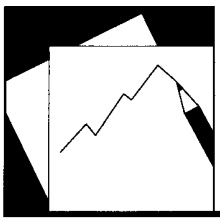
WP/13/130



IMF Working Paper

The Finance and Growth Nexus Re-Examined: Do All Countries Benefit Equally?

Adolfo Barajas, Ralph Chami, and Seyed Reza Yousefi

INTERNATIONAL MONETARY FUND

 WP/13/130

IMF Working Paper

Middle East and Central Asia Department and Institute for Capacity Development

The Finance and Growth Nexus Re-Examined: Do All Countries Benefit Equally?

Prepared by Adolfo Barajas, Ralph Chami, and Seyed Reza Yousefi[1]

Authorized for distribution by Ralph Chami

May 2013

Abstract

A large theoretical and empirical literature has focused on the impact of financial deepening on economic growth throughout the world. This paper contributes to the literature by investigating whether this impact differs across regions, income levels, and types of economy. Using a rich dataset for 150 countries for the period 1975–2005, dynamic panel estimation results suggest that the beneficial effect of financial deepening on economic growth in fact displays measurable heterogeneity; it is generally smaller in oil exporting countries; in certain regions, such as the Middle East and North Africa (MENA); and in lower-income countries. Further analysis suggests that these differences might be driven by regulatory/supervisory characteristics and related to differences in the ability to provide widespread access to financial services.

JEL Classification Numbers: G2, O0, O4, O5, O53

Keywords: Growth, Financial Development, Inclusive Growth, Financial Access

Authors' E-Mail Addresses: abarajas@imf.org; rchami@imf.org; s.reza.y@gmail.com

[1] The authors thank Camelia Minioiu, Romain Ranciere, Ratna Sahay, Era Dabla-Norris, Thorsten Beck, Javier Albarracín Corredor, and seminar participants at the Middle East and Central Asian Department and at the joint IMF, World Bank, CFSP, and DFID Conference on "Financial Deepening, Macro-Stability, and Growth in Developing Countries" for very helpful comments on previous drafts. The working paper is part of a research project on macroeconomic policy in low-income countries supported by the United Kingdom's Department for International Development (DFID).

Contents **Page**

I. INTRODUCTION

It is well established that a vibrant, dynamic, and well-functioning financial sector leads to a host of improved economic outcomes. As surveyed first by Levine (1997a), then by Demirguc-Kunt and Levine (2008, 2009), there is a vast literature showing the benefits that accrue to countries in which financial development is greater. On the theoretical side, early work by McKinnon (1973) and Goldsmith (1969), among others, highlighted the key role in economic development that could be played by a banking system free of the types of controls on interest rates and quantities that were prevalent at the time. As the literature progressed, it began to recognize that the financial system in general—not exclusively banks—performed four basic functions essential to economic development and growth: mobilization of savings, allocation of resources to productive uses, facilitating transactions and risk management, and exerting corporate control. Through these functions, a country providing an environment conducive to greater financial development would have higher growth rates, with much of the effect coming through greater productivity rather than a higher overall rate of investment.

The empirical literature progressed in tandem, providing widespread evidence that financial depth—the extent to which an economy is making use of bank intermediation and financial market activity—is associated with higher rates of economic growth. In order to measure financial depth, several indicators have been used. For the banking sector, the ratio of liquid liabilities to GDP, or M2 to GDP, and of private sector credit to GDP. For stock market activity, market capitalization to GDP, the ratio of value of shares traded either to GDP or total capitalization—both measures of the *turnover* of market activity—have also been used.

Several different econometric methodologies have been employed to uncover this finance and growth nexus.[2] Early studies such as King and Levine (1993) and Levine and Zervos (1998) used a cross-country regression—the former focusing on bank-based measures, and the latter on market-based ones—and controlled for other possible growth determinants and the Solow-Swan convergence effect. To deal with potential reverse causality—that some degree of financial development might possibly be induced by a greater demand for financial services as economies become richer—some studies have regressed growth rates over a relatively long period on *initial values* of financial depth. Later studies by Levine (1998) and Levine, Loayza and Beck (2000) use instrumental variable techniques to address the endogeneity issue in a panel data setting. Finally, other studies have used dynamic panel methodologies. Beck, Levine and Loayza (2000),

[2] See Levine (2004).

Rousseau and Wachtel (2000), and Beck and Levine (2004) rely on GMM estimators to trace the effect of financial development in markets and banks on economic growth.

For the most part, the empirical studies on the determinants of growth have provided a single coefficient for all countries. However, there has also been increasing interest in examining possible sources of cross-country heterogeneity in these relationships. Khan and Senhadji (2000) and Khan, Senhadji and Smith (2001) use a wide sample of countries and find heterogeneity related to financial depth and inflation. The first paper finds threshold levels for inflation in industrial and developing countries above which inflation significantly slows growth, while the second one uncovers a threshold above which inflation impedes financial deepening. More recently, Arcand, Berkes, and Panizza (2011) detect a nonlinear growth impact of banking depth, finding that it becomes progressively weaker as depth increases to very high levels. Eventually, when private sector credit exceeds 110 percent of GDP, the marginal effect of additional deepening on economic activity becomes negative, both at the economy and industry level.

Another type of heterogeneity could arise from a finance-related "resource curse," whereby growth underperformance by natural resource exporters would be partly explained by financial sector underperformance. The resource curse generally refers to negative externalities from the predominant resource-exporting sector to the rest of the economy, operating through either the real exchange rate channel (the Dutch Disease phenomenon), through poor fiscal discipline, or as a result of political economy effects that lead to weak institutions and greater prevalence of corruption and violence.[3] Two recent studies described below go beyond these channels to examine the possible role played by the financial sector in resource-based economies, either ameliorating or contributing to the curse.

Nili and Rastad (2007) investigate a puzzle: the very low growth rates experienced by oil exporters over a 30-year period even while their investment rates are higher on average than in oil importing countries. The authors find that finance helps to explain the puzzle in two ways: oil exporters tend to exhibit lower financial depth, and the positive impact of their financial depth on aggregate investment—and presumably on growth—is substantially weaker than in non-oil exporting economies. Beck (2011) analyzes the case of resource-based economies in general, exploring whether there is a financial channel to the resource curse. He finds that, although the aggregate growth impact of banking depth

[3] For example, Klein (2010) studies a group of 23 oil-exporting countries during 1985–2008 and finds a significant negative impact of oil sector shocks on the non-oil sector in the countries with high oil intensity, and attributes this relationship to factors other than the traditional Dutch Disease channel operating through real exchange rate appreciation.

is no different for resource-based economies, both private credit and stock market activity tend to be weaker, and access to credit for businesses is more limited in resource-based economies. There is evidence that banks in these countries are more profitable—possibly reflecting lower competition—but are not as engaged in intermediating funds to the private sector.

In this paper we explore three dimensions of possible heterogeneity in the finance-growth nexus: across regions, between oil and non-oil exporters, and across income levels. Our dataset encompasses the 1975–2005 period and takes non-overlapping five-year averages of all variables to smooth out short-term fluctuations in growth rates and to reduce the potential bias arising from having a large number of time observations in dynamic panel estimation. The sample includes up to 146 countries included in some regressions, grouped by income level according to the IMF classification, and by oil and non-oil exporters depending on the share of oil in total GDP, which is also included in some regressions as the measure of oil dependence.

We find that, across regions, in Middle East and North Africa (MENA) countries banking sector depth produces a lower growth impact than in the rest of the world, while in Europe and Central Asia the impact is greater. This provides an additional explanatory factor underlying the well-documented sub-par growth performance of the MENA region. For example, during 1975–2005, its real per capita GDP grew by an average 0.4 percent per year, compared to 2.4 percent for Emerging and Developing Countries (EDCs) on average, 5 percent in developing Asia, 1.1 percent in Latin America and the Caribbean, and 2.3 percent in Central and Eastern Europe (Figure 1). Previous studies have examined MENA growth underperformance and have linked it to such factors as shortfalls in institutional quality and ease of doing business, excessive government consumption, and in the case of oil importers, to lack of trade openness.[4] One study, by Bhattacharya and Wolde (2010) identified the lack of access to credit as one factor driving growth differentials between MENA and other regions, along with a shortage of labor skills and of adequate supply of electricity.[5] However, no other study had examined systematically whether the conventional positive link between finance and growth varies across regions, thereby at least partly explaining MENA's disappointing growth

[4] For example, Hakura (2004) examines MENA growth performance over 1980-2000 and Guillaume and Rasmussen (2011) focus on the MENA oil importers during the 1990-2008 period. Both use cross-country OLS regression analysis.

[5] All three variables are derived from the World Bank Enterprise Surveys, in which firms are asked whether different factors are considered a major constraint to their expansion: access to credit and/or lack of appropriate labor skills or of electricity supply.

performance. Our results also suggest that the underperformance of the MENA region, termed a "quality gap" in financial intermediation, could be related to strong state ownership, lack of competition, and lack of progress in financial reform.

We also find that the growth impact of banking depth is weaker for oil exporters in general, and is progressively weaker as the degree of oil dependence increases. However, there is evidence that growth impact of stock market depth may actually be *higher* in oil-exporting countries.

Finally, we find that, indeed, the finance-growth nexus is weaker for Low Income Countries (LICs) as a group, and that it increases continuously with income level. In particular, the estimated growth impact of the credit-GDP ratio is about half as large for LICs relative to other countries with similar depth, and appears to be actually negative at the lowest income levels, becoming significantly positive at about the 73rd percentile of income per capita for LICs in 2008. Other country characteristics appear to influence these effects as well; as is the case for the full sample of countries, oil-exporting LICs derive weaker growth from banking depth but possibly higher growth from stock market depth. Estimations show that LICs with higher-quality supervision or those that are more open to international trade fare relatively better than the rest. While by no means conclusive, we also present supporting data showing that financial access and some regulatory aspects regarding ease of entry may be related to the identified quality gap experienced by LICs. Thus, the policy message should be more nuanced for LICs: while greater depth in undoubtedly desirable, the challenge is to engender high-quality deepening that facilitates greater access, competition, and with proper supervision in place.

This effect, of course, exacerbates the fact that LICs suffer from shallow financial systems. For example, in 2008 the average LIC had a ratio of private credit to GDP of just over 24 percent, compared to 47 percent for Middle Income Countries (MICs) and 110 percent for High Income Countries (HICs). Similarly, LICs had ratios of stock market capitalization to GDP of 23 percent, substantially lower than the levels of 73 percent for MICs and 130 percent for HICs in the same year. What the growth regression results imply is that these countries may also lack the supporting legal, institutional, regulatory or supervisory infrastructure that would allow the greatest benefit to accrue from their existing levels of financial depth. Lack of competition and efficiency, both in the financial and real sectors, could play a part in weakening the growth impact as well.

The organization of the paper is as follows. Section II provides a description of the data and some noteworthy stylized facts; Section III outlines the econometric methodologies used and Section IV presents the main results; Section V concludes and offers some

plausible factors that might be driving the observed heterogeneity in the finance-growth relationship.

II. DATA

A. Datasets

The data used in this study is composed of three datasets that provide annual country-specific observations from 1975 to 2005. The measures of financial development are provided by the Financial Structure Database constructed by World Bank. Standard financial depth indicators were employed: *private credit* and *turnover*. *Private credit* measures the ratio of private credit by deposit money banks to GDP and *turnover* is the ratio of the value of total shares traded to average real market capitalization.[6]

Some variables, such as non-oil GDP, total GDP, and population were obtained from the World Economic Outlook (WEO) April 2010 published database. WEO includes data from IMF staff's projections and evaluations of economic development of all the member countries. In many cases this data was supplemented with series obtained directly from IMF desk economists on real non-oil GDP for oil-exporting countries.

The third database comes from the World Bank open source data. Total real per capita GDP of countries are extracted from this dataset to calculate the growth rate of countries as well as to use the initial levels of GDP in the regressions to control for the convergence effect. The values are in constant 2000 US dollars. Other variables include the percentage of gross secondary school enrollment to reflect human capital, and the ratio of FDI to GDP.

B. Stylized Facts

A list of the variables as well as their corresponding summary statistics is available in Table 1 for the full sample of countries, in Table 2 for the oil exporters, and in Table 3 for the regional and income-level groupings. Table 4 displays the results of tests for differences in means between: non-oil exporters and oil-exporters (first column), the Middle East and North Africa and all other countries (second column), LICs and all other countries (third column), and LICs and high-income countries (fourth column). Finally, Table 5 shows the correlations among the main variables. The list of countries is

[6] For robustness, other financial depth indicators were also used: the ratio of bank deposits or liquid liabilities to GDP, and the ratio of stock market capitalization to GDP. However, here we only report the regression results including *private credit* and *turnover*, the two variables that have shown the most robust relationship with economic growth in the literature.

available in Appendix I, which also indicates which countries are oil exporters, as well as the country income group and regional classification.[7] *Oildep* measures the degree of oil dependence, and is defined as the ratio of non-oil GDP to total GDP, both in real terms. The statistics confirm the Nili-Rastad finding that oil exporters have shallower banking systems on average, as measured by the ratios of deposits and private credit to GDP (Nili and Rastad, 2007). They also have significantly lower average growth rates—of both oil and non-oil GDP—than non-oil exporters.

The means tests also reveal that LICs are at a disadvantage in virtually every dimension with the exception of FDI. Financial depth is significantly lower compared to the average across all other countries, as is the level of secondary enrollment and the growth rate.

As for cross-region differences, over the entire study period the MENA region does not exhibit lower levels of secondary enrollment or FDI compared to other regions—the p-values of the tests of differences in means are all well above 10 percent—however, its growth performance has been significantly weaker (Figure 1). Moreover, the MENA countries on average do not appear to be particularly lacking in financial depth; average levels of bank deposits, private sector credit, or stock market turnover are not significantly different from those in the rest of the world. In fact, in 2008 the average private credit-GDP ratio for the region was, at 45 percent, higher than the emerging economy average of 38 percent, although well short of the 118 percent level typically observed in high-income countries (Figure 2a). Stock markets in MENA countries also appear to be relatively deep, with a turnover ratio of just under 40 percent in comparison to a world average of 54 percent and an EDC average of 40 percent.

However, three main qualifications should be made. First, there is considerable heterogeneity within the Middle East and North Africa. One way to see this is by slicing this region further, into a "Mediterranean Associated Countries," or MEDA subregion, and the rest, which are primarily oil-exporting economies and several of which are also in the high-income GCC grouping.[8] While the two subregions exhibit very similar levels of

[7] We generally followed the World Bank regional classification, but with one notable exception: GCC countries, which are classified by the World Bank in the high-income non-OECD category, are classified here together with the low and middle-income MENA countries. In this manner, the MENA category encompasses all countries in the region, both GCC and non-GCC.

[8] The MEDA group is comprised of Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, and the West Bank and Gaza, while the rest of the region, or non-MEDA includes the GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates), as well Djibouti, Iran, Iraq, Mauritania, and Sudan. Note that, due to data limitations, not all of the countries listed here will be included the regressions. Another subdivision used is between the six GCC and the remaining, non-GCC countries.

private credit, the MEDA group is visibly lagging in stock market depth, with a turnover of about half than that observed in the rest of the MENA region. On a country by country level, Bahrain, Jordan, Lebanon, Morocco, Tunisia, and the United Arab Emirates exhibit markedly deeper banking systems, with depth well above 50 percent of GDP, while others, such as Algeria, Libya and Syria, register depth below 15 percent of GDP (Figure 2b). With regard to equity markets, some GCC countries stand out as having a high level of activity—in particular, Saudi Arabia, with a turnover ratio of more than 130 percent—while Jordan, Egypt and Morocco are at about 30 percent, with the rest of the countries well below the EDC average.

The second qualification is that trends in bank deepening over time are not very encouraging for a number of MENA countries. Although the region on average deepened substantially from 1970 to 2008, the MEDA subregion stalled noticeably after 2005, losing about three percentage points of GDP. At the same time, other regions such as Europe and Central Asia were able to gain ground much more rapidly, gaining close to 20 percentage points of GDP (Figure 3). Although banking systems in other regions may have engaged in unsustainably high rates of bank lending in the run-up to the global financial crisis, the downward movement in MEDA should be cause for some concern, at the very least to merit further study to identify factors underlying this credit slowdown.

Third, MENA countries rank lowest in terms of converting bank deposits into private sector credit. For the average MENA banking system in 2008, credit represented 69 percent of bank deposits, as opposed to 90 percent for the average EDC (Figure 4). In particular, the bulk of the MEDA countries fall short; on average only about half of bank deposits were converted into loans to the private sector in 2008. Furthermore, over three decades the ratio has fallen more rapidly in the MEDA countries than anywhere else, and has continued to fall over the past decade, while beginning to recover in other regions (Figure 4). Thus, in these countries there is substantial untapped potential in the form of deposits that could be channeled into productive activities.

III. EMPIRICAL METHODOLOGY

The empirical objective is to obtain efficient, unbiased, and consistent estimates of the effect of financial development on growth. The general regression model used in most studies, as well as in this paper, can be summarized as:

$$g_{it} = \alpha + \beta f_{it} + \gamma X_{it} + \delta y_{i,t-1} + c_i + \mu_t + \epsilon_{it} \qquad (1)$$

where $y_{i,t}$ is the GDP per capita of country i in period t and g_{it} is the growth rate of GDP per capita in the same period. The focus of the studies is on estimating β which indicates

the effect of financial development, denoted by f_i, on growth. The convergence effect is denoted by δ, as lagged income, $y_{i,t-1}$(or initial income $y_{i,t0}$ in some cases) is expected to have a negative effect on growth rate. X_{it} is the set of control variables: as in Beck and Levine (2004), these include FDI and gross secondary school enrollment. Furthermore, the specification includes c_i, denoting unobserved country-specific time-invariant variable, and μ_t, the time dummy variable in period t to capture common shocks affecting all countries simultaneously. Finally, ϵ_{it} is the error term, a white noise error with mean zero.

This paper focuses on the GMM dynamic panel methodology to present econometric estimates of β, given that the OLS estimator suffers from two deficiencies. First, because of (unobserved) omitted variables that may be correlated with the included covariates and drive economic growth at the same time, OLS estimates might be biased. This arises from the possible correlation of the lagged or initial value of the dependent variable with the error term, i.e., $E[y_{i,t-1}(\mu_i + \epsilon_{it})] \neq 0$ or $E[y_{i0}(\mu_i+\epsilon_{it})] \neq 0$, depending on which version of initial income is used in the regression. Second, the OLS method does not control for other sources of endogeneity such as reverse causality. Some instrumental variable estimations, such those in La Porta et al. (1998) use legal origin dummies as instruments for financial depth, but these require OLS to be applied purely at the cross-section level.

If one wishes to take advantage of time variation in the data and adopts the plausible assumption that the explanatory variables in the regression are weakly exogenous—they are affected only by the present and past levels of economic growth and uncorrelated with future innovations in growth—then the GMM dynamic panel methodology proposed by Arellano and Bover (1995) and Blundell and Bond (1998) provides unbiased estimators for the coefficients of interest. The method combines a regression in levels and a regression in differences. One must be careful to apply it to cases in which the number of periods is small relative to the number of cross-sectional observations, otherwise asymptotic imprecision and biases may arise.[9] For this reason, and to smooth out cyclical variations in growth, this method is applied to non-overlapping five-year averages of the variables. Using 25 years of observations for 150 countries, the averaging produces five 5-year periods for each country, thus the number of time observations is very small relative to the number of countries.

[9] As noted by Roodman (2009a), a rule of thumb for avoiding over-identification of instruments is that the number of instruments be less than or equal to the number of groups in the regressions.

By first-differencing equation (1) we obtain the following equation which eliminates country-specific variables, thus avoiding the potential omitted variable bias caused by time-invariant heterogeneity:

$$\Delta g_{it} = \beta_i \Delta f_{it} + \gamma \Delta X_{it} + \delta \Delta y_{i,t-1} + \Delta \lambda_t + \Delta \epsilon_{it} \quad (2)$$

where $\Delta r_{it} = r_{it} - r_{i,t-1}$ for a given variable *r*. Although this differenced equation eliminates unobserved country-specific variables, it introduces a new correlation between the difference of lagged values of initial income and the error term (because of the correlation between $\epsilon_{i,t-1}$ in the differenced error term and the covariates). Using the weak exogeneity assumption, Arellano and Bond (1991) propose that lagged values of the weakly exogenous (predetermined) and exogenous variables be used as instruments to the differenced equation:

$$E\left[f_{i,t-s}\Delta\epsilon_{it}\right] = E\left[X_{i,t-s}\Delta\epsilon_{it}\right] = E\left[y_{i,t-s}\Delta\epsilon_{it}\right] = 0$$

$$\forall t \geq 3, s \geq 2 \; for \; weakly \; exogenous \; and \; s \geq 1 \; for \; exogenous \; variables$$

Furthermore, the Arellano and Bover method employs additional moments to be used in the GMM estimation. These are obtained from the equation for regression in levels, equation (1), using the intuition that lagged differences of the covariates are valid instruments for the regression in levels and are uncorrelated with the error term under the assumption that the correlations between the country specific term, c_i, and the covariates are constant over time. For example, the lagged difference of financial development, the control variables, and lagged income, are uncorrelated with the error term and the fixed effects in equation (1), i.e.:

$$E\left[\Delta f_{i,t-s}(c_i + \epsilon_{it})\right] = E\left[\Delta X_{i,t-s}(c_i + \epsilon_{it})\right] = E\left[\Delta y_{i,t-s}(c_i + \epsilon_{it})\right] = 0 \; \forall t \geq 3, s = 2$$

Stacking all the moment conditions from the difference and level equations, a two-step GMM estimation is performed. In the first stage, it is assumed that the errors are homoskedastic and independent. The second stage takes the estimates of the variance-covariance matrix and performs a similar estimation to obtain final estimates under the assumption that the error terms are not necessarily homoskedastic and independent.[10]

[10] We use the "xtabond2" command in STATA. Option h(2) is used in all regressions to control for the heteroskedasticity of the errors in the estimation of the variance-covariance matrix. Also, two lags of the covariates are used in all regressions to construct internal instrumental variables. Finally, standard errors are clustered at the country level by use of the **robust** option with xtabond2, as explained by Roodman (2009b).

The empirical model in this paper extends the conventional finance-growth equation to include an interaction term (*Interact*) between financial depth and one of three alternatives: (i) dummy variables to capture regional effects: Europe and Central Asia, MENA (or, alternatively, with MEDA or GCC subgroupings), South Asia, East Asia and Pacific, Sub-Saharan Africa, Latin America and the Caribbean, and the rest of the world (high-income countries);[11] (ii) a dummy variable for oil exporters, *Oilexp*, as in Nili and Rastad (2007); and (iii) the degree of oil dependence, *Oildep*, measured as the share of hydrocarbons in total GDP. In contrast to *Oilexp*, this variable varies over time as well as across countries.

$$g_{it} = \alpha + \beta f_{it} + \kappa\, Interact_i \times f_{it} + \gamma X_{it} + \delta y_{i,t-1} + c_i + \mu_t + \epsilon_{it} \quad (3)$$

We use a similar set of control variables X_i as in Beck and Levine (2004): secondary school enrollment ("education") to control for the effect of the level of human capital, and FDI as a percentage of GDP.[12] All *X* variables are computed as the logarithm of their mean values over each five year period. κ measures the possible heterogeneity across groups of countries in the effect of financial development on economic growth. Finally, regressions are run with either total real GDP per capita or real non-oil GDP per capita as dependent variables.

The present paper introduces the following methodological and data improvements over previous studies: (i) in contrast to the Beck's (2011) analysis of resource-rich economies, it uses a dynamic panel method (as in Nili and Rastad, 2007) rather than cross-country regressions to uncover differences for oil exporters; (ii) in contrast to the Nili and Rastad study of oil exporters, it uses a longer and more updated sample (1975–2005 vs. 1992–2001) and takes non-overlapping five-year averages of all variables, rather than annual observations; (iii) also in contrast to Nili and Rastad, it includes a more comprehensive country sample, with up to 146 countries included in some regressions. In particular, the sample of oil exporters has been expanded,[13] and they are captured in the regressions not

[11] These dummy variables are defined according to the World Bank regional classifications for low- and middle-income countries, with one exception: the six countries of the Gulf Cooperation Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) are classified here as MENA countries, whereas the World Bank classifies them as high-income countries.

[12] Here we report only the specifications including private credit as the banking depth variable and stock market turnover as the market depth variable. The main results of other specifications are essentially the same, and are available from the authors upon request.

[13] Nili and Rastad (2007) include only twelve countries as oil exporters. This paper expands the sample to include 30 oil exporters, some of which Nili and Rastad had incorrectly classified as non-oil countries.

only through a dummy variable, but also in terms of a continuous variable measuring the degree of dependence on oil (as in Beck's measures of resource dependence); (iv) in contrast to both of the above studies, it runs regressions for *non-oil* GDP in addition to total GDP growth. As economic diversification is a major issue for oil-dependent economies, the impact finance has on the long-run performance of the non-oil sector is of paramount importance; and (v) also in contrast to both studies, it not only examines the impact of the banking sector, but also that of stock market activity.

IV. Regression Results

A. Banking depth

The results of the system GMM estimator for the relationship between banking sector depth—as measured by the private credit-GDP ratio—and growth are shown in Tables 6–8. Specifically, we examine heterogeneity in this relationship across regions (Table 6), between oil exporters and other countries (Table 7), and across income levels (Table 8). In the first two cases, we run regressions for growth in non-oil as well as total per capita real GDP. In Table 6, the first and fifth columns present the baseline specification commonly used in the literature (such as in Beck and Levine (2004) or Beck (2008)), with one key modification: we also account for the possible effect of financial crises on the finance-growth relationship. As shown by Rousseau and Wachtel (2011), the empirical link between finance and growth weakens considerably once post-1990 data are introduced, primarily as a result of the proliferation of financial crises and their adverse effects on economic activity. Indeed, using the Laeven and Valencia (2012) definition of systemic banking crises, about 60 percent of all such episodes experienced during the 1970–2007 period occurred in the 1990s. Furthermore, to the extent that the incidence of crises varies across countries, accounting for these episodes is also crucial to disentangle cross-country differences in the growth impact of financial deepening.[14] Across all specifications, financial crises reduce the growth impact of private credit by about one-half.

[14] The Middle East and North African countries have had a particularly low incidence of these episodes: over the 1970–2010 period, systemic banking crises arose about 13 percent of the time, compared to 23 percent on average for emerging and developing economies. Furthermore, during 2000–10, while this frequency spiked at 60 percent for OECD countries, the MENA region managed to avoid these episodes altogether.

The second and sixth columns in Table 6 report the previous results interacting private credit with the region dummy variables,[15] showing that the growth effects are lower for the MENA region, as well as for Latin America and the Caribbean. With regard to total GDP growth, the results indicate that the same level of banking depth in the MENA region produces growth effects that are about one-third smaller than in other regions. When non-oil growth is considered, the MENA region appears to fare even worse, with a growth impact about one-half that of the rest of the world. In addition, there is evidence that Europe and Central Asia obtain relatively greater growth benefits benefit from private credit. Note that, by controlling for financial crises, the estimated heterogeneity refers to growth effects across regions *during normal times*.

Owing to the aforementioned heterogeneity within MENA, columns (3), (4), (7), and (8) introduce regional dummies once again, but distinguish further within MENA, following two alternative subgroupings: Mediterranean-Associated countries vs. the rest; and GCC vs. the rest. The results suggest that the GCC countries behave similarly to high-income countries;[16] the coefficient on the interaction term between private credit and the GCC dummy is not statistically significantly different from zero. Furthermore, when the GCC countries are combined with a set of non-Mediterranean countries, the results are similar; the MEDA interaction coefficient with private credit is negative and significant, whereas the corresponding coefficient for other MENA countries is not statistically significant.[17] Finally, once the GCC countries are accounted for separately, the interaction term for the Latin America and Caribbean region no longer becomes significant. That is, this region behaves relatively similarly to the full set of high-income countries.

In the lower portion of Tables 6–8 we report results of the Arellano-Bond test for autocorrelation and the Hansen test for over-identifying restrictions. The existence of autocorrelation would indicate that lags of the covariates used as instruments are actually endogenous, and therefore, not good instruments for the regressions. The test for

[15] Since the regional classification is applied to emerging and developing countries only, the null hypothesis being tested is that the coefficient on private credit in each region is equal to that in high-income countries. Therefore, significance of the coefficient of a given dummy variable indicates that, in the corresponding region, the growth impact of private credit is significantly different from that in a high-income country.

[16] Recall that in the conventional classification, the GCC countries are in fact classified as high-income countries.

[17] A similar, and somewhat stronger, result occurs when distinguishing between the GCC and all non-GCC countries in the region, that is, MEDA plus Iran, Iraq, Sudan, and Yemen. The interaction coefficient for the GCC is not significant, while that of the non-GCC is negative and highly significant.

autocorrelation, essentially an $AR(2)$ test,[18] yields no evidence of significant autocorrelation among the set of instruments. The Hansen test checks the correlation between the residuals and exogenous variables to assess the validity of instruments.[19] The results for our regressions indicate that the null hypothesis that the instruments are exogenous cannot be rejected.

In quantitative terms, the estimation results imply that the differences in growth potential across regions are not only statistically significant, but economically meaningful as well. Figure 5 shows the estimated impact on long-term total GDP growth from increasing banking sector depth. As one would expect from a log specification, greater growth benefits accrue to countries that begin their deepening from a lower initial level. In Figure 5a, countries are shown in which the current ratio of private credit to GDP is below the EDC, and therefore the figure depicts the estimated increase in growth rate obtained if each country were to reach the EDC average. Relative to countries outside the region, MENA countries would obtain a smaller increase in growth, with the difference amounting to a "quality effect" of their financial depth. For example, if Algeria were to increase its current depth from an initial level of 10 percent to the EDC average of 29 percent, its growth rate is estimated to increase by 112 basis points. However, a non-MENA country starting from the same initial depth could expect to increase its growth rate by 163 basis points, thus resulting in a quality effect of 51 basis points. Several non-MENA countries are shown for comparison purposes. For example, Armenia, which would obtain a full benefit of 160 basis points if it were to reach the EDC average depth. Figure 5a shows a group of MENA countries with initial depth above the EDC average, therefore the Figure displays the gains that would result from increasing depth by 20 percentage points of GDP, roughly the increase observed in high-income countries from 1995 to 2005. As before, for each MENA country there is the predicted effect and that which would accrue to a non-MENA country, with the difference corresponding to a quality effect.

[18] The test is applied to the differenced residuals. As expected, we observe first degree correlation in differences, $AR(1)$, for all the regressions. This is because by construction $\Delta\epsilon_{it} = \epsilon_{i,t} - \epsilon_{i,t-1}$ should be correlated with $\Delta\epsilon_{i,t-1} = \epsilon_{i,t-1} - \epsilon_{i,t-2}$, as both include the $\epsilon_{i,t-1}$ term. To test for correlation between $\epsilon_{i,t-1}$ and $\epsilon_{i,t-2}$, we should check for the second degree correlation, $AR(2)$, in differences - since the former error term appears only in $\Delta\epsilon_{it}$ and the latter is present in $\Delta\epsilon_{i,t-2}$.

[19] Since the number of moment conditions is greater than the number of parameters to be estimated, the model is over-identified. Therefore, the test checks for the joint validity of all instruments, Z, under the null, and evaluates $\mathrm{E}[\mathrm{Z}\epsilon_{it}]$ to examines if it is randomly distributed around zero.

Table 7 presents the results of regressions which distinguish oil exporters from the rest, confirming the Nili and Rastad finding that oil dependency weakens the finance-growth link, and thus providing evidence of a finance channel for the resource-curse. Oil exporters as a group obtain a smaller benefit from financial deepening, and the benefits fall continuously with the degree of oil dependence. Interestingly, both interaction terms are larger in absolute values in the regressions for non-oil GDP growth, thus indicating that banks in these countries have been particularly ineffective in generating productive activity outside the oil sector. Columns (3), (4), (7) and (8) present further interactions of private credit and *Oilexp* and *Oildep* with the GCC dummy. The results indicate that the GCC countries would tend to fare better in comparison to similarly oil-dependent countries outside the region. For example, Saudi Arabia—with an oil dependence of about 33 percent in 2005—would obtain a greater growth benefit from private credit than would a similarly oil-dependent country, such as Trinidad and Tobago. This result is consistent with the previous result that the growth benefits from banking depth in GCC countries are similar to those in high-income countries.

In Table 8 we summarize the findings on heterogeneity across income levels. There is evidence that LICs as a group obtain lower growth benefits from the same level of private credit, and that these benefits increase continuously with income level. Differentiating further, it is apparent that banking systems are more conducive to long-term growth in LICs which are more open to trade—as measured by the ratio of exports and imports to GDP[20]—and where bank supervision is of higher quality.[21] In addition, these two characteristics only appear to affect the growth benefits of private credit in LICs, as the interaction terms for non-LICs are not statistically significant.

In Figures 6–8 we show the magnitudes of the above effects; how the growth impacts of banking depth vary across income levels and with respect to openness and the quality of bank supervision. In Figure 6 we see that at very low income levels the growth impact is not statistically significant, and only becomes positive (at a 95 percent confidence level)

[20] We also tested for heterogeneity across income levels using the liquid liabilities-GDP and the deposits-GDP ratios. Although most results were similar, a significant mitigating effect of openness only arose in the case of private credit-GDP.

[21] The banking supervision variable is obtained from Abiad et al. (2010), and, as mentioned above, is scaled from 1 to 3. Its level depends on the degree to which the country has adopted risk-based capital adequacy ratios based on the Basel I Accord; the supervisor is independent from the executive and has sufficient legal powers; supervision covers a wide range of institutions; and on- and offsite examinations of banks are effective.

at a per capita income of $810, or roughly the 73rd percentile for LICs in 2008.[22] Figure 7 illustrates the mitigating effect of the quality of bank supervision; at low levels, LICs are at a clear disadvantage, but as this quality improves, the growth impact LICs begins to approximate that of middle and high-income countries. As of 2005, the average value of the bank supervision indicator for a sample of 18 LICs s indicator was 1.4, compared to 1.8 for middle-income countries and over 2.5 for high-income countries. Finally, in Figure 8 we show how the lower growth impact of private credit in LICs is mitigated by the degree of trade openness of these countries. LIC banking performance begins to approximate that of other countries once total trade approaches 56 percent of GDP, or at the 47th percentile for LICs in 2008.

B. Stock market activity

Tables 9–11 repeat the same exercises as in Tables 6–8, respectively, including a stock market-based, *Turnover*,[23] rather than a bank-based measure of financial development as the relevant explanatory variable. As in the case of private credit, we account for banking crises and find that the coefficient on stock market turnover is positive and significant in normal times, while crises have a significant negative impact on the coefficient. However, virtually none of the cross-region heterogeneity observed for banks is present in the regressions for stock market activity, aside from weak evidence of a slightly larger growth impact in Europe and Central Asia (Table 9). Thus, it appears that greater deepening should be expected to generate roughly the same benefits across. The same can be said for oil exporters; neither the interaction with the oil exporter dummy nor with the degree of oil dependence yield significant coefficients, although there is weak evidence that oil exporters outside of the GCC might derive greater growth benefits from stock market activity (Table 10, fourth column). Regarding differences across income levels, there is also evidence that LICs obtain less growth benefits from stock market activity, an effect which is mitigated by a having higher quality bank supervision (Table 11, fifth column).

[22] Note that this figure expresses the horizontal axis in log form (as estimated in the regressions), and therefore an exponential transformation is required to translate the thresholds from the plot into income levels. Also, the levels at which the marginal growth impact of financial depth becomes nonnegative and positive are evaluated using the 95 percent confidence bands as shown. These confidence bands were constructed using the Fieller method, as described in Hirschberg and Lye (2010).

[23] As in the case with banking sector depth, we ran alternative regressions (not reported here) using the ratio of stock market capitalization to GDP as the relevant market depth variable. The results are consistent with those using stock market turnover.

Figure 9 shows the magnitude of the potential gains across all regions from increasing stock market turnover by 20 percentage points, approximately equivalent to the deepening experienced by EDCs on average from 1995 to 2008. Starting at 10 percent, the gains are close to one-half of a percentage point, and decline to about one-fifth of a percentage point for countries starting at a turnover ratio of 30 percent.

V. CONCLUDING REMARKS

The positive impact of financial development on growth has been a robust empirical result in the literature for some time now. Different econometric methodologies have been developed by researchers to obtain unbiased estimates of the effect of finance on growth. This paper employs a commonly-used GMM dynamic panel methodology to investigate whether the strength of the estimated effect varies across countries.

We find that the finance-growth nexus is indeed heterogeneous across regions, income levels and between oil and non-oil exporters, and this heterogeneity arises primarily for the level of banking depth rather than for stock market activity. These general results thus give rise to another question: what specific factors drive this heterogeneity? What characteristics of banking systems might explain why some groups of countries derive greater growth benefits from the same level of activity?

Although by no means definitive, one possibility is that differences in access to financial services and in the degree of banking competition—which are not perfectly correlated with banking depth—might help to explain the heterogeneity. Figure 10 shows the performance of MENA countries relative to the EDC average and to sub-Saharan Africa, along the following dimensions: (i) banking depth, measured by private credit-GDP, (ii) use of banking services, measured by the number of bank depositors and borrowers as a share of the adult population; (iii) banking competition, measured by the H-statistic, estimated on an individual country basis by Anzoategui et al. (2010);[24] and (iv) access to banking services as reflected in enterprise surveys which ask whether firms perceive lack of financing to be a major impediment to firm growth; and (v) access measured by the percentage of surveyed firms that are receiving bank financing.

[24] The H-Statistic is an estimate of the responsiveness of bank output prices to changes in input prices. The closer the indicator is to unity, the more the price behavior resembles that of a perfectly competitive market, and therefore a higher level is interpreted as that of a more competitive market. See Anzoategui et al. (2010) for details.

The main message to draw from these comparisons is that in MENA countries the overall volume of bank credit—used in this paper as the basic measure of banking sector depth—is not matched by performance in providing access to a broad segment of households and firms, or in terms of competition or efficiency of the banking system. Therefore, it seems plausible that the "quality gap" observed from the regression results is related to deficiencies in providing access and generating competition. As discussed earlier, the average MENA country mobilizes a larger volume of private sector credit than does the average EDC, about 30 percent greater. However, outreach of banking services to the population is visibly inferior, about 20–30 percent lower, while the proportion of firms citing credit as a constraint is 10 percent higher, and the percentage of firms receiving bank financing is only four fifths of that in the average EDC. Furthermore, estimated competition in the banking system is 20 percent lower.[25]

The relative performance of MENA countries with respect to the most financially underdeveloped region, sub-Saharan Africa, is also illuminating. Despite the fact that MENA depth is over 2½ times the average in sub-Saharan Africa, outreach to borrowers is only twice as large, the share of firms indicating credit as a major constraint only 20 percent lower, and the percentage of surveyed firms receiving bank credit only 20 percent greater. Furthermore, average estimated competition in the banking system is virtually identical.

With this backdrop, the regression results show that MENA countries suffer from what is termed a "quality gap" in banking intermediation; for the same level of depth, the growth benefits are at most two-thirds of those obtained in other regions. As the regression results showed, this gap appears to be more pronounced for the non-GCC countries.

The finance-growth nexus tells us a similar story about LICs, with the added complication that they suffer from shallow financial systems as well. In fact, the differences in access to financial services between LICs and other countries are strikingly larger than the respective differences in depth. For example, while in 2008 banking depth in the average high-income country was 4½ times the level of the average LIC, access to bank branches and ATMs was over 50 times as great, the coverage of banking services (deposits and loans) among the population was about 7 times as great, and that of non-bank institutions was 6–9 times as great (Figure 11).

[25] Anzoategui et al. (2010) find that the difference in banking competition between the MENA and other regions is statistically significant.

Figure 12 summarizes the simple relationship between financial access, use of financial services, and financial depth, comparing across LICs vs. non-LICs, oil exporters vs. others, and MENA vs. other regions. While there is a visible positive cross-country relationship between depth and access, it is noticeable that the three groups that were identified as having subpar growth benefits from depth also tend to underperform in terms of access. For the same level of depth, LICs, those in the MENA region, and oil dependent economies have considerably fewer borrowers from commercial banks and fewer branches relative to other countries.

Differences in bank ownership may also play a role. As Figure 13 shows, many countries in the MENA region are characterized by a relatively high share of state banks and/or a relatively small share of foreign-owned banks. However, there is also considerable heterogeneity within this group of countries. On one extreme, Algeria, Libya and Syria have a dominant role played by state banks—in 2008, the asset shares approached 100 percent in the first two, and about 70 percent in the latter—and essentially no entry of foreign banks. At the other extreme, Lebanon and Jordan have zero state bank participation, while having permitted substantial foreign bank penetration. The remaining countries lie somewhere in between, with state bank participation that is high by international standards—between 37 and 57 percent market share in 2008—and with modest foreign bank participation, below international averages.

What are the consequences of having relatively high state bank participation and low foreign bank participation? Regarding state banks, their strong presence has often been cited as a factor limiting financial development, yet the question of whether they exert an independent negative impact on growth—for example, via a lower quality of bank intermediation—is not clear-cut. However, a recent study by Korner and Schnabel (2010) identified two factors that combine to produce significant negative growth effects from state ownership of banks: low levels of financial depth and low institutional quality.[26] Within the country sample analyzed, several MENA countries—Bahrain, Egypt, Kuwait, and Syria—fell in the group for which state ownership was likely to undermine growth. Furthermore, there is country-level evidence of inefficiency and corruption in lending by state-owned banks. For example, Khwaja and Mian (2005) document the preferential treatment given exclusively by state-owned banks to politically connected firms in Pakistan, amounting to a distribution of political rents which cost the aggregate economy up to an estimated 1.9 percent of GDP per year. Foreign bank presence, on the other hand, has often been linked to improvements in banking sector performance and

[26] This study analyzed the impact of state banks on economic growth during 1970-2007. The institutional variables considered were: democracy, political rights, bureaucracy quality, and corruption control.

competition, thus suggesting potential benefits that could accrue from allowing greater openness to these institutions.

Of course, the weaker link between finance and economic growth in certain groups of countries could also be due to weakness on the demand side of the credit market, that is, to a lack of profitable investment opportunities. In the case of oil exporters, it is certainly plausible that, due to Dutch Disease-type effects, non-oil sectors are simply not competitive and therefore yield lower returns than their counterparts in the rest of the world. Our regression results with non-oil growth as the dependent variable would be consistent with this interpretation. However, it is not clear why other, non-oil exporting MENA countries or LICs would have systematically lower returns on bank-financed investments, as our results would imply. Finally, if the source of weakness is on the demand side, then it is not clear why the weaker finance-growth nexus does not extend to stock markets as well. Therefore, our reading of the results is that it is primarily conditions on the supply side—the functioning of banks and their regulatory environment—that are driving the weaker growth outcomes in MENA, oil exporters, and LICs.

Thus, policymakers in these countries are faced with a complex challenge. In addition to establishing and consolidating macroeconomic stability, and continuing with financial reform, both of which will provide the basis for greater financial deepening both in banking and stock markets, efforts must be made on two additional fronts. First, impediments to credit expansion must be reduced, especially in MENA countries, to increase the amount of credit per unit of deposits. The most likely suspects are fiscal dominance or overly restrictive monetary policy, both of which might be diverting bank funds away from financing the private sector. Second, policymakers should also pursue actions that enhance the quality of bank intermediation—possibly including a reassessment of the role of state banks—which should lead to improvements in access and greater competition. As discussed extensively and convincingly in the recent World Bank flagship report on finance in the MENA region (World Bank, 2011), introducing improvements in information on prospective borrowers—including the establishment of credit bureaus— enhancing the legal protection of creditor rights as well as the framework surrounding secured transactions, are all potential areas where quality gains can be achieved. For LICs, improvements in bank supervision should be pursued as well. Ultimately, these actions should result in benefits in terms of higher and more sustainable long-run growth.

REFERENCES

Abdih, Yasser and Anjali Garg (2011) "Unemployment in the Oil-Importing Countries of the Middle East and North Africa," Unpublished Surveillance Meeting Note (Washington: International Monetary Fund).

Abiad, Abdul, Enrica Detragiache, and Thierry Tressel (2010) "A New Database of Financial Reforms," *IMF Staff Papers*, Vol. 57(2), pp. 281–302.

Al Hussainy, Ed; Andrea Coppola; Erik Feyen; Alain Ize; Katie Kibbuka; Haocong Ren (2011) "FinStats 2011: A Ready-to-Use Tool to Benchmark Financial Sectors Across Countries and Over Time," (Washington: World Bank).

Anzoategui, Diego, María Soledad Martínez Pería, Roberto Rocha (2010) "Bank Competition in the Middle East and Northern Africa Region," World Bank Policy Research Paper 5363 (Washington: World Bank).

Arcand, J.L., E. Berkes, and U. Panizza, 2011, "Too Much Finance?" Unpublished (Washington: International Monetary Fund).

Arellano, M. and O. Bover, 1995, "Another Look at the Instrumental-Variable Estimation of Error-Components Models", *Journal of Econometrics*, Vol. 68, pp. 29-52.

Arellano, M. and S. Bond, 1991, "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*, Vol. 58, pp. 277-97.

Beck, Thorsten, 2008, "The Econometrics of Finance and Growth," World Bank Policy Research Paper 4608 (Washington: World Bank).

Beck, Thorsten, 2011, " Finance and Oil: Is There a Resource Curse in Financial Development?", unpublished (Tilburg, The Netherlands: Tilburg University).

Beck, Thorsten. and Asli Demirgüç-Kunt, 2009, "Financial Institutions and Markets Across Countries and over Time: Data and Analysis", World Bank Policy Research Working Paper No. 4943 (Washington: World Bank).

Beck, Thorsten and Ross Levine (2004), "Stock Markets, Banks, and Growth: Panel Evidence," *Journal of Banking and Finance*, 28, pp. 423-442.

Beck, Thorsten, Ross Levine and Norman Loayza, 2000, "Finance and the Sources of Growth", *Journal of Financial Economics*, Vol. 58, pp. 261-300.

Blundell, R. and S. Bond, 1998, "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models", *Journal of Econometrics*, Vol. 87, pp. 115-43.

Bhattacharya, Rina and Hirut Wolde (2010), "Constraints on Growth in the MENA Region," IMF Working Paper 10/30 (Washington: International Monetary Fund).

Demirguc-Kunt, Asli and Ross Levine (2008), "Finance, Financial Sector Policies, and Long-Run Growth," Unpublished (Washington: World Bank).

Demirguc-Kunt, Asli and Ross Levine (2009), "Finance and Inequality: Theory and Evidence," NBER Working Paper 15275 (Cambridge, Massachusetts: NBER).

Farazi, Subika, Erik Feyen, and Roberto Rocha (2011), "Bank Ownership and Performance in the Middle East and North Africa Region," (Washington: World Bank).

Guillaume, Dominique and Tobias Rasmussen (2011), **"**Growth, Trade, and Competitiveness of Oil Importing Countries in the Middle East and North Africa (MENAP), Unpublished Surveillance Meeting Note (Washington: International Monetary Fund).

Hirschberg, J. and J. Lye, 2010, "A reinterpretation of interactions in regressions," *Applied Economics Letters*, 17, pp. 427-430.

Hakura, Dalia (2004), "Growth in the Middle East and North Africa," IMF Working Paper 04/56 (Washington: International Monetary Fund).

Khwaja, A.I. and A. Mian, 2005, "Do Lenders Favor Politically Connected Firms? Rent provision in an Emerging Financial Market," *Quarterly Journal of Economics*, Vol. 120, Issue 4, pp. 1371-1411.

Khan, M., A. Senhadji, and B. Smith, 2001, "Inflation and Financial Depth," IMF Working Paper No. 00/110 (Washington: International Monetary Fund).

Khan, M., and A. Senhadji, 2000, "Threshold Effects in the Relationship between Inflation and Growth", IMF Working Paper No. 01/44 (Washington: International Monetary Fund).

King, R. G. and R. Levine, 1993, "Finance and Growth: Schumpeter Might Be Right", *Quarterly Journal of Economics*, Vol. 108, pp. 717–38.

Klein, N., 2010, "The Linkage between the Oil and the Non-oil Sectors – A Panel VAR Approach", IMF Working Paper No. 10/118 (Washington: International Monetary Fund).

Korner, T. and I. Schnabel, 2010, "Public Ownership of Banks and Economic Growth: The Role of Heterogeneity," CEPR Discussion Paper 8138.

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.

Laeven, Luc and Fabian Valencia, 2012, "Systemic Banking Crises: An Update," IMF Working Paper 12/163 (Washington: International Monetary Fund).

Levine, R. and S. Zervos, 1998, "Stock Markets, Banks, and Economic Growth", *American Economic Review*, Vol. 88, pp. 537-58.

Levine, R., 1997a, "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*, Vol. 35(2), pp. 688-726.

Levine, R., 1997b, "Law, Finance, and Economic Growth", *Journal of Financial Intermediation*, Vol. 8, pp. 36–67.

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., 2004, "Finance and Growth: Theory and Evidence", NBER Working Paper No. 10766 (Cambridge, Massachusetts: NBER).

Levine, R., N. Loayza and T. Beck, 2000, "Financial Intermediation and Growth: Causality and Causes", *Journal of Monetary Economics*, Vol. 46, pp. 31-77.

Micco, A., U. Panizza, and M. Yáñez, 2007, "Bank Ownership and Performance: Does Politics Matter?" *Journal of Banking and Finance*, Vo. 31 (1), pp. 219-241.

Nili, M. and M. Rastad, 2007, "Addressing the Growth Failure of the Oil Economies: The Role of Financial Development", *The Quarterly Journal of Economics and Finance*, Vol. 46, pp. 726–40.

Roodman, D. M., 2009a, "A Note on the Theme of Too Many Instruments", *Oxford Bulletin of Economics and Statistics*, Vol. 71(1), pp. 135–158.

Roodman, D. M., 2009b, "How to Do xtabond2: An introduction to difference and system GMM in Stata," *The Stata Journal* (2009), Vol. 9, no.1, pp. 86-136.

Rousseau, Peter L. and Paul Wachtel (2011), "What is Happening to the Impact of Financial Deepening on Economic Growth?" *Economic Inquiry*, Vol. 49, No.1, pp. 276-288.

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. 726–40.

World Bank, 2011, *Financial Access and Stability: MENA Financial Flagship Report* (Washington: World Bank).

TABLES

Table 1a: Summary Statistics

	Number of Observations	Mean	Std. Dev.	Min	Max
Private Credit	673	35.951	31.042	0.456	191.697
Bank Deposits	668	38.352	29.249	1.828	216.983
Liquid Liabilities	655	44.220	28.497	5.212	227.672
Market Cap	357	32.217	38.473	0.038	232.213
Turnover	361	33.487	41.633	0.144	294.096
Growth	696	1.737	2.852	-9.838	9.998
Non-Oil Growth	645	1.749	2.923	-10.929	9.860
Education	671	61.825	32.998	2.499	158.453
FDI	696	2.480	3.460	-3.623	33.540
Oil	652	0.040	0.121	0.000	0.780
Lerner Index	315	0.242	0.096	-0.034	0.501
H-Stat	309	0.653	0.185	0.174	1.035

Table 1b: Cross-Country Summary Statistics*

	Number of Countries	Mean	Std. Dev.	Min	Max
Private Credit	146	33.753	26.735	2.857	148.269
Bank Deposits	144	36.713	26.439	4.595	173.864
Liquid Liabilities	142	42.783	26.072	9.591	182.613
Market Cap	105	29.916	33.343	0.547	156.721
Turnover	104	29.761	29.526	0.742	139.587
Growth	150	1.894	1.673	-1.769	7.997
Non-Oil Growth	147	1.886	1.842	-3.747	7.997
Education	150	62.544	31.308	5.638	115.638
FDI	150	2.835	2.817	0.060	16.406
Oil	147	0.056	0.144	0.000	0.757
Lerner Index	70	0.249	0.096	-0.034	0.501
H-Stat	69	0.635	0.185	0.174	1.035

*Computed from country means

Table 2a: Summary Statistics – Oil Exporters

	Number of Observations	Mean	Std. Dev.	Min	Max
Private Credit	136	26.347	21.558	2.004	136.846
Bank Deposits	131	30.526	22.080	2.080	115.104
Liquid Liabilities	132	39.024	23.869	5.212	123.680
Market Cap	70	31.157	41.278	0.038	198.713
Turnover	70	21.639	23.446	0.144	100.875
Growth	137	1.280	3.144	-9.838	9.998
Non-Oil Growth	97	1.153	3.735	-10.929	9.847
Education	131	55.128	26.991	6.043	117.992
FDI	137	2.496	3.537	-3.073	28.225
Oil	104	0.250	0.197	0.000	0.780
Lerner Index	88	0.301	0.113	0.063	0.501
H-Stat	88	0.643	0.161	0.299	0.991

Table 2b: Cross-Country Summary Statistics – Oil Exporters*

	Number of Countries	Mean	Std. Dev.	Min	Max
Private Credit	31	24.896	17.916	2.857	88.680
Bank Deposits	30	29.241	20.258	4.764	92.135
Liquid Liabilities	30	37.533	21.493	12.796	101.873
Market Cap	19	37.261	40.727	6.892	146.005
Turnover	19	21.705	20.291	0.839	67.584
Growth	31	1.432	1.536	-1.278	5.473
Non-Oil Growth	31	1.370	2.259	-3.747	6.212
Education	31	56.913	27.417	8.862	106.619
FDI	31	3.235	3.720	0.115	16.406
Oil	31	0.265	0.210	0.031	0.757
Lerner Index	19	0.320	0.116	0.063	0.501
H-Stat	19	0.620	0.168	0.299	0.991

*Computed from country means.

Table 3: Sample Means by Region

	Middle East and North Africa	East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	South Asia	Sub-Saharan Africa	Rest of the World	Low-Income Countries	Middle-Income Countries
Private Credit	31.474	31.151	13.835	32.519	18.492	14.997	60.339	17.516	29.783
Bank Deposits	39.186	36.874	17.444	36.851	27.880	18.204	58.068	22.571	33.732
Liquid Liabilities	51.399	43.005	24.307	42.618	35.536	25.268	61.611	29.915	41.086
Market Cap	46.140	27.804	8.324	17.399	10.163	21.494	45.728	7.973	21.706
Turnover	21.196	26.181	27.728	10.600	46.906	5.275	50.713	11.501	18.710
Growth	1.366	2.552	2.919	1.667	3.260	1.044	2.251	1.650	2.039
Non-Oil Growth	1.974	2.272	3.166	1.712	3.260	0.965	2.085	1.533	2.123
Education	66.539	49.848	85.836	63.339	38.400	25.501	94.024	36.319	66.544
FDI	2.128	3.044	3.189	3.752	0.439	2.505	3.003	2.965	2.739
Oil	0.238	0.023	0.009	0.018	0.000	0.076	0.017	0.034	0.067
Lerner Index	0.345	0.255	0.242	0.187	0.249	0.241	0.235	0.246	0.225
H-Stat	0.529	0.743	0.608	0.755	0.715	0.527	0.638	0.558	0.676

Table 4: Tests for Differences in Means (p-values)

VI.	VII. Non-oil Exporters vs. Oil Exporters	VIII. All Other Regions vs. Middle East and North Africa	IX. All Other vs. Low Income Countries	X. High Income vs. Low Income Countries
Private Credit	0.0195	0.3290	0.0000	0.0000
Bank Deposits	0.0426	0.4485	0.0000	0.0000
Liquid Liabilities	0.1100	0.1464	0.0000	0.0000
Market Cap	0.1444	0.0366	0.0003	0.0000
Turnover	0.1170	0.1438	0.0012	0.0000
Growth	0.0406	0.0577	0.0902	0.1627
Non-Oil Growth	0.0395	0.4994	0.0403	0.1162
Education	0.1590	0.4280	0.0000	0.0000
FDI	0.2099	0.2075	0.3365	0.4154

Table 5: Unconditional Correlations – Full Sample of Countries

Pairwise Correlation - One observation per country

	Private Credit	Bank Deposits	Liquid Liabilities	Market Cap	Turnover	Growth	Non-Oil Growth
Private Credit	1						
	146						
Bank Deposits	0.8909*	1					
	144	144					
Liquid Liabilities	0.8567*	0.9856*	1				
	142	142	142				
Market Cap	0.6135*	0.5826*	0.5870*	1			
	101	99	97	105			
Turnover	0.4539*	0.3450*	0.3528*	0.3484*	1		
	100	98	96	103	104		
Growth	0.1413	0.1744*	0.1230	-0.0581	0.2143*	1	
	146	144	142	105	104	150	
Non-Oil Growth	0.1501	0.1887*	0.1413	0.0082	0.1625	0.8996*	1
	144	142	140	102	101	147	147

Pairwise Correlation - 5 year averages

	Private Credit	Bank Deposits	Liquid Liabilities	Market Cap	Turnover	Growth	Non-Oil Growth
Private Credit	1						
	673						
Bank Deposits	0.8697*	1					
	666	668					
Liquid Liabilities	0.8343*	0.9856*	1				
	652	654	655				
Market Cap	0.5899*	0.5337*	0.5463*	1			
	335	331	325	357			
Turnover	0.3083*	0.2275*	0.2349*	0.3025*	1		
	338	334	328	351	361		
Growth	0.0884*	0.1245*	0.0972*	0.0526	0.0842	1	
	673	668	655	357	361	696	
Non-Oil Growth	0.0775	0.1157*	0.0907*	0.0252	0.0942	0.9480*	1
	625	620	606	333	337	645	645

The number of observations is shown below each correlation coefficient, and asterisks indicate significance at the 5 percent level or better.

Table 6: Private Credit and Growth: Heterogeneity Across Regions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Real per capita GDP growth				Dependent variable: Real per capita non-oil GDP growth			
Private Credit	0.013 ***	0.016 **	0.012 *	0.015 **	0.012 ***	0.018 **	0.014 **	0.012
	(3.473)	(2.342)	(1.960)	(2.255)	(2.658)	(2.083)	(2.464)	(1.491)
Private Credit x Financial Crisis	-0.006 ***	-0.005 ***	-0.006 ***	-0.006 ***	-0.007 ***	-0.005 ***	-0.006 ***	-0.006 **
	(-5.624)	(-2.670)	(-4.012)	(-2.954)	(-6.022)	(-2.651)	(-2.688)	(-2.602)
Interactions with region dummies								
Private Credit x Middle East and North Africa		-0.005 *				-0.009 ***		
		(-1.765)				(-2.679)		
Subgrouping 1								
Private Credit x MEDA			-0.007 *				-0.008 *	
			(-1.732)				(-1.879)	
Private Credit x non-MEDA			-0.001				0.000	
			(-0.364)				(-0.071)	
Subgrouping 2								
Private Credit x GCC				0.002				0.004
				(0.837)				(1.138)
Private Credit x non-GCC				-0.012 **				-0.009 *
				(-2.018)				(-1.730)
Private Credit x East Asia & Pacific		-0.002	0.000	-0.003		-0.004	-0.002	-0.003
		(-0.389)	(-0.089)	(-0.621)		(-0.636)	(-0.326)	(-0.330)
Private Credit x Europe & Central Asia		0.011 **	0.014 **	0.011 *		0.009	0.014 **	0.010
		(2.043)	(2.425)	(1.734)		(1.457)	(2.174)	(1.566)
Private Credit x Latin American & Caribbean		-0.006 *	-0.004	-0.006		-0.007 *	-0.004	-0.005
		(-1.783)	(-1.181)	(-1.422)		(-1.928)	(-1.007)	(-1.165)
Private Credit x South Asia		-0.008	-0.004	-0.007		-0.009	-0.004	-0.006
		(-1.420)	(-0.734)	(-1.121)		(-1.298)	(-0.565)	(-0.805)
Private Credit x Sub-Saharan Africa		-0.008	-0.005	-0.010		-0.007	-0.004	-0.006
		(-1.418)	(-0.911)	(-1.491)		(-0.981)	(-0.656)	(-0.835)
Controls								
Education	0.021 **	0.022 **	0.017 **	0.018 *	0.018 *	0.026 **	0.018 *	0.021 **
	(2.486)	(2.561)	(2.036)	(1.878)	(1.780)	(2.612)	(1.914)	(2.353)
Initial GDP per capita	-0.015 ***	-0.021 ***	-0.016 **	-0.020 ***	-0.013 ***	-0.023 ***	-0.016 **	-0.018 **
	(-3.270)	(-3.473)	(-2.488)	(-2.636)	(-2.620)	(-2.890)	(-2.382)	(-2.321)
FDI	0.348 ***	0.234 *	0.238 *	0.223 *	0.261 ***	0.138	0.156	0.205
	(3.319)	(1.847)	(1.879)	(1.804)	(2.617)	(1.037)	(1.105)	(1.486)
Constant	-1.603 ***		-1.060 *	-0.964 *	-1.194 **	-0.594	-0.684	-0.904
	(-3.321)		(-1.790)	(-1.678)	(-2.592)	(-0.945)	(-1.050)	(-1.398)
Observations	678		678	678	630	619	630	630
Number of countries	146		146	146	144	140	144	144
AR2	0.927		0.991	0.966	0.968	0.866	0.984	0.965
Hansen	0.300		0.419	0.273	0.140	0.480	0.340	0.479
Number of instruments	76		100	100	76	92	100	100
Wald test statistic for significance of coefficient of Private Credit in certain regions			0.141	0.433			0.070	0.62
Wald Test is for the sum of coefficients on Private Credit and its Interaction with:			MEDA	non-GCC			MEDA	non-GCC

This table shows the results of dynamic panel regressions for growth of real total anf non-oil per capita GDP using a GMM procedure following Arellano and Bover(1995). The explanatory variables are Private credit, the ratio of bank credit to the private sector to GDP; Education, percentage of gross secondary school enrollment; Initial income, initial GDP per capita; and FDI expressed as a percentage of GDP. Some specifications also include interactions between private credit and regional dummy variables. Data are averaged over non-overlapping five year periods beginning in 1980. Robust t-statistics are shown in parentheses, and significance at the 1 percent (***), 5 percent (**), and 10 percent (*) levels are indicated.

Table 7: Private Credit and Growth: Heterogeneity Between Oil Exporters and Other Countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Real per capita GDP growth				Dependent variable: Real per capita non-oil GDP growth			
Private Credit	0.011 ***	0.012 ***	0.011 ***	0.011 ***	0.010 *	0.009 **	0.010 *	0.008 *
	(3.033)	(2.810)	(2.931)	(2.824)	(1.949)	(2.179)	(1.774)	(1.822)
Private Credit x Financial Crisis	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***
	(-5.204)	(-4.864)	(-5.445)	(-5.122)	(-4.959)	(-4.793)	(-5.428)	(-5.219)
Interactions with oil exporter variables								
Private Credit x Oilexp	-0.007 **		-0.004		-0.010 **		-0.010	
	(-2.255)		(-1.438)		(-2.126)		(-1.600)	
Private Credit x Oildep		-0.030 ***		-0.030 **		-0.044 ***		-0.044 ***
		(-3.118)		(-2.021)		(-3.777)		(-3.108)
Private Credit x Oilexp x GCC			0.001				0.003	
			(-0.227)				(0.503)	
Private Credit x Oildep x GCC				0.031 *				0.025
				(-1.903)				(-1.406)
Controls								
Education	0.017 **	0.015 *	0.017 **	0.016 *	0.015	0.011	0.013	0.012
	(2.295)	(1.950)	(2.115)	(1.913)	(1.534)	(1.193)	(1.507)	(1.290)
Initial GDP per capita	-0.012 ***	-0.013 ***	-0.012 ***	-0.012 **	-0.011 **	-0.009 *	-0.010 **	-0.008 *
	(-2.884)	(-2.863)	(-2.761)	(-2.545)	(-2.093)	(-1.848)	(-2.166)	(-1.743)
FDI	0.357 ***	0.276 ***	0.341 ***	0.288 ***	0.284 ***	0.186	0.295 ***	0.208 *
	(3.025)	(2.537)	(-2.989)	(-2.795)	(2.888)	(1.652)	(3.003)	(1.964)
Constant	-1.640 ***	-1.254 **	-1.566 ***	-1.315 ***	-1.294 ***	-0.834	-1.348 ***	-0.946 *
	(-2.997)	(-2.472)	(-2.970)	(-2.751)	(-2.838)	(-1.584)	(-2.949)	(-1.908)
Observations	678	637	678	637	630	630	630	630
Number of countries	146	144	146	144	144	144	144	144
AR2	0.832	0.928	0.880	0.928	0.969	0.946	0.950	0.929
Hansen	0.278	0.098	0.328	0.299	0.096	0.066	0.255	0.218
Number of instruments	90	90	104	101	90	90	101	100
Wald test statistic for significance of coefficient of Private Credit in certain regions	0.337	0.074	0.151	0.232	0.984	0.009	0.645	0.318
Wald Test is for the sum of coefficients on Private Credit and its Interaction with:	Oilexp	Oildep	Oilexp + Oilexp X GCC	Oildep + Oildep X GCC	Oilexp	Oildep	Oilexp + Oilexp X GCC	Oildep + Oildep X GCC

This table shows the results of dynamic panel regressions for growth of real total and non-oil per capita GDP using a GMM procedure following Arellano and Bover(1995). The explanatory variables are: Oilexp, a dummy variable for oil exporting countries; Oildep, the share of oil GDP in total GDP; Private credit, the ratio of bank credit to the private sector to GDP; Education, percentage of gross secondary school enrollment; Initial income, initial GDP per capita; and FDI expressed as a percentage of GDP. Some specifications also include interactions between private credit and either Oilexp or Oildep. Data are averaged over non-overlapping five year periods beginning in 1980. Robust t-statistics are shown in parentheses, and significance at the 1 percent (***), 5 percent (**), and 10 percent (*) levels are indicated.

Table 8: Private Credit and Growth: Heterogeneity Across Income Levels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Real per capita GDP growth							
Private Credit	0.017 ***	-0.047 **	0.017 ***	0.011 **	0.013 ***	0.013 **	0.019 *	0.027 **
	(2.471)	(-2.593)	(3.262)	(2.389)	(2.879)	(2.571)	(1.783)	(2.410)
Private Credit x Financial Crisis	-0.006 ***	-0.006 ***	-0.006 ***	-0.010 ***	-0.010 ***	-0.009 ***	-0.006 ***	-0.006
	(-4.046)	(-4.090)	(-3.905)	(-3.847)	(-3.303)	(-3.435)	(-4.029)	(-3.944)
Interactions with variables related to income								
Private Credit x LIC	-0.006		-0.033 ***	-0.006	-0.011 ***	-0.011 ***	-0.006 *	-0.041 ***
	(-1.483)		(-2.395)	(-1.280)	(-2.795)	(-2.929)	(-1.721)	(-2.627)
Private Credit x Income		0.009 ***						
		(3.092)						
Private Credit x Openness							-0.001	-0.003
							(-0.262)	(-1.019)
Private Credit x LIC x Openness			0.006 ***					0.009 **
			(1.867)					(2.222)
Private Credit x Bank Supervision				0.001		0.001		
				(0.493)		(0.632)		
Private Credit x LIC x Bank Supervision					0.003	0.004 *		
					(0.314)	(1.929)		
Controls								
Education	0.028 ***	0.035 ***	0.024 **	0.023 **	0.017 ***	0.019 *	0.021 **	0.019 **
	(3.142)	(5.056)	(3.118)	(2.178)	(2.259)	(1.873)	(2.609)	(2.509)
Initial GDP per capita	-0.024 ***	-0.054 ***	-0.023 ***	-0.020 ***	-0.019 ***	-0.019 ***	-0.020 ***	-0.020 ***
	(-2.673)	(-4.055)	(-3.644)	(-2.891)	(-3.362)	(-2.935)	(-3.828)	(-4.343)
FDI	0.298 **	0.275 ***	0.362 **	0.225	0.270	0.227	0.389 ***	0.373 ***
	(2.479)	(2.653)	(2.775)	(1.089)	(1.348)	(1.138)	(2.895)	(2.633)
Constant	-1.331 ***	-1.051 **	-1.625 ***	-0.993	-1.180	-1.000	-1.765 ***	-1.680 **
	(-2.347)	(-2.051)	(-2.708)	(-1.036)	(-1.270)	(-1.076)	(-2.865)	(-2.580)
Observations	678	677	652	407	407	407	652	652
Number of countries	146	146	142	80	80	80	142	142
AR2	0.920	0.812	0.985	0.492	0.492	0.467	0.882	0.926
Hansen	0.453	0.301	0.679	0.100	0.100	0.161	0.483	0.707
Number of instruments	96	96	109	63	63	71	109	122

This table shows the results of dynamic panel regressions for growth of real total per capita GDP using a GMM procedure following Arellano and Bover(1995). The explanatory variables are Private credit, the ratio of bank credit to the private sector to GDP; Education, percentage of gross secondary school enrollment; Initial income, initial GDP per capita; and FDI expressed as a percentage of GDP. Some specifications also include interactions between private credit and a Low-Income Country (LIC) dummy variables and/or either the quality of bank bupervision, (from Abiad, et al, 2008) and the degree of trade openness (ratio of exports plus imports to GDP) . Data are averaged over non-overlapping five year periods beginning in 1980. Robust t-statistics are shown in parentheses, and significance at the 1 percent (***), 5 percent (**), and 10 percent (*) levels are indicated.

Table 9: Stock Market Turnover Ratio and Growth: Heterogeneity Across Regions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Real per capita GDP growth				Dependent variable: Real per capita non-oil GDP growth			
Turnover	0.005 **	0.009 **	0.008 **	0.009 **	0.005 **	0.007 *	0.008 **	0.008 *
	(2.472)	(2.225)	(2.218)	-2.411	(2.392)	(1.742)	(2.117)	(1.964)
Turnover x Financial Crisis	-0.006 ***	-0.010 ***	-0.010 ***	-0.009 ***	-0.009 ***	-0.012 ***	-0.013 ***	-0.012 ***
	(-4.140)	(-4.017)	(-3.945)	(-3.314)	(-4.434)	(-3.911)	(-4.098)	(-3.790)
Interactions with region dummies								
Turnover x Middle East and North Africa		-0.001				0.000		
		(-0.155)				(-0.038)		
Subgrouping 1								
Turnover x MEDA			-0.002				-0.003	
			(-0.303)				(-0.453)	
Turnover x non-MEDA			-0.001				-0.001	
			(-0.316)				(-0.079)	
Subgrouping 2								
Turnover x GCC				0.001				0.000
				(0.374)				(0.085)
Turnover x non-GCC				-0.002				-0.002
				(-0.397)				(-0.474)
Turnover x East Asia & Pacific		0.002	0.000	-0.001		0.003	0.001	0.001
		(0.463)	(0.116)	(-0.238)		(0.577)	(0.161)	(0.198)
Turnover x Europe & Central Asia		0.009	0.008	0.006		0.012 **	0.012 *	0.011 **
		(1.508)	(1.359)	(1.036)		(2.222)	(1.834)	(2.009)
Turnover x Latin American & Caribbean		-0.002	-0.002	-0.003		-0.003	-0.003	-0.003
		(-0.455)	(-0.598)	(-0.804)		(-0.612)	(-0.513)	(-0.566)
Turnover x South Asia		-0.003	-0.003	-0.004		-0.001	-0.003	-0.004
		(-0.791)	(-0.729)	(-0.959)		(-0.214)	(-0.568)	(-0.865)
Turnover x Sub-Saharan Africa		-0.005	-0.006	-0.006		0.003	0.001	0.001
		(-0.733)	(-0.926)	(-1.001)		(0.346)	(0.129)	(0.109)
Controls								
Education	0.024 **	0.008	0.006	0.009	0.024 *	0.010	0.010	0.008
	(2.263)	(0.432)	(0.387)	(0.556)	(1.887)	(0.643)	(0.666)	(0.446)
Initial GDP per capita	-0.011 ***	-0.012 **	-0.012 ***	-0.014 **	-0.013 ***	-0.010 *	-0.012 **	-0.012 **
	(-4.265)	(-2.358)	(-2.699)	(-2.408)	(-3.116)	(-1.789)	(-2.225)	(-2.095)
FDI	0.266 *	0.405 **	0.353 *	0.333 *	0.247 *	0.243	0.247	0.285
	(1.792)	(2.056)	(1.784)	(1.781)	(1.748)	(1.073)	(1.112)	(1.448)
Constant	-1.228 *	-1.805 *	-1.554 *	-1.465 *	-1.131 *	-1.078	-1.085	-1.249
	(-1.789)	(-1.969)	(-1.675)	(-1.669)	(-1.732)	(-1.021)	(-1.042)	(-1.362)
Observations	363	363	363	363	339	339	339	339
Number of countries	104	104	104	104	101	101	101	101
AR2	0.969	0.814	0.858	0.891	0.577	0.766	0.626	0.720
Hansen	0.471	0.557	0.739	0.686	0.664	0.682	0.681	0.607
Number of instruments	76	92	95	95	76	92	95	95
Wald test statistic for significance of coefficient of Turnover in certain regions		0.113	0.063	0.275		0.311	0.436	0.174
Wald Test is for the sum of coefficients on Turnover and its Interaction with:		MENA	MEDA	non-GCC		MENA	MEDA	non-GCC

This table shows the results of dynamic panel regressions for growth of real total anf non-oil per capita GDP using a GMM procedure following Arellano and Bover(1995). The explanatory variables are: Turnover, the ratio of stock market val;ue traded to GDP; Education, percentage of gross secondary school enrollment; Initial income, initial GDP per capita; and FDI expressed as a percentage of GDP. Some specifications also include interactions between Turnover and regional dummy variables. Data are averaged over non-overlapping five year periods beginning in 1980. Robust t-statistics are shown in parentheses, and significance at the 1 percent (***), 5 percent (**), and 10 percent (*) levels are indicated.

Table 10: Stock Market Turnover and Growth: Heterogeneity Between Oil Exporters and Other Countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Real per capita GDP growth				Dependent variable: Real per capita non-oil GDP growth			
Turnover	0.004 **	0.004 *	0.004 *	0.004	0.005 **	0.005 **	0.005 **	0.005 **
	(2.299)	(1.740)	(1.804)	(1.597)	(2.026)	(2.426)	(2.150)	(2.329)
Turnover x Financial Crisis	-0.007 ***	-0.007 ***	-0.007 ***	-0.008 ***	-0.010 ***	-0.009 ***	-0.010 ***	-0.010 ***
	(-4.125)	(-3.649)	(-3.981)	(-4.222)	(-5.173)	(-5.042)	(-5.270)	(-5.203)
Interactions with oil exporter variables								
Turnover x Oilexp	0.000		0.002		-0.001		0.000	
	(-0.173)		(0.645)		(-0.386)		(-0.087)	
Turnover x Oildep		-0.006		0.015 **		-0.006		0.018
		(-0.751)		(1.996)		(-0.441)		(0.690)
Turnover x Oilexp x GCC			-0.004				-0.002	
			(-1.573)				(-0.518)	
Turnover x Oildep x GCC				-0.028 ***				-0.032
				(-2.994)				(-1.289)
Controls								
Education	0.023 ***	0.022 *	0.021 **	0.023 **	0.023 *	0.024 *	0.023 **	0.026 *
	(2.808)	(1.889)	(2.369)	(2.035)	(1.974)	(1.761)	(2.018)	(1.748)
Initial GDP per capita	-0.012 ***	-0.011 ***	-0.011 ***	-0.011 ***	-0.014 ***	-0.013 ***	-0.013 ***	-0.013 ***
	(-4.527)	(-3.580)	(-4.104)	(-2.967)	(-3.578)	(-3.241)	(-3.728)	(-3.228)
FDI	0.277 *	0.275	0.262 *	0.253 *	0.195	0.226	0.203	0.183
	(1.781)	(1.641)	(1.810)	(1.819)	(1.462)	(1.544)	(1.504)	(1.442)
Constant	-1.266 *	-1.261	-1.202 *	-1.169 *	-0.877	-1.028	-0.918	-0.836
	(-1.759)	(-1.628)	(-1.793)	(-1.809)	(-1.415)	(-1.523)	(-1.474)	(-1.415)
Observations	363	343	363	343	339	339	339	339
Number of countries	104	101	104	101	101	101	101	101
AR2	0.977	0.481	0.962	0.570	0.551	0.562	0.567	0.746
Hansen	0.753	0.610	0.728	0.759	0.710	0.605	0.672	0.737
Number of instruments	90	90	95	95	89	89	94	94
Wald test statistic for significance of coefficient of Private Credit in certain regions	0.102	0.876	0.728	0.216	0.363	0.973	0.620	0.395
Wald Test is for the sum of coefficients on Private Credit and its Interaction with:	Oilexp	Oildep	Oilexp + Oilexp X GCC	Oildep + Oildep X GCC	Oilexp	Oildep	Oilexp + Oilexp X GCC	Oildep + Oildep X GCC

This table shows the results of dynamic panel regressions for growth of real total and non-oil per capita GDP using a GMM procedure following Arellano and Bover(1995). The explanatory variables are: Oilexp, a dummy variable for oil exporting countries; Oildep, the share of oil GDP in total GDP; Turnvover, the ratio of stock market value traded to GDP; Education, percentage of gross secondary school enrollment; Initial income, initial GDP per capita; and FDI expressed as a percentage of GDP. Some specifications also include interactions between turnover and either Oilexp or Oildep. Data are averaged over non-overlapping five year periods beginning in 1980. Robust t-statistics are shown in parentheses, and significance at the 1 percent (***), 5 percent (**), and 10 percent (*) levels are indicated.

Table 11: Stock Market Turnover and Growth: Heterogeneity Across Income Levels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Real per capita GDP growth							
Turnover	0.007 ***	0.006	0.007 ***	0.013 ***	0.011 ***	0.012 ***	0.002	0.004
	(2.771)	(0.563)	(2.458)	(2.799)	(3.768)	(3.409)	(0.225)	(0.446)
Turnover x Financial Crisis	-0.009 ***	-0.008 ***	-0.007 ***	-0.015 ***	-0.011 ***	-0.014	-0.008 ***	-0.007 ***
	(-3.628)	(-3.374)	(-3.207)	(-4.106)	(-3.628)	(-4.371)	(-3.840)	(-2.916)
Interactions with variables related to income								
Turnover x LIC	-0.003		0.019	-0.004	-0.011 **	-0.010 *	-0.002	0.024
	(-0.884)		(0.668)	(-1.761)	(-2.463)	(-1.904)	(-0.674)	(0.930)
Turnover x Income		0.000						
		(0.066)						
Turnover x Openness							0.002	0.001
							(0.848)	(0.432)
Turnover x LIC x Openness			-0.006					-0.007
			(-0.743)					(-1.002)
Turnover x Bank Supervision				-0.001		-0.001		
				(-0.718)		(-0.910)		
Turnover x LIC x Bank Supervision					0.007 *	0.007		
					(1.970)	(1.407)		
Controls								
Education	0.009	0.012	0.012	0.022 **	0.021 **	0.019 ***	0.003	0.009
	(0.748)	(0.889)	(1.330)	(2.026)	(2.626)	(2.653)	(0.220)	(0.754)
Initial GDP per capita	-0.011 **	-0.010	-0.011 ***	-0.017 ***	-0.017 ***	-0.016 ***	-0.010 **	-0.011 ***
	(-2.187)	(-1.597)	(-3.082)	(-4.721)	(-4.889)	(-4.605)	(-2.128)	(-2.880)
FDI	0.312 **	0.299 *	0.612 ***	0.008	0.283 *	0.296	0.533 ***	0.557 ***
	(2.008)	(1.799)	(5.396)	(1.165)	(1.727)	(1.381)	(4.734)	(5.470)
Constant	-1.389 *	-1.342 *	-2.787 ***	0.000	-1.265 *	-1.327	-2.397 ***	-2.523
	(-1.931)	(-1.755)	(-5.337)	(0.000)	(-1.661)	(-1.341)	(-4.638)	(-5.449)
Observations	363	363	349	292	292	292	349	349
Number of countries	104	104	100	74	74	74	100	100
AR2	0.890	0.820	0.930	0.950	0.978	0.943	0.840	0.891
Hansen	0.793	0.834	0.868	0.014	0.638	0.653	0.963	0.975
Number of instruments	96	96	103	68	63	71	108	116

This table shows the results of dynamic panel regressions for growth of real total per capita GDP using a GMM procedure following Arellano and Bover(1995). The explanatory variables are Turnover, the ratio of stock market value traded to GDP; Education, percentage of gross secondary school enrollment; Initial income, initial GDP per capita; and FDI expressed as a percentage of GDP. Some specifications also include interactions between private credit and a Low-Income Country (LIC) dummy variables and/or either the quality of bank bupervision, (from Abiad, et al, 2008) and the degree of trade openness (ratio of exports plus imports to GDP) . Data are averaged over non-overlapping five year periods beginning in 1980. Robust t-statistics are shown in parentheses, and significance at the 1 percent (***), 5 percent (**), and 10 percent (*) levels are indicated.

FIGURES

Figure 1: Average Real Per Capita GDP Growth Rates Across Regions, 1975–2005

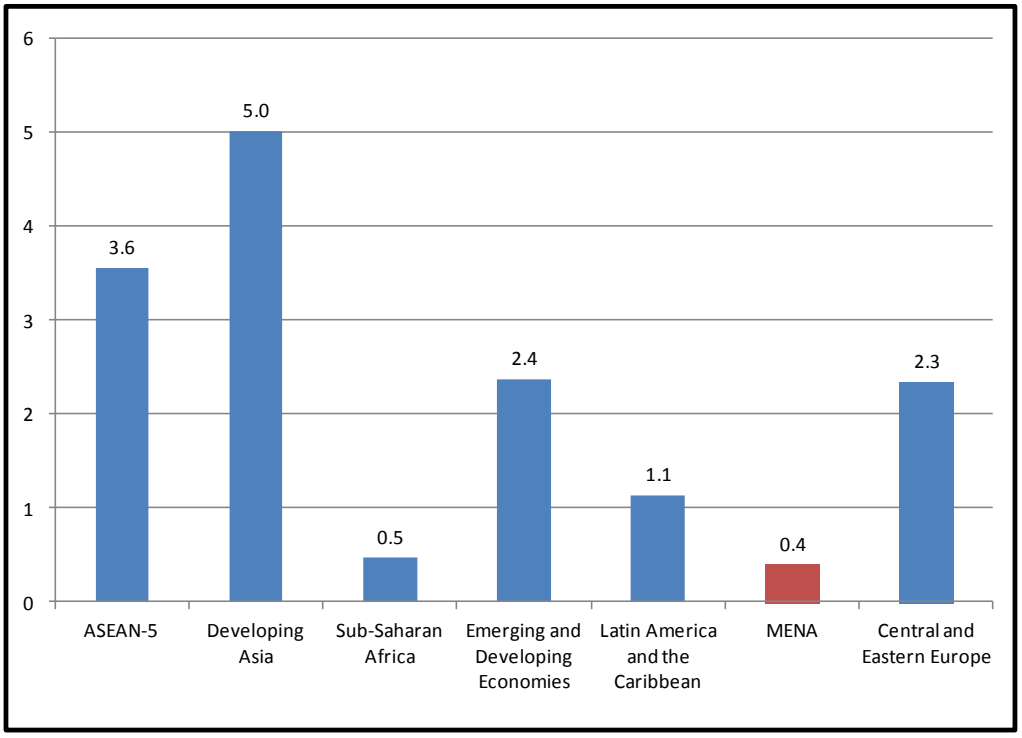
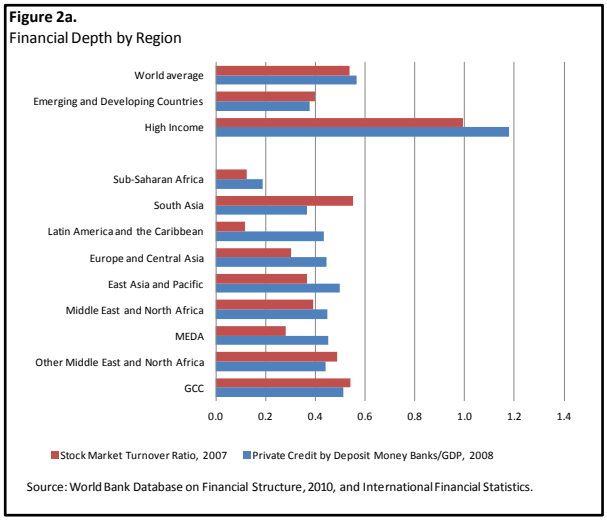


Figure 2: Financial Depth Across Regions and Countries



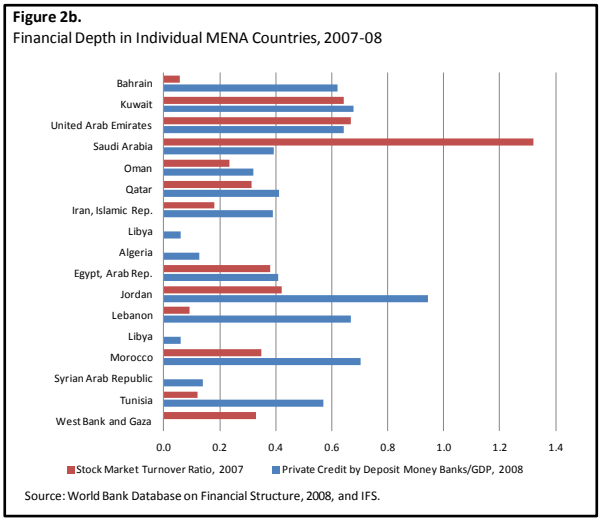


Figure 3: Deepening in the Banking Sector, Across Regions, 1975-2008

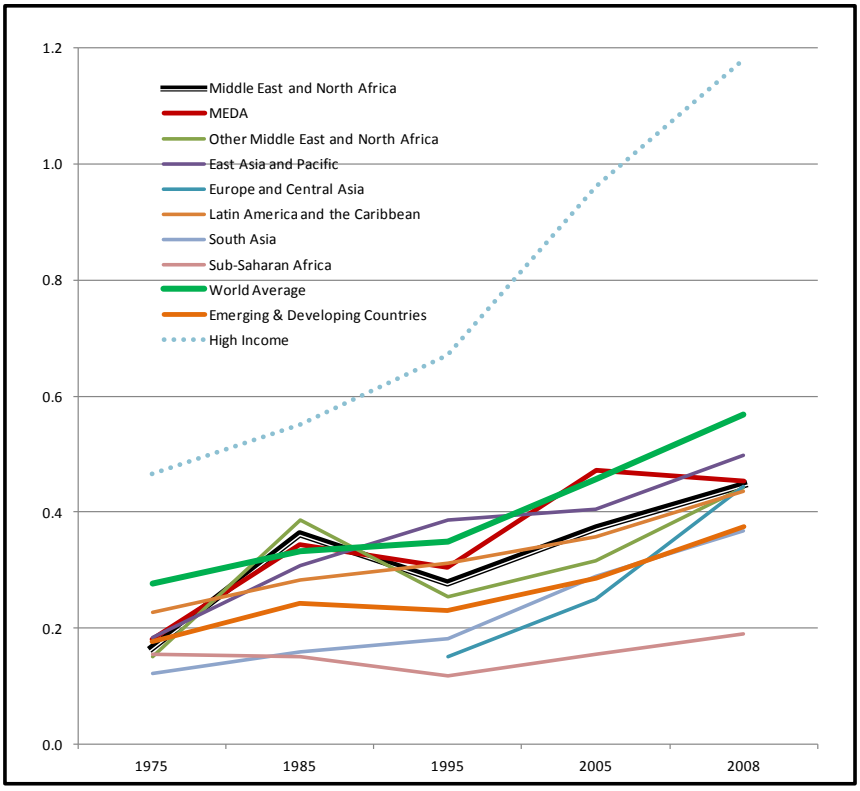


Figure 4: The Ratio of Private Credit to Deposits, 1975–2008

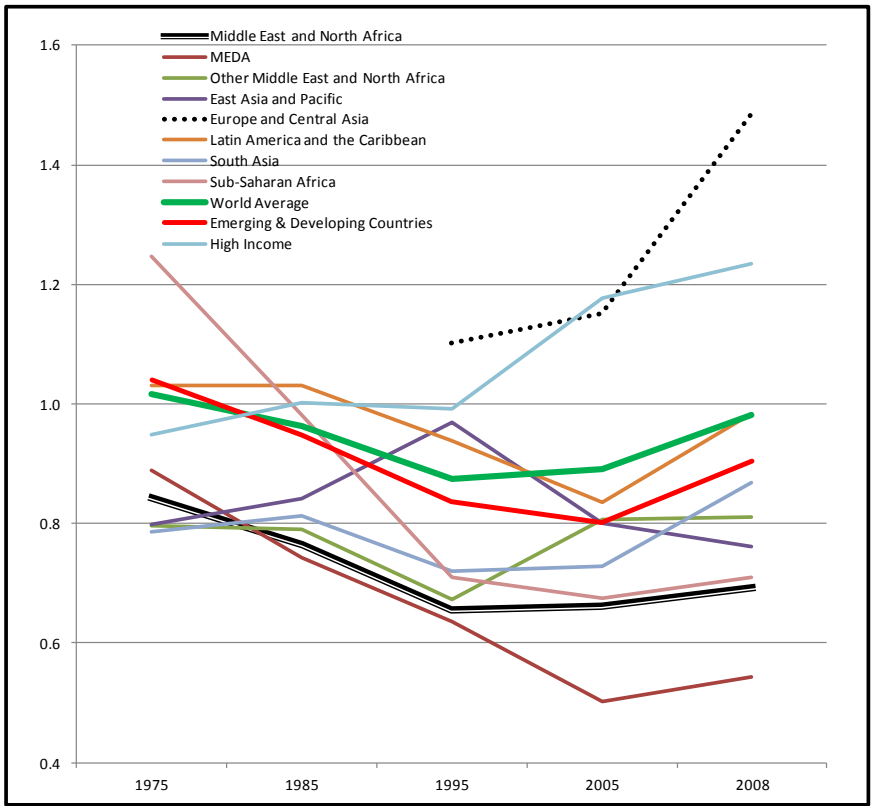


Figure 5: Estimated Impact of Increases in Credit-to-GDP on Real Per Capita Growth (Percentage Points)

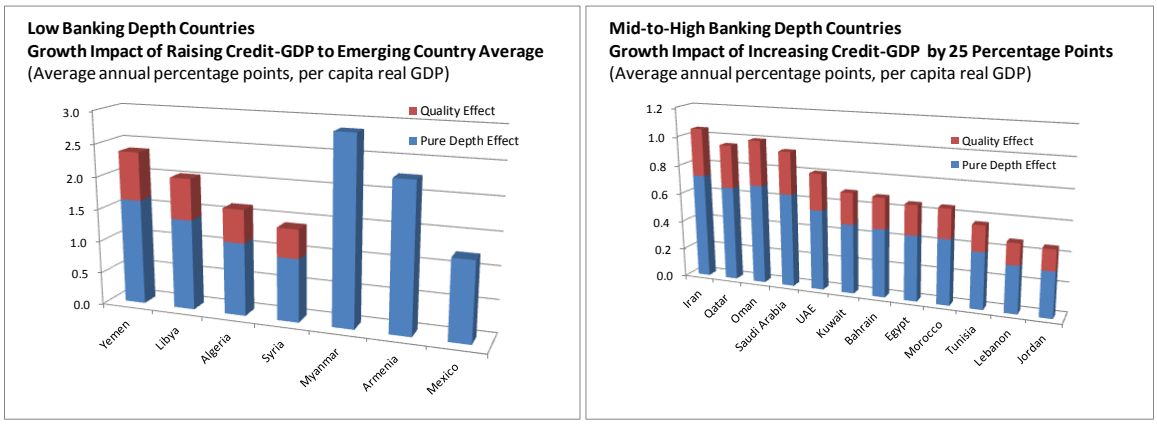


Figure 6: Estimated Marginal Impact of Increases in Private Credit-to-GDP on Growth at Different Income Levels (Percentage Points)

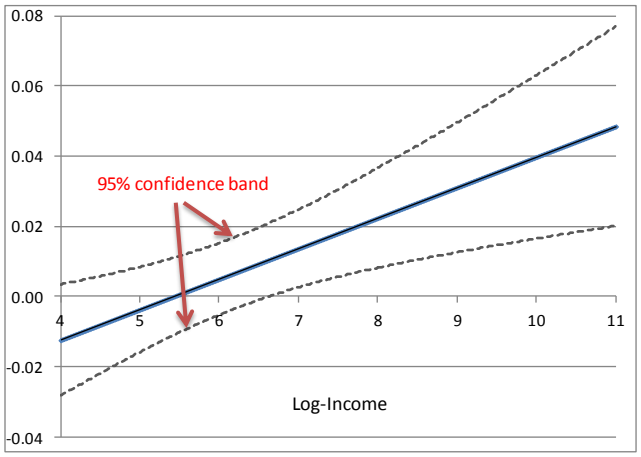


Figure 7: Estimated Differences between LICs and non-LICs in the Growth Impact of Private Credit at Different Levels of Bank Supervision Quality (Percentage Points)

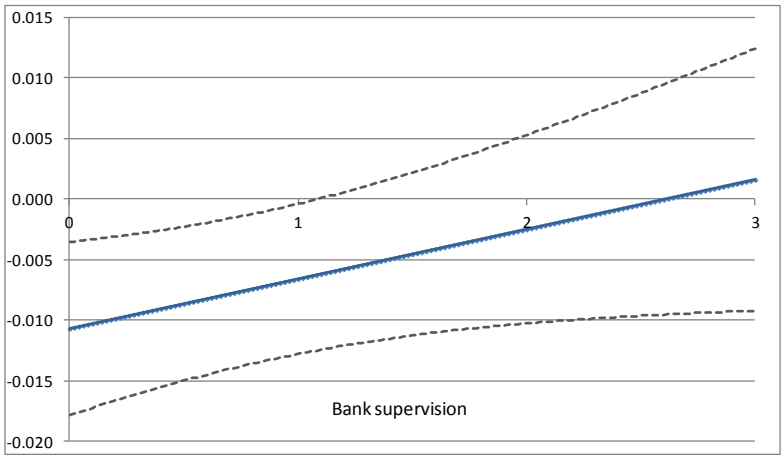


Figure 8: Estimated Differences between LICs and non-LICs in the Growth Impact of Private Credit at Different Levels of Trade Openness (Percentage Points)

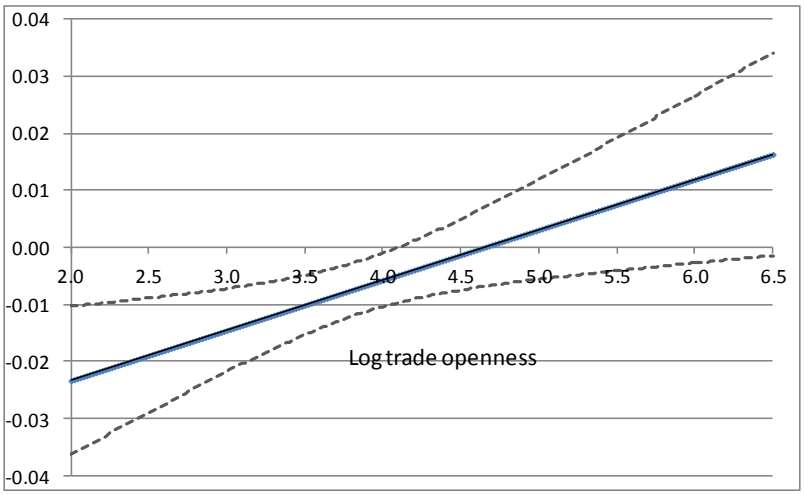


Figure 9: Estimated Increase in Long-Run Growth from an Increase in Stock Market Turnover by 20 Percentage Points of GDP, at Different Initial Levels of Turnover

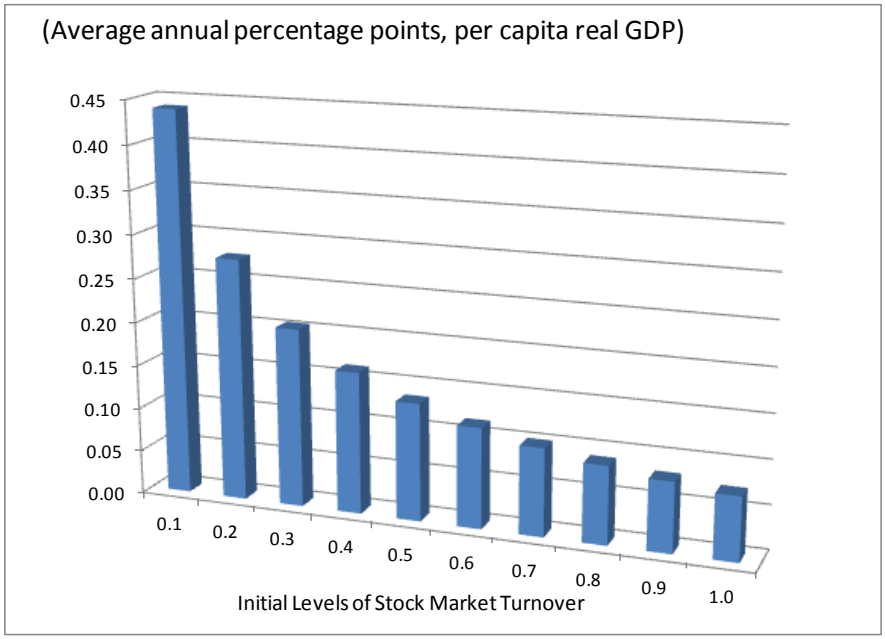
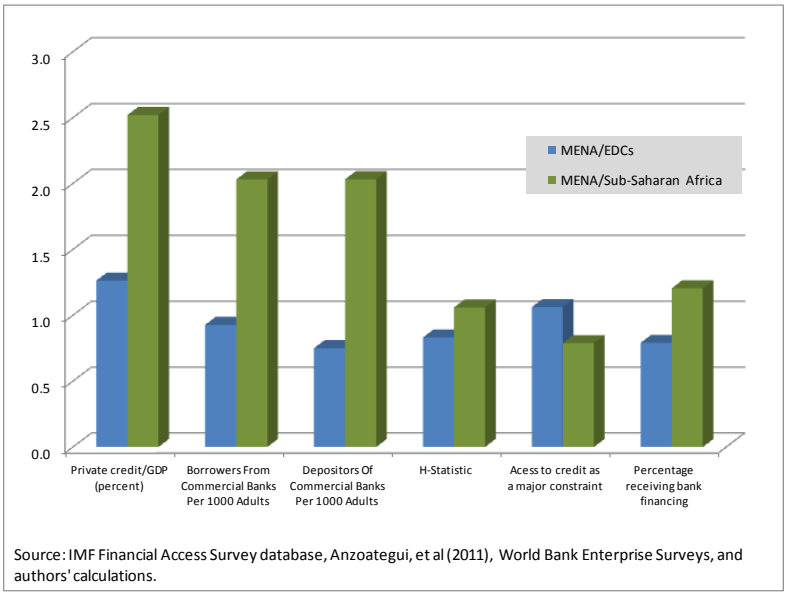
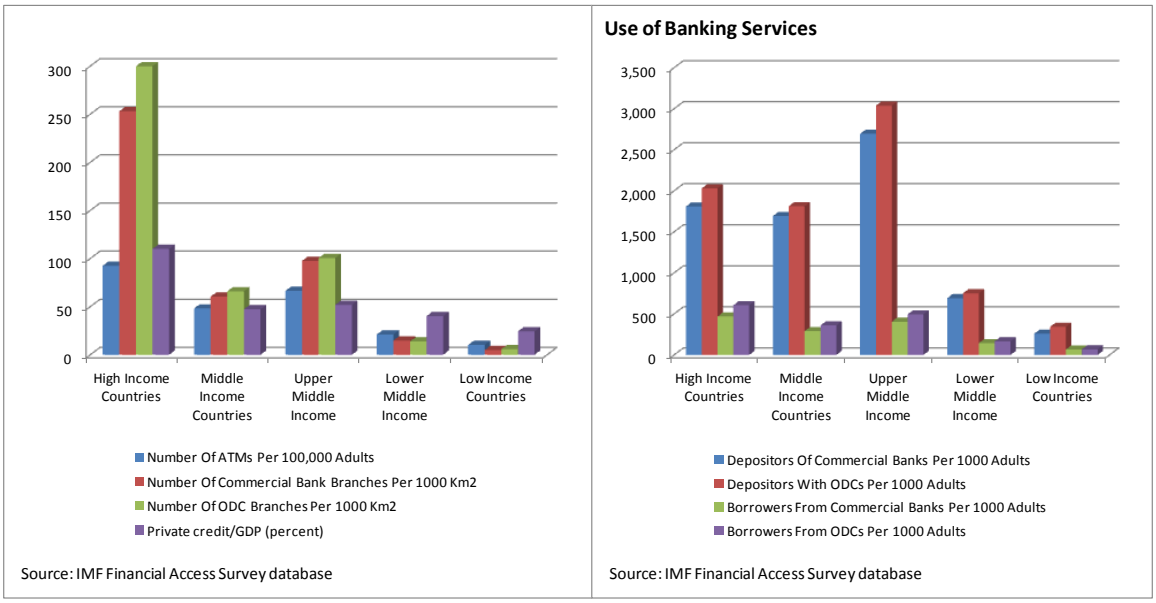


Figure 10: Banking Sector Performance in MENA Countries Relative to Emerging and Developing Country Average and to Sub-Saharan Africa, 2008[27]



Source: IMF Financial Access Survey database, Anzoategui, et al (2011), World Bank Enterprise Surveys, and authors' calculations.

Figure 11: Financial Access, Use of Banking Services, and Depth across Income Groups, 2008



Source: IMF Financial Access Survey database

Source: IMF Financial Access Survey database

[27] The last two indicators shown in this Figure are obtained from the World Bank Enterprise Surveys, most of which reflect responses given between and 2006 and 2009. However, for a few countries the responses were obtained earlier, as early as 2003 in the case of China.

Figure 12: Financial Access and Banking Depth (Privy) Across Countries

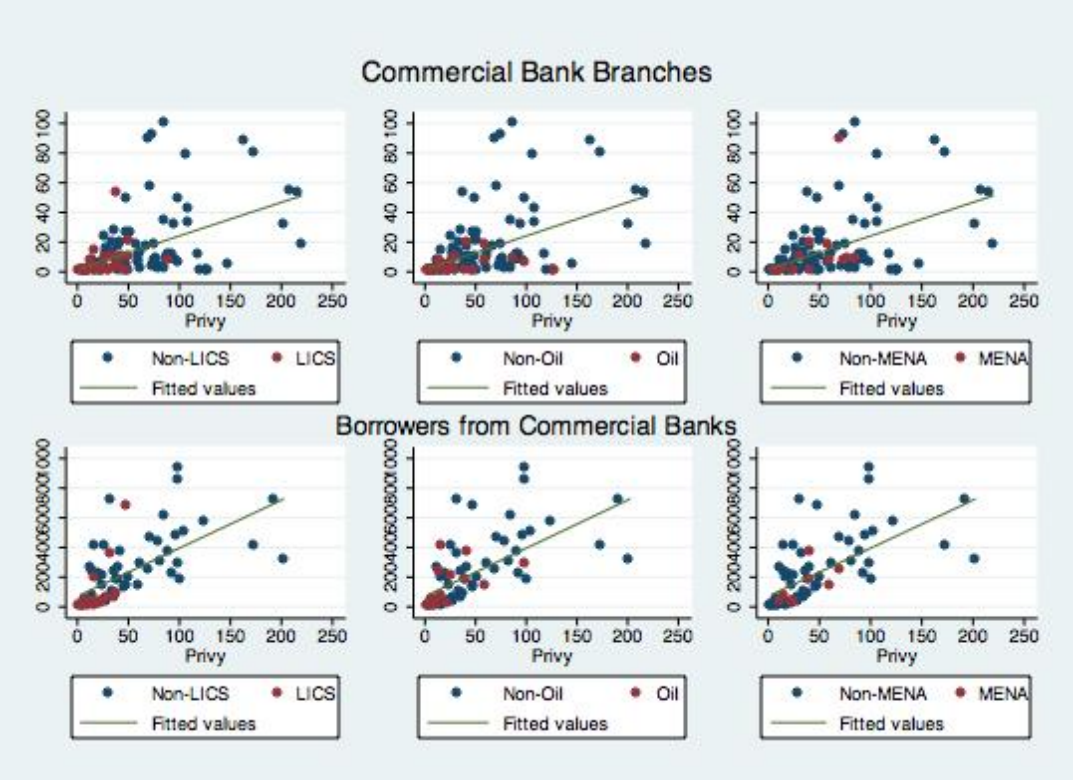
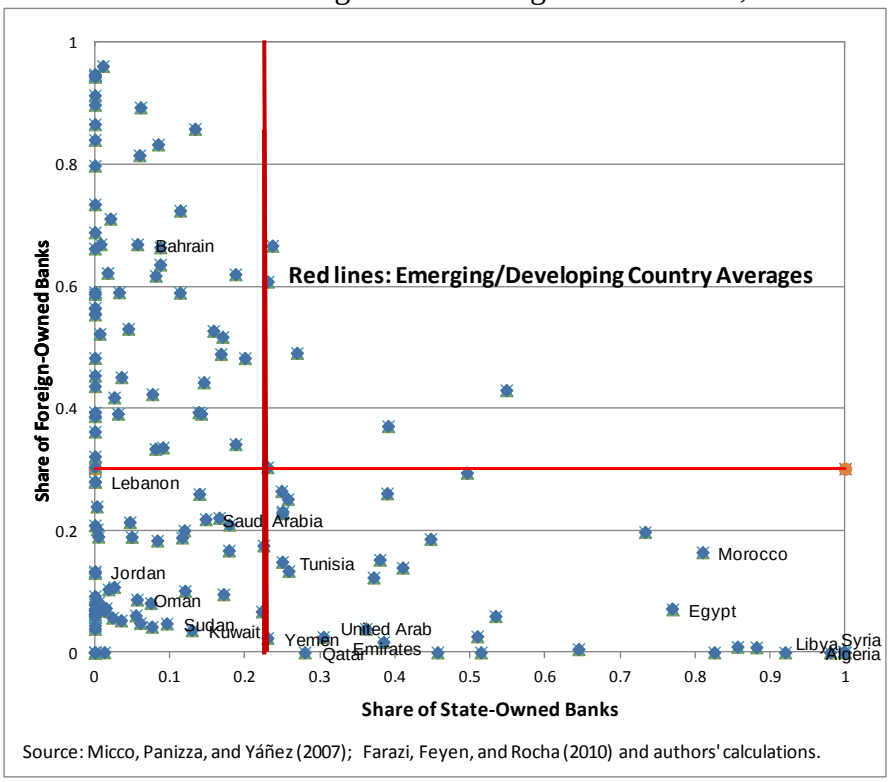


Figure 13: Share of Public and Foreign Banks throughout the World, 2002



Source: Micco, Panizza, and Yáñez (2007); Farazi, Feyen, and Rocha (2010) and authors' calculations.

APPENDIX

COUNTRY LIST BY REGION (150 countries)
(Oil Dependent and low income Economies are marked by * and °, respectively)

East Asia & Pacific

Cambodia°
Fiji
Indonesia*
Lao PDR°
Malaysia*
Mongolia°
Papua New Guinea*°
Philippines
Samoa°
Solomon Islands°
Thailand
Tonga°
Vanuatu°
Vietnam°

Europe & Central Asia

Albania
Armenia°
Bulgaria
Georgia°
Kazakhstan*
Lithuania
Moldova°
Romania
Russian Federation*
Serbia
Turkey
Ukraine
Uzbekistan*°

Latin America & Caribbean

Argentina
Belize
Bolivia*°
Brazil
Chile
Colombia
Costa Rica
Dominica
Dominican Republic°
Ecuador*
El Salvador
Grenada°
Guatemala
Guyana°
Haiti°
Honduras°
Jamaica
Mexico*
Panama
Paraguay
Peru
St. Kitts and Nevis
St. Lucia°
St. Vincent and the Grenadines°
Uruguay
Venezuela, RB*

Middle East & North Africa

Algeria*
Bahrain*
Egypt, Arab Rep.*
Iran, Islamic Rep.*
Jordan
Kuwait*
Lebanon
Libya*
Morocco
Oman*
Qatar*
Saudi Arabia*
Sudan*°
Syrian Arab Republic*
Tunisia*
United Arab Emirates*
Yemen*°

South Asia

Bangladesh°
Bhutan°
India
Nepal°
Pakistan
Sri Lanka

Sub-Saharan Africa

Angola*
Benin°
Botswana
Burkina Faso°
Burundi°
Cameroon*°
Cape Verde°
Central African Republic°
Chad*°
Congo, Rep.*°
Cote d'Ivoire°
Ethiopia°
Gabon*
Gambia°
Ghana°
Kenya°
Lesotho°
Madagascar°
Malawi°
Mali°
Mauritania°
Mauritius
Mozambique°
Namibia
Niger°
Nigeria*°
Rwanda°
Senegal°
South Africa
Swaziland
Tanzania°
Togo°
Uganda°
Zambia°
Zimbabwe

High-Income Countries

Australia
Austria
Bahamas, The
Barbados
Belgium
Brunei Darussalam
Canada*
Croatia
Cyprus
Czech Republic
Denmark
Equatorial Guinea*
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Japan
Korea, Rep.
Latvia
Malta
Netherlands
New Zealand
Norway*
Poland
Portugal
Slovak Republic
Slovenia
Spain
Sweden
Switzerland
Trinidad and Tobago*
United Kingdom
United States