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Financial Development and Economic Growth in the Maghreb Countries

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Abstract: This article studies the link between financial development and economic growth in a panel of 4 Maghreb countries (Tunisia, Morocco, Algeria and Libya) over the 2011-2021 period. Using the generalized method of moment (GMM) estimator for linear dynamic panel data models, we find a positive relation between financial development and economic growth in Maghreb countries. We also find that economic freedom enhances economic growth. These results recommend the need to promote the financial reforms started since the mid-1980s and improve the efficiency of the financial systems of these countries to stimulate savings and investment and, therefore, economic growth in the countries of the region.

Keywords: Financial development, Economic growth, Dynamic panel data analysis

JEL Classification: F13, F43, C23

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1. Introduction

The link between financial development and economic growth has established significant attention in recent decades. It has been shown that relatively more financially developed countries are better able to avoid or withstand currency crises (Federici and Carioli 2009). Therefore, improving the financial development of developing countries can have important positive significances for the many governments in these countries that are affected by economic downturns.

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Then the mid-1980s, many Maghreb countries have attempted to implement reforms to their financial systems in order to achieve faster economic growth. in this context, Abu-Bader and Abu-Qarn (2008) argued that these reforms were part of an overall strategy to establish a more market-oriented in which the private sector plays an important role. Although some of these reforms have been in consequence for some time, little work has been done to assess their effectiveness in enhancing economic growth.

Given the growing economic importance of financial development, this study estimates a dynamic panel model using the Arellano and Bover (1995) system GMM estimator and argues the impact of financial development on the economic growth of 4 Maghreb countries during the period 2011-2021. Our study, based on the endogenous growth theory, shows that financial development has a significant positive impact on the economic growth in the Maghreb countries.

Consequently, this article contributes to the empirical literature on finance–growth nexus in three ways. First, this study studies the dynamic interrelationship between financial development and economic growth in Maghreb countries. Second, this study uses more new information and could expose recent developments in the link between financial development and economic growth. As such, the results of this study could have more reference value for policy makers in the Maghreb. Third, Maghreb governments have expressed many policies to stimulate financial development, but an underdeveloped financial system will affect the application effect of these policies. For all these reasons, the study of the finance-growth nexus constitutes a very factual value.

This paper is ordered as follows. Section 2 reviews some of the voluminous existing literature. Section 3 defines the data and empirical methodology. The empirical results are presented in Section 4. Finally, Section 5 draws conclusions and the main contributions of the study.

2. Literature review

Empirical Literature confirms that the development of financial systems is relevant (see, for example, Alfaro et al. 2004, 2010; Azman-Saini et al. 2010; Hermes and Lensink 2003; among others). Conventional judgment argues that financial development plays an important role in economic growth for several reasons.

For example, Levine (2005) identified four key mechanisms through which finance can improve economic growth: (i) pooling savings through diversification and risk management; (ii) facilitating trade by reducing transaction costs; (iii) improving the distribution of capital by generating ex ante information on investment opportunities; and (iv) increasing the propensity of investors to finance new projects through ex post controls and corporate governance.

The first mechanism is to focus on the “mobilization” rather than the “creation” of savings. Although the neoclassical literature on economic growth emphasizes the primacy of savings, the main constraint on a country’s ability to finance large-scale projects was not the savings rate itself, but the ability of the financial system to pool and allocate resources. Profitable investment projects often have two main characteristics: they require a large amount of capital and they tend to be risky. According to Acemoglu and Zilibotti (1997), few individual investors have the capital to finance such projects, and even those who do may be reluctant to invest a considerable portion of their wealth in a single risky project. A developed financial system

offers a mechanism that allows large and small investors to diversify risks. In the absence of such a mechanism, individual investors prefer to allocate their money to low-risk, low-return projects.

The second mechanism is that specialization and division of labor are at the heart of modern market economies, and such specialization would be impossible without a functioning payment system. Such a payment system is an important public good offered by the financial sector.

The third mechanism is related to the fact that credit is an information-dependent activity. Collecting information on the viability of a given project or on the creditworthiness of a given borrower includes significant fixed costs. Financial intermediaries that bring together many small investors find themselves having to spread these fixed costs.

The fourth mechanism concerns the ability of individuals providing capital to control their agents (entrepreneurs) and their incentives. A system that offers entrepreneurs with the right incentives is more likely to mobilize capital for productive and growth-generating investments.

An efficient financial system improves economic growth through the four mechanisms described above. Conversely, an inefficient financial system risks reducing economic growth due to misallocation of resources and costly financial crises.

The empirical literature on the relationship between finance and growth is voluminous. So far, there is no accord on the association between financial development and GDP growth in terms of the role of financial development in the growth of economy and the direction of causality.

For Levine (2005), the first empirical analysis of the link between finance and growth dates back to Goldsmith (1969). Goldsmith used cross-sectional international data over the 1860-193 period to regress average growth on financial development, defined by the size of the financial intermediation sector (measured by the value of financial assets in relation to GDP). He found a positive association between financial development and economic growth. As Levine (2005) makes clear, this study has limitations: no control variables in the regression; no instrumental variables to deal with potential causality problems, the explained variable is production growth whereas productivity growth or per capita growth would have been more appropriate, and the sample only includes 36 countries. These limitations are addressed by King and Levine in their pioneering 1993 study.

King and Levine (1993) studied a larger sample, of 77 countries over the 1960-1989 period. They regressed the growth of GDP per capita and the growth of total factor productivity, on financial development and a large number of control variables. Financial development is measured in three different ways: (i) the ratio between liquid liabilities (non-equity liabilities) of the financial system and GDP; (ii) the ratio of commercial bank credit to bank credit plus national central bank assets; (iii) the ratio of credit to private companies to GDP. The results showed a positive and significant correlation between financial development and economic growth.

Next, Levine and Zervos (1998) looked at the nature of financial sectors, particularly the importance of stock market development and "liquidity". They focused on what they called the "turnover rate," which is the total value of shares traded over a period divided by the total value

of listed shares. Using a cross-country regression for 42 countries over the period 1976-1993, they indicated that the initial level of bank credit and the initial level of this turnover rate in 1976 were positively and significantly associated with average productivity growth.

For their part, Levine (1999) and Levine et al. (2000) used the legal system indicators from La Porta et al. (1998) as instruments in the regression using financial development. Thus, the first step of the econometric analysis consists of regressing financial development on indicators of the nature of the legal system (Anglo-Saxon common law, French, German or Scandinavian civil code). In a second stage, productivity growth is regressed on development financial explained by the first regression and the other control variables. Levine et al. (2000) obtained a strong and significant positive correlation between explained financial development and productivity growth over the 1960-1995 period.

For their part, Al-Avad and Harb (2005) pointed out the association between financial development and economic growth in ten Middle East and North Africa (MENA) countries over the 1969-2000 period. They concluded that long-term financial development and economic growth may be linked, but there is little or no evidence of a short-term relationship. For his part, Ben Naceur and Ghazouani (2007) evaluated the simultaneous impact of banks and financial system development on economic growth in a sample of 11 MENA countries over the 1979-2003 period. The results confirmed the idea of an absence of significant link between the development of the banking and stock market sector and growth. The link between banking development and economic growth is even negative after taking into account the evolution of stock markets. This lack of link must be related to the relatively small and underdeveloped financial systems in the MENA region which hinder economic growth.

Likewise, Ben Naceur et al. (2008) studied the consequences of the liberalization of capital flows on the development of the financial system. These researchers took a sample of 11 countries from the MENA region over the 1979-2005 period. They found that stock market liberalization has a positive and significant impact in the long term. This can be explained by the fact that the positive effects of the liberalization of stock markets will depend on several factors such as the schooling rate, the size of the public sector, the efficiency of the legal system, commercial openness and the level execution of contracts.

Regarding Baliamoune-Lutz (2008), he examined the short-run dynamics and long-run link between income and financial development in Algeria, Egypt, and Morocco for the period 1960–2001 using cointegration analyses and four financial development indicators. They found a long-run relationship between income and each of these indicators, except for private sector credit in Algeria.

For their part, Ben Salem and Trabelsi (2012) found in an empirical study for 7 countries in the MENA region over the 1970-2006 period, that financial development is a determinant of the economic growth of its countries. As for, Narayan and Narayan (2013) argued that there is evidence of financial sector-led growth; bank credit has a negative impact on GDP growth for a panel of 65 developing countries over the 1995-2011period. Regionally, for Middle Eastern countries, evidence shows that neither the financial sector nor the banking system contributes to economic growth. With the exception of Asia, a relatively weak contribution from the financial system is noted.

Additionally, Barajas et al. (2013) used a database for 150 countries over the 1975-2005 period and applied dynamic panel models to determine whether the impact of financial deepening on economic growth differs across countries. They found that the link between finance and growth is heterogeneous across regions, income levels and between oil-exporting and non-oil countries; they argued that this heterogeneity is mainly due to the level of the banking sector development than the activity of stock market.

For their part, Abubakar et al. (2015) studied the link between financial development, human capital accumulation and economic growth in the Economic Community of West African States (ECOWAS) countries over the1980-2011 period. They argued that private bank credit and domestic private credit play a significant role in economic growth in ECOWAS, both directly and through their effect on human capital investments. They also affirmed that access to credit to businesses and individuals, through suitable financial policies, would enhance economic growth in the ECOWAS.

As for Hamadi and Bassil (2015), they investigated the impact of stock markets and banks on economic growth in MENA countries. The sample includes a panel of 13 MENA countries over the period 1988–2009. They showed that stock markets and banks positively enhance economic growth in the MENA region only during periods of stability.

For his part, Ahiakpor (2016) examined the short and the long run elasticities and the relation between financial development and economic growth in Arab Maghreb countries over the 1970-2012 period. Using the ratio of private credit to GDP as a proxy measure for financial development, they revealed that financial development has a positive impact on economic growth

Regarding Swamy and Dharani (2018), they explored the causal relationship between financial development and economic growth in advanced countries whose levels of financial development are significantly higher. Using a panel of annual data from 24 economies over the 1983-2013 period, they argued that when a linear relationship is imposed, financial development and GDP growth are negatively related. They also revealed bidirectional causality among financial development variables and economic growth.

Indeed, El Menyari (2019) studied the effect of financial development and the entry of foreign banks in African countries over the 1995-2015 period. He found that the entry of foreign banks has a significantly positive effect on economic growth in North and Southern African countries, while in West and Central African countries, South Africa Is, the effect is negative and rarely significant. He also exposed that financial market development has a significantly positive impact on GDP growth only in the Southern African region. He concluded that Policymakers should focus on structural reforms policymakers aimed at strengthening the financial system to truly meet the needs of African youth.

As for An et al. (2020), they examined the influence of financial development on economic growth in sub-Saharan African (SSA) countries, which are subdivided into low-, middle- and high-income groups, to control whether differences in income levels between countries affect the relative effect of financial development on economic growth. Using a panel framework on annual data from 30 SSA countries over the 1985-2015 period, they found that financial depth and financial intermediation decrease economic growth in low- and middle-income countries. Though, it enhances economic growth in high-income countries and across sub-Saharan African countries. They concluded that financial liberalization improves economic growth in

high-income countries and across SSA. However, this decreases economic growth in low- and middle-income countries.

For their part, Nguyen et al. (2022) studied the influence of financial development on the economic growth of 22 emerging markets over the 1980-2020 period. They found that financial development has a significantly positive effect on economic growth. As a result, for emerging markets, expanding financial development looks to be an effective way to enhance economic growth. Similarly, Bayraktar et al. (2023) investigated the association among financial development and economic growth for emerging markets and middle-income economies over the 2002-2019 period. They found that financial development has a positive effect on economic growth in the presence of institutions. Though, if institutional quality is not included in the model, the impact of financial development on economic growth is statistically insignificant. Consequently, supporting the financial system through institutional quality can play a more vigorous role in economic growth by guaranteeing resource use efficiency. They also recommended that policymakers prioritize policies to progress the quality of institutions to enhance the power of financial development in economic growth.

More recently, Asteriou et al. (2023) examined the finance-growth association and financial sector performance measured by the financial depth, accessibility, and efficiency of the two financial sectors, i.e. institutions and stock markets. Using an annual panel data set of 26 European Union countries over the period 1990–2020, they found that in normal times, the link between finance-led growth and the stock market is significantly strong, while in times of stress, the link becomes insignificant. Remarkably, financial institutions prove to be more effective in stimulating economic growth and it is clear that the positive dynamic impact of institutions on economic growth is absorbed by macroeconomic shocks. They concluded that policy makers should formulate policies to improve the supervisory process and thus the quality of banking supervision in order to develop the financial sector, enable institutions to have sufficient capital and adequate risk management.

3. Data and Empirical Methodology

3.1. Data

This article examines a sample of 4 countries in the Maghreb countries (Tunisia, Morocco, Algeria and Libya). The choice of countries selected for this study is mainly dictated by the availability of reliable data over the sample period. The panel covers the 2011-2021 period. The dependent variable is economic growth, measured by the rate of real per capita GDP growth at 2015 prices in US dollars.

The main variable of interest (financial development) and other control variables are attained from the World Development Indicators (2024) published by the World Bank. In this study, we use domestic credit provided by the banking sector to GDP (FD), which measures the degree of intermediation performed by the banking sector, including credit to the public and private sectors. Calderon and Liu (2003) suggested that this indicator has an advantage because it only considers credit to the private sector and isolates credits extended to the private sector, as opposed to credits extended to governments, government agencies, and state-owned enterprises. In addition, it eliminates credits issued by the central bank.

The dependent variable is the real GDP per capita growth. Our base model includes the explanatory variables common to most growth regressions found in the literature:

• Initial GDP per capita (log): log of real GDP per capita. A negative coefficient is expected, signifying the existence of conditional convergence (La Porta et al., 1998; Beck et al., 2003).

• The rate of inflation: The growth of the consumer price index measures the annual percentage change in the consumer price index to determine the inflation rate. This rate reflects the change in prices paid by the average consumer during a given period when purchasing goods and services. A negative coefficient is expected because high inflation can contribute to the deterioration of price competitiveness, leading to negative effects of the external sector on economic growth (Elder, 2004).

• The size of government is estimated in terms of government expenditure as a share of GDP. Government expenditure can improve economic growth, by increasing the marginal productivity of public and private factors of production. Government expenditure on research and development, for example, can improve output levels. This result is reliable with the study by Poku et al. (2022).

The expanded model will also include the following institutional variable:
- The Index of Economic Freedom (IEF) is constructed by the Fraser Institute and is a measure of the degree of economic freedom in terms of five broad areas: (1) the size of government, taxes, and businesses; (2) the legal structure and security of property rights; (3) access to sound money; (4) freedom to trade internationally; and (5) regulation of credit, labor, and business. According to the survey by De Haan et al. (2006), who reviewed empirical studies using this Fraser Institute indicator of economic freedom, greater economic freedom stimulates economic growth. A positive coefficient is therefore expected. This index is taken from (Gwartney et al. 2023).

3.2. Empirical Methodology

The objective of our empirical analysis is to examine whether financial development (FD) plays an important role in influencing economic growth in Maghreb countries. As a starting point we formulate the standard growth model in a manner consistent with Manu et al. (2020). For this purpose, we use the following specification:

$$\mathrm{GDP_{i,t}} = \alpha_0 + \alpha_1 \mathrm{GDP_{i,t-1}} + \alpha_2 \mathrm{FD} + \beta' \mathrm{X_{i,t}} + \lambda' \mathrm{W_{i,t}} + \mu_t + \eta_i + \varepsilon_{i,t} \quad (1)$$

where $GDP_{i,t-1}$ denotes the (logarithm of) level of GDP per capita of country i at the end of period t, FD measures the proxy of financial development, $X_{i,t}$ is a vector of economic determinants of economic growth including: inflation rate; government expenditure, and the index of economic freedom, and $W_{i,t}$ is a vector of institutional determinants of economic growth; μ_t is a time specific effect, η_i is an unobserved country-specific fixed effect and $\varepsilon_{i,t}$ is the error term.[4] We are interested in testing whether the marginal impact of financial development on growth, α_2, is statistically significant.

[4] Note that Eq. (1) can be alternatively written with the economic growth as dependent variable as: $Growth_{i,t} = GDP_{i,t} - GDP_{i,t-1} = \alpha_0 + (\alpha_1 - 1)GDP_{i,t-1} + \alpha_2 FD + \beta' X_{i,t} + \lambda' W_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t}$, where $(\alpha_1 - 1)$ is the convergence coefficient.

The model in question has both a problem of endogeneity of the variables, and a correlation between the lagged endogenous variable and the residuals. Indeed, any model of convergence is dynamic and, as a result, it introduces additional endogeneity within explanatory variables. In general, dynamic models are treated in first differences by the method generalized moments (GMM).

Two econometric methods specific to panel data were successively used: the generalized method of moments in first differences (GMM in differences, Arellano and Bond, 1991) and the generalized method of moments in systems (GMM system, Blundell and Bond, 1997). This last method is the one used in the most recent applied works on the relationship between financial development and economic growth, notably those of Levine et al. (2000); it is on the results of this second method that we mainly base our conclusions.

System GMM estimations not only make it possible to take into account the heterogeneity of countries but also to deal with the problem of the endogeneity of variables, which necessarily arises when examining the association between financial development and economic development. The first authors who were interested in this relationship highlighted the two-way causality (Patrick, 1966) between the two forms of development, if only because the increase in income is accompanied by an increase in savings and therefore acquisitions of financial assets. Work on the theory of endogenous growth has further reinforced the idea of double causality. The sharing of risks that financial intermediation allows and which promotes investment in new technologies involves costs and itself implies a certain level of product per capita (Greenwood and Jovanovic, 1990).

The System GMM estimator for dynamic panel models consists of combining for each period the equation in first differences with that in levels. In the equation in first differences, the variables are then instrumented by their values in levels lagged by at least one period. On the other hand, in the equation in levels, the variables are instrumented by their first differences. The system of equations thus obtained is estimated simultaneously, using the generalized method of moments. Blundell and Bond (1998) tested this method using Monte Carlo simulations. They exposed that the System GMM estimator is more efficient than that of the GMM in differences (Arellano and Bond, 1991) which exploits only the moment conditions of the equation in differences.

To test the validity of lagged variables as instruments, Arellano and Bond (1991), Arellano and Bover (1995), and Blundel and Bond (1998) suggest the Sargan overidentification test (later replaced by the Hansen test) and the second-order autocorrelation test. In most regressions, the results of these two tests are as expected. The statistics of Hansen's overidentification test do not allow us to reject the Ho hypothesis, that of the validity of lagged variables. For the autocorrelation test, the test results do not reject the hypothesis of absence of second-order autocorrelation of the residuals. The results from this estimation are presented in Table (1).

4. Empirical results

At the level of table (1), the results clearly show that the estimated coefficient of the financial development variable is statistically significant at the 1% threshold, which advocates that the financial development plays a positive role in economic growth in the Maghreb countries. Thus, this result is consistent with those obtained by Beck and Levine (2004), Levine (2005) and Abu-Bader and Abu-Qarn (2008).

Table 1. Financial development and economic growth (2011-2021)

Variable	
Initial GDP per capita	-0.065*** (-3.821)
FD	0.89* (2.14)
Inflation	-0.27*** (-0.126)
Government size	0.908*** (3.485)
The index of economic freedom	0.32* (2.47)
Constant	-91.07*** (0.005)
R-squared AR(2) test (p-value) Sargan test (p-value)	0.68 0.541 0.587

Note: AR(2) is a test of second order residual serial correlation while the J-test is the Hansen over-identification test. The t-statistics is in parentheses. *, ** and *** indicate a statistical significance at 10%, 5% and 1% levels, respectively.

The coefficient of initial GDP per capita is negative, which means that the conditional convergence hypothesis is verified: holding constant the other determinants of growth, countries with lower GDP per capita tend to grow more quickly. The initial position of the economy is therefore an important factor in economic growth, as documented by neoclassical theory. This result is consistent with previous studies (see, for example, Barro and Sala-i-Martin, 1997; Bekaert et al., 2003).

The coefficient of the inflation rate has a negative sign and is therefore statistically significant at conventional levels, implying that a high inflation rate will have a negative influence on economic growth. This result therefore validates the work of Aydin et al. (2016). As for the estimate of government spending, it is statistically significant and has a positive effect on economic growth for the entire sample. This result verifies that obtained by Poku et al. (2022). Institutional quality, represented by the index of economic freedom, has a statistically significant impact on economic growth in the Maghreb countries. This result suggests that economic growth is stronger when the index of economic freedom is high because it makes business investment more productive. This is therefore consistent with the work done by De Haan et al. (2006) and Azman-Saini et al. (2010) who argued that economic freedom is vital for economic growth.

5. Conclusion

The link between financial development and economic growth has long continued a subject of significant debate in the literature. This is why these paper purposes to re-study the role of development of financial systems and economic growth in a panel of 4 countries of Maghreb over the 2011-2021 period.

From the empirical analysis, we drew two important conclusions. First, the coefficient measuring the effect of financial development on economic growth is positive and significant, which shows that financial development impacts economic growth in a positive way. Then, it turns out that the economic freedom index which measures the quality of institutions is a significant influence of economic growth in the Maghreb countries.

To fully understand the benefits of financial development, and promote strategic investments with a view to high economic growth, Maghreb countries must, however, continue their reform efforts on the financial level and establishing growth-enhancing financial systems. For example, policies should focus on reduction of state control of banks, investing in human resources, strengthening the legal framework and improving competition. Indeed, a high level of competition, accompanied by quality supervision, can actually help to improve efficiency and strengthen access to financial services without compromising stability.

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