extent of corruption, defined as the use of public power for personal interests and private in terms of wealth and corrupt gain profits.

The phenomenon of growth has been developed by various economic theories. These theories show the importance of the accumulation of physical capital in the development process. They are divided into three streams of different thought. The first trend inspired by Keynesian theory, the main supporters Domar (1946 and 1947) and Harrod (1948). The second trend has emerged in the mid-50s takes the name "Neo" was essentially developed by Solow (1956). The third trend is the endogenous growth theory following the work of Romer (1986) and Lucas (1988).

A/ Data Statistical Analysis

1/ Economic Growth Evolution

The average annual growth rate was 3.29% over the period 1996-2011. However, during the period of analysis we find that it was not regular. It reached its lowest rate in 2011 (-2%) and the highest in 1996 (5.59%) rates. Over the past two years, its evolution has been marked by internal and external shocks such as lower production, lower the value of the Tunisian dinar against the euro and the dollar, rising oil prices.

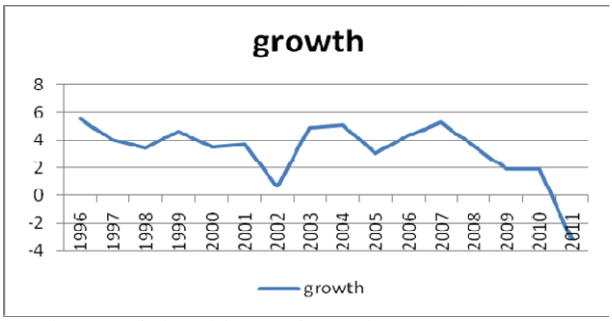

Fig 1. Evolution of the growth rate of GDP (1996-2011)

Economic growth in Tunisia since 2000 remained moderate, with the exception of some years and it is either negative or lower the population growth rate. Production is mainly dominated by the primary sector and tertiary sector. The Tunisian economy is also characterized by the predominance of the informal sector. Since the revolution in 2010, Tunisia knows of negative growth rates and lowers population growth rate.

2/ Financial Intermediaries Size

The evolution from quasi-money to GDP is an indicator of the financial system deepening in the sense that it measures the financial intermediaries size (Fig 2). This indicator has increased by an average of 24.8% in 1996 to 37, 5% in 2011.

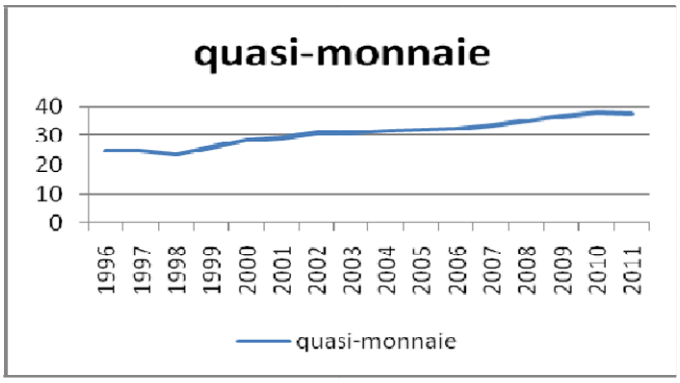

Fig 2. *The ratio of* $\frac{Quasi-Monnaie}{PIB}$ *of Tunisia (1996-2011)*

3/ Evolution of Institutions

The evolution of institutional quality is measured by a composite governance index. This index is used to classify countries into two categories: well governed country and poorly governed country. From figure 3, the Tunisian institutions have experienced an improvement in the institutions quality from an average of -0.048 in 1996 to -0.202 in 2011.

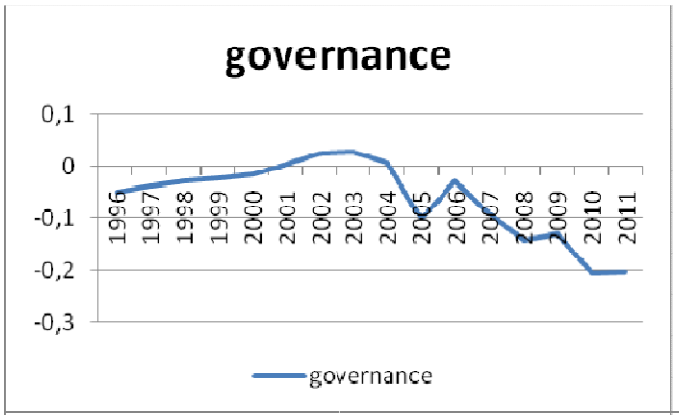

Fig 3.: Governance index of Tunisia (1996-2011)

B/ Empirical modeling

The Solow model considers investment rates, population growth and technological progress as exogenous. The two inputs, capital and labor are paid their marginal productivities. We assume a Cobb-Douglas production which at the time (t) is given by:

$$Y_t = K_t^a [A_t L_t]^{1-a} \quad \text{With} \quad 0<a<1 \qquad (1)$$

Y: is the product, K: capital, L: labor and A: the technology level. L and A are assumed to grow to exogenous rate (n) and (g):

$$L_t = L_0 e^{nt} \qquad (2)$$

$$A_t = A_0 e^{gt} \qquad (3)$$

The number of units actually labor $A_t L_t$ increases rate (n + g). The model assumes that a constant fraction (s) of the product is invested. Or (k) the stock of capital per unit of labor ($k = \frac{K}{AL}$) and (y) the level of output per unit of labor is given by: $y = \frac{Y}{AL}$

The evolution of K is such that:

$$K_t^{'} = sy_t - (n + g + \delta)k$$
$$K_t^{'} = sk_t^a - (n + g + \delta)k_t \quad (4)$$

Where δ is the depreciation rate. Equation (4) implies that (k) converges to a stationary value (k *) or defined by:

$$k_* = \left[\frac{s}{(n + g + \delta)}\right]^{\frac{1}{1-a}} \quad (5)$$

At equilibrium, the capital-labor ratio is positively related to investment rate and negatively to the population growth rate.

The main predictions of the Solow model concern the impact of investment and population growth on real income. By replacing (k) as in equation (5) in the production function and by the logarithmic per capita income yields:

$$Log\left(\frac{Y_t}{L_t}\right) = LogA_0 + gt + \left(\frac{a}{1-a}\right)Logs - \left(\frac{a}{1-a}\right)Log(n + g + \delta) \quad (6)$$

The essential question is whether the data are consistent with the predictions of the Solow model for the determinants of living standards. Thus, suppose that Solow (g) and (s) are constant across countries, with (g) reflects the level of advancement of knowledge which is not a specific country. The term (A0) reflects not only the technology but resource endowments, climate, institutions. It will be different between countries. (A0) therefore contains some factors specific to each country.

It is assumed that $LogA_0 = \alpha + \varepsilon$

With (α) is a constant and (ε) is a shock specific to each country. In this way, the logarithm of per capita income:

$$Log\left(\frac{Y_t}{L_t}\right) = \alpha + gt + \left(\frac{a}{1-a}\right)LogS - \left(\frac{a}{1-a}\right)Log(n + g + \delta) + \varepsilon \quad (7)$$

Equation (7) is the empirical specification baseline in the Solow model. It assumes that investment rate and population growth rate are independent of the specific factors that may affect the production. In this case, this assumption implies that the equation (7) can be estimated using ordinary least squares.

For the generalized model, we will integrate the basic model all factors that affect growth. Equation (1) can be written:

$$Y_t = K_t^a H_t^b \left[A_t L_t\right]^{1-a-b} \quad (8)$$

Where (H) is the stock of human capital, the other variables are defined as in equation (1). (L) and (A) to increase by (n) and (g) rates such that:

$$L_t = L_0 e^{nt} \quad (9)$$

$$A_t = A_0 e^{(gt + X_q)} \quad (10)$$

Where (X) is a political vector and other factors affecting the technology level and economic efficiency. In addition, (q) is the vector of coefficients for these policies and other variables. Let (s_k) and (s_h) fractions of income invested respectively in physical and human capital. The assessment of the economy is determined by:

$$k_t^{'} = s_k y_t - (n + g + \delta)k_t \quad (11)$$
$$h_t^{'} = s_h y_t - (n + g + \delta)h_t \quad (12)$$

Where $y = \frac{Y}{AL}$, $k = \frac{K}{AL}$ and $h = \frac{H}{AL}$ are the actual amounts by work units.

It is assumed that the same production function is applied to human capital, physical capital and consumption. In addition, it is assumed that human capital and physical capital depreciate at the same rate (δ).

Equations (11) and (12) imply that the economy converges to a steady state defined by:

$$k^* = \left[\frac{s_k^{1-b} s_h^{b}}{n + g + \delta}\right]^{\frac{1}{1-a-b}} \quad (13)$$

$$h^* = \left[\frac{s_k^{a} s_h^{1-a}}{n + g + \delta}\right]^{\frac{1}{1-a-b}} \quad (14)$$

Substituting the values of equations (13) and (14) in the production function, with logarithmically, and asking ($a + b = x$), we obtain the per capita income balance:

$$Log\left(\frac{Y_t}{L_t}\right) = LogA_0 + gt + X_q - \left(\frac{x}{1-x}\right)Log(n + g + \delta) + \left(\frac{a}{1-x}\right)Logs_k + \left(\frac{b}{1-x}\right)Logs_h \quad (15)$$

The terms $\frac{x}{1-x}$, $\frac{a}{1-x}$ and $\frac{b}{1-x}$ are the elasticities of per capita income, respectively, compared to the population growth, the fraction of income invested in physical capital and the fraction of income invested in human capital. This model predicts that the amount of elasticity with respect to (s_k) and (S) is equal to the elasticity with respect to (n + g + δ).

Similarly, the Solow model predicts conditional convergence after controlling for determinants of the steady state. In addition, this model makes quantitative predictions about the speed of convergence. Thus, either (y*) per capita income derived from equation (15), the convergence rate is given by:

$$\frac{dLogy}{dt} = \lambda\left[Logy^* - Logy_t\right] \quad (16)$$

With λ = (n + + δ g) (1 - a - b) is the speed of convergence, is produced by the current header. Equation (16) implies:

$$Logy_t = (1 - e^{\lambda t})Logy^* + e^{\lambda t} Logy_0 \quad (17)$$

Subtracting ($logy_0$) in both sides of the equation (17) and replacing (y*), we obtain:

$$Logy_t - Logy_0 = (1 - e^{-\lambda t})\left[\frac{-x}{1-x}Log(n+g+\delta) + \frac{a}{1-x}Logs_k + \frac{b}{1-x}Logs_h + X_q - Logy_0 + gt + LogA_0\right] \quad (18)$$

With T is a time index.

Thus, from the time index is introduced in the model, recent work developed by *J.C Berthélemy and Varoudakis A. (1998)* show that to obtain a satisfactory explanation of empirical real growth, we must introduce explanatory factors other than

simply the progress of labor, human capital and physical capital that appear in the neoclassical model.

To this end, the extension of the Solow growth model (1969) allowed us to enter the permanent effects of financial development through their effects on total factor productivity.

III. Financial Intermediation, Institutions Quality and Economic Growth: Evaluation Test

The estimated model is inspired by the work developed by Mark Hay (2001) to measure the influence of the behavior of banks on economic growth. It uses a sample of 12 countries over a period from 1970 to 1996 with the use of panel data approach. Here the actual variables that influence economic growth and those suggested by the theories of endogenous growth (such as trade openness, inflation, human capital, the investment rate etc.) are taken into account simultaneously with indicators of financial intermediation. The absence of significant financial market in Tunisia allows limiting banks. To specify the model, it came in a first estimate an equation taking into account only the variables of the real economy, which has helped keep real variables whose influence on growth is more important than in a second stage analysis of indicators of financial development has been made to add to this equation the most relevant financial variables. This process allows you to see the extent to which financial variables improves the relationship.

The chosen specification is as follows:

$$Growth_t = aX_t + bZ_t + \mu_t$$

$Growth_t$: GDP per capita at constant prices 2000. From this variable we calculate the dependent variable, namely, the real per capita growth rate by subtracting the GDP in period (t-1) to the GDP in period (t).

$X_{i,t}$: Matrix of variables used in a study of the determinants of growth. These variables are the control variables as following:

- **INV_t:** the ratio (gross fixed capital formation + changes in inventories) / GDP. Investment is a key variable for growth and should have a strong positive effect.
- **INFLATION:** the introduction of the inflation rate as explanatory variable of growth is justified by the concept of financial repression. Indeed, a high inflation rate characterizes economies where financial repression is strong, so that the real interest rate is negative, thereby reducing the burden of government debt. However, high inflation disadvantage long-term investments and has a detrimental effect on growth. The expected sign for this variable is negative.
- **$Trade_t$**: Berthélemy and Varoudakis (1998) he used the trade openness coefficient is calculated by the ratio (Exports + Imports) / GDP. However, this indicator is not optimal since more lines of economic policy; it reflects the influence of natural differences such as the size and location of each country.
- **KH_t**: Human capital is the number of people enrolled in secondary: The gross enrollment rate is to determine the percentage of the total population was recorded at study here the sub-when the people gathered in the age group corresponding to the level of study in question.

Z_t: matrix variables characterizing the banks system, which are as follows:

- **QM:** Quasi-money refers to bank deposits which cannot be processed at any time and in their entirety, by legal fiat money: these are deposits and deposits savings.

The ratio QM/GDP measures the financial intermediary size because M1/PIB consists mainly of highly liquid deposits. This ratio is centralized on long-term deposits.

- **GOV:** Global Governance Index is calculated as the arithmetic average of citizen participation and accountability, political stability and absence of violence, government effectiveness, the regulatory burden, rule of law and the absence of corruption.

With regard to the data source, all financial data are derived from site http://www.worldbank.org/data&statistics World Bank, except data on the governance index from «International Country Risk Guide "(International Country Risk Guide - ICRG) for the period 1980-2011.

The econometric analysis is based on annual data over the period 1980-2011, so 32 observations.

The choice of the period is justified, on the one hand, the availability of data and the other due to the emergence of new financial intermediation over the past three decades.

III. ESTIMATES AND INTERPRETATIONS OF RESULTS

1/ Stationarity test series

The stationarity test is preferred in estimates of temporal data as it avoids the risk of spurious regression. There are a variety of the variables stationarity tests. In our study, we use the Dickey-Fuller (ADF) test.

The results of the stationarity test are summarized in the table below.

TABLE 1
RESULTS OF STATIONARITY TEST

The threshold stationarity test of ***1%, **5% et *10%				
Variables	***Stationarity***		***Dickey-Fuller (ADF)***	
	Yes/No	**Integration order**	**Statistic value**	**Critical value**
GROWTH	Yes	I(0)	-5,7458***	-4,2845
INV	Yes	I(0)	-4,1204**	-3,6032
INFLATION	Yes	I(0)	-3,7882**	-3,5628
TRADE	Yes	I(1)	-5,5460*	-4,2967
KH	Yes	I(1)	-4,2907**	-3,5683
QM	Yes	I(0)	-3,3102*	-3,2217
GOV	Yes	I(1)	-3,8753**	-3.5806

The results of the unit root test of Augmented Dickey-Fuller (ADF) show that the growth rate of gross domestic product (GDP), the investment rate (INV), the inflation rate (INFLATION) and the quasi- money (QM) are stationary in level. Other variables (TRADE, KH, and GOV) are stationary in first differences. Since all variables are integrated of the same order, they cannot be cointegrated in the Granger sense

according to econometric theory. This leads us to choose a Vector AutoRegression (VAR).

The fundamental interest of the Autoregressive Vector or Vector Error Correction is that it allows us to study the causality in the short or long term Granger between financial intermediation and economic growth.

One of the main applications of the VAR model is to analyze the effects of economic policy shocks. The VAR method is also used for residual testing (autocorrelation, homoscedasticity, heteroscedasticity).

2/ VAR model. Stationarity

The below graph shows that the VAR is stationary because the inverse of the roots of AR characteristic polynomial are all located inside the unit circle. This means that all eigenvalues of modulus greater than 1. The estimated model was acceptable R^2 and p-values of the Fisher statistic below 0.05. So the model is acceptable.

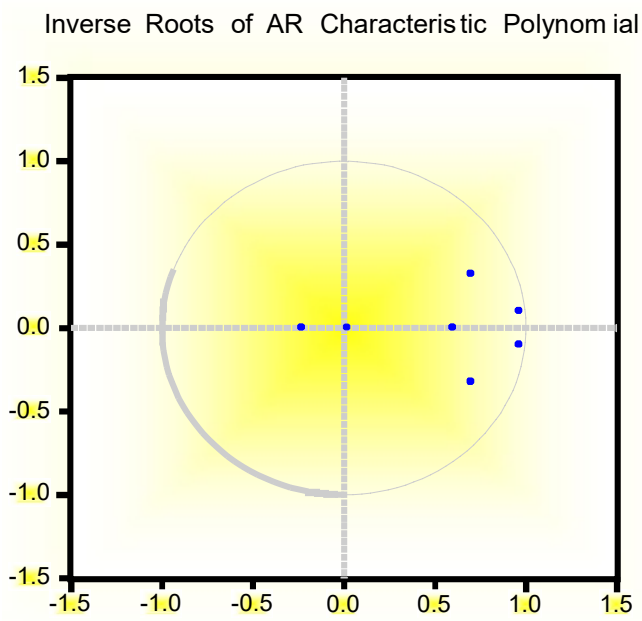

Fig 4. Model Stationarity

Before estimating the model, it was necessary to determine the optimal lag number. To do this we used the method of information criterion because of its accessibility in Eviews. We chose the lag number that minimizes the information criteria, is 1.

Fisher statistics in Table 3 is greater than the reader Fisher's table (1.96) then the model is globally significant. At the individual level, each variable in the model is significant. But in analyzing the financial development-economic growth relationship, we note that financial intermediation and good governance have an impact on economic growth.

3/ Residual Tests

These are tests for normality, heteroskedasticity and errors autocorrelation.

** Normality Test*

The assumption of normality of error terms specifies the statistical distribution of the estimators. This hypothesis can be tested on the model variables or error terms of the model. This test is performed with the Jarque-Bera statistic and follows a chi-square with two degrees of freedom at the 5% level equal to 5.99. It shows whether the variables in the model or not follow a normal distribution. The results of this test show that the residuals are normal because the Jarque-Bera statistics are all below 5.99.

** Heteroskedasticity test of residue*

This test is performed using the White test. It can detect if the errors are homoskedastic or not. Heteroscedasticity describes the series that do not have a constant variance. However, the series must be homoskedastic to present the best estimators. Tests Breusch-Pagan (BP) and White: In a heteroscedasticity test, two tests are generally used. But, the White test is used in our model. The general idea of this test is to check whether the squared residuals can be explained by the variables in the model. In this case, residues are homoskedastic with probability (0.2534) greater than 5%. So the estimates are optimal.

** Errors Autocorrelation Test*

This test, also called correlation test checks for errors if the errors are not correlated. It should detect the errors autocorrelation by the Durbin-Watson. In our study, there is no autocorrelation for the associated probability is greater than 5% as shown in the table below.

Various econometric tests show that our model is well specified, there is no autocorrelation and homoscedasticity of errors, the normal distribution and the model is stable. This model can be used for econometric forecasts.

B/ Causality test and Variance decomposition

According to Granger, a variable X causes variable Y only if the past and present values of X are more predictive values of the variable Y. In other words, a variable X causes variable Y if knowledge of past and present values of X expresses best prediction of Y.

The Granger causality test to examine whether returns the current value of Y is significantly related to lagged values of the same variable and lagged values of X that is considered the causal variable.

The following table gives the results of the causality test of financial intermediation and the growth rate of real GDP through the quality of institutions.

TABLE 2

GRANGER CAUSALITY TESTS

Null Hypothesis of no causality	Ob.	F-Statistic	Probability
QM does not cause GROWTH	31	***2,8301***	***0,0925***
GROWTH does not cause QM		0,3849	0,5350
QM does not cause INV		***12,7960***	***0,0003***
INV does not cause QM		0,0086	0,9259
QM does not cause TRADE		0,6140	0,4333
TRADE does not cause QM		2,4397	0,1183
QM does not cause INFLATION		2,5065	0,1134
INFLATION does not cause QM		1,1841	0,2765
QM does not cause GOV		***3,9373***	***0,0472***
GOV does not cause QM		0,0455	0,8309
QM does not cause KH		***11,0185***	***0.0009***
KH does not cause QM		1,0324	0.3096

The causal analysis told us that financial intermediation because economic growth. The application of these test variables taken in pairs for optimal delay period, indicating that the financial intermediation because investment, governance and human capital.

The results in Table 7, it appears that in the short term or long term financial intermediation cause GDP growth since the P-value is less than 0.05, that is to say that prior information on financial intermediaries allow better prediction of the level of economic growth. Economic growth rate does not cause either the financial variable (the P-value is greater than .05). Therefore, the test results allow us to reject the null hypothesis and conclude that there is unidirectional causality between the financial intermediation and the economic growth rate.

The variance analysis provides information about the relative importance of innovations in the variations of each variable in the VAR. It allows us to determine in which direction the shock has more impact. The variance decomposition for each variable in the VAR gives the results presented in Table 8.

The results of table variance decomposition show that fluctuations in the variance of the growth rate of GDP, investment as a percentage of GDP, inflation, trade openness, the quasi-money as a percentage of GDP, governance and human capital are explained by their variances are decreasing about the first ten years.

IV. CONCLUSION

This paper examines the relationship between financial intermediation and economic growth in Tunisia. Following a detailed time series analysis, the findings reveal that financial intermediation has a positive impact on economic growth in Tunisia. Although an indicator of financial intermediation (quasi-money) was used for the purpose of this paper. This paper observes that in the years 1980 to 2011, the highest average annual economic growth rate and especially before the revolution of December 2010. In addition, this paper suggests the expansion of the model used above to accommodate more explanatory variables. The use of more advanced econometric tests such as the VAR estimation technique or the component analysis approach may be used for a more robust empirical test of the causal link between financial intermediation and economic growth in Tunisia.

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