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Institutions and the finance–growth nexus: Empirical evidence from MENA countries

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Abstract

This paper investigates the effect of institutional quality on the finance–growth nexus. To this end, an empirical model with linear interaction between financial development and institutional quality is estimated. Our main findings show that, while most indicators of financial development have a significantly negative effect on economic growth, the sign of the coefficients of interaction variables are significantly positive. This provides strong evidence that institutional quality mitigates the negative effect of financial development on economic growth. Looking to the subcomponents of our institutional index, our findings show a development of the banking sector in a country with an important score in Law and Order, Bureaucracy and Investment Profile facilitate growth. Also, countries, with an important score of investment profile, can benefit from stock market development in terms of economic growth. These results suggest that, in order to benefit from financial development, financial systems in MENA countries must be embedded within a sound institutional framework.

JEL classification: G1; O11; O4

Keywords: Banking sector development; Stock market development; Economic growth; Institutional quality; MENA countries

1. Introduction

The fundamental economic growth question, which has preoccupied researchers, is why countries grow at different rates. Addressing this question, an important strand of literature paid special attention to the role of the financial system in the growth process. On the theoretical side, an important battery of models articulates mechanisms through which the financial system affects economic growth (e.g. King & Levine, 1993a, 1993b; McKinnon, 1973; Pagano, 1993; Shaw, 1973). These studies support Schumpeter's view which emphasizes the positive role of financial development in determining economic growth.

However, by declaring that "where enterprise leads finance follows" Robinson (1952, p. 86) provided a skeptical view stressing that financial development followed economic growth. This view was echoed by Lucas (1988) who believed that the finance–growth relationship was unimportant. Hence, he asserted that economists tended to overemphasize the role of financial factors in economic growth. Theory provides, also, conflicting predictions about the role of different subcomponents of the financial system on economic growth. Some theories emphasize the relevance of the banking system on economic growth, while others highlight the benefits of stock markets (Allen & Gale, 1999; Boot & Thakor, 1997).

On the empirical side, by using different econometric methodologies, empirical results provide evidence that a range

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of financial indicators have a significant and positive effect on economic growth.[1]

Our research extends previous evidences by investigating the conditional finance–growth relationship in Middle East and North African (MENA) countries. Specifically, we examine whether the finance–growth nexus is affected by institutional quality. In fact, as identified by North (1990), institutions are "the rules of the games in a society". These include both "formal" rules such as constitutions and laws enforced by the state and "informal" constraints such as "codes of conduct, norms of behavior, and conventions" which, generally, are enforced by the members of the relevant group (North, 1990, p. 36). "*In consideration of all these aspects, institutions ensure, define and steer the functioning of market and non-market-activities*" (Balzat, 2006, p. 20). Therefore, when either the rules change frequently or are not respected, markets do not function well. A number of papers (Knack & Keefer, 1995; Mauro, 1995; Rodrik, Subramanian, & Trebbi, 2002) supported the key role played by institutional quality in promoting economic performance. These findings are supported by Bonnal and Yaya (2015).

For the MENA region, Ben Naceur, Cherif, and Khandil's recent study (2014) showed that Institutional quality, particularly rule of law, promoted financial development by signaling confidence in the quality of the legal system in support of economic activity. Gazdar and Cherif's (2015) latest results supported that institutional quality played an important role in the MENA's financial system. However, this role is more relevant for the banking sector than for stock market development.

The main reasons, which motivated us to choose the MENA countries to perform our empirical investigations, were that few studies focused on this region. In addition, and these studies' main findings were that, while MENA countries had embarked on financial reforms since the mid-1980s, financial development had not worked as an engine of economic development in this region (Ben Naceur & Ghazouani, 2007). Over the past two decades or so, the growth performance of the MENA region has been rather disappointing. As a whole, the region experienced the weakest real per capita growth performance amongst all regions worldwide (Bhattacharya & Wolde, 2010; Nabli & Véganzonès-Varoudakis, 2004). One possible reason for these results is that the relationship between financial development and economic growth may not be linear, but rather be dependent simply on the conditions like institutional quality. In fact, an increase in financial deepening, as captured by standard indicators of financial development, may not result in increased growth because of corruption in the banking system or political interference. These may divert credit to unproductive or even wasteful activities (Demetriades & Law, 2006).

We re-investigate how financial development affects the economic growth in MENA countries. Specifically, we examine how the responsiveness of economic growth to financial development depends upon the indicator of institutional quality. Our contribution consists of determining an institutional threshold beyond which financial development can accelerate economic growth. Specifically, we aim to calculate the minimum level of institutional quality that must be attained by MENA countries to benefit from financial development in terms of economic growth.

An empirical model with linear interaction between financial development and institutional quality is estimated. As econometric methodology, we use the GMM estimators developed for dynamic panel data for a sample of 18 MENA countries over the period from 1984 to 2007. Our main findings show that, while most indicators of financial development have a significantly negative effect on economic growth, the sign of the coefficients of interaction variables are significantly positive. This provides strong evidence that institutional quality mitigates the negative effect of financial development on economic growth. These results are in line with Demetriades and Law's (2006) findings.

The rest of this study proceeds as follows. Section 2 reviews the literature exploring the connection between financial development and economic growth. Section 3 describes the data and presents the empirical methodology. Section 4 reports the main results. Section 5 reports the conclusion.

2. Literature review

In the theoretical Arrow-Debreu World, characterized by a state-contingent claim framework with no information or transaction costs, there is no need for a financial system "*that expends resources researching projects, scrutinizing managers, or designing arrangements to ease risk management and facilitate transaction*" (Levine, 1997, p. 690). A financial system becomes essential once frictions are introduced in the Arrow-Debreu model. Therefore, financial intermediaries and markets emerge to ameliorate the problems of asymmetric information and high transaction costs. The ability of the financial system to relax these frictions can lead to facilitating the allocation of resources over space and time (Levine, 1997, 2005; Merton & Bodie, 1995). Thus, in easing information, enforcement, and transactions costs, financial systems provide five broad categories of services to the economy. In a couple of papers, Levine (1997, 2005) classified the functions of financial systems into the following five categories: (1) producing information and allocation of capital; (2) monitoring firms exerting corporate control; (3) risk amelioration; (4) pooling of savings; and (5) easing exchange.

Theoreticians hold different perspectives on the link between financial developments and economic growth. While, as an important extension, the earliest theoretical studies focused on the effect of financial development on economic growth, some studies were interested in the relative merits of a bank-based financial system and a market-based financial system on economic growth. Another strand of studies extended, also,

[1] The early empirical evidences include: King and Levine (1993a, 1993b), Goldsmith (1969), and Atje and Jovanovic (1993). The recent empirical evidences include: Beck and Levine (2004), Demetriades and Law (2006), Hasan, Wachtel, and Zhou (2009a, 2009b), and Hassan, Sanchez, and Yu (2011).

this theory by stressing the nonlinearity of the finance–growth nexus.

The notable early works on finance and development along the Schumpeterian lines include Gurley and Shaw (1955) and Goldsmith (1969). They argued that financial development was crucial in determining economic growth.

Building on the work of Schumpeter, McKinnon (1973) and Shaw (1973) propounded the 'financial liberalization' thesis in 1973 by suggesting that a higher level of financial development, which could be the result of financial liberalization, would lead to increased output growth. They argued that the financial sector could raise the volume of savings as well as the quantity and quality of investment. In the early 1990s the endogenous financial development and growth models[2] emerged. These models point out that financial development leads to long-run economic growth. Similarly, financial distortion reduces the rate of economic growth.

Building on the theoretical evidence, there emerged a number of empirical studies which focused on examining the relationship between financial development and economic growth. These studies proceeded from using country-level data, to using industry and firm-level data. The econometric methodologies on this subject can be categorized broadly into the following four groups (i) pure cross-country, (ii) instrumental variable, (iii) times series; and (iv) firm and household-level approaches.

Empirical investigations on the relationship between finance and growth come back to the seminal contribution of Goldsmith (1969). He sought to assess whether or not finance exerted a causal influence on growth and whether or not the mixture of markets and intermediaries operating in an economy influenced it. To this end, for 35 countries over the period from 1860 to 1963, he considered data on the assets of financial intermediaries relative to GNP and data on the sum of net issues of bonds and securities plus changes in loans relative to GNP. Applying both OLS and graphical analysis, Goldsmith (1969) found a clear relationship between financial development and economic growth. However, as cited in Levine (1997, p. 704) and Levine (2005, p. 40) this study suffered from several weaknesses. Thus, several researchers took steps to address some of these caveats. King and Levine (1993a) adopted a sample of 77 countries over the period from 1960 to 1989 and controlled for other factors affecting long-run growth. Their study's findings provide some support for the Schumpeterian view—that finance matters for growth. King and Levine (1993b) confirmed, also, this finding. In fact, using alternative econometric methods and considering both the financial and growth indicators defined by King and Levine (1993a) for a sample of 80 countries, King and Levine (1993b) found that financial development promoted economic growth.

While the above cited studies focused on the finance–growth relationship through the impact of the banking sector on economic growth, an important strand of studies attempted to examine the role of stock markets on economic growth. These studies started with the contribution of Atje and Jovanovic (1993) who investigated the impact of both stock markets and bank on economic growth. Based on annual observations for 94 countries over the period from 1960 to 1985 and using an OLS analysis, Atje and Jovanovic (1993) found that while stock markets had both positive levels and growth effects on economic activity, they failed to find a similar effect for bank lending. Building on Atje and Jovanovic's (1993) study, Levine and Zervos (1998) examined whether or not banking and stock market indicators both correlated robustly with current and future rates of economic growth, capital accumulation, productivity improvements and private savings. Applying the OLS technique of estimation to a sample of 49 countries for the period from 1960 to 1989, Levine and Zervos (1998) found that while stock market liquidity correlated positively and significantly with current and future rates of economic growth, capital accumulation, and productivity growth, stock market size, volatility, and integration were not linked robustly with growth. Their findings show, also, that the initial levels of both stock market liquidity and banking sector development predict future rates of growth, capital accumulation, and productivity growth.

To overcome the biases related to OLS, the classical approach, adopted in cross-country growth regressions, is to identify an instrumental variable which explains cross-country differences in financial development but is uncorrelated with economic growth beyond its link with financial development and other growth determinants. Therefore, in contrast to traditional cross-country investigations, Levine (1998) examined whether or not cross-country variations in the exogenous component of banking sector development explained cross-country variations in the rate of economic development. Thus, he used the legal determinants of banking development as instrumental variables for the banking sector development indicator. As a result, he found that the exogenous component of banking development was associated positively with all indicators of economic growth. In line with Levine (1998), Levine, Loayza, and Beck (2000) found that the exogenous component of financial intermediary development was associated positively with economic growth.

To account explicitly for biases induced by the inclusion of the lagged dependent variable and to control for the potential endogeneity of all explanatory variables, researchers utilized dynamic panel regressions as an alternative to cross-sectional Instrumental Variable (IV) regressions. To our knowledge, Levine (1999), Rousseau and Wachtel (2000), Beck, Levine, and Norman (2000), Levine et al. (2000) were among the first studies to use the dynamic panel analysis. More specifically they considered the Generalized Method-of-Moments (GMM) estimators developed by Holtz-Eakin, Newey, and Rosen (1988), Arellano and Bond (1991) and Arellano and Bover (1995). Moreover, besides the traditional cross-section instrumental variable procedures (described above), Levine et al. (2000) used the recent dynamic panel techniques "*system estimator*" to examine the relationship between financial intermediary and growth. As with the traditional cross-section,

[2] Pagano (1993), King and Levine (1993b), and Bencivenga, Smith, and Starr (1995).

the results of dynamic panel data show that exogenous changes in financial intermediary development imply large changes in economic growth. Constructing a panel dataset with data averaged over each of the seven 5-year periods between 1960 and 1995 and considering the GMM panel estimator together, they provided a strong positive relationship between financial intermediary and both economic growth and total factor productivity growth. In the same vein Beck and Levine (2004) examined the relationship between growth and both stock markets and bank development. Their findings show that stock markets and banks have positive and significant effects on economic growth and that these effects are not due to potential biases induced by simultaneity, omitted variables or unobserved country-specific effects.

In a more recent paper, Kar, Nazlıoğlu, and Ağır (2011) examined the finance–growth nexus in MENA countries. Specifically they examined the direction of causality between finance and growth. To this end, they applied the recently proposed panel causality testing approach which takes into account cross-sectional dependence across countries. Using a sample of 15 MENA countries over the period from 1980 to 2007, they found that, for all measurements of financial development, there was no clear consensus on the direction of causality between financial development and economic growth and they observed, also, that the findings were country and financial development specific.

Hasan et al. (2009a, 2009b) contributed to this line of research by analyzing, specifically in China, the role of legal institutions, financial deepening and political pluralism on growth rates at the regional level. The results show that while capital market, legal environment, awareness of property rights and political pluralism have a strong influence on growth, the impact of bank lending is insignificant and is sometimes negative.

To investigate the finance and growth relationship, Loayza and Ranciere (2006) and Demetriades and Law (2006) adopted the Pooled Mean Group (PMG) estimators proposed by Pesaran, Yongcheol, and Ron (1999) with its advantage of controlling for country heterogeneity in the finance–growth nexus. Using a sample of 75 countries and annual data for the period from 1960 to 2000 and based on the PMG estimator, Loayza and Ranciere (2006) found that while financial intermediation had a positive and significant effect on economic growth in the long run, this effect was significantly negative in the short run. Demetriades and Law (2006) used data from 72 countries for the period from 1976 to 2000 and adopted both cross-section and panel data econometric methods (MG and PMG). Their findings provide evidence that financial development has an important effect on GDP per capita when the financial system is embedded within a sound institutional framework.

Christopoulos and Tsionas' (2004) study was the first contribution to the finance–growth relationship literature which employed panel data co-integration techniques. Using a sample of 10 developing countries over the period from 1970 to 2000, their empirical results support the hypothesis that the only co-integrating relationship implies unidirectional causality from financial depth to growth. Apergis, Filippidis, and Economidou (2007) contributed to the relevant literature by using a large and heterogenous sample of 65 countries over the period from 1975 to 2000. Applying the panel co-integration techniques developed by Pedroni (1999), Apergis et al. (2007) provide evidence that there is a strong, positive and statistically significant equilibrium relationship between financial development and economic growth. Also, they point out that there is a strong bi-directional causality between financial development and economic growth.

In a time series setting, Ghirmay (2005) explored the causal links between financial development and economic growth in a sample of 13 sub-Saharan African countries. He found that there was a long-run relationship between financial development and economic growth in almost all (12 out of 13) of the countries. Again in eight of the countries, the evidence points to the causality running from financial development to economic growth.

In this vein Abu-Bader and Abu-Qarn (2008) examined, for the period from 1960 to 2004, the causal relationship between financial development and economic growth for six Middle Eastern and North African countries (Algeria, Egypt, Israel, Morocco, Syria, and Tunisia). This study took steps to address some of the weaknesses of the previous empirical analysis of the causality between financial development and economic growth in MENA countries. Unlike most of the previous studies which were based on a bivariate VAR analysis, Abu-Bader and Abu-Qarn (2008) applied a quadvariate Vector Autoregressive (VAR) system to overcome the misspecification bias. In five out of the six countries, the empirical results point to the unidirectional causality running from financial development to economic growth. This causality ran through enhancing investment efficiency rather than through enhancing capital accumulation.

In the case of Greece, Hondroyiannis, Lolos, and Papapetrou (2005) examined, over the period from 1986 to 1999, the relationship between the development of the banking system and stock market and economic performance. Applying VAR models, their findings show that, although their effects are small, both bank and stock market financing can promote economic growth in the long run. However, compared to bank finance, the contribution of the stock market to growth is limited; this can be explained by the minor role played traditionally by the stock market in Greece.

Thangavelu and James (2004) examined empirically the dynamic relationship between financial development and economic growth in Australia in terms of bank-based and market-based financial structure. Therefore, to estimate the relationship, Thangavelu and James (2004) employed time series methodology using a VAR model and the Granger causality test. Using quarterly data, the time span of this study covered the period from 1960 to 1999. Their results suggest that financial intermediaries (bank-based system) and financial markets (market-based system) tend to have different roles in promoting growth in an economy. Indeed, using financial intermediaries' indicators, the empirical results are consistent

with Robinson's (1952) hypothesis that economic growth promotes financial development. However, the results of using financial market indicators are consistent with Schumpeter's view that a market-based system promotes economic growth in the Australian economy.

An important strand of empirical studies examined the non-linear relationship between financial and economic development. In fact, these studies suggested that the finance–growth relationship was very likely to be nonlinear in the sense that the growth effect of finance might vary with alternative macroeconomic and institutional conditions. Applying a threshold regression model to King and Levine's (1993b) dataset which covered 119 countries over the period from 1960 to 1989, Deiddaa and Fattouh (2002) examined empirically the non-linear relationship between financial and economic development. Their results provide evidence consistent with the non-monotonic relationship implied by their empirical model. There is no significant relationship between financial depth and economic growth in low income countries. Using a sample of 74 countries over the period from 1960 to 1995 and applying the GMM dynamic panel data techniques, Rioja and Valev's (2004) results support the non-linear relationship between financial development and economic growth view.

To characterize how inflation affects the influence of finance on growth, Rousseau and Wachtel (2000) applied the rolling panel data regression technique to a sample of 84 countries from 1960 to 1995. The study provides evidence that there is an inflation threshold for the finance–growth relationship. In fact, when inflation exceeds the 13–25% range, financial deepening fails to increase the level of economic growth. In a more recent study, Huang, Lin, Kim, and Yeh (2010) explored whether or not there existed an inflation threshold in the finance growth nexus. To this end, they employed the threshold regression with the instrumental variables of Caner and Hansen (2004). Using Levine et al.'s (2000) dataset, they found strong evidence of a nonlinear inflation threshold in the finance–growth, below which financial development exerted a significantly positive effect on economic growth, while above which the growth effect of finance appeared to be insignificant. In a similar vein, Demetriades and Law (2006) investigated the effect of institutions on the finance–growth nexus. Applying both a cross-sectional estimation and a panel data estimation to a sample of 72 countries for the period from 1978 to 2000, Demetriades and Law (2006) found that financial development had a larger effect on long-run economic development when the financial system was embedded within a sound institutional framework. However, if institutional quality is low, more finance may not generate a significant benefit in economic growth. Our study relates to this last study's objective—examining the effect of institutional quality on the finance–growth nexus—and, also, the adoption of the empirical model with interaction variables. However, our study differs from previous work by determining an institutional threshold beyond which financial development can accelerate economic growth.

3. Method

3.1. Econometric model

An empirical specification, which allows one to test the responsiveness of economic growth to financial development, depends up on an indicator of institutional quality and has the following form:

$$GROWTH_{it} = \alpha_i + \beta_0 FD_{it} + \beta_1 (FD_{it} * INST_{it}) + \varphi INST_{it} + \gamma Z_{it} + \varepsilon_{it} \quad (1)$$

where $GROWTH_{it}$ refers to the growth of real per capita GDP in the ith country for some time-period, this is our measure of economic growth. FD_{it} includes variables which measure stock markets and banking development, Z_{it} represents a matrix of control variables, α_i is an unobserved country specific effect, and ε_{it} is the error term of each observation.

Equation (1) permits us to assess whether or not financial development has a different influence on growth in countries with high values of institutional quality and countries with low values. In this specification, the responsiveness of the steady state level of economic growth to financial development is δ (equation (2)). Specifically, differentiate equation (1) with respect to financial development to obtain the marginal effect of financial development on economic growth:

$$\delta = \frac{\partial GROWTH}{\partial FD} = \beta_0 + \beta_1 * INST \quad (2)$$

Our conditional hypotheses center around the coefficients β_0 and β_1. Four possibilities are created. They are:

- If $\beta_0 > 0$ and $\beta_1 > 0$, financial development has a positive impact on economic growth and institutional conditions affect favorably that positive impact.
- If $\beta_0 > 0$ and $\beta_1 < 0$, financial development has a positive impact on economic growth and institutional conditions affect adversely that positive impact (institutional quality lessens this positive effect).
- If $\beta_0 < 0$ and $\beta_1 > 0$, financial development has a negative impact on economic growth and institutional conditions mitigate the negative effect of financial development.
- If $\beta_0 < 0$ and $\beta_1 < 0$, financial development has a negative impact on economic growth and institutional conditions aggravate the negative effect of financial development.

Equation (2) allows us to calculate the threshold level of institutional quality beyond which financial development can accelerate economic growth. Thus, the positive effect of financial development on economic growth is observed when:

$$\delta > 0 \iff \beta_0 + \beta_1 * INST > 0$$

Therefore, the threshold level of institutional quality is given by the following expression:

$INST > (-\beta_0/\beta_1)$

To estimate our model we apply the Generalized-method-of-moments (GMM) estimators developed for dynamic panel data. The GMM estimators are well designed to correct the drawbacks of previous technique of estimation (OLS): simultaneity and omitted bias.

3.2. Data

Financial development indicators are extracted from the Beck, Demirguç-Kunt, and Levine (2000) revised database.[3] Our data covers a sample of 18 MENA countries.[4,5] We collected from the World Development Indicators (World Development Indicators, 2008) database other information related to control variables, such as macroeconomic stability, trade openness …. However, the data is unavailable for a uniform period of time for each country. Therefore, the number of observations is expected to vary across countries leading to estimations over an unbalanced panel data.

3.2.1. Data on financial development

We consider four indicators for banking sector development and four indictors for stock market development. The banking sector indicators are: (i) Private Credit (PRIVCRE) equals banking institution credit to private sector as a percent of GDP. It is considered to be an indicator for financial intermediaries' activity (Demirgüç-Kunt & Levine, 1996). (ii) Liquid Liabilities (LIABILITIES) is the ratio of liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and non-bank financial intermediaries) divided by GDP. It is a general indicator for the size of financial intermediaries relative to the size of the economy. (iii) Bank Assets (ASSETS) equals the ratio of the total assets of deposit money banks divided by GDP; it provides a measure of the overall size of banking sector. (iv) A Bank Index (BANKINDEX)[6] which is an index of banking sector development that aggregates the information contained in the individual indicators.

The stock market indicators are: (i) Market Capitalization (MCAP) as an indicator of market size which is equal to the ratio of value of domestic equities (traded on domestic exchanges) to GDP; (ii) Total Value Traded (TRADED) as a measure of stock market liquidity which is equal to the total value of domestic equities traded in each country's major stock exchanges as a percentage of GDP; (iii) Turnover ratio (TURNOVER) is, also, a measure of stock market liquidity. It is equal to the total value of domestic shares traded divided by market capitalization. (iv) a Market Index (MARKETINDEX) which is an index of stock market development that aggregates the information contained in the individual indicators.

All indicators of financial development are expected to be linked positively to economic growth.

3.2.2. Data on other variables

To assess the strength of the independent link between financial development and economic growth, we control for other potential determinants of economic growth in our regression. Specifically we consider the most used variables in the empirical growth theory defined as follows: (i) Initial level of development (IIC) equals the logarithm of initial income per capita and provides evidence of any convergence effects; (ii) Trade Openness (TO), proxied by the ratio of the sum of exports and imports to GDP since the empirical growth literature has shown that openness to international trade is an important determinant of economic growth; (iii) Government Consumption (GC) where we control for the level of government consumption by using the ratio of government consumption to GDP; and (iv) Inflation (INF) proxied by the annual inflation rate which is included as an indicator for macroeconomic stability.

To measure institutional quality we construct a composite index of institutional quality using the International Country Risk Guide (ICRG) variables from the Political Risk Services (PRS) Group. The composite index is the sum of five indicators which are: (i) quality of bureaucracy (ranges 0–4) which measures institutional strength, quality of bureaucracy and the autonomy from political pressure; (ii) law and order (ranges 0–6) which reflects the strength and impartiality of the legal system and popular observance of the law; (iii) corruption (ranges 0–6) which refers to corruption in the political system. Countries, with low levels of corruption, have high index values and vice versa. (iv) Democratic accountability (ranges 0–6) which measures how responsive a government is to its people; and (v) investment profile (ranges 0–12) which is an assessment of factors affecting the risks to investment which are not covered by other political, economic and financial risk components. To enable comparability we standardize all sub-indicators of our institutional index to range between 0 and 1, where higher values indicate higher quality.

4. Empirical results

We use the GMM estimators developed for dynamic panel data for a sample of 18 MENA countries over the period from 1984 to 2007. Appendix B Tables present equations with annual data estimated using the Blundell and Bond (1998) dynamic panel data estimation technique, i.e. two-step system GMM estimations. In addition, we use four-year average data to prevent any biased estimates and to abstract from the business cycle phenomena. This transformation entails the existence of four-year periods of data for all countries

[3] The financial structure database is as updated in November 2008.

[4] Algeria, Bahrain, Djibouti, Egypt, Iran, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates, Yemen.

[5] When stock market data is considered, the sample contains only 13 MENA countries: Bahrain, Egypt, Iran, Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia and United Arab Emirates.

[6] Detailed calculations are presented in Appendix A.

(1984–1987, 1988–1991, 1992–1995, 1996–1999, 2000–2003, 2004–2007) which make for six non-overlapping periods. In the Tables of Appendix B, we report the GMM estimates based on four-year average variables. Table 1 provides the descriptive statistics.

The GMM system regressions satisfy both the Sargan test of over-identifying restrictions and the serial correlation test. In all our model specifications, the Hansen test cannot reject the null hypothesis that our instruments are valid. Moreover, the AR2 test fails to reject the null hypothesis that there is no second order autocorrelation in the differentiated residuals.

4.1. Institutional quality and the bank–growth relationship

Table 2 reports the results of regressions analyzing the effect of institutions on the relationship between banking sector and economic growth. In columns 1 and 2, the composite index BANKINDEX is included as the indicator of banking sector development with the interaction term BANKINDEX*INST. The estimated results show that while BANKINDEX remains significantly negative, the additional interaction variable (BANKINDEX*INST) is significantly positive suggesting that institutional development may mitigate very well the negative effect of BANKINDEX. Namely, while an increase in the BANKINDEX reduces growth, the negative effect is reduced in countries with more developed institutional environments. Our results are similar both when the equation is estimated using annual data or four-year average data. The results illustrate that, in order for banking sector development to contribute to economic growth and when we base on annual data estimates, MENA countries must possess a level of institutional development greater than the threshold level of .55 (.58/1.06 = .55) (Table 1 column 1). Based on estimates using four-year average data, the corresponding threshold is .66 (.129/.194 = .66) (Table 1 column 2).

The negative effect of banking sector development on economic growth in the MENA countries is significant because of the low level of institutional development in this region (the average value of institutional quality in MENA countries is .52 which is lower than the .55 and .66 threshold levels seen from the estimations with annual and four-year average data respectively).

Tunisia (as an example) increased the level of banking sector development from -.007 to .10 between 1989 and 2007. Given that its institutional level of .52 is much lower than the threshold of .66, the increase in banking sector development would reduce the annual growth rate by .003% (.003% = [−.129 + (.194*.52)] (.10 + .007)). On the other hand, Israel (where the average value of institutional quality (.76) is greater than the threshold level (.66)) would benefit on average from banking sector development.

Fig. 1 represents the marginal effect of a one unit increase in BANKINDEX on economic growth based on each country's INST value. The countries are placed in order of magnitude of the total effect of a one unit increase in BANKINDEX. Only in Israel does banking sector development have a positive effect on economic growth because

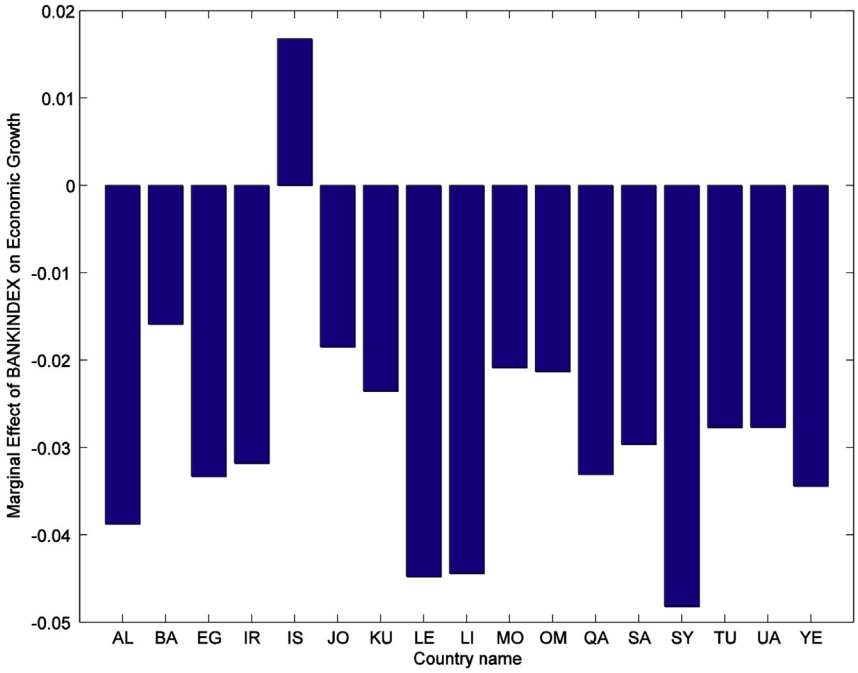

Fig. 1. Marginal effect of BANKINDEX on economic growth. AL = Algeria, BA = Bahrain, EG = Egypt, IR = Iran, IS = Israel, JO = Jordan, KU = Kuwait, LE = Lebanon, LI = Libya, MO = Morocco, OM = Oman, QA = Qatar, SA = Saudi Arabia, SY = Syrian Arab Republic, TU = Tunisia, UAE = United Arab Emirates, YE = Yemen.

it has attained a threshold level of institutional development. On the other hand, the underdeveloped institutional infrastructure of the rest of MENA countries may hamper economic growth.

Looking at the measures of banking sector development, LIABILITIES, ASSETS and PRIVCRE, in most regressions, the institutional variable displays similar results to those when banking development is proxied by BANKINDEX. In fact, the three interaction terms (LIABILITIES*INST, ASSETS*INST and PRIVCRE*INST) are significantly positive when we consider annual data (Table 1). The coefficients for LIABILITIES and ASSETS are significantly negative and suggest that, while a larger and deeper banking system reduces growth, this negative effect is reduced in countries with more developed institutional environments. On the other hand, when we look at estimates based on four-year average data, we find that, while the results are consistent with results of annual data for LIABILITIES, the coefficients for both ASSETS and the interactive term ASSETS*INST do not appear to be statistically significant in Table 2, the last line illustrates that, when the indicator LIABILITIES is considered, the respective threshold levels are .53 and .42 for the annual and four-year average data.

Considering the proxies of banking sector activity (PRIVCRE), the results, displayed in Table 2 columns 7 and 8 indicate that the coefficients of PRIVCRE are negative but no longer significant. On the other hand, when we use respectively annual and four-year average data, the coefficients of (PRIVCRE*INST) are positive and significant at the 1% and 10% levels (1.52 and .73). The consistent threshold levels of institutional quality are .56 for annual data and .55 for averaged data.

Tables 3–7 summarize the results of the regressions run with each of the components of the institutional index[7] including individually and interactively (i.e. FD*BURO, FD*CORR, FD*DEMOC, FD*LAW and FD*INVEST). The main findings suggest that not all dimensions of the institutional framework have the same direct importance for bank growth. In fact, while BURO, LAW and INVEST display qualitatively the same results as those regressions with INST (Table 2), in most regressions including all indicators of banking sector development, CORR does not matter in the banking sector growth nexus.[8]

Generally, when we refer to BANKINDEX, banking sector development leads to economic growth only when, based on annual data, the measures of BURO, LAW and INVEST are higher than the threshold levels (.60, .68, .54 respectively) when. When the four-year average dataset is considered, the consistent thresholds are .60, .57 and .59 respectively.

Democratic accountability (DEMOC) seems to matter only when BANKINDEX is considered. Namely, to benefit from financial intermediaries' development, MENA countries must attain a score of DEMOC higher than the threshold levels (.49 and .55) when we consider respectively annual and averaged data.

4.2. Institutional quality and the stock market-growth relationship

The results of GMM estimators of economic growth on the four indicators of stock market development and the interaction terms between institutional indicators and the four indicators of stock market development are reported in Table 8 using respectively annual and four-year average data.

Similar to banking sector regressions, the evidence from Table 8 shows that, while the four proxies of stock markets development remain significantly negative, the interaction terms have a significantly positive effect on economic growth. This evidence confirms the third possibility (as described above) and suggests the importance of institutional quality in mitigating the negative effect of financial development on economic growth.

When we consider the estimations with four-year average data, the results are consistent with those of the regressions with annual data when we use MARKETINDEX and TRADED as proxies of stock market development (Table 8). In fact, the significantly positive coefficients of the interaction variables (MARKET*INST and TRADED*INST) outline the importance of institutional quality in mitigating the negative effect of stock market on economic growth. However, the coefficients of MCAP and TRNOVER and both the interaction terms (MCAP*INST and TURNOVER*INST) are statistically insignificant.

When considering MARKETINDEX, the results in columns 1 and 2 of Table 8 illustrate that, in order for stock markets to promote economic growth in the MENA region, countries must have a level of institutional development greater than the threshold level of .56 and .53 based on estimates from respectively annual and four-year average data. Building on these results, the significantly negative effect of stock market development on economic growth in MENA countries can be explained by the low level of institutional quality in this region. This is lower than the threshold levels (.56 and .53 for estimates with annual and four-year average data respectively).

When we refer to TRADED, the corresponding thresholds are .59, .52 based on annual and averaged data respectively.

The visual picture of the marginal effect of a one unit increase in MARKETINDEX, based on each country, is depicted in Fig. 2. As seen with BANKINDEX, countries, which demonstrate the positive effects of stock market development, are those countries, such as Israel,[9] which have attained the threshold level of institutional development. On the other hand, as is the case of most MENA countries (for example,

[7] Quality of bureaucracy (BURO), law and order (LAW), corruption (CORR), democratic accountability (DEMOC) and investment profile (INVEST).

[8] We do not find an important significance in the interaction terms of banking sector indicators and CORR.

[9] Lagoarde-Segot and Lucey (2007) argue that considering market capitalization Israel is the most promising markets in the MENA region.

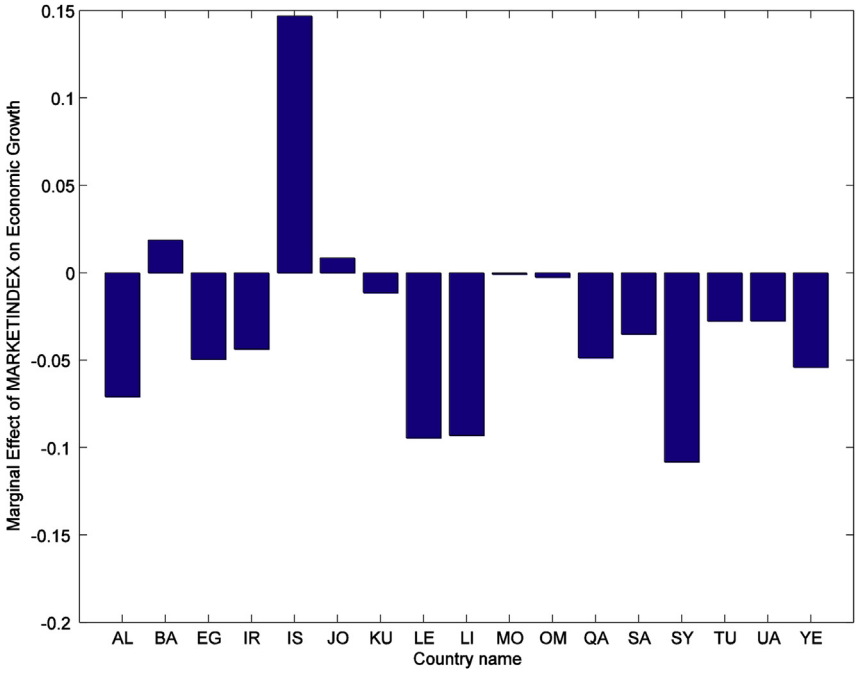

Fig. 2. Marginal effect of MARKETINDEX on economic growth.

Syrian Arab Republic, Tunisia, Qatar), an underdeveloped institutional infrastructure may hamper economic growth.

We do not find statistical support of the view that a well-developed institutional environment promotes economic growth. When we consider both the banking and stock markets development indicators, the institutional indicator comes with a sign which, in most regressions, runs counter to theoretical predictions.

Looking at the regressions run with each of the components of the institutional index (INST), our results (Tables 9–13) show that only the coefficients of INVEST appear to be qualitatively the same as those of the regressions with INST (see Table 13). Thus, stock market development can promote economic growth only when the INVEST measure is higher than the threshold level .85 based on the regression with MARKETINDEX. When we consider MCAP, TRADED and TURNOVER, the corresponding thresholds are .77, .57, and .91 respectively (when based on annual data). Based on four-year average data, the threshold levels for MCAP and TRADED are .47 and .78 respectively (Table 12).

While they appear relevant in the bank–growth nexus, BURO, DEMOC and LAW do not matter in the stock market-growth nexus. These results can be explained by the fact that, in the MENA region, stock markets are in their infancy. Generally, in MENA countries, INVEST is the most relevant indicator of institutional quality in the finance–growth nexus.

In summary, our main findings are that the coefficients of financial indicators alone have a negative sign. However the interaction terms have significant positive coefficients in most regressions. This suggests that financial development alone may hamper economic growth and it can be avoided only if the countries are characterized by a reasonable level of institutional quality. Namely, while an increase in the level of financial development reduces growth, the negative effect is lessened in a country with good institutional quality. Our results are in line with the strand of literature which suggested that the non-positive results of the finance–growth relationship might be largely a product of certain changes in some particular conditions. For example Rousseau and Wachtel (2000) reported that, in countries with high inflation, the effects of finance on growth weakened Similarly, Minier (2003) postulated that a positive correlation between stock market development and growth did not appear to hold for countries with low levels of market capitalization. Shen and Lee (2006) concluded that the conditional variables of financial liberalization, high-income level, and good shareholder protection mitigated evidently the negative impact of banking development on growth. Namely, progress in banking development either in a high-income country or in a country with good shareholder protection or in a financially liberated country facilitates growth.

Consequently, our results provide empirical evidence that, given the low level of institutional quality in the MENA region, more finance may not generate significant benefit in economic growth. Namely, in MENA countries, there is a conditional relationship between financial development and economic growth and institutional quality affects the finance–growth nexus. Moreover, good institutions establish an incentive structure which reduces uncertainty and promotes efficiency and, hence, contributes to stronger economic performance. Moreover, low level of ethnic tensions, good governance, prevalence of law and order and good

socioeconomic conditions are preconditions for successful financial development in promoting economic growth. Namely, financial development and institutional quality can be considered to be complements to promoting growth.

The more developed institutional environment mitigates the negative effect of financial development on economic growth in MENA countries. These results are in line with Levine et al. (2000) who stressed that growth prospects were enhanced because a sound legal environment encouraged the development of financial intermediation. This supports strongly the notion that institutional conditions are a significant factor. In considering a sample of 72 countries for the period from 1978 to 2000, Demetriades and Law (2006) reported that financial development had a larger effect on long-run economic development when the financial system was embedded within a sound institutional environment.

5. Conclusion

The relationship between financial development and economic growth has long remained an important issue of debate in the literature. Therefore, this paper aimed to re-investigate the effect of financial development on economic growth in MENA countries. Specifically, we examined whether or not the results were affected by institutional quality. To this end, we applied the GMM estimators developed for dynamic panel data for a sample of 18 MENA countries over the period from 1984 to 2007.

Based on a model which introduced a linear interaction between the indicator of financial development and institutional index, we found that there was a conditional relationship between financial development and economic growth. In fact, institutional quality mitigates the negative effect of financial development on economic growth when both the banking sector and the stock markets are considered to be indicators of financial development. Moreover, financial development and institutional quality are complements to promoting economic growth in the MENA region. In fact, financial development can promote economic growth only in countries with sound institutional environment. Moreover, the negative effect of financial development on economic growth in the MENA region can be explained by the fact that most MENA countries have not reached the level of institutional quality beyond which financial development can act as a growth enhancing. These results are in line with the findings of Demetriades and Law (2006) who stressed the importance of institutional quality in the finance–growth nexus.

These results reflect on the policy implications. This means that, in order to benefit from financial development in terms of economic growth, the MENA countries' financial systems have to be embedded in sound institutional frameworks. As a main finding, investment profile seems to play a vital role for all areas of financial development; hence, set up a friendly business environment is of upmost importance, in order to reduce investments risks, increase confidence and attract foreign investors to boost economic growth. MENA countries should adopt appropriate policy measures in order to improve the business environment, develop a transparent institutional and legal framework for the financial system. We believe that sound institutions, strong legal system, democracy and low political instability (and hence low political risk) is of key priority for MENA countries to allow their financial systems to perform critical functions to enhance the efficiency of intermediation and push output toward its potential.

Appendix A. The financial index calculation

We construct a conglomerate index of banking sector development (*BANKINDEX*) using a formula,[10] which is similar to the algorithm developed by Demirgüç-Kunt and Levine (1996). Specifically the construction of BANKINDEX follows a two-step procedure. First, for each country i and each time t, transformed variables of private credit, liquid liabilities and bank assets ratios are computed. We define the transformed value of each variable X as follows[11]:

$$X_{it}^{t} = \left(X_{it} - \overline{X}\right) / \left|\overline{X}\right| \quad \text{(A1)}$$

$\overline{X}$ is the average value of variable X across all countries in the panel over the period of observation for each one. Second, we take a simple average of the transformed value of private credit, liquid liabilities and bank assets ratios obtained by equation (A1) in order to provide the overall bank index (BANKINDEX).

We use the three indicators of stock market development to construct the overall stock market index *SMINDEX* based on a formula that is similar to the one developed to obtain a bank index (equation (A1) above).

Appendix B. Empirical results

Table 1
Summary statistics.

Variable	Obs	Mean	Std. dev.	Min	Max
GROWTH	346	.0111	.057	−.428	.346
BANKINDEX	248	−.036	.411	−1	.945
LIABILITIES	238	.646	.235	.262	1.31
ASSETS	240	.590	.251	.089	1.35
PRIVCRE	239	.449	.228	.0439	1.02
MARKETINDEX	134	.011	1.383	−.950	8.75
MCAP	182	.481	.486	.021	2.984
TRADED	183	.182	.408	.0007	3.496
TURNOVER	141	.292	.3511	.0089	2.31
IIC	343	3.519	.509	2.646	4.546
INF	331	.090	.180	−.104	1.77
TO	355	.827	.341	.137	1.91
GC	317	.211	.0747	.01	.762
INST	376	.564	.128	.134	.938

[10] This formula is also adopted by Ben Naceur and Ghazouani (2007) to construct a composite stock market and banking indices.

[11] X indicates variables *PRIVCRE, LIABILITIES or ASSETS*.

Table 2
The effect of institutional quality on the bank–growth relationship.

	FD = BANKINDEX		FD = LIABILITIES		FD = ASSETS		FD = PRIVCRE	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
BANKINDEX	−.581* (−4.09)	−.129** (−2.03)						
LIQUIDLIABILITIES			−.456* (−3.01)	−.547** (−2.48)				
BANKASSETS					−.708** (−2.19)	.051 (1.41)		
PRIVATECREDIT							−.153 (−.63)	−.401 (−1.11)
INST	−.019 (−.34)	.188** (2.07)	−.554* (−3.3)	−.967* (−2.62)	−.990** (−2.32)	.242 (1.31)	−.992* (−3.41)	−.348* (−2.61)
BANKINDEX*INST	1.06* (5.11)	.194*** (1.65)						
LIQUIDLIABILITIES* INST			.863* (3.31)	1.31* (2.68)				
BANKASSETS*INST					1.49** (2.32)	−.024 (−.27)		
PRIVCRE*INST							1.52* (3.29)	.739*** (1.85)
IIC	.035 (1.01)	.001 (.04)	.0401 (1.49)	.053 (.93)	.084*** (1.92)	.053 (1.37)	−.0049 (−.08)	.068* (3.20)
INFLATION	.0006 (.04)	−.0084 (−.37)	.023** (2.09)	.046* (3.25)	−.023 (−.55)	−.0081 (−.38)	.187* (2.91)	.016 (.27)
TO	.024 (1.00)	.016 (.73)	.010 (.57)	−.008 (−.35)	−.0013 (−.04)	−.008 (−.35)	−.0361*** (−1.70)	.0032 (.13)
GC	−.565* (−2.86)	−.211*** (−1.72)	−.471* (−3.73)	−.558* (−3.97)	.836* (−3.76)	−.555* (−4.82)	−1.17* (−5.58)	−.456** (−2.46)
cst	−.023 (−.41)	−.066 (−.68)	.246** (2.06)	.355 (1.13)	.344 (1.26)	−.199 (−1.27)	.490*** (1.84)	.0495 (.42)
AR(2)	.664	.169	.703	.240	.719	.550	.645	.370
Sargan	.245	.713	.591	.889	.692	.887	.075	.649
Hansen	.516	.599	.691	.494	.991	.316	0. 399	.761
N	222	64	220	63	222	64	222	64
Threshold level of INST	55%	66%	53%	42%	48%	na	56%	55%

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 3
The effect of bureaucracy quality on the bank–growth relationship.

Variable	FD = BANKINDEX		FD = LIABILITIES		FD = ASSETS		FD = PRIVCRE	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
BANKINDEX	−.367* (−3.29)	−.104* (−3.10)						
LIABILITIES			−.708 (−.85)	−.013** (−2.14)				
ASSETS					.339 (.63)	.042 (1.12)		
PRIVCRE							−.699** (−2.39)	−.122 (−1.54)
BURO	.090 (1.50)	.0059 (.49)	−.650 (−.93)	.007 (.64)	.452 (1.12)	−.009 (−.33)	−.271** (−2.69)	−.135*** (−1.94)
BANKINDEX*BURO	.613* (2.47)	.174* (4.48)						
LIABILITIES*BURO			1.22 (.98)	.037* (38.36)				
ASSETS*BURO					−.735 (−.95)	−.001 (−.04)		
PRIVCRE*BURO							.751** (3.01)	.310*** (1.86)
IIC	−.054 (−.94)	.043 (1.13)	−.227 (−.99)	.003 (1.11)	.147 (1.26)	.050* (4.79)	.115* (2.71)	.024 (1.57)
INF	−.022 (−.72)	−.161 (−3.65)	−.074 (−.90)	−.104* (−5.92)	.097*** (1.81)	−.141* (−3.82)	−.075 (−1.49)	−.178* (−3.46)
TO	.043** (2.80)	.004 (.55)	.067 (.93)	−.005 (−1.47)	−.025 (−.32)	−.0054 (−.71)	.058 (1.33)	−.004 (−.43)
GC	−.206 (−1.09)	−.346** (−2.51)	.646 (.61)	−.028 (−.49)	−.850*** (−1.93)	−.384* (−9.66)	−.573** (−2.70)	−.360* (−3.46)
Cst	.145 (.99)	−.068 (−.65)	1.012 (1.00)	.015*** (1.89)	−.527 (−1.01)	−.086* (−3.09)	−.037 (−.33)	.067 (1.52)
AR(2)	.887	.653	.753	.362	.843	.845	.978	.580
Sargan	.262	.885	.834	.694	.531	.980	.374	.911
Hansen	.577	.184	.808	.460	.392	.783	.694	.272
N	210	60	208	54	210	59	210	.59
Threshold level of BURO	60%	60%	na	35%	Na	na	93%	39%

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 4
The effect of corruption on the bank–growth relationship.

Variable	FD = BANKINDEX		FD = LIABILITIES		FD = ASSETS		FD = PRIVCRE	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
BANKINDEX	−.042 (−.79)	.046 (1.66)						
LIABILITIES			.632 (.68)	.185 (1.45)				
ASSETS					.001 (.02)	.152 (1.01)		
PRIVCRE							−.135 (−.28)	.135 (1.22)
CORR	.0044 (.08)	−.029 (−1.38)	.673 (.60)	.155 (.93)	−.099 (−1.42)	.236 (1.05)	−.089 (−.26)	.117 (1.27)
BANKINDEX*CORR	.182** (2.72)	−.034 (−.52)						
LIABILITIES*CORR			−.699 (−.41)	−.253 (−.84)				
ASSETS*CORR					.186*** (1.81)	−.414 (−1.15)		
PRIVCRE*CORR							.243 (.30)	−.273 (−1.26)
IIC	−.0040 (−.10)	.052* (4.01)	.235 (1.29)	.0312 (1.76)	−.034 (−.95)	.113** (2.63)	.044 (.56)	.065* (3.15)
INF	.002 (.16)	.051 (1.58)	−.116 (−.93)	.010 (.24)	−.014 (−.74)	.077*** (1.93)	.0041 (.13)	.029 (1.19)
TO	.022 (.80)	.004 (.30)	−.275 (−1.54)	.009 (.46)	.018 (1.27)	−.010 (−1.14)	.013 (.87)	−.002 (−.29)
GC	−.348 (−1.60)	−.408* (−6.65)	−1.15 (−1.10)	−.254** (−2.91)	−.367*** (−1.85)	−.407* (−5.26)	−.335 (−1.60)	−.419* (−8.18)
Cst	.073 (.66)	−.080*** (−1.94)	−.843 (−1.61)	−.166 (−1.50)	.194*** (2.11)	−.389*** (−1.99)	−.031 (−.24)	−.187** (−2.24)
AR(2)	.672	.892	.796	.857	.674	.108	.760	.904
Sargan	.074	.060	.804	.378	.573	.389	.217	.671
Hansen	.770	.629	.429	.435	.498	.526	.719	.620
N	210	64	208	63	210	63	210	63
Threshold level of CORR	23%	na	na	na	Na	na	na	Na

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 5
The effect of democratic accountability on the bank–growth relationship.

Variable	FD = BANKINDEX		FD = LIABILITIES		FD = ASSETS		FD = PRIVCRE	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
BANKINDEX	−.288** (−2.68)	−.164* (−3.10)						
LIABILITIES			−.145 (−.56)	−.002 (−.02)				
ASSETS					.0410 (−.23)	.037 (1.01)		
PRIVCRE							−.110 (−.42)	−.136** (−2.24)
DEMOC	−.027 (−.88)	−.0057 (−.24)	.021 (.11)	−.094 (−1.32)	.0150 (.06)	.0113 (.14)	−.058 (−.30)	−.167** (−2.45)
BANKINDEX*DEMOC	.595** (4.55)	.299* (4.21)						
LIABILITIES*DEMOC			.039 (.12)	.126 (1.00)				
ASSETS*DEMOC					.019 (.06)	−.0132 (−.11)		
PRIVCRE*DEMOC							.164 (.44)	.307** (2.39)
IIC	.070 (.99)	.027 (1.01)	−.009 (−.20)	.066** (2.56)	.025 (.59)	.0250 (.79)	.016 (.28)	.090* (4.00)
INF	.029 (.81)	−.027 (−.68)	−.031 (−1.18)	.0236 (.91)	−.005 (−.30)	−.025 (−.88)	−.0008 (−.02)	.076* (3.56)
TO	.00007 (.00)	.007 (.38)	.047 (1.38)	−.0135 (−1.10)	.0119 (.56)	.010** (2.43)	.027 (.91)	.002 (.28)
GC	−.889*** (−1.98)	−.365* (−3.09)	−.130 (−.70)	−.422** (−4.30)	−.313 (−1.30)	−.280* (−6.31)	−.290*** (−1.99)	−.531* (−12.57)
Cst	−.061 (−.41)	−.019 (−.33)	.110 (.43)	−.118 (−1.37)	−.015 (−.10)	−.047 (−.38)	.0317 (.19)	−.131** (−2.82)
AR(2)	.929	.320	.834	.856	.805	.340	.765	.370
Sargan	.172	.177	.863	.350	.572	.074	.591	.739
Hansen	.568	.258	.939	.481	.839	.313	.771	.536
N	210	65	208	63	210	64	210	65
Threshold level of DEMOC	49%	55%	na	na	Na	na	na	45%

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 6
The effect of law and order on the bank–growth relationship.

Variable	FD = BANKINDEX		FD = LIABILITIES		FD = ASSETS		FD = PRIVCRE	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
BANKINDEX	−.159** (−2.48)	−.200* (−8.08)						
LIABILITIES			−.243*** (−1.78)	−.335* (−3.27)				
ASSETS					−.441*** (−1.96)	.022 (.73)		
PRIVCRE							−.341* (−4.07)	−.168 (−1.09)
LAW	.075 (1.20)	.008 (.49)	−.291*** (−2.00)	−.347* (−3.84)	−.753*** (−2.09)	.006 (.44)	−.170** (−2.78)	−.202** (−2.30)
BANKINDEX*LAW	.233* (3.92)	.349* (11.08)						
LIABILITIES*LAW			.416*** (1.99)	.566* (4.42)				
ASSETS*LAW					1.33** (2.26)	.0207 (.70)		
PRIVCRE*LAW							.427* (3.31)	.451*** (1.94)
IIC	−.080 (−.68)	.045** (2.84)	.115** (2.60)	.086* (3.56)	.187* (3.84)	.0183 (1.72)	.067** (2.80)	.042* (4.31)
INF	.015 (.90)	.019 (.78)	.031** (2.96)	.032 (1.04)	.044 (1.32)	−.023 (−.84)	.014 (.58)	.036 (.211)
TO	.010 (.39)	.0061 (.56)	.004 (.64)	−.011 (−1.12)	−.074 (−1.34)	.0051 (.81)	.011 (.38)	−.005 (−1.26)
GGEX	.177 (.36)	−.332* (−5.24)	−.767* (−3.17)	−.505* (−4.47)	−.980** (−2.21)	−.265* (−9.01)	−.449* (−4.71)	−.458* (−8.18)
Cst	.195 (.74)	−.097** (−2.37)	−.069 (−.57)	.028 (.43)	−.130 (−1.02)	−.0233 (−.60)	−.010 (−.14)	.026 (.40)
AR(2)	.703	.194	.938	.272	.691	.313	.829	.384
Sargan	.218	.062	.843	.397	.740	.247	.655	.993
Hansen	.285	.305	.834	.341	.791	.551	.726	.910
N	210	65	208	63	210	64	210	64
Threshold level of LAW	68%	57%	58%	60%	34%	na	80%	40%

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 7
The effect of investment profile on the bank–growth relationship.

Variable	FD = BANKINDEX		FD = LIABILITIES		FD = ASSETS		FD = PRIVCRE	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
BANKINDEX	−.179*** (−1.84)	−.089* (−3.45)						
LIABILITIES			−.258** (−2.79)	−.106 (−1.30)				
ASSETS					−.504* (−3.39)	−.027 (−.91)		
PRIVCRE							−1.07* (−3.28)	−.151** (−2.66)
INVEST	.079 (1.04)	.056** (2.70)	−.453* (−3.56)	−.117 (−1.59)	−.561* (−5.34)	.068 (1.77)	−.802** (−2.64)	−.065 (−.95)
BANKINDEX*INVEST	.336*** (2.07)	.152** (2.83)						
LIABILITIES*INVEST			.640* (4.27)	.230** (2.59)				
ASSETS*INVEST					.941* (4.68)	.032 (.63)		
PRIVCRE*INVEST							1.68* (2.80)	.265** (2.38)
IIC	−.107 (−.92)	.0018 (.09)	.176* (3.19)	.044 (.78)	.123* (3.25)	−.025 (−1.72)	.115 (1.33)	.0229 (.74)
INF	.015 (1.13)	−.0011 (−.05)	.052* (3.68)	.028 (1.50)	.035 (1.67)	−.0008 (−.06)	−.015 (−.48)	.005 (.19)
TO	.050* (3.13)	.0183* (3.28)	−.016 (−.61)	.001 (.06)	.014 (.57)	.0207** (2.86)	.052 (1.65)	.010 (1.07)
GC	.227 (.46)	−.143 (−1.51)	−1.09* (−3.93)	−.352 (−1.53)	−.804* (−3.82)	−.0413 (−.72)	−.695** (−2.41)	−.219 (−1.30)
Cst	.252 (.95)	−.012 (−.26)	−.190 (−1.55)	−.0214 (−.14)	.021 (.15)	.0611 (1.35)	.199 (.64)	.002 (.04)
AR(2)	.849	.063	.704	.955	.615	.114	.462	.052
Sargan	.397	.088	.880	.390	.874	.205	.688	.485
Hansen	.428	.601	.594	.585	.664	.232	.604	.388
N	210	65	208	63	210	64	210	64
Threshold level of INST	54%	59%	41%	47%	53%	84%	64%	57%

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 8
The effect of institutional quality on the stock market−growth relationship.

	FD = MARKETINDEX		FD = MARKETCAP		FD = TRADED		FD = TURNOVER	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
MARKETINDEX	−.425* (−2.73)	−.037 (−1.40)						
MARKETCAP			−1.14*** (−1.86)	.1002 (.82)				
TRADED					−.426** (−3.54)	−.215*** (−1.87)		
TURNOVER							−1.57** (−2.41)	−.099 (−.49)
INST	.088 (1.13)	.0923* (3.57)	−.119 (−.91)	.073 (.77)	−.128 (−1.41)	−.061 (−.44)	−.449 (−1.11)	−.002 (−.03)
MARKETINDEX*INST	.761* (2.77)	.072*** (1.77)						
MARKETCAP*INST			1.855*** (1.89)	−.147 (−.68)				
TRADED*INST					.747* (3.15)	.415*** (2.01)		
TURNOVER*INST							2.77** (2.37)	.299 (.84)
IIC	−.025 (−.42)	.0065 (.13)	−.508*** (−1.80)	.066** (2.30)	.133*** (1.88)	.016 (.78)	.174 (.93)	−.016 (−.42)
INFLATION	−.171 (−1.50)	−.228** (−2.12)	−.701** (−1.96)	−.130 (−1.22)	−.081 (−.59)	−.150 (−.55)	−.026 (−.10)	−.278** (−2.09)
TO	−.0075 (−.18)	−.022 (−1.12)	.101*** (1.91)	−.030** (−2.54)	−.036 (−.78)	−.023 (−.75)	.038 (1.23)	−.007 (−.45)
GC	−.567** (−2.18)	−.343 (−1.26)	.519 (1.13)	−.502** (−3.26)	−.783** (−2.45)	−.262* (−6.16)	−1.44*** (−1.85)	−.365 (−2.89)
Cst	.182 (1.02)	.0434 (.36)	1.747*** (1.86)	−.128*** (−1.75)	−.190 (−1.16)	.072 (1.28)	−.084 (−.15)	.157 (1.11)
AR(2)	.488	.533	.458	.695	.220	.495	.548	.274
Sargan	.740	.292	.533	.497	.104	.597	.263	.625
Hansen	.974	.251	.989	.863	.837	.503	.798	.755
N	222	42	145	45	152	44	222	43
Threshold level of INST	56%	53%	62%	na	59%	52%	57%	na

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 9
The effect of bureaucracy quality on the stock market growth relationship.

Variable	FD = MARKETINDEX		FD = MCAP		FD = TRADED		FD = TURNOVER	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
MARKETINDEX	−.020 (−.25)	.002 (.12)						
MCAP			.058 (.24)	−.0013 (−.01)				
TRADED					.037 (.06)	.330 (.89)		
TURNOVER							−.203 (−1.55)	.100 (1.53)
BURO	.094 (.82)	.137 (1.38)	.084 (.27)	−.058 (−.15)	.076 (.28)	.487 (1.37)	−.173 (−1.53)	.068 (.89)
MARKETINDEX*BURO	.044 (.26)	−.013 (−.40)						
MCAP*BURO			−.065 (−.14)	.014 (.03)				
TRADED*BURO					−.033 (−.03)	−.378 (−.63)		
TURNOVER*BURO							.297 (1.48)	−.081 (−.50)
IIC	−.073 (−.48)	.053*** (1.99)	.023 (.35)	.160** (2.20)	.014 (.72)	−.435 (−1.82)	.202** (2.70)	.007 (.17)
INF	−.177 (−.76)	−.248*** (−1.97)	−.183 (−1.20)	−.093 (−.47)	−.12 (.213)	−.683 (−1.53)	−.012 (−.12)	−.345** (−2.68)
TO	.023 (1.45)	.027 (.70)	−.001 (−.04)	−.030 (−.66)	.005 (.65)	.059 (1.10)	−.015 (−.29)	−.0224 (−1.77)
GC	−.052 (−.11)	−1.04** (−2.99)	−.417*** (−2.18)	−.793* (−4.76)	−.411* (−4.21)	1.07 (1.79)	−1.05* (−3.96)	−.326** (−2.70)
Cst	.227 (.58)	−.042 (−.50)	−.024 (−.14)	−.324 (−1.59)	.005 (.04)	1.04*** (1.92)	−.367** (−2.28)	.048 (.30)
AR(2)	.186	.361	.220	.746	.153	.935	.437	.927
Sargan	.858	.479	.957	.947	.543	.130	.821	.485
Hansen	.457	.897	.989	.983	.829	.920	.978	.961
N	144	42	135	43	142	44	144	43
Threshold level of BURO	na	na	na	na	na	na	na	na

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 10
The effect of corruption on the stock market−growth relationship.

Variable	FD = MARKETINDEX		FD = MCAP		FD = TRADED		FD = TURNOVER	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
MARKETINDEX	.130 (.98)	−.056** (−2.82)						
MCAP			.399 (.96)	.123 (1.43)				
TRADED					.258 (1.32)	.012 (.13)		
TURNOVER							.129 (1.07)	.021 (.69)
CORR	−.058 (−.42)	.169** (2.42)	.375 (1.25)	.150 (1.50)	.176 (1.81)	.057 (.77)	.151*** (1.89)	.054 (.49)
MARKETINDEX*CORR	−.320 (−.93)	.151** (2.65)						
MCAP*CORR			−.820 (−.89)	−.265 (−1.22)				
TRADED*CORR					−.766 (−1.33)	.089 (.32)		
TURNOVER*CORR							−.347 (−.94)	.008 (.13)
IIC	−.055 (−.42)	.078 (.36)	−.0030 (−.05)	.040 (.33)	.090** (2.38)	.015 (.32)	.0506 (.58)	.145** (3.03)
INF	−.103 (−1.17)	−.163 (−.81)	−.309*** (−2.05)	−.262 (−1.30)	−.170*** (−2.02)	−.300 (−1.64)	−.067 (−.62)	−.037 (−.09)
TO	.024 (.55)	−.0005 (−.01)	.016 (.33)	−.011 (−.32)	.037 (.81)	−.044*** (−2.20)	−.004 (−.20)	−.036 (−1.01)
GC	.206 (.24)	−1.16*** (−2.20)	−.274 (−.97)	−.432 (−.89)	−.652** (−2.70)	−.323 (−1.60)	−.378 (−.57)	−.837** (−2.83)
Cst	.182 (.56)	−.090 (−.14)	−.095 (−.51)	−.086 (−.28)	−.258 (−1.82)	.049 (.37)	−.139 (−.75)	−.328** (−2.47)
AR(2)	.416	.200	.338	.722	.254	.309	.251	.609
Sargan	.841	.088	.963	.734	.547	.185	.639	.296
Hansen	.916	.868	.944	.759	.880	.940	.789	.914
N	144	42	144	43	138	44	144	43
Threshold level of CORR	na	30%	na	na	na	na	na	na

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 11
The effect of democracy accountability on the stock market growth relationship.

Variable	FD = MARKETINDEX		FD = MCAP		FD = TRADED		FD = TURNOVER	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
MARKETINDEX	.130 (.98)	−.007 (−1.02)						
MCAP			.631 (.72)	−.181 (−.46)				
TRADED					.049 (.26)	.024 (.45)		
TURNOVER							.146 (1.30)	.053 (1.00)
DEMOC	−.058 (−.42)	.007 (.20)	.432 (.80)	−.214 (−.51)	.157*** (1.90)	−.004 (−.13)	.162*** (2.14)	.052 (.68)
MARKETINDEX* DEMOC	−.320 (−.93)	.023 (1.09)						
MCAP*DEMOC			−1.36 (−.74)	.404 (.52)				
TRADED*DEMOC					−.229 (−.43)	.047 (.47)		
TURNOVER*DEMOC							−.395 (−1.15)	−.101 (−.35)
IIC	−.055 (−.42)	.047 (.19)	.185 (1.25)	.051 (.92)	.148** (3.00)	.016 (.32)	.041 (.47)	.115 (.71)
INF	−.103 (−1.17)	−.221 (−.63)	.128 (.58)	−.024 (−.11)	−.227*** (−2.21)	−.225 (−1.25)	−.067 (−.60)	−.150 (−.56)
TO	.024 (.55)	.011 (.17)	.008 (.51)	−.015 (−.39)	.034 (.65)	−.031* (−3.51)	−.004 (−.21)	−.035*** (−1.97)
GC	.206 (.24)	−.943*** (−1.97)	.035 (.03)	−.451 (−1.43)	−1.06* (−3.27)	−.291 (−1.53)	−.318 (−.49)	−.603 (−1.61)
Cst	.182 (.56)	.042 (.06)	−.859 (−1.81)	.049 (.22)	−.369** (−2.30)	.055 (.36)	−.122 (−.64)	−.252 (−.51)
AR(2)	.416	.309	.387	.644	.257	.341	.258	.755
Sargan	.841	.082	.988	.545	.708	.240	.738	.747
Hansen	.916	.832	.962	.853	.988	.970	.910	.979
N	144	42	131	43	138	44	144	43
Threshold level of DEMOC	na	na	na	na	na	na	na	Na

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 12
The effect of law and order on the stock market−growth relationship.

Variable	FD = MARKETINDEX		FD = MCAP		FD = TRADED		FD = TURNOVER	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
MARKETINDEX	−.076 (−1.21)	−.006 (−.36)						
MCAP			−.070 (−.14)	.099 (1.67)				
TRADED					−.450 (−.46)	.564 (1.75)		
TURNOVER							−.049 (−.34)	−.037 (−.31)
LAW	.376 (1.78)	−.058*** (−1.88)	−.045 (−.28)	−.014 (−.45)	−.096 (−.46)	.015 (.33)	−.136 (−1.64)	−.013 (−.16)
MARKETINDEX*LAW	.121 (1.39)	.007 (.30)						
MCAP*LAW			.127 (.19)	−.133 (−1.31)				
TRADED*LAW					.533 (.46)	−.662 (−1.77)		
TURNOVER*LAW							.318 (1.41)	.044 (.26)
IIC	−.156 (−1.16)	.069* (4.62)	.012 (.13)	.073 (1.34)	.142 (.49)	−.008 (−.15)	.054 (.84)	.023 (.12)
INF	1.92 (1.77)	−.204 (−1.33)	−.170** (−2.18)	−.179 (−1.07)	−.067 (−.27)	−.161 (−1.27)	−.063 (−1.04)	−.147 (−.92)
TO	.140 (1.52)	.011 (.34)	−.0138 (−.18)	−.029 (−1.72)	−.010 (−.26)	−.038 (−1.72)	−.013 (−.31)	−.037** (−2.15)
GC	.794 (.98)	−.935** (−2.72)	−.519*** (−1.95)	−.534*** (−2.03)	−.847 (−.63)	.107 (−.38)	−.757* (−3.30)	−.289 (−.32)
Cst	−.086 (−.59)	.007 (.11)	.123 (.40)	−.089 (−.62)	−.228 (−.36)	.094 (.76)	.033 (.23)	.049 (.10)
AR(2)	.848	.607	.252	.618	.362	.332	.325	.559
Sargan	.686	.066	.877	.502	.183	.380	.269	.559
Hansen	.980	.882	.980	.817	.874	.510	.921	.491
N	144	42	135	43	142	44	144	42
Threshold level of LAW	na	na	na	na	Na	na	na	na

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 13
The effect of investment profile on the stock market−growth relationship.

Variable	FD = MARKETINDEX		FD = MCAP		FD = TRADED		FD = TURNOVER	
	(1) Annual data	(2) 4-year Average data	(3) Annual data	(4) 4-year Average data	(5) Annual data	(6) 4-year Average data	(7) Annual data	(8) 4-year Average data
MARKETINDEX	−.154*** (−2.03)	.012 (.62)						
MCAP			−.632*** (−2.18)	−.123 (−1.74)				
TRADED					−.192 (−.92)	−.412 (−1.77)		
TURNOVER							−.848** (−2.26)	.0004 (.00)
INVEST	−.017 (−.38)	.086 (.80)	−.335*** (−1.84)	−.073 (−.95)	−.209 (−1.41)	−.099 (−.94)	−.154 (−.98)	.205 (1.17)
MARKETINDEX*INVEST	.180*** (2.11)	.001 (.04)						
MCAP*INVEST			.813** (2.38)	.267*** (2.33)				
TRADED*INVEST					.338*** (1.89)	.526*** (1.87)		
TURNOVER*INVEST							.928** (2.38)	−.032 (−.19)
IIC	−.225 (−1.10)	−.003 (−.11)	−.022 (−.30)	−.031 (−1.21)	.255 (1.41)	.068 (.79)	.120 (.81)	−.126 (−.86)
INF	−1.45*** (−2.04)	.051 (.13)	−.365*** (−2.08)	−.198 (−1.30)	−.039 (−.37)	−.362 (−1.78)	−.004 (−.03)	−.059 (−.36)
TO	.036 (.97)	−.052 (−.93)	.051 (1.19)	−.062** (−2.50)	−.096 (−.94)	−.029 (−1.74)	−.012 (−.32)	−.0003 (−.01)
GC	.264 (−.86)	.344 (.43)	.144 (.47)	.053 (.44)	.015 (.03)	−.468 (−1.27)	−.435 (−.59)	.370 (.54)
Cst	.915 (1.36)	−.048 (−.23)	.283 (1.65)	.205*** (1.95)	−.686 (−1.14)	−.016 (−.09)	.159 (−.53)	.276 (1.05)
AR(2)	.389	.556	.273	.437	.305	.988	.866	.953
Sargan	.330	.186	.642	.066	.572	.595	.448	.553
Hansen	.800	.985	.872	.912	.999	.877	.764	.738
N	144	42	135	43	142	44	144	43
Threshold level of INST	85%	na	77%	47%	57%	78%	91%	na

Notes: *N* refers to number of observations included in the estimation. For Sargan test, the null hypothesis is that the instruments are not correlated with the residuals. Hansen statistic tests the validity of our instruments. For the test for autocorrelation AR(2), the null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation. T-statistics for coefficient in parentheses ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

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