Financial Development, Institutions and Economic Growth in North African Countries

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Abstract
This paper investigates the relationships between financial development (FD), institutions and economic growth on *a* panel of *four* North African countries *(Tunisia, Morocco, Algeria and Egypt), over a 5-year period from 1996 to 2015. Using the dynamic generalized method of moments (GMM) in a panel data analysis, we found that FD has a positive effect on economic growth. We also found that institutions appear to be working as a complement to FD and, that the effect of FD is more pronounced in the presence of the institutional quality variable. As a policy implication, we recommend that policy makers place special importance on implementing policies that result in the deepening of financial systems, including a sound institutional framework. Thus, by promoting the development of a country's financial system, economic growth will be accelerated.*

Keywords: Financial development, Institutions, Economic growth, Panel data analysis.

JEL Classification: F23, F34, F43

1. Introduction

The link between financial development and economic growth has received a great deal of attention in recent decades. Indeed, it has been suggested that countries that are relatively more financially developed are better suited to avoid or withstand currency crises (Federici and Carioli 2009). Therefore, enhancing the financial development in many developing countries may have important positive consequences for the many organizations and individuals within such countries that are affected by economic downturns.

In terms of institutional quality and financial sector performance, North African countries are making inroads with significant improvement in the institutional environment and financial deepening. Differences in institutional quality and financial development can have significant impact on economic growth. In more

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applied works (for example, World Bank, 2002) institutions appear crucial for supporting markets and increasing competition, for the definition and enforcement of property rights and contracts, for the diffusion of information about market transactions, hence for the reduction of uncertainty in exchange; in short, for the efficient distribution of resources.

Overall review of literature highlighted the importance of institutions on economic growth (see Acemoglu and Johnson, 2005). Recently, the empirical economic growth literature has explored the impact of financial development on economic growth conditional on a country's institutional quality. Most of the research has examined the interaction between institutions and financial development on economic growth since both factors can be either complements or substitutes. So far, evidence of such interaction is mixed and inconclusive. While Demetriades and Law (2006) and Anwar and Cooray (2012) argued that both institution improvement and financial development are necessary conditions for stimulating economic growth, Ahlin and Pang (2008) and Compton and Giedeman (2011) confirmed that both factors are substitutes for determining economic growth.

This paper examines the interaction effect between financial development and institutions on economic growth within the context of North African countries. This study is particularly significant for the North Africa region following recent political unrest and social tensions in many of these countries. Indeed, financial development contributes to economic growth in North Africa, which in turn generates additional revenues for the governments and the populations of the region through fiscal policies and job creation. Additionally, institutional quality and better governance tend to amplify the positive impacts of financial development on economic growth in the region. It is therefore important for governments in this region to continue investing in social infrastructures while improving the quality of their institutions and their governance because doing so will help them avoid the type of unrest we have witnessed recently.

This paper contributes to the literature in four important aspects. First, we believe that this study is the first to analyze the relationship between, financial development, institutions and economic growth in the North Africa region. Second, we used the economic freedom index developed by the Fraser Institute in examining the role of the institutions on the financial development-growth relation. Third, the empirical method involves regressing economic growth on financial development, institutions, interactions between these two variables, and other growth determinants recommended in the literature. However, the financial development and institutions variables are likely to be endogenous, possibly because of feedback from economic growth to financial development and institutions. Therefore, this

study uses generalized method of moments (GMM) estimation to deal with endogeneity and simultaneity bias. Last, in terms of policy implications, the results of this research will guide policy makers in designing policies aimed at better institutional quality is potent in ensuring the effectiveness of financial development and improving the economic growth.

The main purpose of this paper is to examine the role of institutions in mediating the financial development effect on economic growth on a panel of four North African countries, namely Tunisia, Morocco, Algeria and Egypt, over a 5-year period from 1996 to 2015. Our dynamic panel regression analyses show that financial development positively and significantly effects economic growth in North African countries. This study also highlights the positive complementarities between financial development and institutions. This implies that, in order to benefit from financial development in terms of economic growth, financial systems in North African countries must be embedded within a sound institutional framework.

The remainder of the paper is structured as follows. Section 2 provides a detailed literature review. Section 3 describes the used data and the empirical methodology. Section 4 presents the empirical results. Section 5 presents the concluding remarks and policy implications.

2. Literature review

Beginning with the work of Schumpeter and Opie (1934), highlighted the role of financial institutions in funding productive investments and encouraging innovation, both of which foster growth, to the cross country analysis of King and Levine (1993a), several econometric studies based have provided empirical support for the leading view that finance promotes growth. Patrick (1966) argued that nature of the linkage between financial system and economic growth may be in the demand-following and supply-leading characters. On the similar lines, Gurley and Shaw (1955) and Goldsmith (1969) noted that more developed financial markets promote economic growth by mobilizing savings to finance the most productive investments. McKinnon (1973) and Shaw (1973) argued that pervasive financial regulations involving interest rate ceilings and reserve requirements, especially in developing countries, impede saving-investment decisions and stressed the importance of financial liberalization via a deregulation of interest rates which would lead to an increase in loanable funds as well as to a more efficient allocation of funds. The emergence of endogenous growth theory (Lucas, 1988; Romer, 1986) generated renewed interest in the role of financial development in promoting economic growth. This literature highlights the positive role played by the financial

sector in boosting economic growth, in particular by mobilizing savings, efficient resource allocation to the most productive investments, minimizing information, transaction and monitoring costs, diversifying risks, and facilitating the exchange of goods and services.

The main element of our analysis concerns the presence of a long-run relationship between finance-growth. One strand of literature observed that financial development stimulates faster economic growth. Greenwood and Jovanovic (1990) suggested that financial intermediaries promote investment and growth by enabling a higher rate of return on capital, while the growth itself spurs the expansion of financial institutions, implying a two-way relationship between financial intermediation and economic growth. Likewise, in Bencivenga and Smith (1991), emerging financial intermediaries shift the composition of savings towards productive investments and improve the management of liquidity risks. By doing so, banks enhance the efficiency of capital allocation, which in turn increases the equilibrium growth path. Explaining the endogenous emergence of a financial sector at some critical level of economic development by assuming a fixed cost of financial transactions, Saint-Paul (1992), Zilibotti (1994), and Blackburn and Hung (1998) concluded that financial development is mostly growth-promoting. Some of the studies have underlined on the bank credit channel of financial development and showed that financial development can boost or decline economic growth depending on the types of bank credit (Aghion et al., 2010; Beck et al., 2012; Sassi and Gasmi, 2014). The positive impact of financial development on economic growth is predominantly driven by enterprise credit rather than consumer credit (Beck et al., 2012).

However, the finance-growth literature also offered some studies that question the robustness of the finance-growth nexus. Demetriades and Hussein (1996) argued that they did not found the evidence of a causal relationship going from finance to economic growth in their study involving 16 countries. Demetriades and Law (2006) showed that financial development does not affect economic growth in countries with poor institutions and Rousseau and Wachtel (2002) found that finance has no effect on growth in countries with double digit inflation. Further, Rousseau and Wachtel (2011) also found a weakening effect of financial development and showed that credit to the private sector has no statistically significant impact on economic growth.

Another strand of literature stems from the notion that the large financial system is simply a by-product of the overall process of economic development and is well represented by the assertion that "where enterprise leads, finance follows" (Robinson, 1952). Some researchers since the 1990s argued that there exists a causal

relationship going from finance to economic growth. King and Levine (1993a) were the first to show that financial development is a predictor of economic growth and Levine and Zervos (1998) showed that stock market liquidity predicts GDP growth. Likewise, Levine et al., (2000) employed different types of instruments and econometric techniques to detect the presence of a causal link going from finance to economic growth. Finally, Rajan and Zingales (1998) provided additional evidence for a causal relationship going from financial to economic development by showing that industrial sectors that, for technological reasons, are more dependent on finance grow relatively more in countries with a larger financial sector. There is by now a large literature showing that finance does indeed play a positive role in promoting economic development and few economists now doubt the existence of such a causal link (Levine 2005).

In the case of North African countries, stability or lack thereof of the financial system is another channel through which financial development influences economic growth. A sound financial system is characterized by healthy financial institutions and smooth, well-functioning financial systems, which jointly allow for robustness and resilience in the face of adverse shocks.

In recent decades, institutions as a fundamental cause of economic growth have received an increasing attention from researchers and policymakers. The evidence suggests that a country's institutional framework is crucial in determining her economic growth (Acemoglu and Johnson, 2005; Chauffour, 2011; Nawaz, 2015). For example, Acemoglu and Johnson (2005) found that institutions that affect all sectors of the economy have a significant direct effect on financial development. They showed that property rights and contracting institutions are important determinants of financial development. Chauffour (2011) argued that institutions, measured by economic freedom and civil and political liberties determine why some countries realize and sustain better economic growth. Baier et al., (2012) noted that in the period immediately following a crisis there generally is a diminution of economic freedom that stems from increased regulation, portending slower economic growth in the future. Hafer (2013) showed that countries with higher levels of initial economic freedom, on average, reveal greater levels of financial intermediary development in subsequent years. Nawaz (2015) also established that institutions play an important role in determining economic growth in developed economies relative to developing economies.

Furthermore, there is also an established literature that links legal institutions with financial development.[2] According to Fergusson (2006), a well-developed financial market depends on legal institutions that can adequately implement financial contracts so as to prevent obstacles to financial intermediation. Whereas, better institutions can facilitate access to finance by overcoming the effects of information and transaction cost, the converse can also be estimated when institutions are weak. Securing property rights and contract enforcement by the legal system places a constraint against government expropriation - hence determining the quality of the financial market (Demirguc-Kunt and Maksimovic, 2002). Moreover, La Porta et al., (1998) indicated that whether a country commercial's law had British, French, German, or Scandinavian legal origins was critical to explaining the country's laws on creditor rights, shareholder rights, and private property rights. These explicated the country's level of bank and stock market development.

Rajan and Zingales (2003) emphasized the role the interest groups, especially the incumbent industrial firms and the domestic financial sector, can play in the process of financial development. They argued that incumbents have strong incentives to block the development of a more transparent and competitive financial sector, although these incentives may be weakened by openness to external trade and international flows of capital. Roe and Siegel (2011) confirmed a strong association between political instability and financial development. Empirically, studies have shown that legal institutions clearly contribute to financial development (see Chinn and Ito, 2006; Huang, 2010). McDonald and Schumacher (2007) indicated that legal institutions and information sharing have deeper financial systems.

It is now widely acknowledged that financial development can indirectly influence economic growth through institutional development as a conditioning variable. So far, existing studies have reached mixed conclusions. Demetriades and Law (2006) found that financial development had larger effect on economic growth when the financial system was embedded within a sound institutional framework. However, if institutional quality is low, more finance may not engender a significant benefit in economic growth. Similarly, Al-Yousif (2002) highlighted that the link between financial development and economic growth cannot be generalized across countries because economic policies are country specific and their success depends on the efficiency of the institutions implementing them. In the same vein, focusing on the Asian economies, Ito (2006) investigated whether financial openness leads to financial development after controlling for the level of legal/institutional development, and whether trade opening is a pre-condition for financial opening.

[2] The paper by Fernandez and Tamayo (2017) provide excellent surveys of the literature on the links between institutions and financial development.

He concluded that equity market development is supported by a high degree of financial liberalization, although this occurs exclusively with a specific degree of bureaucratic and legal development.

In relation to institutions that affect capital markets, Djankov et al., (2007) confirmed that legal creditor rights and information-sharing institutions are important determinants of financial development. When lenders can more easily enforce repayment, seize collateral, gain control over firms, and have better access to information about potential borrowers, they will be more willing to extend credit. Andrianova et al., (2008) examined the relation between government ownership of banks, institutions and financial development showed the importance of institutions for financial development. They argued that while the government sector can establish banks to jump start economies with very low institutional quality, governments should build institutions that promote private sector banking.

Ahlin and Pang (2008) reported that low corruption and stock market development both facilitate the undertaking of productive projects and consequently lead to higher economic growth. They also indicated that corruption control and stock market development are substitutes rather than complements. Compton and Giedeman (2011) found similar results that the growth effect of financial development weakens as institutional quality rises. They see their finding as evidence in favor of a substitution effect between financial development and institutions. On the other hand, Anwar and Cooray (2012) reported that institutions enhance the impact of financial development on economic growth as both factors are complements in the economic growth process.

Law et al., (2013) found that the financial development-growth nexus is contingent on the level of institutional quality, thus supporting the idea that better finance is important in promoting economic growth. Barajas et al., (2013) noted that the beneficial effect of financial deepening on economic growth varies across countries; lower income countries benefit less because their regulatory and supervisory systems are less developed. For the Middle East and North Africa (MENA) region, Ben Naceur et al., (2014) showed that institutional quality; particularly rule of law, promoted financial development by signaling confidence in the quality of the legal system in support of economic activity. Gazdar and Cherif (2015) indicated that finance is more likely to support economic growth in MENA countries with sound institutional environment. More recently, Law et al., (2017) argued that the marginal impact of financial development on economic growth depends on institutional quality. Our study relates to this last study's objective-examining the effect of institutional quality on the finance-growth nexus and, also, the adoption of the empirical model with interaction variables.

3. Data and Empirical methodology

3.1 Data

This paper considers a sample of four North African countries, namely Tunisia, Morocco, Algeria and Egypt. The choice of the selected countries for this study is primarily dictated by the availability of reliable data over the sample period. The panel covers the period 1996-2015, and is divided into five non-overlapping five-year periods.[3] The dependent variable is economic growth, measured as the growth rate of real GDP per capita at 2010 USD prices. The main variable of interest (financial development) and the other control variables are obtained from the World Development Indicators database (World Bank, 2017).

In this study we use the credit provided by the banking sector to GDP to measure financial development. This indicator measures how much intermediation is performed by the banking system, including credit to the public and private sectors. Calderon and Liu (2003) suggested that this indicator has an advantage as it takes into account the credits to private sector only and isolates credit issued to the private sector, as opposed to credit issued to governments, government agencies, and public enterprises. Furthermore, it excludes credits issued by the central bank. They argued that the measure is even better than indicators used by previous studies such as King and Levine (1993a, b)[4] and Levine (1999).[5] Indeed, De Gregorio and Guidotti (1995) claimed that indicator is a better measure of financial development than measures of monetary aggregates such as M1, M2 and M3 because it reflects the more accurately on the actual volume of funds channeled into private sector. The ratio, therefore, is more directly linked to the investment and economic growth. Moreover, Calderon and Liu (2003) showed that a higher ratio credit provided by the banking sector to GDP indicates more financial services and hence, greater financial intermediary development.

The hypothesis that financial development and other economic and institutional variables affect economic growth is tested by estimating dynamic panel data model for GDP per capita growth for consecutive, non-overlapping, 5-year periods, from

[3] Most panel studies on growth cycles are based on five-year averages as the time unit to eliminate the business cycle effect. Additionally, in this study we lacked annual data for some of the variables of interest. As such this did not allow us to use annual data.

[4] King and Levine (1993a, b) use a measure of gross claims on the private sector divided by GDP. But, this measure includes credits issued by the monetary authority and government agencies.

[5] Levine (1999) uses a measure of money bank credits to the private sector divided by GDP, which does not include credits to the private sector by non-deposit money banks and it only covers the period 1976-1993.

1996 to 2015.[6] Our baseline model includes the explanatory variables common to most growth regressions found in the literature (all except initial GDP per capita are averaged over each 5-year period):

• Initial GDP per capita (log): log of real GDP per capita lagged by one 5-year period. A negative coefficient is expected, indicating the existence of conditional convergence among countries;

• Investment (% GDP) defined as the ratio of gross fixed capital formation to GDP. A positive coefficient is expected, as greater investment shares have been shown to be positively related to economic growth (Mankiw et al., 1992);

• Trade openness measured by the ratio of total imports plus exports over GDP. Assuming that openness to international trade is beneficial to economic growth, a positive coefficient is expected.

In order to account for the effects of macroeconomic stability on economic growth, two additional variables will be added to the model[7]:

• Inflation rate measured as the annual percentage change in the consumption price index.[8] A negative coefficient is expected, as high inflation has been found to negatively affect economic growth (Elder, 2004);

• Government spending defined as the ratio of central government expenditures to GDP. An excessively large government is expected to crowd out resources from the private sector and be harmful to economic growth. Thus, a negative coefficient is expected.

The extended model will also include the following institutional variable[9]:
• The index of economic freedom is constructed by the Fraser Institute and is a measure of the degree of economic freedom in terms of five major areas: (1) government size, taxes, and enterprises; (2) legal structure and the security of property rights; (3) access to sound money; (4) freedom to trade internationally and (5) the regulation of credit, labor and business. In their meta-analysis of the literature, Doucouliagos and Ulubasoglu (2006) found a positive relationship

[6] The periods are: 1996-2000, 2001-2005, 2006-2010, and 2011-2015.

[7] Here, we follow Levine et al., (2000), who accounted for macroeconomic stability in a growth regression by including the inflation rate and the size of government.

[8] In order to avoid heteroskedasticity problems resulting from the high variability of inflation rates, Inflation was defined as log(1+Inf /100).

[9] There is an extensive literature on the effects of institutions on economic growth. See, among others, Acemoglu et al., (2001), Glaeser et al., (2004) and De Haan (2007).

between economic freedom and economic growth. Thus, a positive coefficient is expected. The data are obtained from Miller and Kim (2017).

3.2 Empirical methodology

The purpose of our empirical analysis is to examine if economic freedom (EF) plays an important role in influencing the effects of financial development (FD) on economic growth in North African countries. To this end, we employ a specification that is broadly similar to others (e.g., Law et al., 2013; Gazdar et Cherif, 2015). We consider the following model:

$$y_{i,t} = \alpha y_{i,t-1} + \beta_1 FD_{i,t} + \beta_2 EF_{i,t} + \beta_3 X_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t} \quad (1)$$

Eq. (1) can also be alternatively written with the growth rate as a dependent variable as:

$$Growth_{i,t} = y_{i,t} - y_{i,t-1} = (\alpha - 1) y_{i,t-1} + \beta_1 FD_{i,t} + \beta_2 EF_{i,t} + \beta_3 X_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t} \quad (2)$$

The subscript "t" represents one of these 5- year periods, whereas i represents the country, y is the logarithm of the real GDP per capita, FD is the financial development variable, EF is the index of economic freedom and X is the matrix of control variables described in the previous section, μ_t is a time specific effect, η_i is an unobserved country-specific fixed effect and $\varepsilon_{i,t}$ is the error term. Eq. (2) forms the basis for our estimation. $(\alpha - 1)$ is the convergence coefficient.

While FD has the potential to affect economic activity through a host of channels, in a second set of regressions, we examine one specific link between FD and economic growth, specifically the one working through EF. The hypothesis we would like to test is whether the level of EF in the host country affects FD on economic growth. To this end, we add an interaction term constructed as the product of FD and the EF (i.e., FD*EF) to Eq. (2) as an additional explanatory variable, apart from the standard variables used in the economic growth equation. To ensure that the interaction term does not proxy for FD or the level of EF, both of the latter variables were included in the regression independently. If the coefficient on the interaction term is positive and significant, it implies that the marginal effect of FD on economic growth depends on the level of EF.

The regression to be estimated is the following:

$$Growth_{i,t} = (\alpha - 1) y_{i,t-1} + \beta_1 FD_{i,t} + \beta_2 EF_{i,t} + \beta_3 (FD_{i,t}.EF_{i,t}) + \beta_4 X_{i,t} + \mu_t + \eta_i + \varepsilon_{i,t} \quad (3)$$

As explained above, the aim of this paper is to exanimate empirically the hypothesis that financial development and institutions are complementary with respect to enhancing economic growth. Therefore, Eq. (3) provides the basis for the empirical model by interacting between financial development and institutions at lower and higher financial development to capture quality of finance.

This paper applies the GMM panel estimator developed by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). There are two main reasons for choosing this estimator. The first is to control for country specific effects, which cannot be done with country-specific dummies due to the dynamic structure of the regression equation. Second, is to control for a simultaneity problem caused by the possibility that some of the explanatory variables may be endogenous with growth or other dependent variables.

Following Arellano and Bond (1991), Eq. (1) can be transformed into a first-difference equation to eliminate country-specific effects as follows:

$$y_{i,t}-y_{i,t-1}=\alpha(y_{i,t-1}-y_{i,t-2})+\beta_1(FD_{i,t}-FD_{i,t-1})+\beta_2(EF_{i,t}-EF_{i,t-1})+\beta_3(X_{i,t}-X_{i,t-1})+(\varepsilon_{i,t}-\varepsilon_{i,t-1}) \quad (4)$$

To address the possible simultaneity bias of the explanatory variables and the correlation between $(y_{i,t-1}-y_{i,t-2})$ and $(\varepsilon_{i,t}-\varepsilon_{i,t-1})$, Arellano and Bond (1991) proposed that the lagged levels of the regressors are used as instruments. It is valid under the assumptions that the error term is not serially correlated and the lag of the explanatory variables are weakly exogenous. This strategy is known as Difference GMM estimation and the moment conditions can be listed as follows:

$$E\left[y_{i,t-s}.(\varepsilon_{i,t}-\varepsilon_{i,t-1})\right]=0 \text{ for } s\geq 2;\ t=3,...,T \quad (5)$$

$$E\left[FD_{i,t-s}.(\varepsilon_{i,t}-\varepsilon_{i,t-1})\right]=0 \text{ for } s\geq 2;\ t=3,...,T \quad (6)$$

$$E\left[EF_{i,t-s}.(\varepsilon_{i,t}-\varepsilon_{i,t-1})\right]=0 \text{ for } s\geq 2;\ t=3,...,T \quad (7)$$

$$E\left[X_{i,t-s}.(\varepsilon_{i,t}-\varepsilon_{i,t-1})\right]=0 \text{ for } s\geq 2;\ t=3,...,T \quad (8)$$

If the variables are persistent, however, their past values convey little information about their future changes, making their lagged value a weak instrument for their differenced series (Acemoglu and Robinson, 2008). This may be the case for the institution variables which may lead to a biased estimation of parameters in small samples and asymptotically larger variance. Arellano and Bover (1995) suggested a combination of the differenced Eq. (4) and level Eq. (1). Blundell and Bond (1998) showed that this estimator is able to increase the efficiency via its reduction in biases, and imprecision characterized the Difference GMM estimator, especially the above mentioned weak instrument problem. Arellano and Bover (1995) and

Blundell and Bond (1998) proposed a System GMM estimator as follows. In addition to the moment conditions of Eqs. (5)-(8), the authors proposed that the System GMM uses the following moment conditions:

$$E\left[(y_{i,t-s}-y_{i,t-s-1}).(\eta_i+\varepsilon_{i,t})\right]=0 \text{ for } s=1 \quad (9)$$

$$E\left[(FD_{i,t-s}-FD_{i,t-s-1}).(\eta_i+\varepsilon_{i,t})\right]=0 \text{ for } s=1 \quad (10)$$

$$E\left[(EF_{i,t-s}-EF_{i,t-s-1}).(\eta_i+\varepsilon_{i,t})\right]=0 \text{ for } s=1 \quad (11)$$

$$E\left[(X_{i,t-s}-X_{i,t-s-1}).(\eta_i+\varepsilon_{i,t})\right]=0 \text{ for } s=1 \quad (12)$$

The consistency of the System GMM estimator depends on the validity of the assumption that the error term does not exhibit serial correlation and on the validity of the instruments. By construction, the test for the null hypothesis of no first-order serial correlation should be rejected under the assumption that the error is not serially correlated; but the test for the null hypothesis of no second-order serial correlation, should not be rejected. We use two diagnostics tests proposed by Arellano and Bover (1995) and Blundell and Bond (1998), the Sargan test of over-identifying restrictions, and whether the differenced residuals are second-order serially correlated. If the null hypothesis of both tests cannot be rejected, this would indicate that the model is adequately specified and the instruments are valid. The results from this estimation procedure are reported in table 1.

4. Empirical results

The empirical results are presented in Table 1. Column (1) reports a preliminary analysis on the effects of FD and EF on economic growth. Column (2) presents the coefficient estimates obtained from the baseline specification, which used an interaction term constructed as a product of FD and EF.

Table 1: The growth effect of FD and EF

Variable	(1)	(2)
Initial GDP per capita	-0.0628***	-0.0582***
	(-3.54)	(-3.22)
Financial Development	0.031*	0.034*
	(1.92)	(2.1)
*Financial Development*Economic freedom*	-	0.0071*
		(1.814)
Investment (% GDP)	0.0283*	0.032*
	(1.739)	(1.93)
Trade Openness	0.043***	0.041***
	(2.832)	(2.67)
Inflation	-0.24***	-0.266***
	(-2.78)	(-2.99)
Government Spending	-0.0123	-0.0067
	(-0.6)	(-0.32)
Economic Freedom	0.033*	0.029*
	(1.99)	(1.76)
Constant	0.267	0.171
	(1.17)	(0.83)
R-Squared	0.55	0.51
AR(2) test (p-value)	0.751	0.664
Sargan test (p-value)	0.71	0.681

Notes: *The dependent variable* is the *growth rate of real GDP per capita.* System-GMM estimations for dynamic panel data models. Sample period 1996-2015. AR(2) is a test of second order residual serial correlation. J-test is the Hansen over identification test. t-Statistics are in parentheses**.** Significance levels at which the null hypothesis is rejected: ***, 1%; **, 5%, and *, 10%.

The results in Column (1) clearly indicate that the estimated coefficient on FD is statistically significant at 1% level, which suggests that FD plays a positive role in boosting the economic growth of North African countries. This result is consistent with some studies in the FD-growth literature (e.g. Choong, 2012; Law et al., 2013). Meanwhile, the EF coefficient carries a positive sign and is statistically significant at conventional levels, implying that economic growth is stronger when EF is high because it makes investment more productive. This finding is in line with the survey conducted by De Haan et al., (2006) and Azman-Saini et al., (2010) who argued that EF is crucial for economic growth. It should be noted that the coefficients of the core variables considered in the equation enter the regression equation with the correct sign and are significant at the 10 percent significance level or better. Additionally, the estimated regression passed both specification tests. The null hypothesis of no second-order serial correlation cannot be rejected at the 5 percent level. The regression is not plagued by simultaneity bias as the orthogonality conditions cannot be rejected at the 5 percent level, as indicated by Hansen's test. This suggests that the equation is adequately specified and the instruments employed in the analysis are valid.

Next, Column (2) shows the regression results based on interaction specification using an interaction term between FD and the EF index (FD*EF). In this specification, we relied on the interaction term to establish the contingency. If the term is positive and significant, this implies that the impact of FD on economic growth increases with EF. The first thing to note is that the interaction term turns out to be positively signed and statistically significant at the 10 percent level. This result implies that a better contribution of FD to economic growth requires taking into account the interrelationship and the complementarity between FD and EF. This finding is consistent with Demetriades and Law (2006) and Law et al., (2013), who found that a better institutions environment allows an economy to exploit the benefits of financial development on economic growth. The p-values of second-order serial correlation and Hansen's over-identification tests indicate that the model is adequately specified. This finding is consistent with recent studies which found that a better institutions environment allows an economy to exploit the benefits of financial development on economic growth.

We introduced the level of initial GDP per capita (the natural logarithm) as an independent variable according to the conditional convergence hypothesis. The coefficient of initial GDP per capita shows the expected negative sign and is highly significant, indicating a convergence of per capita income across countries as proposed in the growth theories. This result corroborates the work of Barro and Sala-i-Martin (1997). The effect of the other variables in the regression is consistent with the standard growth regression results. Investment and trade openness have

positive and statistically significant coefficients, indicating that greater investment and trade openness promote growth. Regarding macroeconomic stability, inflation and government size have the expected signs, but only the first is statistically significant. Finally, the Index of Economic Freedom is included in the model in order to account for favorable economic institutions. It is statistically significant and has a positive sign, as expected.

5. Conclusions and policy implications

The link between financial development and economic growth has long remained an important issue of debate in the literature. Therefore, this paper aimed to re-investigate the role of institutions in mediating the positive relationship between financial development and economic growth. This implies that the marginal impact of financial development on economic growth depends on institutional quality.

In order to test the hypothesis, this study uses the System GMM panel estimator and data from four countries of North Africa, over a 5-year period from 1996 to 2015. From the empirical analysis, we drew three important conclusions. First, the coefficient measuring the impact of the FD on economic growth is positive and significant, indicating that FD affects economic growth in a positive way. Second, EF is found to be an important factor for economic growth for the countries considered. Finally, the effect of FD on economic growth is contingent on the level of EF in the host countries. This means that a better institutions environment allows an economy to explore the benefits of financial sector reforms in promoting economic growth.

In this context, countries should propose measures that reinforce institutional reforms to enhance the functioning of financial systems and improve economic growth. We believe that a sound institution is of key priority the governments to allow their financial systems to perform critical functions to enhance the efficiency of intermediation and push output toward its potential. However, the building of more effective institutions will be a long and arduous process. In some countries, it may be politically difficult for governments to make a range of reforms in the short run but in the long-run they can lead to tremendous economic benefits.

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