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

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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 and types of economy. Using a rich dataset for more than 130 countries for the period 1975-2005, cross-section and 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 differing performance on financial access for a given level of depth.

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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 and 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 been used frequently.

Several different econometric methodologies have been employed to uncover this finance and growth nexus.[1] 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 control for other potential growth determinants and the Solow-Swan convergence effect. To deal with potential reverse causality—some degree of financial development possibly being 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), Rousseau and Wachtel (2000) and Beck and Levine (2004)

[1] See Levine (2004)

rely on panel 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 provide a single, homogeneous 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 one 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 oil 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.[2] Two recent studies described 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 though their investment rates are higher on average than in oil importing countries. They 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 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

[2] 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.

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: by income level, across regions, and between oil exporters and other countries. Regarding income level, it is evident that Low Income Countries (LICs) in general 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. Needless to say, this shallowness on both fronts should limit LIC growth potential over the long run. However, it is also possible that these countries also lack the supporting legal, institutional, regulatory or supervisory infrastructure that would allow the greatest benefit to accrue from 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.

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 to and reduce the potential bias arising from having a large number of time observations in a dynamic panel estimation[3]. 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—particularly those not in the high-income Gulf Cooperation Council group—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 this region. For example, during 1975-2005, real per capita GDP grew by an average 0.4 percent per year in MENA, compared to 2.4 percent for 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

[3] As noted by Roodman (2007), 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.

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 has examined systematically whether the conventional positive link between finance and growth varies across regions, thereby at least partly explaining MENA's disappointing growth 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.

Regarding oil-exporting countries, the growth impact of banking depth is found to be weaker for oil exporters as a whole 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 is weaker for LICs, 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 on average relative to other countries, 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 in our previous paper, 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 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 is undoubtedly desirable, the challenge is to engender high-quality deepening that facilitates greater access, competition, and with proper supervision in place.

The organization of the paper is as follows. Section II provides description of the data and some noteworthy stylized facts. Section III describes the econometric methodologies. Section IV presents the main results. Finally, Section V explores possible explanations for the weak

[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 lack of appropriate labor skills or of electricity supply.

performance of banks in the MENA region, Oil dependent and Low income countries and concludes.

II. DATA

A. Datasets

The data used in this study is composed of different 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 and updated to 2010. Standard financial depth indicators were employed: *private credit,* and *turnover*. *Private credit* measures private credit by deposit money banks to GDP, *turnover* is the ratio of the value of total shares traded to average real market capitalization.[6]

Some variables, such as non-oil and total GDP, terms of trade in goods and services, public consumption expenditure, and population of the countries 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 used in this paper comes from the World Bank open source data. Total 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 of GDP are in constant terms and in US Dollars in 2000. Other controls include the percentage of gross secondary school enrollment to reflect human capital, and the ratio of foreign direct investment to GDP.

Other variables used in this study include measures of banking supervision and financial access. The banking supervision variable is obtained from Abiad, et al (2008), 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. Furthermore, two measures of financial access (include number of bank branches per 1000 kilometer squares and number of borrowers from commercial banks per 1000 adults) are extracted from IMF's Financial Access database.

[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.

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 and Table 2 for the oil exporters. Table 3 shows the means for the main variables for each region, and Table 4 displays the results of tests for differences in means between non-oil exporters and oil-exporters (first column), and between the Middle East and North Africa and the rest of the world (second column). The list of countries is 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. They also have significantly lower turnover ratios than non-oil exporters.

As for cross-region differences, over the entire study period the Middle East and North Africa region does not exhibit particularly low levels of financial depth nor of secondary enrollment or FDI compared to other regions—the p-values of the means tests are all well above 10 percent—however, its growth performance has been significantly weaker.

Looking more closely at recent cross-regional differences in financial depth, MENA countries on average do not appear to be particularly lacking. As Figure 2 shows, in 2008 the average private credit-GDP ratio for MENA was, at 45 percent; higher than the emerging economy average of 38 percent, although well short of the 100 percent level typically observed in high-income countries. Furthermore, stock markets in MENA countries appear to substantially more developed on average than in other emerging and developing countries; with a turnover ratio of 44 percent, the region compares quite favorably with the 28 percent average for the emerging countries as a whole, and even so with the 30 percent average for the East Asia and Pacific region.

However, two main qualifications should be made. First, there is considerable heterogeneity within MENA countries. In particular, Jordan, Kuwait, Lebanon, Morocco, Tunisia, and 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. With regard to equity markets, several Gulf Cooperation Council (GCC) countries as well as Jordan stand out as having particularly high activity, while Egypt and

[7] The World Bank regional classification was generally followed, 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, regardless of income level.

Morocco are at about the EDC average, and the rest of MENA countries are well below Figure 3).

Second, trends in bank deepening over time are not encouraging for MENA countries. Although they deepened substantially along with other regions from 1970 to 2005, this is the only region that failed to deepen further after 2005, with private credit to GDP falling by two percentage points up to 2008 (Figure 2b). 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, this 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.

III. EMPIRICAL METHODOLOGY

The finance and growth literature is concerned with obtaining 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:

$$g_{it} = \alpha + \beta f_{it} + \gamma X_{it} + \delta y_{i,t0} + c_i + \mu_t + \epsilon_{it} \qquad (1)$$

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 initial income $y_{i,t0}$ 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 Foreign Direct Investment, Terms of Trade, and/or Government Consumption. Furthermore, in some cases the specification includes c_i, denoting the 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.

Two methods have been used to present econometric estimations of β. First, a cross-section regression which uses OLS on country-specific period averages, and second, GMM dynamic panel methodology which combines time as well cross-country variation in the data. This paper will focus on the latter, given that the OLS methodology suffers from two deficiencies. First, because of the presence of omitted variables which are unobserved and may drive economic growth, the estimates might be biased. The reason for this issue arises from the possible correlation of the lagged or initial value of the dependent variable with the error term i.e. $E[y_{i,t-1}(\mu_i \epsilon_i)] \neq 0$ or $E[y_{i0}(\mu_i \epsilon_i)] \neq 0$, depending on which is used in the regression. Second, the OLS method does not control for endogeneity of the variables. Some instrumental variable estimations, such those in La Porta et al (1998) use legal origin

dummies as instruments for financial depth, but these do not address the possible endogeneity of other variables in the growth regression.

If one 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. The method combines both 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 observations, otherwise asymptotic imprecision and biases may arise.[8] 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 30 years of observations for more than 140 countries, the averaging produces six five-year periods for each country, thus the number of time observations is very small relative to the number of countries.

First-differencing equation (1), the following equation is obtained which eliminates country-specific variables, thus avoiding the potential omitted variable bias:

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

where $\Delta \mathrm{r}_{\mathrm{it}} = \mathrm{r}_{\mathrm{it}} - \mathrm{r}_{\mathrm{i,t-1}}$ 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. Using the weak exogeneity assumption, Arellano and Bond (1991) propose that lagged values of the weakly exogenous (predetermined) variables be used as instruments to the differenced equation.

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 regression in levels and are uncorrelated with the error term. For example, the lagged difference of financial development is uncorrelated with the error term and the unobserved fixed effects in equation 1 i.e.:

$$\mathrm{E}[\Delta f_{it-s}(c_i + \epsilon_{it})] = 0 \qquad \forall t \geq 3, s = 2$$

Stacking all the moment conditions from the difference and level equation, 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 variance-covariance matrix and

[8] As noted by Roodman (2007), 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.

performs a similar estimation to obtain final estimates under the assumption that the error terms are not necessarily homoskedastic and independent[9].

The regression in this paper extends the conventional finance-growth equation to include an interaction term (*Interact*) between financial depth and one of five alternatives: (i) dummy variables to capture regional effects: Europe and Central Asia, MENA (or, alternatively, sub-groups of countries within the region), South Asia, East Asia and Pacific, Sub-Saharan Africa, Latin America and the Caribbean, and the rest of the world (high-income countries);[10] (ii) as in Nili and Rastad (2007) a dummy variable for oil exporters, *Oilexp*; (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; (iv) a dummy variable for low income countries, *LICS*; and (v) income level, or the level of GDP per capita, as a continuous measure for the wealth of the country, *Income*.

$$g_{it} = \alpha + \beta f_{it} + \kappa\, Interact_i \times f_{it} + \gamma X_{it} + \delta y_{i0} + c_i + \mu_t + \epsilon_{it} \qquad (3)$$

The control variables X_i are: secondary school enrolment in gross percentage to control for the effect of the level of human capital, government consumption, terms of trade in goods and services and foreign direct investment as a percentage of GDP.[11] All *X* variables are computed as the logarithm of their mean values over each five year period. κ measures the possible heterogeneity 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 latter is relevant for capturing to what extent financial intermediation promotes economic diversification in oil-dependent economies, a crucial issue for long-term development.

The present paper introduces methodological and data improvements over previous studies: (i) in contrast to Beck (2011), it uses a dynamic panel method (as in Nili and Rastad, 2007)

[9] "Xtabond2" is the command used by 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 as internal instrumental variables.

[10] 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.

[11] Here we report only the specifications including private credit as the banking depth variable and stock market turnover as the market depth variable. In addition, we report only the specifications including education, initial per capita GDP, and foreign direct investment as control variables. The main results of other specifications are essentially the same, and are available from the authors upon request.

rather than cross-country regression to uncover differences for oil exporters; (ii) in contrast to Nili and Rastad, 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 144 countries included in some regressions. In particular, the sample of oil exporters has been expanded,[12] and they are reflected in the regressions not only as 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 in 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 of stock market activity.

IV. Regression Results

A. Banking depth

The results of the system estimator exhibit quite interesting results for the relationship between banking sector depth—as measured by the private credit-GDP ratio—and growth. Tables 6-8 present estimations where the dependent variable is total real GDP growth (Tables 6 and 8) or non-oil real GDP growth (Table 7). In each of the three tables, the first column presents the baseline specification commonly used in the literature (such as in Beck and Levine (2004) or Beck (2008)), with one key modification: it also accounts 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 (2008) definition of systemic banking crises, about 60 percent of all such episodes experienced during the 1970-2007 period occurred in the 1990s. For both MENA and Low-Income Countries, accounting for crises is crucial in order to distinguish their growth effects accurately with respect to the rest of the world, as they are relatively less prone to banking crises.[13] As the first column in both tables shows, financial crises reduce the growth impact

[12] 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.

[13] In fact, one subset of Middle East and North African countries has distinguished itself by having a particularly low incidence of banking crises: the GCC. Over the 1970-2007 period, there was only one GCC banking crisis.

of private credit by about one-half. Furthermore, the control variables perform as expected, with education attainment and FDI both positively related to growth and with a highly significant convergence effect as well.

The cross-region differences are tested in Tables 6 and 7. The second column in these tables reports the results interacting private credit with the region dummies to capture cross-region heterogeneity, and shows that the growth effects are lower for this region as a whole, a result that strengthens in both magnitude and statistical significance when non-oil growth is used the dependent variable. With regard to total GDP growth, the results indicate that the same level of banking depth in the Middle East and North Africa produces growth effects that are about one-third smaller than in other regions. In addition, there is some evidence that Europe and Central Asia have growth impact from banks that is high by international standards. Note that, by controlling for financial crises, these regressions effectively compare the growth effects across regions *during normal times*.

The third and fourth columns of Tables 6 and 7 confirm earlier findings that oil dependency weakens the finance-growth link, thus providing evidence of a finance channel for the resource-curse. As with the cross-region test, 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.

The fifth column introduces regional dummies once again, but distinguishes between two subgroups within MENA: the Arab Mediterranean, or MEDA countries, and other Middle East and North Africa countries. The results suggest that MEDA countries were driving the negative interaction observed for the Middle East and North Africa as a whole. While the MEDA interaction coefficient with private credit is negative and significant, the corresponding coefficient for other Middle East and North Africa countries is negligible, not statistically significantly different from zero.[14]

Finally, the sixth and seventh columns interact private credit further, with the MEDA dummy and either *Oilexp* and *Oildep*. The results indicate that the MEDA oil producers—Algeria, Egypt, and Libya—would tend to fare well in relation to similarly oil-dependent countries outside the region. For example, Algeria—with an oil dependence of about 34 percent in 2005—would obtain a greater growth benefit from private credit than would an equally oil-dependent country, such as Trinidad and Tobago.

[14] 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.

Turning to heterogeneity across income levels, the results indicate that the growth benefits emanating from higher financial depth tend to be smaller for LICs. The interaction term with the LIC dummy is negative in all regressions, and is statistically significant in most, whether included on its own or further interacted with other country-specific variables. In addition to the simple comparison of LICs vs. non-LICs which the interaction with the dummy variable provides, we also find that growth impact of depth increases continuously with income level, a relationship that is statistically significant (Table 8).

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 4 shows the estimated impact on long-term growth from increasing banking sector depth by 20 percentage points of GDP, comparable to the average worldwide financial deepening that occurred from 1995 to 2008. As one would expect from a log specification, greater growth benefits accrue to countries that begin their deepening from a lower initial level. A non-MENA country that begins its deepening process at about 10 percent of GDP—for example, Armenia—could expect to gain additional 1.3 percentage points of per capita growth once the deepening process is completed at 30 percent of GDP. However, a MENA country starting from a similar level—say, Libya, for example—would only add just over one-half of a percentage point of growth.

Regarding the size of differences across income levels, we see from Figure 5 that the estimated impact of private sector credit on growth is nonnegative at even the lowest income levels. The conventional result—a positive growth impact of financial depth—occurs above an income of $770 - $810, or roughly at the 73rd percentile for LICs in 2008. Further interactions reveal the relevance of certain country characteristics. The quality of regulation and supervision appears as a mitigating factor; LICs with better supervision and regulation tend to display a greater growth impact of depth, particularly on the banking side. Partial influence functions suggest that LICs can approach the gains from banking depth of other countries by introducing significant improvements in supervision and regulation (Figure 6). As of 2005, LICs are certainly lagging in this regard; for a sample of 18 of these countries, the average value for this indicator was 1.4, compared to 1.8 for middle-income countries and over 2.5 for high-income countries.

B. Stock market activity

Tables 9 and 10 repeat the same exercises as in Tables 6 and 7, respectively, including a market-based rather than a bank-based measure of financial development as the relevant explanatory variable. As in the case of private credit, accounting for banking crises is also relevant; the coefficient on stock market turnover is positive and significant in normal times, and crises have a significant negative impact on this coefficient. Interestingly, financial crises appear to have a larger impact on the growth benefits of stock market depth in comparison to

those of banking depth; in the baseline specification an occurrence of financial crisis virtually erases all of the direct growth impact of stock market depth, whereas it reduces the growth effect of banking depth by between a third and one-half. 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. Thus, it appears that stock markets do not exhibit a corresponding "quality effect"; greater deepening should be expected to generate roughly the same benefits across regions and equally for oil-dependent and non-oil-dependent countries. Thus, the main challenge in this regard is to encourage greater stock market activity. Figure 7 shows the potential gains 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 just over one-half of a percentage point, and decline to about one-fifth of a percentage for countries starting at a ratio of 40 percent.

However, there is some evidence that the finance-growth link might differ across income levels. Table 11 shows that, although the coefficient on turnover does not appear to vary continuously with income level, LICs as a group display a lower growth impact, which is also partially offset to the extent that supervision improves.

V. Concluding Comments

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 more precise estimates of the effect of finance on growth in terms of getting unbiased, consistent and more efficient predictions. This paper uses a frequently used GMM dynamic panel methodology to investigate whether the strength of the estimated effect varies across countries, and specifically, to what certain regions, oil dependent and low income countries in particular compare to the rest of the world.

As to whether financial depth itself is visibly different for these countries, the answer is affirmative for low income countries, which suffer from significantly shallow financial systems, and mixed for those in the MENA region and oil exporters. First, on average, MENA countries do not appear far off from international standards in terms of both banking and stock market depth. However, they are a quite heterogeneous grouping; with several of them exhibiting very high banking depth. Many also have relatively vigorous stock markets; while the rest tend to lie below world and even EDC averages. What appears to set MENA countries apart is in their lack of ability to convert bank deposits into credit to the private sector. The region ranks last and has shown a downward trend in the credit-deposit ratio while virtually all other regions are increasing.

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 less than two-thirds to one-half of those obtained in other regions.

The finance and growth nexus tells us a similar story about low income countries with the exception that they also suffer from shallow financial systems. The results show that, in addition to the observed shallowness of financial systems in poorer countries, these also tend to obtain less of a growth benefit from their existing levels of depth than do their higher-income counterparts. Our analysis shows that this result not only holds when comparing LICs as a group to non-LICs, but also as income is increased continuously over the country sample. Therefore, while increasing financial depth should continue to be a critical component of a pro-growth strategy, our analysis suggests that *quality* of financial intermediation, the efficiency with which funds are put to productive uses, can play an important part in the growth process as well.

Thus, the challenge in LICs is twofold; along with actions aimed at increasing depth; these countries should undertake policies that enhance the quality of finance. Our analysis shows that supervision and regulation constitute one area in which LICs have scope to introduce improvements which could serve to lessen their disadvantage relative to higher-income countries.

What might explain these differences in performance across countries? Although by no means a definitive explanation, these results are at least consistent with worldwide patterns of behavior regarding access to financial services, which could be reflecting how widely the benefits of financial activity are disseminated throughout the economy. As it turns out, the differences in access between LICs and other countries are strikingly larger than the respective differences in depth. For example, while in 2008 banking depth (private credit-GDP) 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 large, the degree of coverage of banking services (deposits and loans) among the adult population was about 7 times as large, and that of non-bank institutions was 6-9 times as large (Figures 8 and 9). Therefore, to gain a better understanding of the types of policies that will most benefit LICs, future work will focus on the interplay between supportive policies, financial access, and the growth impact of depth.

Figure 10 summarizes these patterns for two dimensions of financial access and compares those measures by three categories of countries, LICs vs. non-LICs, Oil vs. non-Oil, and MENA vs. non-MENA. While there is a positive cross-country relationship between financial depth—the ratio of credit to GDP—and financial access, the three groups that tend to underperform in the growth regressions also tend to have subpar financial access. For the same level of depth, low income countries, those in the MENA region and oil dependent economies have considerably fewer borrowers from commercial banks and fewer bank

branches relative to those with higher incomes, outside the MENA region and non-oil countries, respectively.

One main message to draw from these comparisons is that in low income countries and specially 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. Indeed, estimated competition in the banking system is 20 percent lower.[15] Therefore, it seems plausible that the quality gap observed from the regression results is related to deficiencies in providing access and generating competition.

Thus, policymakers in MENA and low income 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 low income countries, in particular 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, by encouraging improvements in access and greater competition. As discussed extensively and convincingly in the recent World Bank flagship report on finance in the Middle East and North Africa (World Bank, 2011), introducing improvements in information on prospective borrowers—including the establishment of credit bureaus— enhancing the legal protection of creditors' rights as well as the framework surrounding secured transactions, are all potential areas where quality gains can be achieved. Ultimately, these actions should result in benefits in terms of higher and more sustainable long-run growth.

[15] Anzoategui, et al (2010) find that the level of banking competition in the MENA region, as measured by estimates of the H-Statistic and Lerner Index, is significantly below that of other regions..

TABLES

Table 1: Summary Statistics

	Number of Countries	Mean	Std. Dev.	Min	Max
Private Credit	145	33.105	26.100	0.849	146.769
Bank Deposits	143	35.991	25.785	2.378	173.864
Liquid Liabilities	141	42.201	25.501	5.223	182.613
Market Cap	104	31.406	33.146	0.547	170.660
Turnover	102	29.065	30.826	0.188	139.587
Growth	148	1.533	1.717	-4.082	5.969
Non-Oil Growth	148	1.655	1.770	-4.082	5.969
Education	148	64.014	32.051	4.888	130.257
FDI	148	2.600	2.402	0.062	14.291
Gov. Consumption	143	17.182	6.992	5.148	44.185
Oildep	148	0.054	0.141	0.000	0.741

Table 2: Summary Statistics – Oil Exporters

	Number of Countries	Mean	Std. Dev.	Min	Max
Private Credit	30	25.336	18.267	2.857	88.680
Bank Deposits	29	29.450	19.618	4.452	92.135
Liquid Liabilities	29	37.802	20.846	13.255	101.873
Market Cap	20	35.998	32.311	7.298	118.027
Turnover	20	19.393	18.882	0.188	65.469
Growth	30	1.028	1.470	-1.582	4.050
Non-Oil Growth	30	1.631	1.854	-2.491	5.147
Education	30	58.682	25.975	10.321	110.044
FDI	30	2.496	2.096	0.114	8.632
Gov. Consumption	29	17.579	7.931	6.807	40.073
Oildep	30	0.267	0.206	0.031	0.741

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	High Income Countries
Private Credit	31.79016	30.53237	13.81342	31.83212	18.85499	14.05062	61.1243
Bank Deposits	37.85002	36.45852	18.17295	35.83654	28.2585	17.21493	59.00035
Liquid Liabilities	50.23919	42.92228	25.2436	41.81426	35.90789	24.15422	62.72528
Market Cap	41.28443	32.69947	8.080053	18.43247	10.61311	22.43843	48.5813
Turnover	18.84237	23.27136	23.00729	10.57569	50.60017	5.236888	51.58792
Growth	1.01657	2.421664	0.937277	1.572915	3.138463	0.574575	2.279379
Non-Oil Growth	2.238709	2.340906	1.249532	1.639131	3.138463	0.453524	2.21922
Education	65.78453	51.81511	86.99828	67.94454	40.92151	27.1761	98.80421
FDI	1.843851	2.865721	3.896061	3.546653	0.437963	2.075482	2.671397
Gov. Consumption	19.95044	15.58892	15.19516	16.10588	11.71363	16.5141	19.4476
Oil	0.234741	0.025376	0.008985	0.018086	0	0.069815	0.014181
Lerner Index	0.345462	0.255436	0.237485	0.187119	0.248771	0.241037	0.235257
H-Stat	0.528725	0.743302	0.590843	0.754631	0.714502	0.527103	0.638444

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

Variable	Non-oil Exporters vs. Oil Exporters	All Other Regions vs. Middle East and North Africa
Private Credit	0.0335	0.3864
Bank Deposits	0.0632	0.5191
Liquid Liabilities	0.1495	0.8405
Market Cap	0.7534	0.8628
Turnover	0.059	0.1115
Growth	0.0356	0.0649
Non-Oil Growth	0.4672	0.8779
Education	0.1546	0.45
FDI	0.3954	0.1262
Gov.Consumption	0.6333	0.9444

Table 5: Correlations – All Countries

	Private Credit	Bank Deposits	Liquid Liabilities	Market Cap	Turn over	GDP PC Growth	Non-Oil Growth
Private Credit	1.000						
Bank Deposits	0.884	1.000					
Liquid Liabilities	0.827	0.963	1.000				
Market Cap	0.592	0.635	0.576	1.000			
Turnover	0.269	0.229	0.213	0.087	1.000		
GDP PC Growth	0.359	0.279	0.289	-0.038	0.311	1.000	
Non-Oil Growth	0.448	0.398	0.382	0.142	0.324	0.817	1.000

Table 6: Private Credit and Growth: Dynamic Panel Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: Real per capita GDP growth						
Private Credit	0.013 ***	0.016 **	0.011 ***	0.012 ***	0.012 *	0.011 ***	0.012 ***
	(3.473)	(2.342)	(3.033)	(2.810)	(1.960)	(2.934)	(2.886)
Private Credit x Financial Crisis	-0.006 ***	-0.005 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***
	(-5.624)	(-2.670)	(-5.204)	(-4.864)	(-4.012)	(-5.543)	(-4.678)
Private Credit x Middle East and North Africa		-0.005 *					
		(-1.765)					
Private Credit x MEDA					-0.007 *		
					(-1.732)		
Private Credit x non-MEDA					-0.001		
					(-0.364)		
Private Credit x East Asia & Pacific		-0.002			0.000		
		(-0.389)			(-0.089)		
Private Credit x Europe & Central Asia		0.011 **			0.014 **		
		(2.043)			(2.425)		
Private Credit x Latin American & Caribbean		-0.006 *			-0.004		
		(-1.783)			(-1.181)		
Private Credit x South Asia		-0.008			-0.004		
		(-1.420)			(-0.734)		
Private Credit x Sub-Saharan Africa		-0.008			-0.005		
		(-1.418)			(-0.911)		
Private Credit x Oilexp			-0.007 **			-0.008 **	
			(-2.255)			(-2.289)	
Private Credit x Oildep				-0.030 ***			-0.028 ***
				(-3.118)			(-2.816)
Private Credit x Oilexp x MEDA						0.003	
						(0.524)	
Private Credit x Oildep x MEDA							0.047 ***
							(3.530)
Education	0.021 **	0.022 **	0.017 **	0.015 *	0.017 **	0.016 **	0.015 *
	(2.486)	(2.561)	(2.295)	(1.950)	(2.036)	(2.187)	(1.955)
Initial GDP per capita	-0.015 ***	-0.021 ***	-0.012 ***	-0.013 ***	-0.016 **	-0.012 ***	-0.013 ***
	(-3.270)	(-3.473)	(-2.884)	(-2.863)	(-2.488)	(-2.699)	(-2.929)
FDI	0.348 ***	0.234 *	0.357 ***	0.276 **	0.238 *	0.358 ***	0.267 **
	(3.319)	(1.847)	(3.025)	(2.537)	(1.879)	(3.251)	(2.423)
Constant	-1.603 ***	-1.030 *	-1.640 ***	-1.254 **	-1.060 *	-1.645 ***	-1.214 **
	(-3.321)	(-1.726)	(-2.997)	(-2.472)	(-1.790)	(-3.212)	(-2.365)
Observations	678	670	678	637	678	678	637
Number of countries	146	142	146	144	146	146	144
AR2	0.927	0.879	0.832	0.928	0.991	0.832	0.936
Hansen	0.300	0.309	0.278	0.098	0.419	0.584	0.162
Number of instruments	76	92	90	90	100	104	98
Wald test statistic for significance of coefficient of Private Credit in MEDA countries and/or Oil exporters.			0.337	0.074	0.141	0.265	0.007
Wald Test is for Private Credit and its Interaction with:			Oilexp		MEDA	Oilexp + Oilexp X MEDA	

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: 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 regional dummy variables and/or 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 7: Private Credit and Non-Oil Growth: Dynamic Panel Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: Real per capita Non-oil GDP growth						
Private Credit	0.012 ***	0.018 **	0.010 *	0.009 **	0.014 **	0.010 **	0.011 **
	(2.658)	(2.083)	(1.949)	(2.179)	(2.464)	(1.982)	(2.032)
Private Credit x Financial Crisis	-0.007 ***	-0.005 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***
	(-6.022)	(-2.651)	(-4.959)	(-4.793)	(-2.688)	(-4.856)	(-4.829)
Private Credit x Middle East and North Africa		-0.009 ***					
		(-2.679)					
Private Credit x MEDA					-0.008 *		
					(-1.879)		
Private Credit x non-MEDA					0.000		
					(-0.071)		
Private Credit x East Asia & Pacific		-0.004			-0.002		
		(-0.636)			(-0.326)		
Private Credit x Europe & Central Asia		0.009			0.014 **		
		(1.457)			(2.174)		
Private Credit x Latin American & Caribbean		-0.007 *			-0.004		
		(-1.928)			(-1.007)		
Private Credit x South Asia		-0.009			-0.004		
		(-1.298)			(-0.565)		
Private Credit x Sub-Saharan Africa		-0.007			-0.004		
		(-0.981)			(-0.656)		
Private Credit x Oilexp			-0.010 **			-0.011 **	
			(-2.126)			(-2.307)	
Private Credit x Oildep				-0.044 ***			-0.043 ***
				(-3.777)			(-3.336)
Private Credit x Oilexp x MEDA						0.001	
						(0.140)	
Private Credit x Oildep x MEDA							0.055 **
							(2.505)
Education	0.018 *	0.026 **	0.015	0.011	0.018 *	0.014	0.012
	(1.780)	(2.612)	(1.534)	(1.193)	(1.914)	(1.377)	(1.187)
Initial GDP per capita	-0.013 ***	-0.023 ***	-0.011 **	-0.009 *	-0.016 **	-0.011 *	-0.011 **
	(-2.620)	(-2.890)	(-2.093)	(-1.848)	(-2.382)	(-1.962)	(-2.000)
FDI	0.261 ***	0.138	0.284 ***	0.186	0.156	0.276 ***	0.154
	(2.617)	(1.037)	(2.888)	(1.652)	(1.105)	(2.811)	(1.512)
Constant	-1.194 **	-0.594	-1.294 ***	-0.834	-0.684	-1.257 ***	-0.685
	(-2.592)	(-0.945)	(-2.838)	(-1.584)	(-1.050)	(-2.744)	(-1.435)
Observations	630	619	630	630	630	630	630
Number of countries	144	140	144	144	144	144	144
AR2	0.968	0.866	0.969	0.946	0.984	0.988	0.916
Hansen	0.140	0.480	0.096	0.066	0.340	0.153	0.037
Number of instruments	76	92	90	90	100	97	97
Wald test statistic for significance of coefficient of Private Credit in MEDA countries and/or Oil exporters.			0.984	0.009	0.070	0.956	
Wald Test is for Private Credit and its Interaction with:			Oilexp		MEDA	Oilexp + Oilexp X MEDA	

This table shows the results of dynamic panel regressions for growth of real per capita non-oil 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; Terms of trade in goods and services; FDI expressed as a percentage of GDP; and Government consumptionas a percentage of GDP. Some specifications also include interactions between private credit and regional dummy variables and/or 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: Credit-GDP and Growth in Low Income Countries: Dynamic Panel Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: Growth rate of real per capita GDP						
Credit-GDP	0.012 ***	0.017 ***	-0.047 **	0.011 **	0.013 **	0.019 *	0.027 **
	(2.477)	(2.471)	(-2.593)	(2.389)	(2.571)	(1.783)	(2.410)
Credit-GDP x Financial crisis	-0.006 ***	-0.006 ***	-0.006 ***	-0.010 ***	-0.009 ***	-0.006 ***	-0.006
	(-2.744)	(-4.046)	(-4.090)	(-3.847)	(-3.435)	(-4.029)	(-3.944)
Credit-GDP x LIC		-0.006		-0.006	-0.011 ***	-0.006 *	-0.041 ***
		(-1.483)		(-1.280)	(-2.929)	(-1.721)	(-2.627)
Credit-GDP x Income			0.009 ***				
			(3.092)				
Credit-GDP x Openness						-0.001	-0.003
						(-0.262)	(-1.019)
Credit-GDP x LIC x Openness							0.009 **
							(2.222)
Credit-GDP x Bank Supervision				0.001	0.001		
				(0.493)	(0.632)		
Credit-GDP x LIC x Bank Supervision					0.004 *		
					(1.929)		
Education	0.025 ***	0.028 ***	0.035 ***	0.023 **	0.019 *	0.021 **	0.019 **
	(3.163)	(3.142)	(5.056)	(2.178)	(1.873)	(2.609)	(2.509)
Initial GDP per capita	-0.017 ***	-0.024 ***	-0.054 ***	-0.020 ***	-0.019 ***	-0.020 ***	-0.020 ***
	(-2.987)	(-2.673)	(-4.055)	(-2.891)	(-2.935)	(-3.828)	(-4.343)
FDI	0.361 ***	0.298 **	0.275 ***	0.225	0.227	0.389 ***	0.373 ***
	(3.028)	(2.479)	(2.653)	(1.089)	(1.138)	(2.895)	(2.633)
Constant	-1.664 ***	-1.331 ***	-1.051 **	-0.993	-1.000	-1.765 ***	-1.680 **
	(-3.020)	(-2.347)	(-2.051)	(-1.036)	(-1.076)	(-2.865)	(-2.580)
Observations	678	678	677	407	407	652	652
Number of countries	146	146	146	80	80	142	142
AR2	0.857	0.920	0.812	0.492	0.467	0.882	0.926
Hansen	0.382	0.453	0.301	0.100	0.161	0.483	0.707
Number of instruments	83	96	96	63	71	109	122

This table shows the results of dynamic panel regressions for real per capita GDP growth, using a GMM procedure following Arellano and Bover(1995). The explanatory variables are: The ratio of bank credit to the private sector to GDP; Education, percentage of gross secondary school enrollment; Initial GDP per capita; and FDI expressed as a percentage of GDP. Some specifications also include interactions between liquid liabilities and either a dummy variable for LICs, Income, the level of income per capita; Openness, the ratio of exports plus imports to GDP; or the quality of bank supervision. All specifications include an interaction term between the credit-GDP ratio and a dummy variable expressing whether the country experienced a financial crisis during each five-year period. The dependent variable as well as the explanatory variables (except the dummies and Supervision) are expressed their mean values over non-overlapping five year-periods during 1975-2005, and the explanatory variables are expressed in logs. Robust t-statistics are shown in parentheses, and significance at the 1 percent (***), 5 percent (**), and 10 percent (*) levels are indicated.

Table 9: Turnover Ratio and Growth: Dynamic Panel Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: Real per capita GDP growth						
Turnover	0.005 **	0.009 **	0.004 **	0.004 *	0.008 **	0.005 **	0.004 *
	(2.472)	(2.225)	(2.299)	(1.740)	(2.218)	(2.351)	(1.870)
Turnover x Financial Crisis	-0.006 ***	-0.010 ***	-0.007 ***	-0.007 ***	-0.010 ***	-0.007 ***	-0.007 ***
	(-4.140)	(-4.017)	(-4.125)	(-3.649)	(-3.945)	(-4.129)	(-3.572)
Turnover x Middle East and North Africa		-0.001					
		(-0.155)					
Turnover x MEDA					-0.002		
					(-0.303)		
Turnover x non-MEDA					-0.001		
					(-0.316)		
Turnover x East Asia & Pacific		0.002			0.000		
		(0.463)			(0.116)		
Turnover x Europe & Central Asia		0.009			0.008		
		(1.508)			(1.359)		
Turnover x Latin American & Caribbean		-0.002			-0.002		
		(-0.455)			(-0.598)		
Turnover x South Asia		-0.003			-0.003		
		(-0.791)			(-0.729)		
Turnover x Sub-Saharan Africa		-0.005			-0.006		
		(-0.733)			(-0.926)		
Turnover x Oilexp			0.000			-0.001	
			(-0.173)			(-0.464)	
Turnover x Oildep				-0.006			-0.006
				(-0.751)			(-0.750)
Turnover x Oilexp x MEDA						0.001	
						(0.117)	
Turnover x Oildep x MEDA							0.002
							(0.030)
Education	0.024 **	0.008	0.023 ***	0.022 *	0.006	0.020 **	0.021 *
	(2.263)	(0.432)	(2.808)	(1.889)	(0.387)	(2.314)	(1.905)
Initial GDP per capita	-0.011 ***	-0.012 **	-0.012 ***	-0.011 ***	-0.012 ***	-0.012 ***	-0.011 ***
	(-4.265)	(-2.358)	(-4.527)	(-3.580)	(-2.699)	(-4.150)	(-3.367)
FDI	0.266 *	0.405 **	0.277 *	0.275	0.353 *	0.287	0.268
	(1.792)	(2.056)	(1.781)	(1.641)	(1.784)	(1.555)	(1.521)
Constant	-1.228 *	-1.805 *	-1.266 *	-1.261	-1.554 *	-1.307	-1.228
	(-1.789)	(-1.969)	(-1.759)	(-1.628)	(-1.675)	(-1.532)	(-1.509)
Observations	363	363	363	343	363	363	343
Number of countries	104	104	104	101	104	104	101
AR2	0.969	0.814	0.977	0.481	0.858	0.893	0.504
Hansen	0.471	0.557	0.753	0.610	0.739	0.816	0.768
Number of instruments	76	92	90	90	95	98	98
Wald test statistic for significance of coefficient of Private Credit in MEDA countries and/or Oil exporters.		0.113	0.102		0.063	0.446	
Wald Test is for Private Credit and its Interaction with:		MENA	Oilexp		MEDA	Oilexp + Oilexp X MEDA	

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: Oilexp, a dummy variable for oil exporting countries; Oildep, the share of oil GDP in total GDP; Turnover, the stock market turnover ratio; 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 and/or 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 10: Turnover Ratio and Non-Oil Growth: Dynamic Panel Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: Real per capita Non-oil GDP growth						
Turnover	0.005 **	0.007 *	0.005 **	0.005 **	0.008 **	0.005 **	0.005 **
	(2.392)	(1.742)	(2.026)	(2.426)	(2.117)	(2.140)	(2.420)
Turnover x Financial Crisis	-0.009 ***	-0.012 ***	-0.010 ***	-0.009 ***	-0.013 ***	-0.010 ***	-0.009 ***
	(-4.434)	(-3.911)	(-5.173)	(-5.042)	(-4.098)	(-5.316)	(-4.939)
Turnover x Middle East and North Africa		0.000					
		(-0.038)					
Turnover x MEDA					-0.003		
					(-0.453)		
Turnover x non-MEDA					-0.001		
					(-0.079)		
Turnover x East Asia & Pacific		0.003			0.001		
		(0.577)			(0.161)		
Turnover x Europe & Central Asia		0.012 **			0.012 *		
		(2.222)			(1.834)		
Turnover x Latin American & Caribbean		-0.003			-0.003		
		(-0.612)			(-0.513)		
Turnover x South Asia		-0.001			-0.003		
		(-0.214)			(-0.568)		
Turnover x Sub-Saharan Africa		0.003			0.001		
		(0.346)			(0.129)		
Turnover x Oilexp			-0.001			-0.002	
			(-0.386)			(-0.425)	
Turnover x Oildep				-0.006			-0.008
				(-0.441)			(-0.508)
Turnover x Oilexp x MEDA						0.003	
						(0.494)	
Turnover x Oildep x MEDA							(0.063)
							(-0.474)
Education	0.024 *	0.010	0.023 *	0.024 *	0.010	0.023 *	0.022
	(1.887)	(0.643)	(1.974)	(1.761)	(0.666)	(1.809)	(1.582)
Initial GDP per capita	-0.013 ***	-0.010 *	-0.014 ***	-0.013 ***	-0.012 **	-0.014 ***	-0.013 ***
	(-3.116)	(-1.789)	(-3.578)	(-3.241)	(-2.225)	(-3.367)	(-3.144)
FDI	0.247 *	0.243	0.195	0.226	0.247	0.205	0.212
	(1.748)	(1.073)	(1.462)	(1.544)	(1.112)	(1.452)	(1.470)
Constant	-1.131 *	-1.078	-0.877	-1.028	-1.085	-0.919	-0.956
	(-1.732)	(-1.021)	(-1.415)	(-1.523)	(-1.042)	(-1.401)	(-1.436)
Observations	339	339	339	339	339	339	339
Number of countries	101	101	101	101	101	101	101
AR2	0.577	0.766	0.551	0.562	0.626	0.531	0.500
Hansen	0.664	0.682	0.710	0.605	0.681	0.834	0.829
Number of instruments	76	92	89	89	95	96	96
Wald test statistic for significance of coefficient of Private Credit in MEDA countries and/or Oil exporters.		0.311	0.363	0.973	0.436	0.195	
Wald Test is for Private Credit and its Interaction with:		MENA	Oilexp	Oildep	MEDA	Oilexp + Oilexp X Mediterr	

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: Oilexp, a dummy variable for oil exporting countries; Oildep, the share of oil GDP in total GDP; Turnover, the stock market turnover ratio; 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 and/or 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: Turnover Ratio and Growth in Low-Income Countries: Dynamic Panel Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
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 LIC dummy and other indicators								
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)		
Control variables								
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 real per capita GDP growth, using a GMM procedure following Arellano and Bover(1995). The explanatory variables are: Turnover, the ratio of stock market value traded to capitalization; Education, percentage of gross secondary school enrollment; Initial GDP per capita; and FDI expressed as a percentage of GDP. Some specifications also include interactions between liquid liabilities and either a dummy variable for LICs, Income, the level of income per capita; Openness, the ratio of exports plus imports to GDP; or the quality of bank supervision. All specifications include an interaction term between Turnover and a dummy variable expressing whether the country experienced a financial crisis during each five-year period. The dependent variable as well as the explanatory variables (except the dummies and Supervision) are expressed their mean values over non-overlapping five year-periods during 1975-2005, and the explanatory variables are expressed in logs. Robust t-statistics are shown in parentheses, and significance at the 1 percent (***), 5 percent (**), and 10 percent (*) levels are indicated.

GRAPHS

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

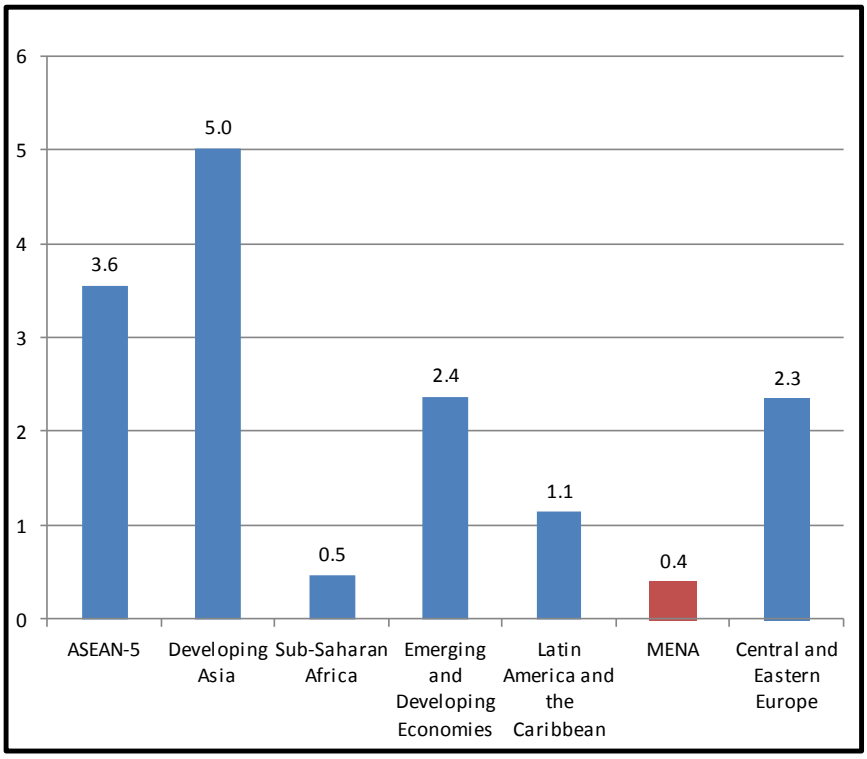
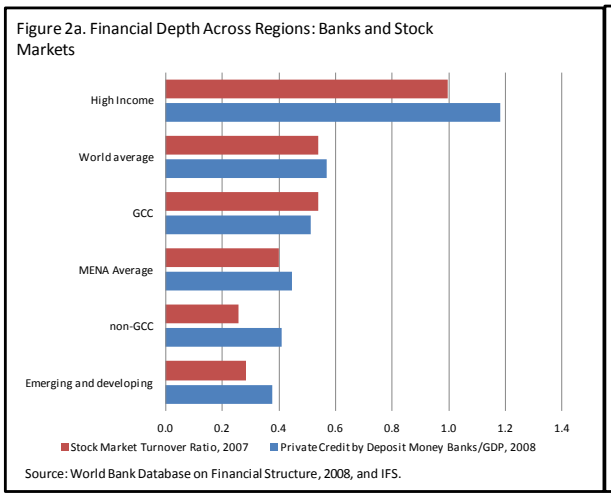


Figure 2. Financial Depth Across Regions



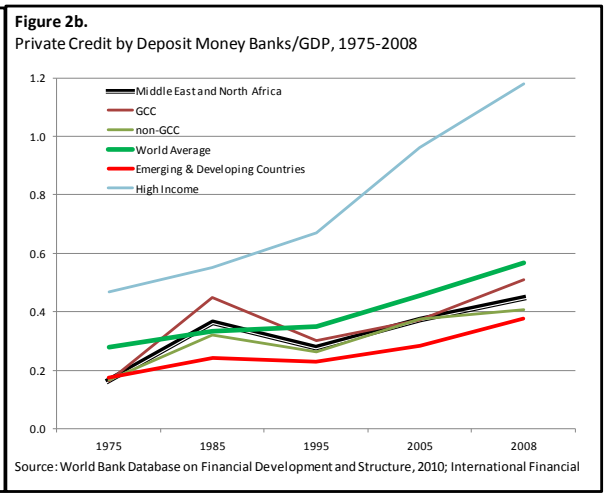
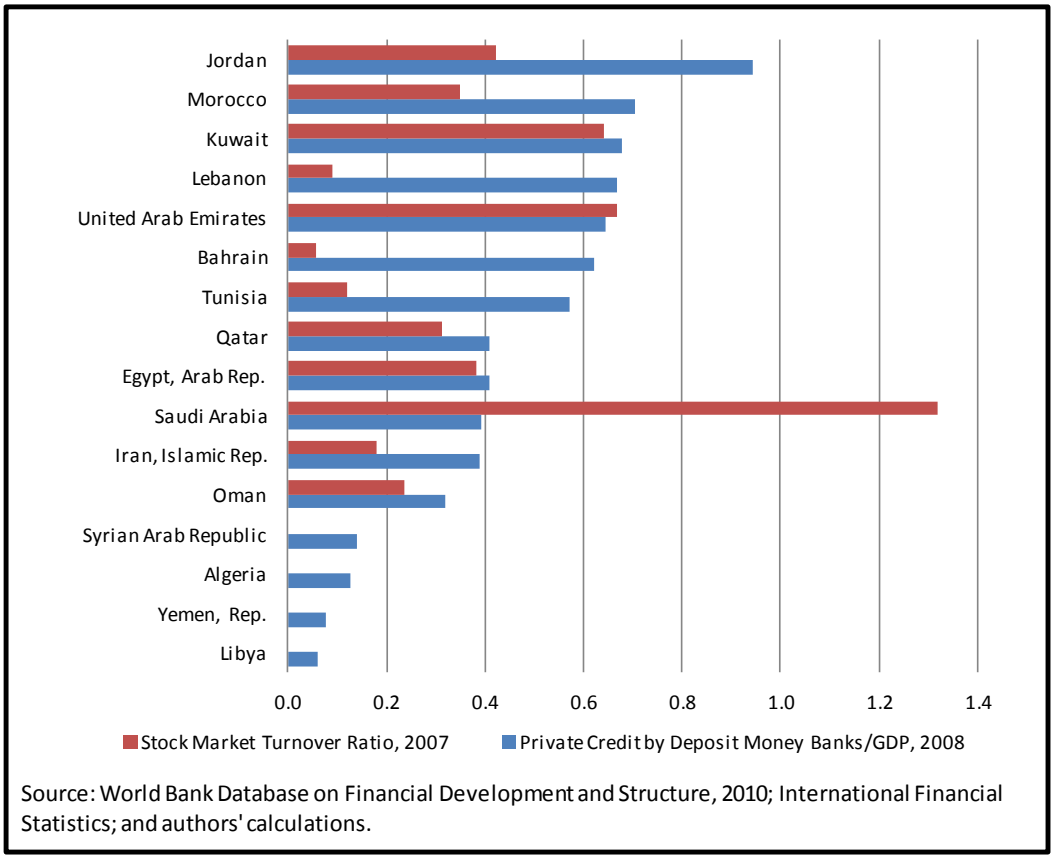
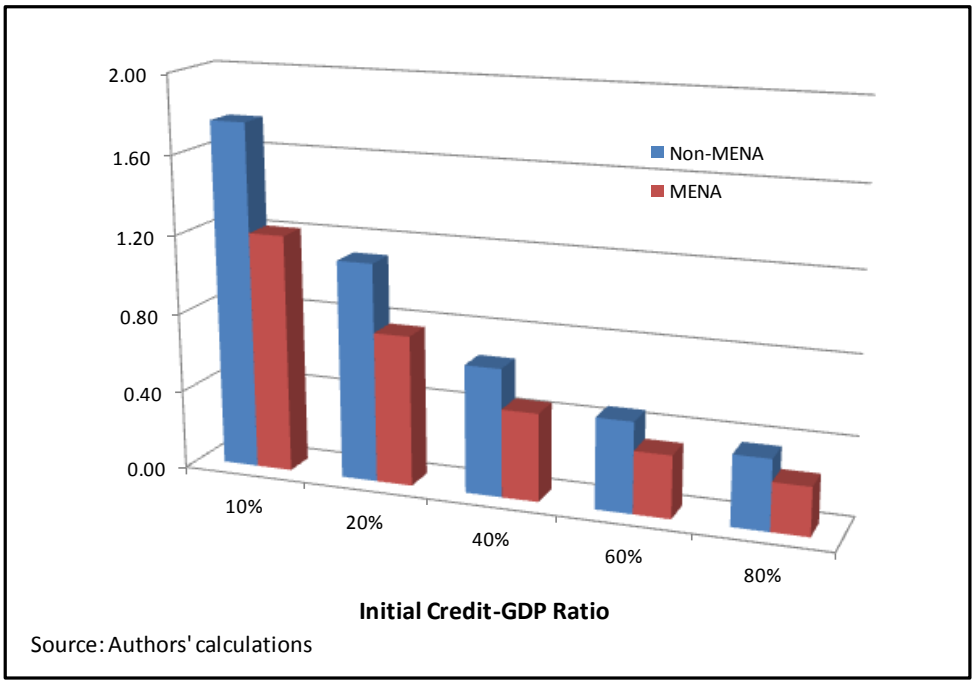


Figure 3. Financial Depth in MENA Countries, 2008



Source: World Bank Database on Financial Development and Structure, 2010; International Financial Statistics; and authors' calculations.

Figure 4. Estimated Impact on Real Per Capita Growth of a 20 Percentage-Point Increase in Credit-GDP (Percentage points)



Source: Authors' calculations

Figure 5: The Impact of Private Credit on Growth at Different Income Levels

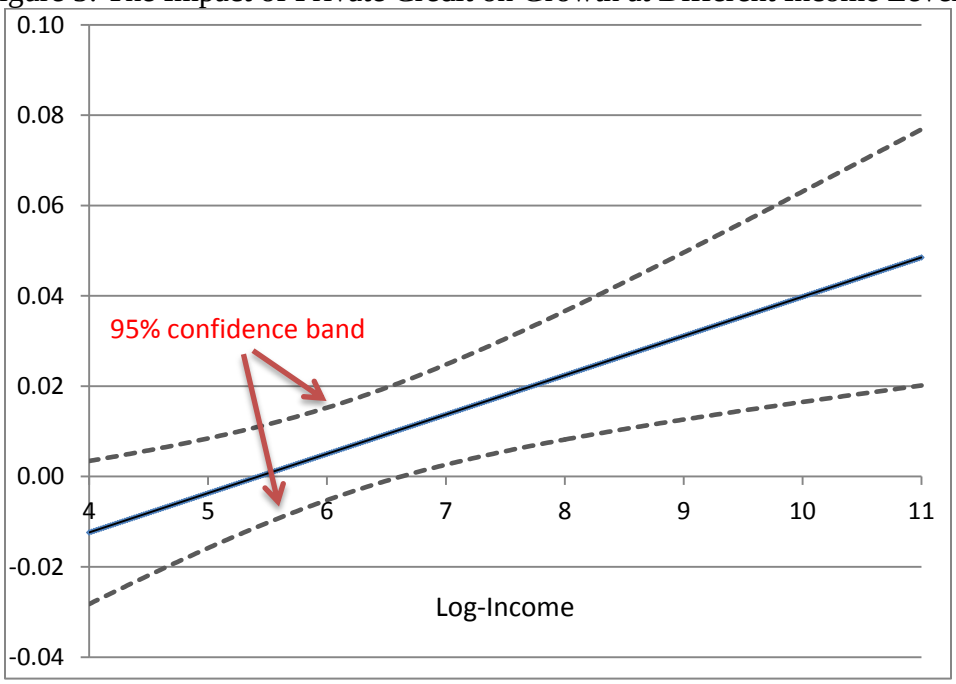


Figure 6: The Marginal Impact of Private Credit on Growth in LICs
at Different Levels of Bank Supervision

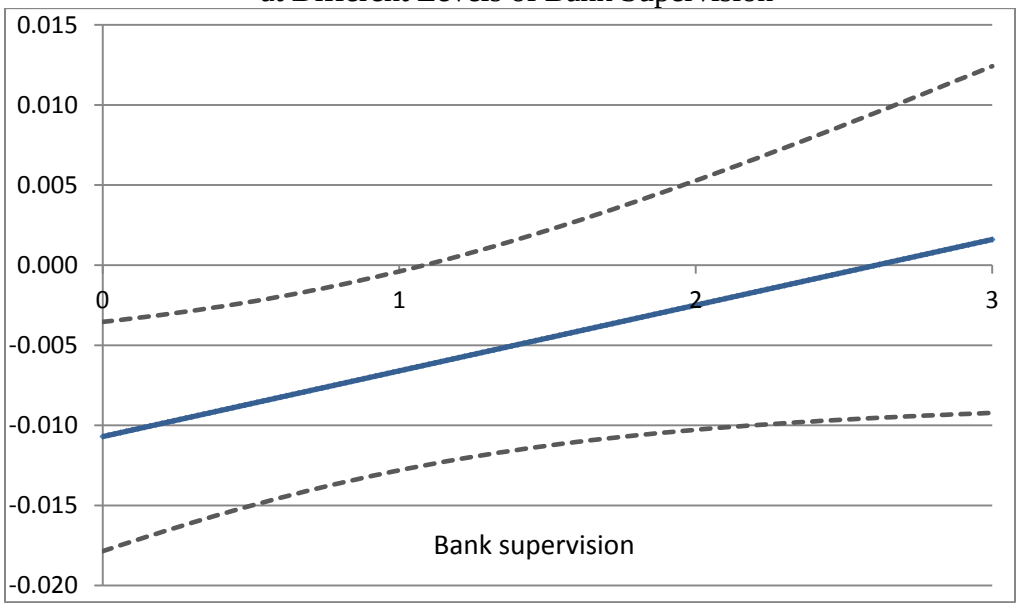


Figure 7. Estimated Impact on Real Per Capita Growth of a 20 Percentage-Point Increase in Stock Market Turnover (Percentage points)

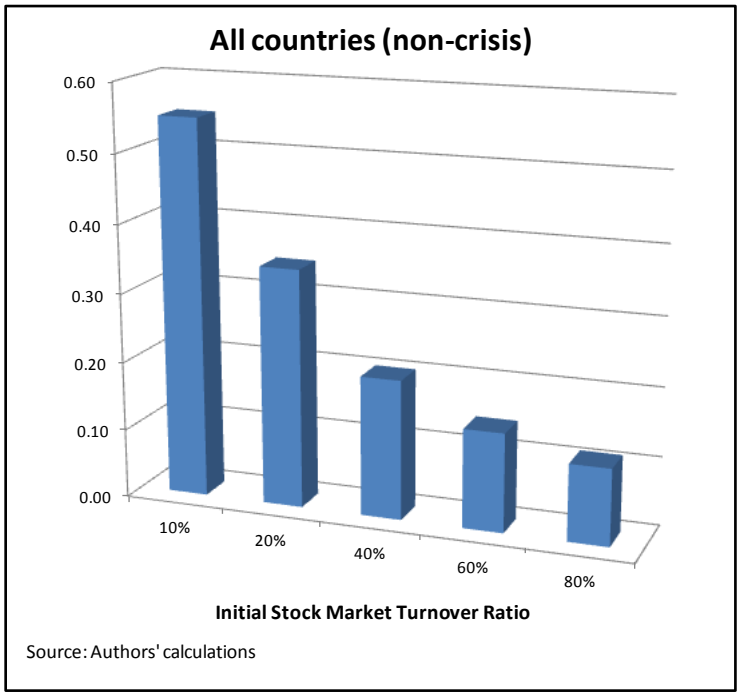


Figure 8. Banking Sector Performance in MENA Countries Relative to Emerging and Developing Country Average and to Sub-Saharan Africa, 2008[16]

[ENTER FIGURE 8 HERE]

Figure 9. Financial Access and Depth across Different Income Groups

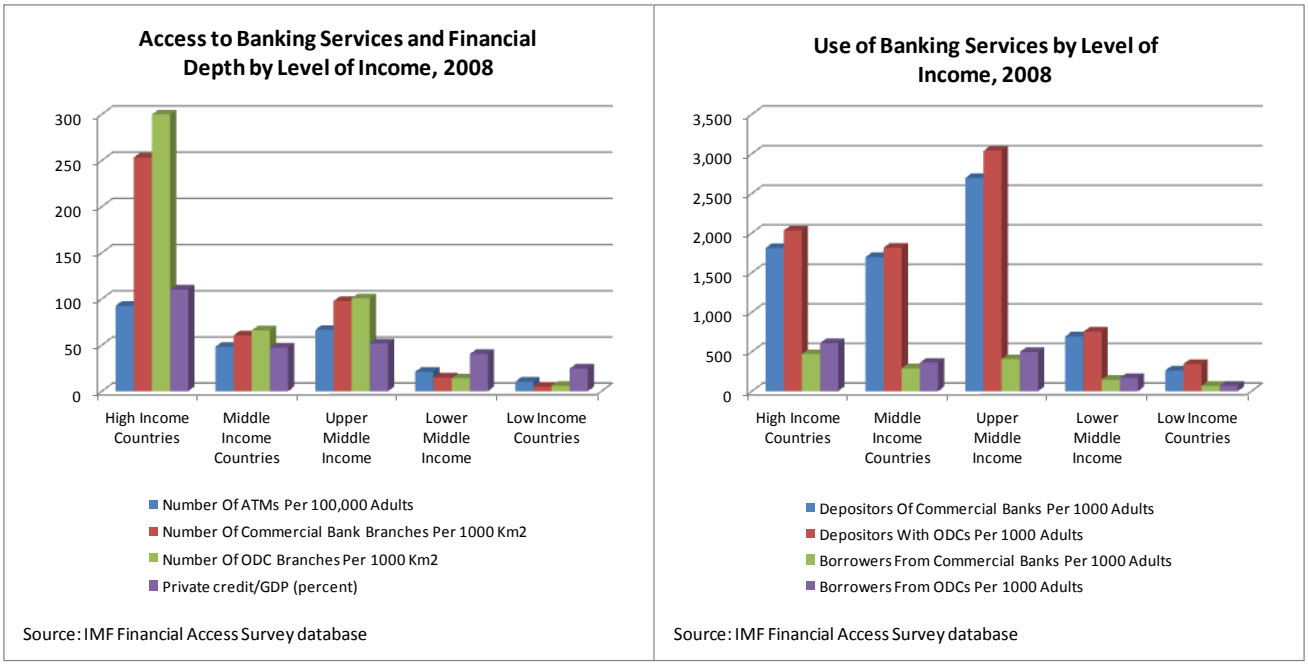
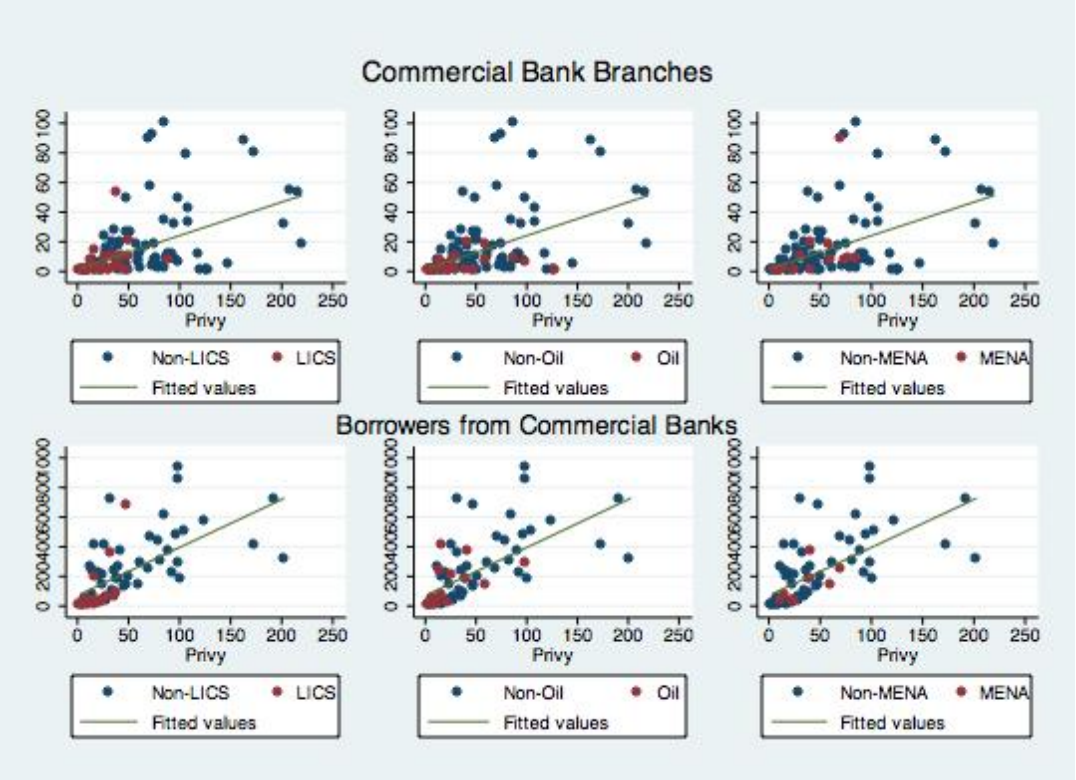


Figure 11. Comparison of Financial Access by Income Level, Oil and MENA Categories

[16] 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.



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