Financial Development, Bank Efficiency and Economic Growth across the Mediterranean

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Abstract

This paper explores the relationship between financial sector development and economic growth, using a sample of northern and southern Mediterranean countries for the years 1985-2009. The authors included several variables to measure the development of the financial sector to account both for quantity and quality effects. The results indicate that credit to the private sector and bank deposits are negatively associated with growth, which confirms deficiencies in credit allocation in the region and suggests weak financial regulation and supervision. On the stock market side, the results seem to indicate that stock market size and liquidity play a significant role in growth, especially when accounting for the quality of an institution. Investment, whether domestic or in the form of FDI, contributes significantly to economic growth. Stronger institutions and low inflation are key growth factors. Initial GDP has a persistently and significantly negative impact on growth, which implies that poorer countries are catching up richer countries in terms of economic growth.

Contents

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1. Introduction

Financial development and growth has been intensively studied in developed countries – with results indicating a strong positive relationship between growth and financial sector development. Studies in the developing countries, especially in the southern Mediterranean region, were scarcer, however, and support evidence of a negative or insignificant impact of finance on growth using most of the time series estimators.

This paper uses the panel data method with a wide and updated range of data from 1970 to 2009. The paper contributes to the literature in several ways. It uses more up-to-date data; it includes countries from both the developed and developing regions, with a special focus on the southern Mediterranean countries. In addition, the paper includes institutional variables to assess whether an improvement in institutions would lead to more growth and if financial development impacts growth when institutions are of a better quality. The paper uses new quantity (e.g. the size and the liquidity of the financial sector) and quality (such as banking efficiency) measures of financial development to assess potential links with economic growth.

The results show that financial sector development is not negatively associated with growth. The improvement of institutions is a key factor for growth but is not sufficient to make banking sector development contribute positively to growth. On the other hand, by introducing an interaction of market capitalisation with the quality of institutions, the impact of stock market capitalisation and turnover becomes positive and significant. However, an improvement in banking sector efficiency is not sufficient to improve growth in southern Mediterranean countries; additional conditions must be met, such as better quality institutions, regulations and supervision.

Section 2 of the paper presents the review of the literature on the finance and growth nexus. Section 3 provides the details of the empirical methodology. Section 3 gives the results and section 4 concludes and provides some policy implications.

2. Relevant literature

The relationship between finance and growth has been extensively debated and investigated over the last two centuries. Some argue that finance is a strong contributor to growth (Baghehot, 1873; Schumpeter, 1912; Hicks, 1969 and Miller, 1998) while others such Robinson (1952) suggest that growth leads to financial development and Lucas (1988) shows that finance is over-stressed in explaining growth. In a review paper, Levine (2005) stresses that financial development contributes to growth by providing information about potential projects, monitoring the implementation of investment, enhancing risk management and diversification, pooling savings and facilitating the exchange of goods and services.

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A large body of research on finance and growth studies the impact of financial sector development (size and structure) on growth and its sources. Most of the studies include cross-country regressions, time-series analysis, panel studies, but also industry and firm-level investigations.

Goldsmith (1969) finds in a cross-country study that the size of the financial system positively contributes to economic growth but was unable to display any relationship between financial structure and economic growth. Levine (2005) raises several problems with Goldsmith's findings: the sample is small (only 34 countries), variables that could impact growth are not accounted for, the functioning of the financial system is not gauged and the direction of causality is not investigated.

In the early 1990s, King and Levine (1993) improve on the work of Goldsmith by enlarging the sample to 77 countries, by introducing control factors, by examining three growth indicators (real per capital growth, growth in capital accumulation and total productivity growth) and by introducing new financial development measures (liquid liabilities over GDP, bank credit over bank credit plus central bank domestic assets and credit to private sector divided by GDP). They find a strong positive relationship between each financial measure and the three growth indicators, using alternative econometric specifications. However, King and Levine did not address the causality issue and focused only on the banking sector. La Porta et al. (2002) used the degree of public sector ownership of banks around the world as a different financial sector measure and they find that a higher degree of state ownership is negatively associated with bank development and economic growth. Levine and Zervos (1998) add stock market development to cross-country studies. They used stock market size and liquidity measures along with initial bank development on a sample of 42 countries. They find that initial stock market liquidity and bank development are positively correlated with all three measures of economic growth after controlling for other factors that could affect growth. The results indicate that bank development and stock market liquidity are complementary by providing different financial functions. There are some problems associated with Levine and Zervos' approach, however. First, they do not address causality. Second, they exclude other components of the financial sector such as bond market and the non-banking financial institutions. Third, they limit stock market to liquidity while it also provides risk diversification.

To account for simultaneity bias, Levine (1998, 1999) and Levine et al. (2000) have used the legal origin measure (La Porta et al., 1998) as an instrument for financial development. Levine et al. (2000) find that the positive impact of financial development on growth does not come from a simultaneity bias on a sample of 71 countries. They find that the exogenous component of financial development is strongly related to growth.

Panel data has also been applied to assess the financial development and growth relationship. Levine et al. (2000) use a panel GMM estimator to examine the relationship between finance and growth, while Beck et al. (2000) study the link between finance and the sources of growth. Both papers indicate a positive relationship between finance, growth and its sources. Beck et al. (2000) argue that the channel of financial development to growth is through productivity growth and not through capital accumulation. While these studies focus on a linear relationship between growth and finance, Rioja and Valev (2004a) suggest that financial development contributes to growth in industrial countries by enhancing total factor productivity and in developing countries by increasing capital accumulation. Additionally, Rioja and Valev (2004b) find that the impact of financial development on growth is stronger for rich countries than for low-income countries. Loayza and Ranciere (2002) emphasise the difference between the short- and long-run impact of financial development on growth. They find that the negative short-term association is related to a surge of financial crisis. Rousseau and Watchel (2000) find that the exogenous component of bank and stock development contributes to economic growth. They also state that stock market capitalisation is not associated with growth because listing is not sufficient to enhance growth.

Time-series techniques have also been applied to the finance-growth relationship, using mainly Granger-causality tests and vector autoregressive regressions (VAR). Demetriades and Hussein (1996) find that the relationship between the ratio of money to GDP and economic growth runs in both ways for developed countries. Rousseau and Watchel (1998) find on a sample of five countries over the 19th

century that the direction of causality runs from finance to growth. Arestis et al. (2001) use both bank and stock market to assess the finance and growth relationship, using quarterly data on a sample of developing countries. They find a positive and significant association between finance and growth, with a larger impact from banking sector measures. Christopoulos and Tsionas (2004) address the high frequency factors influencing the finance growth nexus by using panel cointegration analysis. They find that the long-run causality runs from financial development to growth. Bekaert et al. (2001, 2005) show that financial liberalisation spurs growth by improving resource allocation and increases the accumulation rate.

One of the principal conclusions from the papers reviewed above is that finance is good for growth, especially in middle and high-income countries. The contribution of bank development is stronger than stock market to growth. Do these conclusions apply to southern and eastern Mediterranean countries (SEMCs)?

Two types of research have been investigated in the finance and growth literature on the SEMCs' region: time-series and panel data regression analysis. Studies on time-series could be divided into two types: country and region specific.

For the country studies, Ghali (1999) investigated the question of whether finance contributes to economic growth in Tunisia. The paper has used two measures of financial development; the ratio of bank deposit liabilities to GDP and the ratio of bank claims on the private sector to nominal GDP. The dynamic relationship between finance and growth has been investigated using the Granger-causality test and the results indicate the existence of a long-term stable relationship between financial development and per capita real output where the causality runs from finance to growth.

Abu-Bader and Abu-Qarn (2008) examine the causal relationship between financial development and economic growth in Egypt during the period 1960-2001 using a trivariate VAR framework. The paper employs four different measures of financial development (ratio of money to GDP, ratio of M2 minus currency to GDP, ratio of bank credit to the private sector to GDP, and the ratio of credit issued to private sector to total domestic credit). The paper suggests that the causality is bi-directional. Moreover, the paper shows that the impact of financial development on growth is through both investment and efficiency.

Kar and Pentecost (2000) study the relationship between finance and economic growth in Turkey. They use five measures of financial development, the Granger-causality test and the vector error correction methodology (VECM). The results show that the causality depends on the financial development measure. For instance, the direction of causality runs from financial development to economic growth when the money-to-income ratio is used, while it runs from growth to finance when financial development is proxied by bank deposits, private credit and domestic credit ratios.

Bolbol et al. (2005) analyse the relationship between Egypt's financial structure and total factor productivity (TFP) during the 1974-2002 period. The result shows that bank-based indicators have a negative effect on TFP unless they are interacted with per capital income, while the market-based indicators have a positive impact on TFP. The paper suggests that diversifying the financial system by reforming the stock market could enhance TFP in Egypt.

On a multi-country analysis but still in a time-series analysis, Abu-Bader and Abu-Qarn (2008) explore the causal relationship between financial development and economic growth for six SEMCs (Algeria, Egypt, Israel, Morocco, Syria, and Tunisia) using a quadvariate VAR. They employ four different measures of financial development and support the hypothesis that finance leads growth in five countries (Algeria, Egypt, Morocco, Syria, and Tunisia). The results suggest that financial reforms need to be continued to stimulate saving/investment and, therefore, long-run economic growth.

Abdelhafidh (2013) investigates the direction of causality between finance and growth in North African countries over the period 1970-2008. Abdelhafidh distinguished between domestic saving and foreign inflows but also disaggregated the former into grants, FDI, portfolio investment and loans. Trivariate VAR models have been used to disentangle the direct and indirect impact of financial development on growth. The result indicates that economic growth Granger-causes domestic saving.

In Algeria, grants and multilateral foreign loans and bonds Granger-cause growth. In Egypt, grants, FDI, long-term loans, short-term loans, bilateral loans, multilateral loans and bank loans all Granger-cause growth with a reverse causality running form growth to foreign inflows. In Morocco and Tunisia, grants Granger-cause growth and it is growth that Granger-causes loans. These results underscore the finding that policy implications should be tailored to each case.

Baliamoune-Lutz (2008) explores the short-run dynamics and long-run relationship between real output and financial development in three North African countries: Algeria, Egypt and Morocco for the period 1960-2001. He uses cointegration and VECM models and four indicators of financial development. The results indicate a stable long-run relationship between finance and income when the ratio of liquid liabilities to GDP (LIQ) is used. Besides, in the short-run real output adjusts to equilibrium in all three countries when LIQ is used. Overall, the paper suggests that finance leads growth when finance is measured by LIQ and the mixed results are linked to differences in banking regulation and supervision.

Boulila and Trabelsi (2004) investigate the relationship between finance and growth in the SEMCs for different periods ranging from 1960-2002. They support the hypothesis that growth leads finance using cointegration techniques and Granger causality tests. They attribute these results to four factors: i) financial repression, ii) the lagging behind financial reforms, iii) the high level of non-performing loans and iv) the high information and transaction costs that hampers financial deepening.

Panel data studies on the SEMCs uses fixed-effect, dynamic GMM, panel cointegration and panel causality analysis. Kar et al. (2011) explore the direction of causality between finance and growth in the region. The approach used in based on the Seemingly Unrelated regressions and Wald tests applied to a panel of fifteen countries for the period 1980-2007. The results suggest that the direction of causality depends on the measure of the financial development measure and the country investigated.

Al-Aawad and Harb (2005) investigate the relationship between finance and growth using the panel cointegration analysis on ten SEMCs over the period 1969-2000. The results indicate the existence of a long-run association between finance and growth. Moreover, in the short-run the financial sector is unable to support economic growth to a high degree of financial repression and a weak financial sector.

 On the same vein, Ben Salem and Trabelsi (2012) explore the importance of financial development as a determinant of growth in seven SEMCs during the period 1970-2006 by applying the Pedroni's panel cointegration analysis. The paper suggests the existence of a long-run relationship between finance and growth. Besides, very weak support is provided to the supply-side hypothesis. Indeed, economic growth leads to financial sector development. Ben Salem and Trabelsi relate these findings to macroeconomic imbalances, weak institutional development and the weakness of the private sector in the southern and eastern Mediterranean region.

Ben Naceur and Ghazaouani (2007) conduct a study on eleven SEMCs to assess the fundamental relationship between financial development and economic growth over the period 1979-2003. The paper uses a dynamic GMM in a panel setting. The results indicate that banking sector development impacts negatively on economic growth after controlling for stock market development. This is related to the overwhelming public sector in credit allocation and to weak financial regulatory and supervisory bodies. Besides, the paper finds no impact of stock market development on growth and links this result to a high degree of financial repression and the small and illiquid capital market.

Also, Ben Naceur et al. (2008) investigate the impact of stock market liberalisation on economic growth in the SEMCs on a sample of eleven countries over the 1979-2005 period by using the dynamic GMM regression model. The results indicate that stock market liberalisation has no effect on investment and growth.

Achy (2005) aims to study the impact of financial development on private savings, on private investment and on economic growth using a sample of five SEMCs over the 1970-1999 period by using panel GLS regressions. The coefficients of financial development and financial liberalisation are negative in the finance investment regressions, which imply a negative impact on private investment.

The results also suggest that the impact of financial development is absent in the finance and growth regressions. These disappointing results may be attributed to the distortion of financial liberalisation in favour of consumption.

The research on SEMCs is mixed on the relationship between finance and growth, but many papers highlight the fact that banking sector development does not contribute to growth – some argue that it even hampers growth. They related these disappointing results to financial repression, weak institutions and the ineffective allocation of financial resources. The problem with all these studies is that they focus on the size of the banking sector rather than on its quality. Two recent papers have proposed measuring banking sector development by using efficiency in order to assess the extent to which banks are efficiently using their resources.

Hasan et al. (2009) derive a measure for the development of the banking sector by calculating cost efficiency for each individual bank in a sample of 100 countries between 1996 and 2005. They find an independent and significant economic effect of bank cost efficiency on economic growth. The quality effect is stronger in developed economies, while quantity increase is also beneficial in developing economies.

In the same vein as Hasan et al. (2009), Koetter and Wedow (2010) study the relationship between the quality of the financial system measured by cost efficiency and economic growth, using a sample of 97 German economic planning regions. They suggest that the quality of the financial system contributes to economic growth while the quantity proxied by credit volume is not related to growth. In fact, the result indicates that economic growth requires better but not necessarily more credit.

The recent global financial crisis has raised concerns that some countries have oversized financial systems compared to the size of the domestic economy. Arcand et al. (2012) study whether there is a threshold above which financial development stops contributing to growth. This paper shows that in countries with a very large financial sector the relationship between financial depth and economic growth disappears. Credit to the private sector above 80-100% of GDP has a negative impact on economic growth. Arcand et al. (2012) suggests two possible reasons for this negative impact: i) excessive credit growth could lead to high economic volatility and probability of financial crisis and ii) high credit volume is generally related to potential resource misallocation.

Cecchetti and Kharroubi (2012) examine the impact of size and growth of the financial system on productivity growth and economic level using a sample of 50 countries observed over the period 1980-2009. The paper finds that financial sector size has an inverted U-shaped effect on productivity growth and a further increase in the size of the financial system contributes negatively to TFP growth. This suggests that more finance is not always better.

3. Data and methodology

3.1 The sample

The measures of financial development are extracted from the data set of Beck et al. (2009). For banking development measures, the dataset includes all the eleven southern and eastern Mediterranean (SEMCs) countries except Lebanon, Libya, and the Palestine Authority as well as seven EU-MED countries for the years 1985 to 2009. For the capital market development measures, the dataset covers all the EU-MED countries and the SEMCs, except Algeria and Syria, for the years 1989 to 2009.

Table 3.1 provides an overview of the variables used in the study.

Table 3.3.1 Descriptive statistics

Variable	Source	N	Mean	S.Dev.	Min	Max
Credit to private sector (% GDP)	Beck et al. (2009)	633	51.73	36.58	3.57	224.20
Bank deposits (% GDP)	Beck et al. (2009)	655	57.57	32.21	5.56	228.53
Stock market cap. (% GDP)	Beck et al. (2009)	327	40.20	39.80	0.29	242.02
Value traded (% GDP)	Beck et al. (2009)	336	46.30	62.62	0.19	579.32
Market turnover (% stock market cap.)	Beck et al. (2009)	330	26.12	46.10	0.00	372.27
Log real GDP per capita ($)	WDI	743	8.25	1.10	6.07	10.07
Total trade (% GDP)	WDI	866	54.42	39.48	0.00	194.76
Financial openness index	Chinn-Ito (2008)	640	-0.18	1.54	-1.84	2.48
Inflation (% growth in deflator)	WDI	726	11.56	24.05	-9.42	390.68
Growth of government debt (%)	Jaimovich & Panizza (2010)	430	3.03	12.35	-72.87	141.38
Legal & democratic quality index	PRS	415	24.98	13.49	1.11	54.76
Financial reform index	Abiad et al. (2008)	396	10.01	6.33	0.00	21.00
Net FDI (% GDP)	IFS	675	1.33	3.37	-10.09	28.96
Net portfolio investments (% GDP)	IFS	672	-0.21	5.62	-73.55	18.88
Official aid & grants (% GDP)	IFS	557	1.35	2.94	-3.26	20.20
Remittances (% GDP)	IFS	557	2.76	6.60	-52.51	29.92
Other net investments (% GDP)	IFS	641	2.25	7.04	-39.85	89.22

Source: Beck et al. (2009).

3.2 Variable definition

The dependent variable is economic growth (Growth) and it is defined as the log difference of real GDP per capita.

Five measures of financial development are used in this study. The amount of *bank credit to the private sector* (as % of GDP) represents the general level of development in the banking sector. The share of *bank deposits* (as % of GDP) provides the extent of access and deposit mobilisation the financial system offers. *Meta-efficiency* is the distance of a bank from the meta-frontier, which is defined by the product of country cost efficiency and technical rate of growth (TRG). *Stock market capitalisation* (as % of GDP) is included to provide an estimate of the size of the equity market while *stock market total value traded* (as % of GDP) is used as a measure of the extent of activities in the domestic equity markets. *Stock market turnover* (Value traded over market capitalisation) is included to measure the liquidity of the stock market.

A number of explanatory variables were used as determinants of economic growth. *Lagged GDP per capita* (in constant US dollars) was included to control for economic convergence in our regressions. Several studies point out that per capita income could serve as a good proxy for the general development and sophistication of institutions (La Porta et al., 1997; La Porta et al., 1998; Beck et al., 2003; Djankov et al., 2007). *Inflation*, measured as the annual growth of the GDP deflator, is included since inflation is found to be an important determinant of economic growth.

To control for the potential offsetting impact of a liberalised economy, an index of *financial openness* was introduced. The financial openness index, developed by Chinn and Ito (2002; 2008), measures the extent of capital controls based on the information from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).

Most studies on financial development and growth, as reviewed above, find that legal institutions and democratic governance are important factors that improve the development of financial systems and economic growth. In order to assess both aspects together, a composite index on *legal quality and*

democratic accountability was constructed, using four indicators from the International Country Risk Guide (ICRG), published by the PRS Group. First, an index for the quality of legal institutions was built, equalling the first principal components of bureaucratic quality, control for corruption, and law and order.[1] The resulting index was then multiplied by ICRG index on democratic accountability. The multiplication implies that the resulting index treats both legal quality and democratic accountability as complements.

Lastly, capital flow variables, controlling for net foreign direct investments (FDI) and portfolio investments were included. All of these were obtained from the most recent version of the IMF's International Financial Statistics (IFS) database.

3.3 Empirical specification

The study examines the impact of financial development (FD) and a variety of macroeconomic, democratic, legal and other institutional variables on the economic growth in the southern Mediterranean countries. The econometric investigations with panel data, are specified as:

$$\Delta \text{Log real GDP per capita}_{i,t} = \alpha_0 + \gamma FD_{i,t} + \beta' X_{i,t} + \varepsilon_{i,t}, \tag{1}$$

where: FD is the financial development variables, X is a vector of control variables and s is the number of lag-years.

The estimations are based on fixed effect panel regressions but other estimators were used such as fixed effect with time dummies, random effects and GMM models, however the fixed effects give the most robust results (the results of the other specifications could be provided upon request).

The meta-frontier is derived as the envelope of the single-country frontiers by linear programming (Casu and Ferrari, 2012). Define:

$$C_{it}^k = \exp(X_{it}\beta^k)\exp(v_{it}^k + u_{it}^k) \tag{2}$$

as the *k*-th country cost frontier, which depends on a matrix of independent variables X and a vector of country-specific parameters β^k. The meta-frontier is defined as the envelope of the k estimations of Equation (2):

$$C_{it}^* = f(X_{it}\beta^*) = \exp(X_{it}\beta^*) \tag{3}$$

Equation (3) has the same functional form of Equation (2) and a vector of parameters β^* satisfying:

$$X_{it}\beta^* \leq X_{it}\beta^k \tag{4}$$

This means that by construction the meta-technology will always give the minimum possible cost among all the groups. As we said (3) and (4) are estimated by the deterministic technique of linear programming.

The distance of each bank from the meta-frontier is called meta-efficiency (EFF$_{it}$*) and it is defined as the product of its national cost efficiency (EFF$_{it}$) and the Technical Gap Ratio (TGR), that is

$$EFF_{it}^* = TGR \times EFF_{it} \tag{5}$$

The TGR is a measure of the distance between the country frontier and the metafrontier and it is ≤ 1 with higher values indicating closer proximity to the best available technology and vice versa.

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[1] See (http://www.prsgroup.com/ICRG_Methodology.aspx) for more on the construction methodology of these indexes and others.

4. Empirical Results

The estimation results are reported in tables 4.1 and 4.2. Table 4.1 shows the growth equation with the credit to private sector over GDP, bank deposit over GDP and banking sector efficiency as the finance development variables. Columns 1 and 2 display the growth estimates using credit to private sector over GDP and its interaction with institutional quality. Columns 3 and 4 show the growth estimates with the deposit over GDP as a measure of financial sector development. Columns 5 and 6 contain the growth equation using banking sector efficiency as the financial sector development variable. Efficiency is included to assess whether the quality of the financial sector affects economic growth.

Table 4.1 shows that the size of the banking sector measured by the variable credit to private sector is negatively and significantly associated with economic growth, even if we include the credit to private sector interacted with the quality of institution. The conclusion from the results is that an increase in credit to private sector in the southern Mediterranean countries is not contributing to growth. This could be explained by the high level of financial repression (in the southern part of the Mediterranean the banking sector is dominated by public banks that lack good governance and are unable to effectively select growth-enhancing projects). Poor regulation and supervision also hamper the good allocation of credit. Southern Mediterranean countries should therefore focus on improving credit allocation in the banking sector and its quality, rather than increasing the volume of credit in order to increase growth. The other drivers of growth in our estimations are the large volumes of foreign direct investment, high domestic investment rate, institution quality, low inflation and trade openness.

The results in column 3 and 4 confirm the results in the first two columns. An increase in banks' deposits does not per se contribute to growth. Most important is how these resources are used and how effectively they are allocated to finance projects. Moreover, a country that is able to attract foreign direct investment, to spur domestic investment, to enhance the quality of its institutions and to open its trade can easily improve its growth prospects. Countries need to manage their inflation rates in order to experience better growth.

However, if we look to the quality of the banking sector by using the meta-efficiency in columns 5 and 6, the relationship with growth becomes positive but insignificant, meaning that improving the efficiency of the banking sector is not sufficient to enhance growth.

Finally, initial GDP has a persistently and significantly negative impact on growth, which implies that poorer countries are catching up richer countries by displaying higher growth rates during the period of study.

Table 4.1 Bank development and growth results.

VARIABLES	(1) Credit Private Sector	(2) Credit Private Sector	(3) Bank deposit	(4) Bank deposit	(5) Bank Efficiency	(6) Bank Efficiency
L.lngdpcap	-6.980***	-6.733***	-9.095***	-8.458***	-10.46**	-10.45**
	(1.722)	(1.734)	(1.702)	(1.728)	(4.306)	(4.268)
bdev	-0.0316***	-0.0853*	-0.0189	-0.129**	0.163	0.343
	(0.00954)	(0.0464)	(0.0135)	(0.0598)	(2.840)	(17.89)
bdev* i_ircavg	-	0.00801	-	0.0165*	-	-0.0302
	-	(0.00678)	-	(0.00870)	-	(2.971)
i_ircavg	1.620***	1.271***	1.477***	0.577	0.255	0.275
	(0.293)	(0.416)	(0.293)	(0.558)	(0.424)	(2.148)
c_fdi_net_gdp	0.149**	0.156***	0.170***	0.179***	0.0584	0.0585
	(0.0581)	(0.0583)	(0.0592)	(0.0592)	(0.0828)	(0.0842)
c_portinv_net_gdp	0.0177	0.0214	0.00988	0.0143	-0.00603	-0.00603

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	(0.0266)	(0.0268)	(0.0277)	(0.0277)	(0.0185)	(0.0186)
c_inv_gdp	0.185***	0.187***	0.167***	0.168***	0.289***	0.290**
	(0.0467)	(0.0467)	(0.0477)	(0.0475)	(0.0965)	(0.0987)
c_infl	-0.0204**	-0.0220**	-0.0231**	-0.0257***	-0.0175	-0.0175
	(0.00954)	(0.00962)	(0.00976)	(0.00982)	(0.0124)	(0.0124)
c_trade_gdp	0.0405**	0.0401**	0.0509***	0.0599***	0.0812**	0.0812**
	(0.0191)	(0.0191)	(0.0193)	(0.0198)	(0.0353)	(0.0379)
f_openness	0.434**	0.410**	0.388**	0.282	0.155	0.155
	(0.172)	(0.173)	(0.173)	(0.182)	(0.381)	(0.385)
Constant	47.18***	47.35***	64.96***	64.86***	77.35**	77.21**
	(13.90)	(13.89)	(13.61)	(13.56)	(36.28)	(35.60)
Observations	357	357	362	362	207	207
R-squared	0.256	0.260	0.228	0.236	0.188	0.188
Number of id	16	16	16	16	16	16
N	357	357	362	362	207	207
r2_a	0.203	0.204	0.173	0.179	0.151	0.147
r2_w	0.256	0.260	0.228	0.236	0.188	0.188
r2_b	0.0119	0.0102	0.0114	0.00610	0.126	0.126
r2_o	0.00526	0.00571	0.00245	0.00342	0.0181	0.0181
F	12.72	11.60	11.05	10.38	10.85	10.08
p	0	0	0	0	4.27e-05	5.51e-05

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: authors' compilation.

Table 4.2 presents the growth regressions using stock market variables (stock market capitalisation, value traded and turnover ratio) as measures for financial development.

Columns 1 and 2 introduce stock market capitalisation as a measure of stock market development. Columns 3 and 4 display stock market turnover as a measure of stock market development. Columns 5 and 6 use value traded as a measure of stock market development.

Table 4.2 shows that the size of the stock market measured by market capitalisation has no effect on growth in column 1. By introducing the interaction of market capitalisation and the quality of the institution, the impact of stock market capitalisation becomes positive and significant, especially in countries where the institutions are of a lower quality. This result is even stronger when we use stock market turnover. The improvement of the liquidity of the stock market in a country with institutions of low quality contributes positively and significantly to growth. The quality of the institution, a higher volume domestic and foreign direct investment and low inflation are key ingredients for economic growth. Initial GDP has a persistently and significantly negative impact on growth, which implies that less developed countries grow at a higher rate than developed ones.

Table 4.2 Stock markets indicators and growth results

VARIABLES	(1) Market Capitalisation	(2) Market Capitalisation	(3) Market Turnover	(4) Market Turnover	(5) Value Traded	(6) Value Traded
L.lngdpcap	-8.360***	-8.820***	-7.646***	-7.698***	-7.084***	-7.185***
	(1.789)	(1.809)	(1.671)	(1.647)	(1.729)	(1.732)
smdev	0.0113	0.0929*	-0.00575	0.0642***	-0.00972*	0.0602
	(0.00772)	(0.0534)	(0.00349)	(0.0236)	(0.00508)	(0.0719)
smdev*i_ircavg	-	-0.0135*	-	-0.0113***	-	-0.0108
	-	(0.00874)	-	(0.00378)	-	(0.0111)
i_ircavg	1.432***	1.849***	1.626***	1.936***	1.598***	1.685***
	(0.357)	(0.447)	(0.342)	(0.353)	(0.344)	(0.356)
c_fdi_net_gdp	0.160**	0.154**	0.154***	0.142**	0.166***	0.150**
	(0.0622)	(0.0622)	(0.0584)	(0.0577)	(0.0580)	(0.0604)
c_portinv_net_gdp	0.0137	0.0112	0.0112	0.0162	0.0180	0.0171
	(0.0417)	(0.0416)	(0.0274)	(0.0271)	(0.0288)	(0.0288)
c_inv_gdp	0.289***	0.302***	0.236***	0.258***	0.240***	0.254***
	(0.0584)	(0.0588)	(0.0562)	(0.0559)	(0.0581)	(0.0598)
c_infl	-0.0464***	-0.0442**	-0.0442**	-0.0562***	-0.0463***	-0.0447***
	(0.0171)	(0.0171)	(0.0171)	(0.0174)	(0.0170)	(0.0171)
c_trade_gdp	-0.00577	-0.00795	0.0158	0.0102	0.0168	0.0121
	(0.0239)	(0.0239)	(0.0241)	(0.0238)	(0.0242)	(0.0247)
f_openness	0.182	0.217	0.255	0.320*	0.313	0.317*
	(0.203)	(0.203)	(0.184)	(0.183)	(0.192)	(0.192)
Constant	59.78***	61.19***	52.88***	51.44***	47.96***	48.31***
	(15.26)	(15.25)	(13.88)	(13.69)	(14.55)	(14.56)
Observations	285	285	294	294	290	290
R-squared	0.257	0.264	0.239	0.263	0.234	0.237
Number of id	14	14	14	14	14	14
N	285	285	294	294	290	290
r2_a	0.195	0.199	0.177	0.200	0.171	0.171
r2_w	0.257	0.264	0.239	0.263	0.234	0.237
r2_b	0.126	0.120	0.126	0.125	0.0949	0.0930
r2_o	0.0263	0.0249	0.0262	0.0295	0.0246	0.0247
F	10.08	9.358	9.432	9.636	9.067	8.254
p	0	0	0	0	0	0

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: authors' compilation.

5. Conclusion

This paper has looked at the relationship between the financial sector and economic growth in the southern Mediterranean region. We tested different econometric specifications (but displayed only the robust ones) to assess these relationship over the 1984-2010 period. We included several variables to measure the development of the financial sector in order to account both for quantity and quality effects but also to encompass the entire financial system.

The results on the large sample indicate that credit to the private sector and bank deposits are in many specifications negatively associated with growth, meaning that there are problems of credit allocation in the region and weak financial regulation and supervision. On the stock market side, the results seem to indicate that stock market size and liquidity are playing a significant role in growth, especially when the quality of the institution is low. Investment, whether domestic or in the form of FDI, contribute significantly to economic growth. Better institutions and low inflation are key growth factors. Initial GDP has a persistently and significantly negative impact on growth, which implies that poorer countries are catching up richer countries in terms of economic growth.

References

Abdelhafidh, S. (2013), "Potential financing sources of investment and economic growth in North African countries: A causality analysis", *Journal of Policy Modelling*, Vol. 35, No. 1, pp. 150-169.

Abu-Bader, S. and A.M. Abu-Qarn (2008), "Financial development and economic growth: empirical evidence from MENA countries", *Review of Development Economics*, Vol. 12, pp. 803-817.

Achy, L. (2005), "Financial liberalization, savings, investment, and growth in MENA countries", *Research in Middle East* Economics, Vol. 6, pp. 67-94.

Al-Awad, M. and N. Harb (2005), "Financial Development and Economic Growth in the Middle East", *Applied Financial Economics*, Vol. 15, pp. 1041-1051.

Arcand, J-L, E. Berkes and U. Panizza (2012), "Too Much Finance?", IMF Working Paper WP/12/161, International Monetary Fund, Washington, D.C.

Arestis, P., P.O. Demetriades and K.B. Luintel (2001), "Financial Development and Economic Growth: The Role of Stock Markets", *Journal of Money, Credit and Banking*, Vol. 33, pp. 16-41.

Bagehot, W. (1873), *Lombard Street*, Homewood, IL: Richard D. Irwin (1962 Edition).

Baliamoune-Lutz, M. (2008), "Financial Development and Income in North Africa", *International Advances in Economic Research*, Vol. 14, No. 4, pp. 422-432.

Beck, T., A. Demirgüç-Kunt and R. Levine (2000), "A New Database on Financial Development and Structure", *World Bank Economic Review*, Vol. 14, pp. 597-605.

Bekaert, G., C.R. Harvey and C. Lundblad (2001), "Emerging Equity Markets and Economic Development", *Journal of Development Economics*, Vol. 66, pp. 465-504.

Bekaert, G., C.R. Harvey and C. Lundblad (2004), "Does Financial Liberalization Spur Growth?", *Journal of Financial Economics*, Vol. 77, pp. 3-55.

Ben Naceur, S. and S. Ghazouani (2007), "Stock markets, banks, and economic growth: Empirical evidence from the MENA region", *Research in International Business and Finance*, Vol. 21, No. 2, pp. 297-315.

Ben Naceur, S., S. Ghazouani and M. Omran (2008), "Does stock market liberalization spur financial and economic development in the MENA region?", *Journal of Comparative Economics*, Vol. 36, pp. 673-693.

Ben Salem, J.B. and M. Trabelsi (2012), "More on finance and growth in the MENA region: more growth, more finance", *Middle Eastern Finance and Economics*, Vol. 17, pp. 113-124.

Bolbol, A.A., A. Fatheldin and M.M. Omran (2005), "Financial Development, Structure, and Economic Growth: The Case of Egypt, 1974-2002", *Research in International Business and Finance*, Vol. 19, pp. 171-194.

Boulila, G. and M. Trabelsi (2004), "The Causality Issue in the Finance and Growth Nexus: Empirical Evidence from Middle East and North African Countries", *Review of Middle East Economics and Finance*, Vol. 2, pp. 123-138.

Cecchetti, S. and E. Kharroubi (2012), "Reassessing the Impact of Finance on Growth", mimeo, BIS.

Chinn, Menzie and Ito Hiro (2002), "Capital Account Liberalization, Institutions and Financial Development: Cross Country Evidence", NBER Working Paper No. 8967. National Bureau of Economic Research, Cambridge, MA.

Chinn, M. and H. Ito (2008), "A New Measure of Financial Openness", *Journal of Comparative Policy Analysis*, Vol. 10, Issue 3, pp. 309–322.

Christopoulos, D.K. and E.G. Tsionas (2004), "Financial Development and Economic Growth: Evidence from Panel Unit Root and Cointegration Tests", *Journal of Development Economics*, Vol. 73, pp. 55-74.

Demetriades, P. and K. Hussein (1996), "Does Financial Development Cause Economic Growth? Time Series Evidence from 16 Countries", *Journal of Development Economics*, Vol. 51, pp. 387-411.

Ghali, K.H. (1999), "Financial development and economic growth: The Tunisian experience", *Review of Development Economics*, Vol. 3, No. 3, pp. 310-322.

Goldsmith, R.W. (1969), *Financial Structure and Development*, New Haven, CT: Yale University Press.

Hasan, I., M. Koetter and M. Wedow (2009), "Regional growth and finance in Europe: Is there a quality effect of bank efficiency?", *Journal of Banking and Finance*, Vol. 33, No. 8, pp. 1446-1453.

Hicks, J. (1969), *A Theory of Economic History*, Oxford: Clarendon Press.

Kar, M. and E.J. Pentecost (2000), "Financial Development and Economic Growth in Turkey: Further Evidence on the Causality Issue", Economic Research Paper No. 00/27, Loughborough University.

Kar, M., S. Nazlioglu and H. Agir (2011), "Financial development and economic growth nexus in the MENA countries: Bootstrap panel granger causality analysis", *Economic* Modelling, Vol. 28, Nos. 1-2, pp. 685-693.

King, R.G. and R. Levine (1993), "Finance and Growth: Schumpeter Might Be Right", *Quarterly Journal of Economics*, Vol. 108, pp. 717-738.

Koetter, M. and M. Wedow (2010), "Finance and growth in a bank-based economy: Is it quantity or quality that matters?", *Journal of International Money and Finance*, Vol. 29, pp. 1529-1545.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R.W. Vishny (1998), "Law and Finance", *Journal of Political Economy*, Vol. 106, pp. 1113-1155.

La Porta, R., F. Lopez-de-Silanes and A. Shleifer (2002), "Government Ownership of Commercial Banks", *Journal of Finance*, Vol. 57, pp. 265-301.

Levine, R. (1998), "The Legal Environment, Banks, and Long-Run Economic Growth", *Journal of Money, Credit and Banking*, Vol. 30, pp. 596-613.

Levine, R. (1999), "Law, Finance, and Economic Growth", *Journal of Financial Intermediation*, Vol. 8, pp. 36-67.

Levine, R. and S. Zervos (1998), "Stock Markets, Banks, and Economic Growth", *American Economic Review*, Vol. 88, pp. 537-558.

Levine, R., N. Loayza and T. Beck (2000), "Financial intermediation and economic growth: Causes and causality", *Journal of Monetary* Economics, Vol. 46, pp. 31-77.

Levine, R. (2005), "Finance and Growth: Theory, Evidence, and Mechanisms", in P. Aghion and S. Durlauf (eds), *The Handbook of Economic Growth*, Amsterdam: North-Holland.

Loayza, N. and R. Ranciere (2002), "Financial Fragility, Financial Development, and Growth", World Bank, Washington, D.C., mimeo.

Lucas, R.E. (1988), "On the Mechanics of Economic Development", *Journal of Monetary Economics*, Vol. 22, No. 1, pp. 3-42.

Miller, M.H. (1998), "Financial Markets and Economic Growth", *Journal of Applied Corporate Finance*, Vol. 11, pp. 8-14.

Rioja, F. and N. Valev (2004a), "Finance and the Sources of Growth at Various Stages of Economic Development", *Economic Inquiry*, Vol. 42, pp. 27-40.

Rioja, F. and N. Valev (2004b), "Does One Size Fit All?: A Reexamination of the Finance and Growth Relationship", *Journal of Development Economics*, Vol. 74, No. 2, pp. 429-447.

Robinson, J. (1952), "The Generalization of the General Theory", in *The Rate of Interest and Other Essays*, London: MacMillan.

Rousseau, P.L. and P. Wachtel (1998), "Financial Intermediation and Economic Performance: Historical Evidence from Five Industrial Countries", *Journal of Money, Credit and Banking*, Vol. 30, pp. 657-678.

Rousseau, P.L. and P. Wachtel (2000), "Equity Markets and Growth: Cross-Country Evidence on Timing and Outcomes, 1980-1995", *Journal of Business and Finance*, Vol. 24, pp. 1933 1957.

Schumpeter, J.A. (1912), *Theorie der Wirtschaftlichen Entwicklung*, Leipzig: Dunker & Humblot, [The Theory of Economic Development, 1912, translated by R. Opie, Cambridge, MA: Harvard University Press, 1934.]

About MEDPRO

MEDPRO – Mediterranean Prospects – is a consortium of 17 highly reputed institutions from throughout the Mediterranean funded under the EU's 7th Framework Programme and coordinated by the Centre for European Policy Studies based in Brussels. At its core, MEDPRO explores the key challenges facing the countries in the Southern Mediterranean region in the coming decades. Towards this end, MEDPRO will undertake a prospective analysis, building on scenarios for regional integration and cooperation with the EU up to 2030 and on various impact assessments. A multi-disciplinary approach is taken to the research, which is organised into seven fields of study: geopolitics and governance; demography, health and ageing; management of environment and natural resources; energy and climate change mitigation; economic integration, trade, investment and sectoral analyses; financial services and capital markets; human capital, social protection, inequality and migration. By carrying out this work, MEDPRO aims to deliver a sound scientific underpinning for future policy decisions at both domestic and EU levels.

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