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Abstract: The objective of this article is to test the impact of a financial system inspired mainly by the banking sector on the economic growth in Tunisia. In this work uses annual data from 1980 to 2017. We have used four proxies of Financial Development (DF) with reference to the banking sector, namely Broad Money (M2), Domestic Credit to the Private Sector (DCPS), Credit domestic by banking sector (DCBS), and bank deposits (BDL). Control variables, such as trade (TRADE), government expenditure (govexp), and gross domestic savings (GDS), were added to the analysis. The results revealed that there is a positive relationship and statistically significant difference between financial development and economic growth. However, BDLs are positive but statistically insignificant, and M2 is negative and statistically insignificant. Also, unidirectional and bidirectional causality was found between the variables. Indeed, there is an urgent need for a robust banking sector to ensure long-term sustainable economic growth.

Keywords: Financial Development, Economic Growth, Tunisian Banks.

1. Introduction

A developed, healthy and well-diversified financial system is undoubtedly an important factor of economic growth. In the Tunisian financial system, the banking sector constitutes the fundamental element. In fact, banks and other institutions receiving deposits are generally the first and sometimes the only institutions which mobilize household savings. For most theoreticians, the intervention of the banking sector turns out to be a determining factor, which allows the mobilization of savings as well as a better allocation of resources, always supporting the economy promotion.

In this article, our objective is to test the impact of a financial system inspired mainly by the banking sector on economic growth. During the period (1980-2017), we are trying to identify a relationship between financial development indicators and economic growth in Tunisia.

2. Financial Development and Economic Growth: Literature Review

According to the Global Financial Development report, the financial sector is the set of institutions, instruments and markets as well as the legal and regulatory framework for granting credit. Financial sector development is about overcoming the "costs" generated by the financial system. This process of cost reduction is linked to the acquisition of information, the application of contracts and the transactions that have resulted in the emergence of financial contracts, markets and intermediaries. Different types and combinations of information and transaction costs, associated with different legal, regulatory and tax systems, have driven distinct contracts, markets and financial intermediaries in all countries and throughout history.

There is ample evidence to suggest that the financial sector development plays a major role in economic development. It promotes economic growth through capital accumulation and technological progress by increasing the savings rate, mobilizing and pooling savings, producing information on investment, facilitating and encouraging inflows of foreign capital and optimizing the allocation of capital. Countries with better developed financial systems tend to grow faster over long periods of time. Absolutely, there is much evidence to suggest that this effect is causal: financial development is not just the result of economic growth but it also contributes to that growth.

In the recent years, Tunisia has made notable efforts to reform its financial system, which is considered an integral part of macroeconomic policy. Financial reforms are expected to generate significant economic benefits, notably through more efficient mobilization of national resources of economies and also more efficient allocation of wealth.

The financial sector and economic development are interdependent. No economy can develop and improve the standard of living of its population without a functioning and well-organized financial sector. Tunisian banks represent 90% of the financial sector. Therefore, a strong banking system is directly linked to the economic growth and development of Tunisia.

Focusing on the effects of financial development, there are many approaches on which the analysis could be based. Here we have also focused on a solution for which Levine's procedure will be a good framework. It enables the financial sector to contribute to technological progress and capital accumulation, which can accelerate economic growth. In other words, well-developed financial sector can increase investment, a fact that can promote economic growth. Thus, Levine's procedure can be useful for testing the relationships, causality, and impact of financial and economic development on the growth of the banking sector.

For work relating to developing countries, we can cite the work of Avromovic (1964), in which he considers it difficult to duplicate the experiences of Western countries to developing countries. According to Avramovic, developing countries are generally characterized by two deficits: a savings deficit and a currency deficit. Nevertheless, a calculated and controlled international debt strategy could allow, in the light of his thesis, to move from a net creditor status to a relatively robust financial system compared to the international financial one. In the “debt-growth” process, the return on investment and the propensity to save are the key variables that ensure this progression.

Moreover, Avramovic leads to a calibration of his theory in order to characterize the cycle of passage from net borrower to that of net lender which he situates at 36 years. Avramovic's optimistic results offered interesting avenues for promoting the growth of developing countries but did not characterize their financial systems. At this stage, we can introduce the work of Mckinnon (1973) and his thesis on financial repression. In fact, this thesis is based on the observation that in many developing countries, financial markets are cramped. To invest, agents must finance themselves from real assets or from the real cash they hold. To develop the financial market under these conditions, it is necessary, also, to increase the real return on cash holdings, which is often negative because of uncontrolled inflation.

According to McKinnon, there is an increase in the liquidity rate (M1 / GDP) when the real return on money increases, which encourages the self-financing of investment; to cite the adduction effect. During this phase, we observe a positive correlation between holding money and investing, the first being a prerequisite for financing the second. Investment increases with real return to a turning point despite the high return on cash. Individuals increasingly prefer to hold their wealth in monetary form instead of investing; the substitution effect outweighs the income effect. Therefore, countries with low liquidity rates must deregulate nominal rates and practice disinflation policies.

McKinnon's analysis has implications for the use of external funding. He considers that an external contribution of savings could destabilize the local financial market which is poorly organized. Thus, if the opportunities for profitable domestic investments are limited, the external contribution of savings crowds out local savings by lowering the interest rate. If, moreover, States finance their deficits by monetary creation (monetization of budget deficits), the resulting increase in inflation further reduces the return on savings: the substitution effect no longer operates between the demand for money and investment but between local savings and external savings (often constituted by short-term investments).

The causality between financial development and economic growth remains, both theoretically and empirically, a source of debate and discussion. Indeed, the idea that finance plays an important role for economic development has been seen and reviewed by many economists over the years. The majority of economists have succeeded in demonstrating that financial development causes long-term economic growth and have supported the idea that a well-developed financial system is only one of the main factors in the overall process of economic development of a country. Although a rich literature converges on the existence of a causality going from the financial system to economic growth, some articles challenge this consensus and assert causality in the opposite direction.

It was in the early 1990s that King and Levine (1993b) first demonstrated that the size of the financial sector was an indicator of economic growth. The two authors collected data for 77 countries for the period 1960-1989 and showed that the size of the financial sector in 1960 foreshadowed economic growth, investment and productivity growth over the next thirty years , even taking into account initial income, education, public consumption and trade openness. In a follow-up article, Levine and Zervos (1998), focused on equity capital markets and showed that stock market liquidity predicted GDP growth.

Although King and Levine, then Levine and Zervos proved that financial development predicts growth, their results could not be used to say in which direction financial development caused growth.

Beck *et al.* (2000) examined a sample of 71 countries for the period 1961-1995 and used legal origin as an instrument for financial development. They then observed a significant effect of the exogenous component of financial development on long-term growth and attested to the conformity of their results with the idea of the impact of financial development on economic growth.

The approach of Rajan and Zingales (2001), confirms this postulate by examining the performance of different industrial sectors by country. Given that industries which, for technical reasons, need more external financial resources should perform relatively better in countries with more developed financial sectors. They then developed an index that assesses industries' need for external resources and showed that the positive association between this index and financial development is positively correlated with the growth of value added from industry.

Demetriades P. O. and Hussein (1996), for their part, studied a sample of 16 countries and found bidirectional causality between finance and growth. Similarly, Arestis *et al.* (2002) have examined, though, that a time series approach, the world relation of 1989 published by the World Bank, already presented an in-depth study of the link between finance and growth with an emphasis on the development of the financial sector in developing countries in order to strengthen economic growth.

Time series studies for individual countries have found two-way causality between financial variables and real variables during the post-war period. These studies did not provide a clear distinction between direct effects and feedback effects. Rousseau and Wachtel (1998) were interested in the study of industrialized countries and used a reduced number of financial development measures due to the lack of data availability for the period 1870-1929. The authors used the time series with a VAR (Auto-Regessive Vector) analysis. The authors found that the financial intensity measures have a causal effect in the sense of Granger on the output while the output does not cause any of the variables of the intensity of financial intermediation for all the industrialized countries studied.

3. Financial Development and Economic Growth: An Empirical Validation on the Case of the Tunisian Banking Sector

3.1. Methodological Aspects

3.1.1. Data

This work is based on secondary time series data. The data sources are the World Bank indicator database, the Tunisian Central Bank and the analysis of banks' financial statements. This work uses annual data from 1980 to 2017. We used, also, four financial development agents with reference to the banking sector, namely broad money supply (M2), Domestic credit to the private sector (DCPS), Domestic credit by sector banking (DCBS) and bank deposits (BDL). Control variables, such as trade (TRADE), government expenditure (gov exp), and gross domestic savings (GDS), were added to the analysis.

3.1.2. Definition of the Variables

The dependent and independent variables of the study were selected within the framework of the financial theories broad orientations mentioned above. In addition, several financial models tested by specialists around the world were also reviewed and taken into account.

In this work, (GDP) is taken as dependent variable, while broad money supply (M2), DCPS, DCBS and BDL relative to GDP is taken as independent variables. Some control variables are also used in the analysis, namely trade (TRADE), government expenditure (gov exp) and gross domestic savings (GDS). The variables of the study are defined as follows:

The Dependent Variable:

- Gross domestic product (GDP):

The monetary value of all the goods and complete services produced within the limits of a country in a given period. GDP is measured on an annual basis. This includes investments, all private and public consumption, public spending and exports minus imports that take place in a defined region (Hassan *et al.*, 2011).

The Independent Variables:

- The broad money supply (M2):

The broad money supply includes money in circulation outside banks, foreign currency deposits from local sectors and sight deposits other than those of the central government, bank and traveller's cheques, and other titles.

- Domestic Credit provided to the Private Sector (DCPS):

Domestic Credit provided to the Private Sector is described as the financial fund in the form of loans to the private sector, trade credits, and purchases of non-equity securities and accounts receivable that generate a demand for repayment. These receivables contain credits to public enterprises for some countries.

- Banking Sector Domestic Credit (DCBS):

Banking Sector Domestic Credit includes all gross credit to various sectors, excluding net credit to central government. A higher DCBS value indicates a higher level of dependence on the banking sector for funding (Hassan *et al.*, 2011).

- Banks deposit liabilities (BDL) to GDP:

It is the ratio by which currency in circulation is excluded from the broad money supply (Jordaan and Eita, 2007); Kargbo and Adamu (2010).

Other Control Variables:

- Trade:

Trade is the sum of exports and imports of goods and services calculated as part of GDP. Terms of trade, from a country's perspective, calculates a country's export prices relative to its import prices (Mercan *et al.*, 2013).

- Government expenditure (gov exp):

Government expenditure includes all government expenditure, including existing expenditure for the purchase of goods and services. These expenditures also represent the bulk of defence and national security expenditures (Abubakar and Gani, 2013).

- Gross domestic savings (GDS):

It is measured as GDP minus final consumption expenditure (total consumption).

3.1.3. Statistical Test

In this article, the unit root test (Augmented Dickey - Fuller (ADF)) is applied to check data stationarity , a co-integration test to check the long-term integration of the variables, an ordinary least squares (OLS) regression for global research model and the Granger causality test are applied to verify the bidirectional relationship between growth and financial development.

3.2. Methodology and Interpretation of the Results

3.2.1 Presentation of the Model

In order to analyse the financial and economic development of Tunisia in relation to the banking sector, we develop the following regression:

$$GDP_t=\alpha_0 + \beta_1 FD_t + \beta_2 OI_t + X_t + \alpha_i + \varepsilon_t$$

With:

- **GDPt:** gross domestic product at time t,
- α_0: interception of relation in the model / constant term.
- **β1** and **β2** : the coefficients of each independent or explanatory variable.
- FD_t: economic and financial development at time t.
- OI_t: other indicators at time t.
- X_t: control variables not modified at time t (normally taken as a vector of the explanatory variables of the study under a risk model as defined by.
- α_i : is an individual effect invariant over the observed time.
- ε_t : error term.

3.2.2. Empirical Results and Interpretation

The integration order of the time series data was evaluated by applying the unit root test. As shown in **Table 1**, the null hypothesis of the unit root of the GDP series has been rejected because GDP is stationary at this level. In addition, broad money (M2) and trade are also stationary at this level in the ADF test equation. Consequently, we can conclude that GDP, M2 and trade openness are also stationary at this level because their "p-values" value is lower than the critical value (value p <0,05). Other financial development indicators and other control variables, notably DCPS, DCBS, BDL, public expenditure and GDS, obtained stationarity at the first level.

Table 1. ADF stationarity tests

Variable: GDP	**t-Statictic**	**Prob.***
Augmented Dickey–Fuller test statistic	-4.868827	0.0036
Test critical values :	-4.773227	
	-3.598860	
	-3.303259	
Variable: M2	**t-Statictic**	**Prob.***
Augmented Dickey–Fuller test statistic	-2.726279	0.0071
Test critical values :	-3. 555759	
	-2. 891104	
	-2. 728959	
Variable: DCPS	**t-Statictic**	**Prob.***
Augmented Dickey–Fuller test statistic	-4. 715412	0.0007
Test critical values :	-3. 7015544	
	-2. 7015544	
	-2. 598971	
Variable: DCBS	**t-Statictic**	**Prob.***
Augmented Dickey–Fuller test statistic	-4. 791190	0.0004
Test critical values :	-3. 592259	
	-2. 861104	
	-2. 598959	
Variable: BDL	**t-Statictic**	**Prob.***
Augmented Dickey–Fuller test statistic	-6. 692243	0.0000
Test critical values :	-3. 772159	
	-2. 881222	
	-2. 708957	
Variable: TRADE	**t-Statictic**	**Prob.***
Augmented Dickey–Fuller test statistic	-2. 859544	0.0511
Test critical values :	-3. 756629	
	-2. 896921	
	-2. 738545	
Variable: gov exp	**t-Statictic**	**Prob.***
Augmented Dickey–Fuller test statistic	-4. 116688	0. 0043
Test critical values :	-3. 752754	
	-2. 861104	
	-2. 728959	
Variable: GDS	**t-Statictic**	**Prob.***
Augmented Dickey–Fuller test statistic	-6. 765923	0.0000
Test critical values :	-3. 772223	
	-2. 891255	
	-2. 728959	

Secondly, we analyze the long-term relationship between economic growth and financial development. The results show that the eigenvalue and maximum trace statistics reject the null hypothesis of the non-cointegration vector among all the financial development and GDP growth approximations.

Table 2 revealed that all null hypotheses up to a maximum of 5 are rejected because the calculated trace statistics are greater than the critical value at the 5% significance level; the results therefore indicate that there are more than 5 co-integrations present in the variables, which indicates the presence of a long-term relationship between all the variables of financial development and GDP growth.

Table 2. Co-integration test

Hypothesized No.of CS(s)	Eigenvalue	Trace statistic	0.05 Critical Value	Prob.**
None*	0. 966655	359.4988	198.5911	0.0000
At most 1*	0. 897652	274.8991	160.6486	0.0000
At most 2*	0.875694	189.8991	131.7866	0.0000
At most 3*	0. 820597	141.9991	91.89427	0.0000
At most 4*	0. 703160	89.84719	71.78998	0.0012
At most 5*	0. 603034	53.87619	50.79724	0.03081
At most 6	0. 428969	26.44891	30.80698	0.1600

Following the exploration of the long-term association between economic growth and financial development, we performed the Granger causality test. The main objective of this test is to reveal the direction of causality between the variables. **Table 3** presents the results of the causal link between all the variables. The results show that there is a two-way causality between banks' deposit liabilities (BDL), economic growth represented by GDP growth, and a one-way causality between (DCPS) domestic credit provided to the private sector and economic growth passing from economic growth (GDP) to DCPS.

Table 3. Granger causality test

Null Hypothesis	Obs	F-statistic	Prob.**
M_2 does not Granger Cause GDP	37	2.71895	0. 1206
GDP does not Granger Cause M_2		0. 89765	0. 3345
DCPS does not Granger Cause GDP	37	0. 00059	0. 9645
GDP does not Granger Cause DCPS		3. 12493	0. 0901
DCBS does not Granger Cause GDP	37	0. 31604	0. 5979
GDP does not Granger Cause DCBS		1. 61743	0. 3059
BDL does not Granger Cause GDP	37	3. 76549	0. 0612
GDP does not Granger Cause BDL		6. 46112	0. 0208

OLS regression analysis provides the results for the value of the coefficient of determination (R2), which shows the goodness of the model fit. The (p-values) clarifies the meaning of all the coefficients, while the (F-statistic) test indicates the total strength of the model. The results of the regression analysis are shown in Table 4. The value of R2 is 0.68 or 68%, indicating that our independent variables explained the 68% variance of the dependent variable, namely the GDP. The value of F-statistics is 6.497234 (0.000160), which describes the long-term relationship between the dependent variable and the independent variables. The Durbin - Watson value is 1.876164, which implies that there is almost no autocorrelation problem in the research model.

Table 4. Results of the regression analysis.

Variable	Coefficient	Std Error	t-Statistic	Prob.
M_2	-0. 362345	0. 223214	-1. 718925	0. 1121
DCPS	0. 120114	0. 112231	1. 796610	0. 0764***
DCBS	0. 178921	0. 098822	2. 088718	0. 0482**
BDL	0. 080194	0. 203940	0. 398725	0. 7018
Trade	0. 304182	0. 153241	1. 792355	0. 0793***
Gov Exp	-0. 604460	0.215719	-2. 761004	0. 0222*
GDS	0. 120484	0.089795	1.318288	0. 2013
C	0. 312041	0. 106504	0. 071352	0. 9398
R^2	0. 680325	F-*statisticProb(F.statistic		6.497234

Adjusted R^2		0. 570122				0.000160
Durbin Watson Stat		1.876164				

The result of a positive relationship between financial development and economic growth reported in this work is consistent with general evidence in the empirical literature. The results for broad money supply (M2) are similar to those of the studies by Demetriades P. and Hook (2006) according to which financial development (in terms of M2) may not stimulate growth so much that there would be no well-developed institutions.

The results of DCPS are similar to those of many studies such as those of Hassan *et al.* (2011), Kargbo and Adamu (2010), Jalil and Feridun (2011) , which found a high ratio of DCPS to GDP that not only specifies a higher level of national investment, but also further development of the financial system (Kargbo and Adamu, 2010). The results of DCBS are confirmed by the studies of Hassan *et al.* (2011) according to which an improvement in the amount of credit by banks helps to distribute funds to new projects and increase the level of technology.

There is a positive relationship and a two-way causality between BDL and GDP, and these results are confirmed by the studies of Gurgul *et al.* (2012) and Jordaan and Eita (2007), which indicated that a stable growth of this ratio during the study period also indicates an improvement in the financial sector (Khan *et al.*, 2005).

The control variables also contribute to economic growth, as shown in the results. Trade openness has a statistically significant and positive influence on growth. This showed that financial instruments other than bank credit play better role in financial intermediation in Tunisia. In contrast, public spending has a negative but statistically significant effect on growth, showing that public spending can reduce economic growth through the crowding out effect on private investment due to the need to finance public deficits through monetary financing (Abubakar and Gani, 2013). The GDS result correlates with the study by Hassan *et al.* (2011). GDS has a positive effect on growth, which means that the shift from savings to investment is one of the channels through which financial deepening affects growth.

4. Conclusion

Regression analysis revealed that the financial and economic development of DCPS and DCBS is statistically significant for the economic growth, while broad money (M2) is not statistically significant for the economic growth. Relatively, BDL has a positive relationship with economic growth, but it is statistically insignificant. Granger's causality test suggests that DCPS indicated unidirectional causation from economic growth to financial development, while BDL indicated a two-way causation. Therefore, two of the four financial development indicators used revealed unilateral dependence while the two others revealed bilateral dependence between the financial system and the economic growth in Tunisia. In general, the empirical results have revealed a long-term relationship between the financial development and the economic growth in Tunisia which confirms the interdependence between economic growth and financial development. Depending on the results, some policy recommendations need to be taken into account.

The government should avoid excessive deficits and borrowing from the private sector, which results in crowding out the private, investment. It is possible to continue the restrictive monetary policy on the part of the Tunisian Central Bank to reduce the number of M2 transactions. Therefore, restrictive monetary policy measures will also support the economy by reducing the inflation rate of the consumer price index in Tunisia.

The Tunisian Central Bank should focus on stable growth rates in the country and design longer-term strategic action plans to strengthen DCPS, DCBS, BDL and GDS.

Tunisia, with a population of over 11 million, is a large market where the banking sector could set up low-cost investment loan systems to generate more economic activity in terms of entrepreneurship, considered to be the backbone of a country's socio-economic development.

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