Stock Markets, Banks, and Economic Growth: Evidence from More Homogeneous Panels

Tolina Fufa*
Department of Economics
Oklahoma State University

Jaebeom Kim†
Department of Economics
Oklahoma State University
Stillwater, OK 74078, USA

*Tel.: 405.744.5195; Fax: 405.744.5180; Email: tolina@okstate.edu
†Corresponding author. Tel.: 405.744.7359, Fax: 405.744.5180, Email: jb.kim@okstate.edu

Stock Markets, Banks, and Economic Growth:
Evidence from More Homogeneous Panels
(March 2016)

Abstract

The present paper investigates whether the link between stock markets, banks, and economic growth becomes more evident as more homogeneous groups of countries are considered. The issue of fundamental importance in this study is the extent to which the role of financial intermediaries and markets in economic growth across countries can be measured in terms of a degree of homogeneity controlling for the endogeneity problem. The dynamic panel generalized method of moment (GMM) estimator is employed using data of European and non-European high-income countries as well as upper and lower middle-income countries averaged over five and three years. Our results indicate that the growth effects of banks and stock markets differ for various groups of economies, implying that the link between financial development and economic growth depends on the stages of economic growth of the countries. As more homogeneous economies are involved in a panel, a more economically stylized link is uncovered.

Keywords: Economic growth; stock market development; financial development; homogeneous panel; GMM

JEL Classification: G10, G21, O16, O40.

1 Introduction

The present paper investigates whether there exists a link between financial development and economic growth by considering the financial sectors across stock markets and banks as more homogeneous groups of countries are involved. Since the pioneering works of Schumpeter (1934) and, more recently, Goldsmith (1969), McKinnon (1973), and Shaw (1973), there has been an intense debate regarding the link between financial sector development and economic growth. Some early studies, including Robinson (1952) and Lucas (1988), contend that the financial sector develops merely in response to economic growth or has no significant contribution to growth. However, a body of recent literature, including King and Levine (1993a), Levine (1997), Bekaert, Harvey and Lundblad (2005) and Bertocco (2008), emphasizes that a well-functioning financial system improves the allocation of resources and hence promotes economic growth by mitigating the effects of information asymmetry and transaction costs.[1]

The theory presents somewhat conflicting explanations about whether stock markets and banks have independent roles in economic growth and whether the two have any comparative importance in economic activity. On the one hand, Holmstrom and Tirole (1993), Boyd and Smith (1998), and Allen and Gale (1999), among others, argue that well-functioning stock markets are better at reducing information and transition costs and thus fostering economic growth. On the other hand, a number of studies, including Boot and Thakor (1997) and Coval and Thakor (2005), argue that banks are relatively better at reducing market frictions associated with the mobilization and allocation of resources towards more productive activities. Still others, including Levine (1997), Allen and Gale (2000), and Song and Thakor (2010), emphasize that the focus should be on creating well-functioning banks and markets rather than on making a choice between the two as they are not only competing but also complementary sources of financing. The literature also

[1] See also Diamond (1984), Stiglitz (1985), Greenwood and Jovanovic (1990), Bencivenga and Smith (1991), Bhide (1993), Bencivenga, Smith and Starr (1995), Allen and Gale (1997), and Khan (2001). For a thorough review of the literature refer to Levine (1997, 2005) and Beck (2013).

stresses that the relative merits of banks and stock markets evolve over time and vary at different stages of economic growth of countries.[2] These studies show that as economies grow, the services provided by financial markets become relatively more important and countries become more market-based and imply that the services provided by banks make a significant contribution to the process of economic growth in the early stages of development. For instance, Singh and Weisse (1998) show that stock markets are unlikely to spur long-term economic growth in developing countries as they encourage short-term profits and also require sophisticated monitoring systems to function effectively. Banks, on the other hand, nurture long-term relationships with investors and hence provide a stable source of finance for achieving long-term economic growth and industrialization.

The issue of fundamental and empirical importance in this study is the extent to which the role of financial intermediaries and markets in economic growth across countries can be measured in terms of a degree of homogeneity dealing with the endogeneity problem. The answer to the question especially depends on how persistent financial systems are and how big economic heterogeneity is among the countries. Because of the strong spillovers and externalities in financial systems, serious income inequality, and different levels of economic growth of countries in a group, existing panel studies fail to settle two important issues: heterogeneity of the countries in a panel, and high correlation and strong integration of financial intermediaries and markets between cross-sectional units. As can be seen in many recent empirical studies, including Beck and Levine (2004), Deidda and Fattouh (2008), and Demirguc-Kunt, Feyen, and Levine (2013), developing and developed countries are usually pooled together under a strong assumption of homogeneity, and the impact of banks and markets on economic growth is assessed in one pass. However, this may not be very informative as it is likely that financial intermediaries and markets have quite different impacts on growth depending on the phases of countries' economic development. In particular, the results from panel regressions based on pooled heterogeneous cross-country observations may have limited policy relevance.

[2] For details, see Boot and Thakor(1997), Boyd and Smith (1998), and Song and Thakor (2010).

The main question in this study is whether the link between financial development and economic growth becomes more evident as more homogeneous groups of countries are included after considering the endogeneity issue. First, to control for the heterogeneous characteristics of countries in a panel, a group of 64 countries is divided into four different subgroups: European high-income countries (HICs), non-European HICs, upper middle-income countries (MICs), and lower MICs, following the World Bank's income classification. By doing this, we can at least assess whether the role of financial development, including both stock markets and banks, differs based on the various stages of economic growth of the countries after controlling for simultaneity bias, omitted variable bias, and the endogeneity problem with the inclusion of a lagged dependent variable as a regressor.

Second, to estimate the link and test the impact of the development of stock markets and the banking system on economic growth in terms of a degree of homogeneity, we employ a dynamic panel generalized method of moments (GMM) estimator by Blundel and Bond (1998) with Windmeijer (2005) correction to the data from 64 countries. More specifically, in order to consider the highly integrated financial systems that have close relationships with one another, we present a GMM with more homogeneous groups to utilize reasonable information from a variance-covariance matrix to account for cross-equation correlations among the cross-sectional units in each group. For the sensitivity analysis, three different variables are employed to measure both stock markets and banks. Finally, comparisons are made between the dynamic panel system and difference GMM estimators, with data averaged over three and five years to abstract from business cycle relationships in European and non-European HICs as well as the upper and lower MICs. This study is distinct from the existing literature in that the dynamic panel system GMM with Windmeijer (2005) correction not only utilizes information more efficiently from financial systems and economies but also provides more economically reasonable estimates as more homogeneous countries become involved.

In general, our empirical results are consistent with the views that the financial system provides important services for economic growth, and that stock markets and banks play

different roles. In sharp contrast to the existing empirical findings, however, this paper finds that the effects of stock markets and banking system development on economic growth differ for the various income groups of the economies, implying that the link between financial development and economic growth depends on the stages of economic growth of the countries considered in the study. The regression results show that while bank credits and stock market liquidity have a positive and robust impact on the economic growth of the MICs, the same cannot be said of their effect on the growth of the HICs. Bank credit is a strong determinant of economic growth for both the upper- and the lower-MICs; however, stock market liquidity exerts a robust influence on the economic growth of the upper-MICs only. We find that bank credit is not robust and stock market liquidity is only significant in the case of non-European HICs. For European HICs, stock market liquidity is not a strong determinant of growth, unlike bank credit. Thus, to understand the relationship between the financial system and economic growth more comprehensively, it is significant to note that the more homogeneous the economies involved in a panel, the greater the opportunity to observe the link in terms of more economically reasonable and stylized evidence.

2 Data and Preliminary Analysis

2.1 Data

The study employs a panel of 64 countries for which we have complete stock market and banking system data for the period 1989-2012. The countries are divided into two groups, high-income (31) and middle-income (33), following the World Bank's income classification system. The HICs include both European and non-European countries, and the MICs are composed of upper and lower MICs.[3] It is a common practice in panel studies of the finance and growth relationship to rely on a less frequent data set to minimize the effects

[3] According to the World Bank, the MICs have a gross national income (GNI) per capita of more than $1,045 but less than $12,746, while the HICs have a GNI per capita of $12,746 or more. The lower and upper MICs are separated at a GNI per capita of $4,125. Note that the low- and middle-income economies are sometimes referred to as developing economies.

of business cycle fluctuations masking the true long-run relationship between growth and financial development. Data permitting, taking into account the time dimension of the data, and also to allow easy comparison with the existing literature, the data are averaged over five-year non-overlapping periods: 1989-1993, 1994-1998, 1999-2003, 2004-2008, and 2009-2012.[4] We source the financial system indicators from the World Bank's "Financial Structure and Development Data Base,"[5] whereas the data for all the control variables, with the exception of *schooling* from the Barro and Lee (2010) data base, are sourced from the electronic version of the World Bank's *World Development Indicators*.

Well-functioning financial systems mitigate market frictions and spur economic growth through the provision of information about investment opportunities, monitoring of investments, diversification and sharing of risks, pooling and mobilization of savings, and facilitation of exchange of goods and services. However, there is no single best indicator that shows the extent to which banks and stock markets provide these services across a number of countries. As a result, we rely on multiple standard measures of the size and activity of banks and stock markets.

To measure stock market development, we use three measures: *turnover ratio*, *traded value*, and *market capitalization*. *Turnover ratio* equals the value of the traded shares in the domestic stock market divided by the total value of listed shares, and it measures the liquidity of the stock market relative to its size. *Traded value* equals the value of all domestic shares traded in the stock market divided by GDP, and it measures how active the stock market is relative to the size of the economy. *Market capitalization* equals the total value of listed shares in the stock market divided by GDP, and it measures the size of the market relative to the economy. The theory predicts that more liquid/active markets facilitate efficient allocation of resources and foster growth.

For banking system development, we use *bank credit*, *private credit*, and *liquid liabilities*.

[4] For sensitivity analysis, three-year averaged data are also used in this study.

[5] Wher available, the financial system indicators are updated using the original sources: Standard & Poor's *Emerging Stock Markets/ Global Stock Markets Factbook* for stock market measures, and IMF's *International Financial Statistics Yearbook* for banking system measures.

Bank credit equals total credit extended by deposit money banks to the private sector as a share of GDP. It excludes credits by other financial institutions and to the government and public enterprises. *Private credit* equals credit issued by deposit banks and other financial institutions, excluding central banks, to the private sector divided by GDP. These two measures were almost identical until the late 1990s, but they started diverging at the beginning of the new millennium.[6] Higher levels of each could represent higher degrees of financial services to the private sector and thus greater financial intermediary development. However, it could also show over-lending, which could deter growth. *Liquid liabilities* are calculated as the ratio of liquid liabilities[7] of the financial system to GDP, or the ratio of broad money, M3, to GDP. It measures the overall size of the financial intermediary sector and is commonly used in the literature under the assumption that the size of the sector is directly correlated with the financial services it renders. However, it does not necessarily measure the degree to which financial institutions overcome the adverse effects of information asymmetry and transaction costs to provide effective service. All the financial system indicators are deflated by end-of-period prices, and their average is divided by GDP deflated by annual CPI.

2.2 Preliminary Analysis

Table 1 presents the summary statistics of the indicators. As we can see, there is a huge cross-country variation in these measures. For instance, *turnover ratio* averages about 53% (72% in the HICs and 34% in the MICs), where Swaziland had the minimum value of 0.02% in 2004-2008, and Pakistan had the maximum value of 377% in 1999-2003. *Traded value* also varies from a minimum of 0.002% in Swaziland in 2004-2008 to a maximum of 621% in Hong Kong in 2009-2012, with the average being 38% for the full sample (62% in the HICs and 15% in the MICs). The average size of the stock market is about 58% of GDP (79% in the HICs and 38% in the MICs). In general, the HICs have the largest

[6] For details, see Arcand, Berkes, and Panizza (2012).

[7] This includes currency plus demand and interest-bearing liabilities of banks and other financial institutions.

and most active stock markets while the lower MICs have the least active markets, relative to the total sample. Table 1 also shows the variation in banking system measures across the sample. *Bank credit*, for example, averages about 66% of GDP (94% in the HICs and about 40% in the MICs), with the minimum credit of about 5% issued by deposit banks in Ghana in 1989-1993 and the maximum amount of about 224% extended by banks in Iceland in 2004-2008. *Private credit* also averages about 71% of GDP (101% and 43% in the HICs and MICs, respectively). *Liquid liabilities* range from a minimum of 12% in Peru in 1989-1993 to a maximum of 354% in Luxembourg in 2004-2008, with the average being 72% (95% in the HICs and 50% in the MICs).

As is standard in the literature on the finance-growth nexus, we include the following control variables, which have been shown empirically to have robust growth effects: real GDP per capita, to capture the tendency for growth rates to converge across countries and over time; average years of schooling in the population 25 years of age or older, to control for human capital accumulation;[8] the ratio of total final government consumption expenditure, as measured by the government size; the CPI-based inflation rate; and trade openness, which is the sum of imports and exports as a fraction of GDP.[9]

The correlations in Tables 2 and 3 show that for the MICs, growth is positively and significantly correlated with all financial measures except market capitalization. On the other hand, credit measures are negatively and significantly correlated with growth, while traded value and market capitalization are positively and significantly correlated with growth in the case of the HICs.[10] The summary statistics for individual countries are given in Table 4.

[8] Both variables are commonly referred to as a simple control set.

[9] The last three variables for macroeconomic stability are policy related and, together with the simple control set, form our policy control set.

[10] At the same time, the banking system and stock market measures are generally significantly correlated to each other for both sets of countries (especially in the case of the MICs), implying that both bank and stock market measures may offer more conservative estimates of the role of banks and stock markets in economic growth than alternative approaches. We use a Wald test to examine if the indicators enter our regression jointly significantly.

3 Econometric Methodology

We examine the link between economic growth and both stock markets and banking system development using the dynamic panel GMM estimators.[11] The cross-country growth regression can be written as follows:

$$y_{i,t} - y_{i,t-1} = (\alpha - 1)y_{i,t-1} + \beta' X_{i,t} + \tau_t + \mu_i + \varepsilon_{i,t} \tag{1}$$

Note that we can rewrite Equation 1 as:

$$y_{i,t} = \alpha y_{i,t-1} + \beta' X_{i,t} + \tau_t + \mu_i + \varepsilon_{i,t} \tag{2}$$

where $y_{i,t}$ is the logarithm of real per capita GDP in country i at time t, and $X_{i,t}$ is a set of explanatory variables, including average years of schooling, measures of stock markets and bank development, government consumption expenditure, inflation rate, and trade openness. τ_t captures time-specific effects, μ_i represents time invariant country-specific effects, and $\varepsilon_{i,t}$ denotes the idiosyncratic shocks.[12] The inclusion of time dummies, τ_t, is to capture time-specific effects as well as unobserved cross-sectional dependence across national outputs that might be correlated through common economic shocks. In our estimation, this term is removed by using cross-sectionally demeaned data for all variables. Beware that Equation 2 contains the lagged dependent variables correlated with the unobserved country fixed effects, μ_i, giving rise to bias and inconsistency of estimators. To remove this dynamic panel bias, Holtz-Eakin, Newey, and Rosen (1988) and Arellano and Bond (1991) propose the first-difference transform of equation 2 as follows:

$$y_{i,t} - y_{i,t-1} = \alpha(y_{i,t-1} - y_{i,t-2}) + \beta'(X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \tag{3}$$

Although the fixed effects are expunged, the lagged per capita GDP as well as any of the control variables in X are still potentially endogenous. To overcome the issue of

[11] For a detailed description of the various GMM estimators, refer to Hansen (1982), Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998), and Roodman (2009).

[12] This is a modified version of Barro's (1991) growth regression model.

endogeneity, Arellano and Bond (1991) use the lagged levels of the explanatory variables as instruments. This dynamic panel estimator, commonly referred to as difference GMM, uses the following moment conditions.

$$E[y_{i,t-l}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \text{ for } l \geq 2;\ t = 3, \ldots, T \tag{4}$$

$$E[X_{i,t-l}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \text{ for } l \geq 2;\ t = 3, \ldots, T \tag{5}$$

However, Blundell and Bond (1998) demonstrate that when explanatory variables are persistent over time, the untransformed lagged levels of these variables are weak instruments for transformed variables, and this adversely affects the small sample and asymptotic properties of the difference GMM. To increase efficiency, Blundell and Bond develop a system GMM, which was proposed by Arellano and Bover (1995), to augment the difference estimator by simultaneously estimating in differences and levels, with the two equations being distinctly instrumented. The addition of regression in levels also allows us to examine the cross-country relationship between our variables of interest. While the instruments for the equation in differences are the same as above, the instruments for the equation in levels are the lagged differences of the explanatory variables. These are valid instruments under the following additional assumption: although a correlation may exist between the levels of the explanatory variables and country fixed effects in (2), there is no correlation between the differences of these variables and the country-specific effect. This assumption results in the following stationarity properties:

$$E[y_{i,t+p}\mu_i] = E[y_{i,t+q}\mu_i] \text{ and } E[X_{i,t+p}\mu_i] = E[X_{i,t+q}\mu_i] \text{ for all } p \text{ and } q \tag{6}$$

The additional moment conditions for the regression in levels are:

$$E[(y_{i,t-l} - y_{i,t-l-1})(\mu_i + \varepsilon_{i,t})] = 0 \text{ for } l = 1 \tag{7}$$

$$E[(X_{i,t-l} - X_{i,t-l-1})(\mu_i + \varepsilon_{i,t})] = 0 \text{ for } l = 1 \tag{8}$$

The dynamic panel GMM-sometimes referred to as system GMM-, thus, uses the moment conditions in equations (4), (5), (7), and (8) to generate consistent and efficient estimates.

The consistency of the dynamic panel GMM results rests on the validity of the instruments and the assumption that the error terms do not exhibit serial correlation. In particular, the estimator can suffer from a potential instrument proliferation; the instrument count may become equal to or larger than the number of cross-sectional units, thus over-fitting the instrumented variables, and they may fail to remove the endogenous components of the variables and result in biased parameter estimates towards those from non-instrumenting estimators. We can reduce this instrument count problem by either restricting the instruments to certain lags instead of all available lags or by collapsing the instrument matrix. The latter can be formally expressed as:

$$E[y_{i,t-l}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \text{ for each } l \geq 2 \tag{9}$$

$$E[X_{i,t-l}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \text{ for each } l \geq 2 \tag{10}$$

In a dynamic panel GMM, we replace the moment conditions of the standard difference GMM (4) and (5) with (9) and (10). The new moment conditions state the same orthogonality assumption between the lagged levels and differenced error term (namely, (4) and (5)) but we only want the estimator to minimize the magnitude of the empirical moments $\sum_t y_{i,t-l}(e_{i,t} - e_{i,t-1})$ for each l, rather than separate moments $\sum_{t,l} y_{i,t-l}(e_{i,t} - e_{i,t-1})$ for each l and t. This method, known as the Windmeijer correction, significantly minimizes the potential biases that arise due to over-identification problems and boosts the efficiency of our estimates without losing information, as no lags are actually dropped.[13] We also use two specification tests. The first relates to instruments and includes a Hansen-J test of joint validity of the instruments and the difference-in-Hansen tests of exogeneity of instrument subsets (the null hypothesis being that the lagged differences of the explanatory variables are uncorrelated with the residuals). The second test examines the hypothesis that the error term is not second-order serially correlated.[14]

[13] See Roodman (2009) for details.

[14] By construction, the differenced error term is likely first-order serially correlated.

4 Empirical Results

Tables 5 and 6 show the empirical results from the dynamic panel GMM for the full sample as well as the five- and three-year average data for the MICs and HICs, respectively.[15] Each of the two reported regressions includes bank credit and turnover ratio, and controls for lagged income and average years of schooling. The regression also controls for government consumption, trade openness, and inflation. As can be seen, the estimation results are qualitatively very similar in both the difference and the system GMM estimators for five- and three-year averaged data. Both GMM estimators show that while bank credit is statistically not significant at the 5% level, the turnover ratio enters all regressions for the full sample with a statistically significant coefficient. This implies that only stock market liquidity exhibits a meaningful growth effect for all countries in our sample. However, separate regressions for the two income groups - the MICs and HICs - show somewhat interesting outcomes.[16] As can be seen, in the case of the MICs, both GMM estimators show that bank credit and turnover ratio enter all the regressions with positive and statistically significant coefficients. For the HICs, the coefficient estimate of bank credit is insignificant. However, the stock market turnover ratio is significant in all regressions for both the three-year and five-year averaged data. It appears that the overall impact of financial development on economic growth is the same whether we use a three-year or five-year average data set. The above regression results indicate that after controlling for liquidity of stock markets, the credits extended to the private sector strongly boost the economic growth of the MICs, but they have no discernible effect on that of the HICs. The results also indicate that stock market liquidity is a major determinant of economic

[15] In addition to bank credit and turnover ratio, we employ private credit and traded value as well as liquid liabilities and market capitalization as indicators of banking system and stock markets, respectively. All results are qualitatively similar and are available upon request from the authors.

[16] In addition to sorting out our sample countries into HICs and MICs and running separate regressions, we run regressions on the full sample, where we interact the group dummy variable, MIC (which takes a value of 1 and 0 respectively if the country is a middle-income and high-income country, respectively) with bank and stock market measures. Although we implicitly assume that the coefficients of the control variables are the same for all countries, the interaction terms between the indicator variable and bank and stock market measures support our findings.

growth for both groups of countries. These results are robust to the inclusion of more control variables.[17]

A panel regression that does not address the heterogeneity in the cross-country units may conceal the likely differential growth effects of financial development arising, among other factors, from differences in the stages of economic development of the countries. In order to attenuate this problem and obtain a more policy relevant outcome, we further sort the countries into upper-and lower-MICs and European- and non-European HICs and run separate regressions for each of these relatively more homogeneous sub-groups. We expect that the more homogeneous the countries, the more representative the coefficient estimates of each country in the group. The empirical results from both the dynamic panel difference and the system GMMs in Tables 7 through 10 show that while the coefficient estimates of both bank credit and turnover ratio are statistically significant for the upper-MICs, only bank credit enters the lower-MICs growth regression with significant coefficients. The results imply that the size of credit extended to the private sector is a strong determinant of economic growth for both the upper- and lower-MICs. Stock market liquidity, however, exerts a robust influence on the economic growth of upper-MICs only. In the case of the two sub-groups of the HICs, stock market liquidity is statistically not significant for the European-HICs but it is statistically significant in all the regressions for the non-European HICs. Bank credit, on the other hand, is not robust for non-Europeans, although it enters the European-HICs regressions with significant coefficients. Our specification tests also confirm that we cannot reject the null hypotheses of no second-order serial correlation in the differenced error term, and the overall validity of our instrument sets and subsets.

It is interesting to see that though the overall banking system measures are statistically insignificant for the HICs, they are significant for the European HICs. The fact that the banking system explains economic growth better than the stock market for the

[17] In the case of the HICs, although only stock market measures enter the regressions with statistically significant coefficients, the Wald test for joint significance shows that, in general, both bank and stock market measures enter the regressions jointly significantly, supporting the inclusion of both measures in our regressions to examine if each exerts an independent effect on growth.

European HICs may be attributed to the strong common monetary policy adopted in the region. Some studies, including Rose (2014), indicate that banks and bond markets, particularly those with long-term maturity, are more effective at influencing economic growth under inflation-targeting regimes. The finding that stock market measures are statistically not significant for the European HICs, although they are marginally significant for the non-European HICs, stands for countries with the most developed stock markets such as U.S.A., Canada, and Japan, is somewhat intriguing as stock markets are regarded as having a comparative advantage over banks in raising funds for the innovative and high-tech investments that characterize these countries.

For the MICs, the lower-MICs in particular, the insignificant coefficient estimates of stock market measures perhaps imply that their already established stock markets may not yet have reached some minimum size or activity level beyond which they can robustly influence economic growth. It may also be that the stock markets may suffer from lack of transparency - limited firm-specific information, in particular - which, by hindering effective exercise of property rights and corporate governance by investors, leads to poor performance of stock markets.[18] By establishing and nurturing a long-run personal relationship with investors, the banking system may also have continued to be the major source of financial services in these countries.

The findings that the banking system measures are statistically significant unlike the stock markets for the lower-MICs lends credence to the argument put forward by Singh and Weisse (1998). They contend that developing countries should focus on making the banking sector the primary source of their financial services rather than diverting scarce resources to the promotion of sophisticated financial institutions like stock markets, which not only rely on more advanced monitoring and infrastructure but also encourage short-term profits. Our finding regarding the lack of robust growth effects of financial sectors, especially for the HICs, is in line with the findings of some recent cross-country and panel studies: although financial deepening has had a positive and significant effect on growth

[18] For details, see Jin and Myers (2006).

between 1960-1989,[19] its effect vanishes during the later period of 1990-2004, which was characterized by recurrent financial crises (Rousseau and Wachtel, 2011); the prevalence of excess bank credit - credit boom - in many developed countries is dampening economic growth (Arcand, Berkes, and Panizza, 2012); and there is no clear evidence that finance spurs growth, although the correlation between the two is well-established (Favara, 2003).

5 CONCLUSION

The main question in this study is whether the link between financial development and economic growth becomes more evident as more homogeneous groups of countries are involved after dealing with simultaneity bias, omitted variable bias, and the endogeneity issue. For this purpose, we employ the dynamic panel GMM estimator with relatively more homogeneous groups of countries. The empirical results show that while the size of credit extended to the private sector and stock market liquidity exert strong positive impacts on the economic growth of the MICs, only stock market liquidity positively and strongly influences the economic growth of the HICs. It is also found that bank credit spurs growth for both the upper- and lower- MICs, but stock market liquidity has a robust impact on the growth of the upper-MICs alone. For the non-European HICs, bank credit is not robust and stock market liquidity is only marginally significant. In the case of European HICs, stock market liquidity is not a strong determinant of growth, unlike bank credit.

In general, our empirical results are consistent with the views that the financial system provides important services for economic growth and that stock markets and banks play different roles. In sharp contrast to the existing empirical findings, however, our empirical study, which uses more homogeneous income groups, finds that the growth effects of banks and stock markets differ for the various groups of economies, implying that the link between financial development and economic growth seems to depend on the stages of the countries'

[19] It is a period analyzed by most of the early studies that established a positive relationship between financial development and economic growth.

economic development. Thus, in order to understand the relationship between the financial system and economic growth more comprehensively, it is vital to include more homogeneous economies in the panel, so that more economically reasonable and stylized evidence is uncovered regarding the link.

6 Acknowledgements

We thank Lee Adkins, Wenyi Shen, David Carter, and seminar participants at the MEA and SEA conferences for helpful comments and discussions. All remaining errors are our own.

References

[1] Allen, F., Gale, D. 1997. Financial markets, intermediaries, and intertemporal smoothing. Journal of Political Economy 105(3), 523-546.

[2] Allen, F., Gale, D. 1999. Diversity of opinion and financing of new technologies. Journal of Financial Intermediation 8, 68-89.

[3] Allen, F., Gale, D. 2000. Comparing financial systems. Cambridge, MA: MIT Press.

[4] Arcand, J.L., Berkes, E., Panizza, U. 2012. Too much finance? IMF Working Paper, 12/161.

[5] Arellano, M., Bond, S. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Review of Economic Studies 58, 277-297.

[6] Arellano, M., Bover, O. 1995. Another look at the instrumental-variable estimation of error-components models. Journal of Econometrics 68, 29-52.

[7] Barro, R. 1991. Economic growth in a cross section of countries. The Quarterly Journal of Economics, 407-443.

[8] Barro, R., Lee, J.W. 2010. A New data set of educational attainment in the world, 1950-2010. Journal of Development Economics 104, 184-198.

[9] Beck, T. 2013. Finance, growth and fragility: The role of government. International Journal of Banking, Accounting and Finance 5 (1/2), 49-77.

[10] Beck, T., Levine, R. 2004. Stock markets, banks, and growth: Panel evidence. Journal of Banking and Finance 28, 423-442.

[11] Bekaert, G., Harvey, C.R., Lundblad, C. 2005. Does financial liberalization spur growth? Journal of Financial Economics 77, 3-55.

[12] Bencivenga, V.R., Smith, B.D. 1991. Financial intermediation and endogenous growth. Review of Economic Studies 58(2), 195-209.

[13] Bencivenga, V.R., Smith, B.D., Starr, R.M. 1995. Transactions costs, technological choice, and endogenous growth. Journal of Economic Theory 67, 153-177.

[14] Bertocco, G. 2008. Finance and development: Is Schumpeter's analysis still relevant? Journal of Banking and Finance 32(6), 1161-1175.

[15] Bhide, A. 1993. The hidden costs of stock market liquidity. Journal of Financial Economics 34, 31-51.

[16] Blundell, R., Bond, S. 1998. Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87, 115-143.

[17] Boot, A.W.A., Thakor, A. 1997. Financial system architecture. Review of Financial Studies 10(3), 693-733.

[18] Boyd, J.H., Smith, B.D 1998. The evolution of debt and equity markets in economic development. Economic Theory 12, 519-560.

[19] Coval, J.D., Thakor, A.V. 2005. Financial intermediation as a beliefs-bridge between optimists and pessimists. Journal of Financial Economics 75, 535-569.

[20] Deidda, L., Fattouh, B. 2008. Banks, financial markets and growth. Journal of Financial Intermediation 17, 6-36.

[21] Demirguc-Kunt, A., Feyen, E., Levine, R. 2013. The evolving importance of banks and securities markets. World Bank Economic Review, World Bank Group, 27(3), 476-490.

[22] Diamond, D.W. 1984. Financial intermediation and delegated monitoring. Review of Economic Studies 51(3), 393-414.

[23] Favara, G. 2003. An empirical reassessment of the relationship between finance and growth. IMF Working Paper, 03/123, European I Department.

[24] Goldsmith, R.W. 1969. Financial structure and development. New Haven, CT: Yale University press.

[25] Greenwood, J., Jovanovic, B. 1990. Financial development, growth and the distribution of income. Journal of Political Economy 98(5), 1076-1107.

[26] Hansen, L.P. 1982. Large sample properties of generalized method of moments estimators. Econometrica 50(4), 1029-1054.

[27] Holmstrom, B., Tirole, J. 1993. Market liquidity and performance monitoring. Journal of Political Economy 101(4), 678-709.

[28] Holtz-Eakin, D., Newey, W., Rosen, H. 1988. Estimating vector autoregressions with panel data. Econometrica 56 (6), 1371-1395.

[29] Jin, L., Myers, S.C. 2006. R2 around the world: New theory and new tests. Journal of Financial economics 79, 257-292.

[30] Khan, A. 2001. Financial development and economic growth. Macroeconomic Dynamics 5(3), 413-433.

[31] King, R.G., Levine, R. 1993a. Finance and growth: Schumpeter might be right. Quarterly Journal of Economics 108(3), 717-738.

[32] King, R.G., Levine, R. 1993b. Finance, entrepreneurship, and growth: Theory and evidence. Journal of Monetary Economics 32, 513-542.

[33] Levine, R. 1997. Financial development and economic growth: Views and agenda. Journal of Economic Literature 35(2), 688-726.

[34] Levine, R. 2005. Finance and growth: Theory and evidence. In Aghion, P., & Durlauf, S.N. (Eds.), Handbook of economic growth (865-934). Amsterdam: Elsevier.

[35] Lucas, R.E. 1988. On the mechanics of economic development. Journal of Monetary Economics 22, 3-42.

[36] McKinnon, R. 1973. Money & Capital in Economic Development. Washington, D.C.: Brookings Institution.

[37] Robinson, J. 1952. The generalization of the general theory. In The rate of interest and other essays (67-142). London: Macmillan.

[38] Roodman, D. 2009. A note on the theme of too many instruments. Oxford Bulletin of Economics and Statistics, 71(1), 135-158.

[39] Rose, A.K. 2014. The bond market: An inflation-targeter's best friend. NBER Working Paper 20494.

[40] Rousseau, P.L., Wachtel, P. 2011. What is happening to the impact of financial deepening on economic growth? Economic Inquiry 49(1), 276-288.

[41] Schumpeter, J.A. 1934. The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle. Cambridge, MA: Harvard University Press.

[42] Shaw, Edward S. 1973. Financial deepening in economic development. Oxford University Press, New-York.

[43] Singh, A., Weisse, B.A. 1998. Emerging stock markets, portfolio capital flows and long-term economic growth: Micro and macroeconomic perspectives. World Development 26(4), 607-622.

[44] Song, F., Thakor, A.V. 2010. Financial system architecture and the co-evolution of banks and capital markets. The Economic Journal 120(547),1021-1055.

[45] Stiglitz, J.E. 1985. Credit markets and the control of capital. Journal of Money, Credit and Banking 17(2), 133-152.

[46] Windmeijer, F. 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics 126, 25-51.

Table 1. Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.
All Countries (64)				
Economic growth	2.04	2.40	-8.38	10.39
Bank credit	66.02	47.33	4.84	224.01
Private credit	71.10	51.15	4.84	224.01
Liquid liabilities	71.62	53.26	11.94	353.89
Turnover ratio	52.62	55.43	0.02	376.85
Traded value	37.80	62.65	0.002	621.33
Mkt. Capitalization	58.22	60.76	0.033	478.67
Initial Income	15228.91	16424.59	366.23	85529.8
Schooling	7.94	2.52	1.97	13.25
Govt. size	16.37	5.18	5.49	30.72
Inflation	27.88	173.82	-2.97	2282.40
Openness	84.33	64.90	15.87	425.63
Middle-income countries(33)				
Economic growth	2.47	2.68	-8.38	10.39
Bank credit	40.30	29.67	4.84	147.28
Private credit	43.38	33.91	4.84	150.97
Liquid liabilities	50.02	30.31	11.94	169.08
Turnover ratio	34.26	51.68	0.021	376.85
Traded value	15.04	25.68	0.002	124.56
Mkt. Capitalization	38.17	42.69	0.033	236.37
Initial Income	2715.31	1916.14	366.23	8312.76
Schooling	6.31	2.02	1.97	11.69
Govt. size	13.84	4.03	5.49	28.62
Inflation	49.58	239.92	-0.01	2282.40
Openness	72.38	40.53	15.87	206.98
High-income countries(31)				
Economic growth	1.59	1.98	-5.65	6.76
Bank credit	93.75	47.23	18.48	224.01
Private credit	101.00	49.82	17.58	224.01
Liquid liabilities	94.77	62.21	30.00	353.89
Turnover ratio	71.82	52.80	0.20	325.73
Traded value	61.59	79.07	0.23	621.33
Mkt. Capitalization	79.44	69.39	1.10	478.67
Initial Income	28469.12	14490.20	4631.50	85529.80
Schooling	9.67	1.69	5.37	13.25
Govt. size	19.05	4.92	7.08	30.72
Inflation	4.78	15.57	-2.99	191.77
Openness	97.05	81.61	18.03	425.63

Table 2. Correlations, Middle-income countries

	Econ. Growth	Bank Credit	Private Credit	Liquid Liab.	Turnover Ratio	Traded Value	Mkt. Cap.	Initial Income	Schooling	Govt. Size	Inflation	Openness
EconGrowth	1.00											
BankCredit	0.284	1.00										
	(0.000)											
PrivateCredit	0.222	0.947	1.00									
	(0.004)	(0.000)										
LiquidLiab.	0.300	0.845	0.745	1.00								
	(0.000)	(0.000)	(0.000)									
TurnoverRatio	0.246	0.244	0.215	0.248	1.00							
	(0.002)	(0.002)	(0.006)	(0.001)								
TradedValue	0.296	0.576	0.627	0.532	0.592	1.00						
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)							
Mkt.Cap.	0.122	0.571	0.684	0.511	0.123	0.745	1.00					
	(0.121)	(0.000)	(0.000)	(0.000)	(0.122)	(0.000)						
InitialIncome	-0.114	0.110	0.169	-0.03	-0.015	0.113	0.238	1.00				
	(0.148)	(0.160)	(0.031)	(0.706)	(0.846)	(0.153)	(0.002)					
Schooling	0.083	0.090	0.113	0.035	-0.167	0.075	0.262	0.484	1.00			
	(0.291)	(0.249)	(0.148)	(0.659)	(0.034)	(0.347)	(0.001)	(0.000)				
Govt.Size	-0.154	0.144	0.213	0.159	-0.119	0.082	0.234	0.238	0.156	1.00		
	(0.049)	(0.065)	(0.006)	(0.042)	(0.134)	(0.300)	(0.003)	(0.002)	(0.043)			
Inflation	-0.300	-0.061	-0.064	-0.173	0.012	-0.071	-0.125	0.054	-0.006	-0.066	1.00	
	(0.000)	(0.436)	(0.411)	(0.027)	(0.881)	(0.373)	(0.112)	(0.495)	(0.936)	(0.398)		
Openness	0.079	0.442	0.381	0.444	-0.223	0.136	0.334	0.080	0.206	0.144	-0.195	1.00
	(0.313)	(0.000)	(0.000)	(0.000)	(0.005)	(0.085)	(0.000)	(0.307)	(0.008)	(0.064)	(0.012)	

Note: Significance levels are reported in parenthesis.

Table 3. Correlations, High-income countries

	Econ. Growth	Bank Credit	Private Credit	Liquid Liab.	Turnover Ratio	Traded Value	Mkt. Cap.	Initial Income	Schooling	Govt. Size	Inflation	Openness
EconGrowth	1.00											
BankCredit	-0.201	1.00										
	(0.012)											
PrivateCredit	-0.218	0.881	1.00									
	(0.007)	(0.000)										
LiquidLiab.	-0.036	0.583	0.561	1.00								
	(0.660)	(0.000)	(0.000)									
TurnoverRatio	0.099	0.234	0.353	-0.071	1.00							
	(0.224)	(0.004)	(0.000)	(0.386)								
TradedValue	0.140	0.387	0.479	0.310	0.626	1.00						
	(0.082)	(0.000)	(0.000)	(0.000)	(0.000)							
Mkt.Cap.	0.206	0.450	0.456	0.615	0.149	0.755	1.00					
	(0.010)	(0.000)	(0.000)	(0.000)	(0.065)	(0.000)						
InitialIncome	-0.241	0.496	0.540	0.474	0.089	0.183	0.274	1.00				
	(0.002)	(0.000)	(0.000)	(0.000)	(0.274)	(0.023)	(0.001)					
Schooling	-0.119	0.180	0.356	0.044	0.307	0.199	0.070	0.386	1.00			
	(0.141)	(0.026)	(0.000)	(0.586)	(0.000)	(0.013)	(0.391)	(0.000)				
Govt.Size	-0.292	-0.072	-0.101	-0.367	-0.006	-0.269	-0.440	0.153	0.160	1.00		
	(0.000)	(0.375)	(0.216)	(0.000)	(0.941)	(0.001)	(0.000)	(0.057)	(0.047)			
Inflation	-0.177	-0.204	-0.218	-0.144	-0.017	-0.114	-0.154	-0.215	-0.099	0.031	1.00	
	(0.026)	(0.011)	(0.007)	(0.076)	(0.831)	(0.159)	(0.056)	(0.007)	(0.219)	(0.701)		
Openness	0.177	0.208	0.088	0.533	-0.157	0.287	0.615	0.109	-0.182	-0.409	-0.065	1.00
	(0.023)	(0.01)	(0.279)	(0.000)	(0.052)	(0.000)	(0.000)	(0.176)	(0.023)	(0.000)	(0.421)	

Note: Significance levels are reported in parenthesis.

Table 4. Bank & Stock market measures and economic growth, country Average, 1989-2012

Country	Econ. Growth	Bank Credit	Private Credit	Liquid Liabilities	Turnover ratio	Traded Value	Market Capitalization
Argentina*	2.611	17.456	17.852	25.684	20.433	3.067	25.173
Australia	1.639	92.322	92.322	70.411	65.333	61.647	90.705
Austria	1.417	104.647	105.060	91.575	50.872	12.158	20.725
Belgium	1.012	75.885	75.913	88.437	31.524	18.724	56.510
Bolivia*	1.901	42.746	44.166	45.075	0.917	0.102	13.950
Brazil*	1.314	51.232	52.167	42.952	54.065	20.527	39.066
Barbados	0.563	57.376	57.570	78.712	3.688	3.316	72.795
Botswana*	2.910	18.043	18.084	29.850	5.286	0.806	21.790
Canada	1.132	96.867	122.867	93.622	62.036	59.658	93.559
China*	8.434	106.948	107.549	123.573	147.283	56.287	40.942
Cote d'Ivoire*	-0.646	19.515	19.754	27.952	2.201	0.355	15.832
Colombia*	1.950	29.988	33.852	22.923	9.946	2.910	27.571
Denmark	0.987	119.556	119.675	61.490	65.374	35.570	52.703
Ecuador*	1.282	20.227	20.564	23.882	5.410	0.347	6.402
Egypt*	2.608	39.034	39.034	79.317	27.322	11.748	33.033
Finland	1.377	74.367	75.262	57.183	78.518	72.556	82.297
France	1.044	95.299	95.354	68.533	75.447	72.556	63.258
Germany	1.508	105.988	105.988	92.169	120.738	45.744	39.104
Ghana*	2.967	10.586	10.759	22.21	3.468	0.372	12.605
Greece	0.630	63.137	63.242	77.145	47.891	22.746	39.827
Hong Kong	2.752	155.777	154.424	230.957	73.508	263.571	324.407
Hungary	0.966	43.633	43.682	48.777	60.776	13.477	17.793
Indonesia*	3.616	34.380	35.525	40.683	46.723	11.421	27.109
India*	4.545	33.556	33.556	54.450	98.709	42.471	48.051
Iran*	3.302	22.977	22.977	40.097	17.463	2.838	16.172
Iceland	1.015	105.620	105.664	56.778	41.876	44.072	61.937
Israel	1.866	77.558	77.558	83.846	59.655	31.162	58.783
Italy	0.561	80.770	81.028	65.166	101.330	33.214	30.684
Jamaica*	0.576	24.453	24.454	45.072	5.550	2.541	54.159
Jordan*	1.107	72.107	72.263	113.823	28.100	37.066	105.946
Japan	1.078	139.940	193.085	202.194	78.175	61.350	76.841
Kenya**	0.411	26.014	30.020	41.510	5.877	1.601	23.832
Korea	4.226	98.446	99.880	71.066	190.457	109.291	60.317
Luxembourg	2.124	127.235	127.296	320.509	1.328	1.886	149.121
Malaysia*	3.630	114.035	115.394	114.087	38.053	64.320	159.589
Mauritius*	3.546	62.329	62.357	80.689	5.606	2.249	39.291
Mexico*	1.287	18.418	20.558	25.235	32.451	8.396	27.899
Morocco*	2.334	44.514	45.670	79.584	16.616	7.718	38.452
Netherlands	1.548	138.390	138.465	98.412	99.811	93.674	90.278
New Zealand	1.117	110.945	110.945	79.800	35.964	14.061	41.386
Nigeria*	2.980	16.310	16.406	22.272	8.286	1.667	14.487
Norway	1.604	67.945	67.997	53.574	85.595	41.295	42.162
Pakistan*	1.718	23.879	23.913	41.270	150.753	28.264	18.839
Panama*	3.998	74.939	81.001	68.750	2.352	0.455	22.286
Peru*	2.294	19.321	20.133	25.451	15.224	3.368	32.081
Philippines*	1.890	32.007	32.028	51.701	23.391	12.090	53.739
Poland	2.864	31.293	31.302	39.718	60.726	7.724	18.195

Table 4. continued

Country	Econ. Growth	Bank Credit	Private Credit	Liquid Liabilities	Turnover ratio	Traded Value	Market Capitalization
Portugal	1.422	118.112	118.271	98.945	52.968	18.680	31.550
Russia*	0.291	23.369	23.758	27.962	65.855	24.897	34.395
Saudi Arabia	1.656	28.707	28.526	48.534	77.813	64.670	58.066
Singapore	3.590	96.022	96.027	115.187	60.303	92.112	161.407
South Africa*	0.786	66.141	128.12	47.798	33.560	60.430	169.980
Spain	1.406	125.778	125.903	100.353	125.281	89.271	63.534
Sri Lanka*	4.391	25.619	25.645	38.246	15.320	2.785	18.370
Swaziland*	1.504	18.201	18.340	22.729	0.814	0.074	10.416
Sweden	1.545	82.326	110.367	54.778	85.378	83.245	90.961
Switzerland	0.763	159.845	159.852	152.614	84.260	159.645	183.563
Thailand*	3.904	109.459	116.638	95.203	84.012	44.557	59.547
Trinadad & Tob.	2.992	33.586	40.210	51.554	5.155	1.730	52.687
Tunisia*	2.804	56.139	62.698	54.272	12.106	1.663	13.116
Turkey*	2.428	24.999	24.999	32.640	131.858	32.005	24.330
UK	1.551	143.504	143.856	112.228	89.503	110.808	125.916
United States	1.422	50.694	161.113	65.014	149.065	166.063	108.146
Uruguay*	2.753	31.096	31.271	39.238	1.821	0.031	0.843

Note: * represents MIC and the rest HIC. The values are based on 5- year average data.

Table 5. Dynamic Panel GMM (5-year average data)

Variable	Full Sample (64)				HICs (31)				MICs (33)			
	Difference GMM		System GMM		Difference GMM		System GMM		Difference GMM		System GMM	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BankCredit	-0.124	0.126	-0.092	-0.065	-0.037	0.039	-0.004	0.038	0.162**	0.150**	0.233**	0.167**
	(0.130)	(0.174)	(0.056)	(0.047)	(0.057)	(0.054)	(0.049)	(0.065)	(0.071)	(0.048)	(0.079)	(0.040)
TurnoverRatio	0.070**	0.054**	0.123**	0.078**	0.110**	0.083**	0.069**	0.057**	0.044*	0.050**	0.135*	0.047**
	(0.020)	(0.021)	(0.041)	(0.026)	(0.042)	(0.037)	(0.015)	(0.025)	(0.022)	(0.021)	(0.068)	(0.022)
y_{t-1}	-0.297	-0.420*	-0.019	-0.082	-0.260*	-0.533**	-0.328**	-0.562**	-0.264	-0.264*	-0.077	-0.217
	(0.184)	(0.227)	(0.138)	(0.140)	(0.147)	(0.101)	(0.122)	(0.124)	(0.209)	(0.149)	(0.235)	(0.140)
Schooling	0.900	0.570	0.135	0.071	0.004	-0.572	0.050	-0.323	0.329	0.286	-0.110	0.343
	(0.596)	(0.468)	(0.203)	(0.200)	(0.350)	(0.402)	(0.231)	(0.377)	(0.310)	(0.179)	(0.417)	(0.222)
Gov'tSize.		-0.072		-0.061		-0.124		-0.079		-0.034		-0.015
		(0.283)		(0.276)		(0.159)		(0.168)		(0.154)		(0.129)
Inflation		0.163		-0.042		-0.469		-0.524**		-0.099		-0.054
		(0.315)		(0.094)		(0.425)		(0.208)		(0.123)		(0.066)
TradeOpenness		0.101		0.155		0.510**		0.454**		0.055		0.043
		(0.099)		(0.105)		(0.179)		(0.143)		(0.061)		(0.075)
Observations	189	189	189	189	91	91	91	91	98	98	98	98
Wald test(a)	0.004	0.004	0.015	0.014	0.032	0.008	0.001	0.040	0.003	0.000	0.007	0.000
AR(2) test(b)	0.480	0.164	0.261	0.150	0.046	0.237	0.027	0.237	0.197	0.234	0.185	0.281
Hansen J(c)	0.118	0.220	0.105	0.277	0.145	0.332	0.174	0.281	0.030	0.186	0.346	0.449
Diff in Hansen(c)			0.174	0.448			0.130	0.238			0.326	0.404

Note: All variables are logged and cross-sectionally demeaned; (1) controls for lagged income per capita (y_{t-1}) and schooling, while (2) controls for those in (1) and government size, inflation, and trade openness; all regressions incorporate Windmeijer (2005) correction, with robust standard errors in parentheses; * and ** indicate significance at the 10% and 5% level, respectively; P-values of post-estimation tests are reported; (a) The null hypothesis is that banking and stock market measures enter the regression with zero coefficients, implying test of joint significance of banking and stock market measures; (b) The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation; (c) The null hypothesis is that the instruments used are not correlated with the residuals.

Table 6. Dynamic Panel GMM (3-year average data)

Variable	Full Sample (64)				HICs (31)				MICs (33)			
	Difference GMM		System GMM		Difference GMM		System GMM		Difference GMM		System GMM	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BankCredit	0.036	0.034	0.025	0.030	-0.085	-0.051	-0.041	-0.022	0.065**	0.083**	0.100**	0.082**
	(0.027)	(0.030)	(0.023)	(0.028)	(0.060)	(0.035)	(0.028)	(0.039)	(0.029)	(0.024)	(0.034)	(0.040)
TurnoverRatio	0.037**	0.029**	0.039**	0.040**	0.059**	0.051**	0.041**	0.039**	0.024**	0.027**	0.034**	0.058**
	(0.012)	(0.012)	(0.010)	(0.011)	(0.024)	(0.021)	(0.017)	(0.016)	(0.011)	(0.009)	(0.015)	(0.020)
y_{t-1}	-0.304**	-0.252**	-0.198*	-0.175**	-0.123	-0.148*	-0.059	-0.212**	-0.251**	-0.185**	-0.130	-0.124
	(0.101)	(0.080)	(0.101)	(0.073)	(0.140)	(0.085)	(0.085)	(0.083)	(0.076)	(0.086)	(0.125)	(0.098)
Schooling	0.379**	0.166**	0.271*	0.133	0.108	-0.088	-0.107	-0.230*	0.313**	0.140	0.241	0.044
	(0.108)	(0.077)	(0.148)	(0.087)	(0.192)	(0.163)	(0.139)	(0.134)	(0.086)	(0.089)	(0.204)	(0.105)
Gov'tSize.		-0.143**		-0.161**		-0.144		-0.098		-0.120*		-0.041
		(0.057)		(0.056)		(0.119)		(0.100)		(0.059)		(0.075)
Inflation		0.008		-0.046		-0.782**		-0.899**		-0.094**		-0.059
		(0.038)		(0.098)		(0.212)		(0.351)		(0.043)		(0.057)
TradeOpenness		0.150**		0.105**		0.130*		0.196**		0.037		0.156**
		(0.057)		(0.039)		(0.068)		(0.087)		(0.058)		(0.075)
Observations	377	377	377	377	182	182	182	182	195	195	195	195
Wald test(a)	0.000	0.017	0.000	0.000	0.058	0.059	0.052	0.064	0.005	0.000	0.006	0.000
AR(2) test(b)	0.470	0.785	0.176	0.295	0.121	0.024	0.062	0.026	0.341	0.173	0.107	0.321
Hansen J(c)	0.017	0.094	0.019	0.172	0.161	0.474	0.175	0.732	0.233	0.436	0.283	0.775
Diff in Hansen(c)			0.019	0.152			0.166	0.719			0.265	0.724

Note: All variables are logged and cross-sectionally demeaned; (1) controls for lagged income per capita (y_{t-1}) and schooling, while (2) controls for those in (1) and government size, inflation, and trade openness; all regressions incorporate Windmeijer (2005) correction, with robust standard errors in parentheses; * and ** indicate significance at the 10% and 5% level, respectively; P-values of post-estimation tests are reported; (a) The null hypothesis is that banking and stock market measures enter the regression with zero coefficients, implying test of joint significance of banking and stock market measures; (b) The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation; (c) The null hypothesis is that the instruments used are not correlated with the residuals.

Table 7. Dynamic Panel Difference GMM (5-year average data)

Variable	European HICs (18)		Non-European HICs (12)		Upper-MICs (20)		Lower-MICs (11)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BankCredit	0.262**	0.161**	0.071	0.192	0.107*	0.213**	0.178**	0.327**
	(0.120)	(0.068)	(0.091)	(0.171)	(0.059)	(0.099)	(0.063)	(0.112)
TurnoverRatio	0.073**	0.046	0.046*	0.051*	0.116**	0.072*	0.042	0.044
	(0.032)	(0.033)	(0.021)	(0.025)	(0.049)	(0.040)	(0.068)	(0.125)
y_{t-1}	-0.857**	-0.946**	-0.127	-0.387	-0.135	-0.009	0.153	-0.004
	(0.291)	(0.230)	(0.094)	(0.310)	(0.155)	(0.169)	(0.138)	(0.176)
Schooling	-0.337	-0.283	-0.359	-0.592	0.254	-0.418	0.249	0.616**
	(0.572)	(0.427)	(0.494)	(1.069)	(0.217)	(0.450)	(0.188)	(0.266)
Gov'tSize.		-0.413		0.072		-0.252		-0.631
		(0.403)		(0.387)		(0.331)		(0.390)
Inflation		-0.180		1.680		-0.131		2.076
		(2.626)		(1.019)		(0.174)		(1.517)
TradeOpenness		0.528		0.203		0.258**		-0.318
		(0.437)		(0.337)		(0.101)		(0.335)
Observations	54	54	35	35	57	57	33	33
Wald test(a)	0.038	0.007	0.066	0.107	0.017	0.020	0.046	0.023
AR(2) test(b)	0.547	0.230	0.414	0.331	0.381	0.135	0.824	0.651
Hansen J(c)	0.130	0.752	0.321	0.702	0.353	0.400	0.355	0.390

Note: All variables are logged and cross-sectionally demeaned; (1) controls for lagged income per capita (y_{t-1}) and schooling, while (2) controls for those in (1) and government size, inflation, and trade openness; all regressions incorporate Windmeijer (2005) correction, with robust standard errors in parentheses; * and ** indicate significance at the 10% and 5% level, respectively; P-values of post-estimation tests are reported; (a) The null hypothesis is that banking and stock market measures enter the regression with zero coefficients, implying test of joint significance of banking and stock market measures; (b) The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation; (c) The null hypothesis is that the instruments used are not correlated with the residuals.

Table 8. Dynamic Panel System GMM (5-year average data)

Variable	European HICs (18)		Non-European HICs (12)		Upper-MICs (20)		Lower-MICs (11)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BankCredit	0.120**	0.154**	-0.015	0.004	0.146**	0.186**	0.544**	0.301**
	(0.044)	(0.053)	(0.081)	(0.121)	(0.068)	(0.078)	(0.144)	(0.111)
TurnoverRatio	0.077*	0.021	0.052*	0.056*	0.073**	0.069**	0.073	0.064
	(0.039)	(0.032)	(0.030)	(0.034)	(0.019)	(0.029)	(0.162)	(0.087)
y_{t-1}	-0.907**	-0.781**	-0.370**	-0.775**	-0.163	-0.332	-0.024	-0.068
	(0.164)	(0.194)	(0.115)	(0.252)	(0.274)	(0.303)	(0.418)	(0.372)
Schooling	0.514*	-0.170	0.869	1.755**	0.297	0.133	-0.026	0.257
	(0.260)	(0.292)	(0.657)	(0.693)	(0.410)	(0.392)	(0.450)	(0.449)
Gov'tSize.		-0.300		0.323		0.116		0.045
		(0.262)		(0.463)		(0.195)		(0.569)
Inflation		-0.212		1.990		0.027		0.973**
		(0.235)		(1.408)		(0.060)		(0.251)
TradeOpenness		0.328**		-0.108		0.340**		-0.214
		(0.104)		(0.183)		(0.151)		(0.299)
Observations	54	54	35	35	57	57	33	33
Wald test(a)	0.001	0.006	0.192	0.132	0.000	0.003	0.008	0.004
AR(2) test(b)	0.845	0.453	0.459	0.896	0.277	0.241	0.388	0.058
Hansen J(c)	0.275	0.295	0.779	0.982	0.437	0.851	0.310	0.927
Diff in Hansen(c)	0.184	0.225	0.426	0.887	0.402	0.356	0.438	0.804

Note: All variables are logged and cross-sectionally demeaned; (1) controls for lagged income per capita (y_{t-1}) and schooling, while (2) controls for those in (1) and government size, inflation, and trade openness; all regressions incorporate Windmeijer (2005) correction, with robust standard errors in parentheses; * and ** indicate significance at the 10% and 5% level, respectively; P-values of post-estimation tests are reported; (a) The null hypothesis is that banking and stock market measures enter the regression with zero coefficients, implying test of joint significance of banking and stock market measures; (b) The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation; (c) The null hypothesis is that the instruments used are not correlated with the residuals.

Table 9. Dynamic Panel Difference GMM (3-year average data)

Variable	European HICs (18)		Non-European HICs (12)		Upper-MICs (20)		Lower-MICs (11)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BankCredit	0.261**	0.251*	0.044	-0.298	0.095**	0.092**	0.133*	0.110**
	(0.120)	(0.140)	(0.126)	(0.234)	(0.040)	(0.034)	(0.067)	(0.041)
TurnoverRatio	0.054	0.039	0.033**	0.120*	0.046**	0.049**	0.033	0.014
	(0.032)	(0.029)	(0.015)	(0.063)	(0.013)	(0.018)	(0.031)	(0.031)
y_{t-1}	-0.909**	-0.891**	-0.558**	-0.026	-0.355**	-0.324**	-0.259	-0.248
	(0.183)	(0.346)	(0.102)	(0.293)	(0.133)	(0.151)	(0.303)	(0.242)
Schooling	-0.006	-0.186	1.216**	1.085**	0.321*	0.177	0.324	0.032
	(0.503)	(0.176)	(0.271)	(0.493)	(0.177)	(0.202)	(0.430)	(0.124)
Gov'tSize.		-0.132		-0.769*		-0.148		0.154
		(0.199)		(0.391)		(0.215)		(0.192)
Inflation		-1.838		-0.519		-0.073		0.658
		(1.299)		(0.724)		(0.076)		(0.489)
TradeOpenness		0.113		-0.136		0.111		0.148
		(0.230)		(0.163)		(0.087)		(0.110)
Observations	108	108	70	70	112	112	66	66
Wald test(a)	0.004	0.001	0.048	0.045	0.001	0.006	0.017	0.005
AR(2)Test(b)	0.823	0.166	0.678	0.266	0.663	0.468	0.810	0.437
Hansen J(c)	0.515	0.965	0.474	0.693	0.455	0.999	0.221	0.999

Note: All variables are logged and cross-sectionally demeaned; (1) controls for lagged income per capita (y_{t-1}) and schooling, while (2) controls for those in (1) and government size, inflation, and trade openness; all regressions incorporate Windmeijer (2005) correction, with robust standard errors in parentheses; * and ** indicate significance at the 10% and 5% level, respectively; P-values of post-estimation tests are reported; (a) The null hypothesis is that banking and stock market measures enter the regression with zero coefficients, implying test of joint significance of banking and stock market measures; (b) The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation; (c) The null hypothesis is that the instruments used are not correlated with the residuals.

Table 10. Dynamic Panel System GMM (3-year average data)

Variable	European HICs (18)		Non-European HICs (12)		Upper-MICs (20)		Lower-MICs (11)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
BankCredit	0.183**	0.128**	-0.097	-0.133	0.115**	0.104**	0.100**	0.091**
	(0.071)	(0.058)	(0.090)	(0.113)	(0.040)	(0.049)	(0.039)	(0.036)
TurnoverRatio	0.050**	0.025	0.076*	0.046*	0.056**	0.057**	0.017	0.021
	(0.019)	(0.018)	(0.030)	(0.025)	(0.021)	(0.023)	(0.022)	(0.017)
y_{t-1}	-0.764**	-0.418**	-0.145	-0.149	-0.076	-0.217	-0.058	-0.077
	(0.220)	(0.155)	(0.211)	(0.097)	(0.206)	(0.202)	(0.193)	(0.087)
Schooling	0.081	0.280	0.266	0.630	0.101	0.002	0.156	0.158
	(0.316)	(0.366)	(0.673)	(0.461)	(0.276)	(0.282)	(0.283)	(0.159)
Gov'tSize.		-0.998		-0.442**		-0.207		-0.028
		(0.642)		(0.175)		(0.133)		(0.148)
Inflation		-0.007		-0.626		-0.068		0.143
		(0.830)		(0.652)		(0.070)		(0.239)
TradeOpenness		0.004		0.056		0.297**		-0.081
		(0.177)		(0.075)		(0.123)		(0.098)
Observations	108	108	70	70	113	113	66	66
Wald test(a)	0.002	0.004	0.179	0.135	0.006	0.011	0.045	0.075
AR(2) test(b)	0.788	0.599	0.274	0.124	0.342	0.837	0.147	0.561
Hansen J(c)	0.201	0.954	0.823	0.999	0.523	0.999	0.994	0.999
Diff in Hansen(c)	0.147	0.934	0.749	0.999	0.522	0.999	0.991	0.999

Note: All variables are logged and cross-sectionally demeaned; (1) controls for lagged income per capita (y_{t-1}) and schooling, while (2) controls for those in (1) and government size, inflation, and trade openness; all regressions incorporate Windmeijer (2005) correction, with robust standard errors in parentheses; * and ** indicate significance at the 10% and 5% level, respectively; P-values of post-estimation tests are reported; (a) The null hypothesis is that banking and stock market measures enter the regression with zero coefficients, implying test of joint significance of banking and stock market measures; (b) The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation; (c) The null hypothesis is that the instruments used are not correlated with the residuals.