Financial Openness and Financial Development: An Analysis Using Indices

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Abstract

This paper examines the link between financial openness and financial development through panel data analysis on advanced and emerging market countries. Using indices, financial openness together with institutional and educational variables explains a large part of the variation in financial development across countries and over time. Our analysis demonstrates that different indexing strategies serve in finding better measures for financial openness and financial development in comparison to the individual indicators used in the literature. Our principal component type financial openness index conveys a positive effect on financial development independent from the lag structure or specifications used.

JEL Codes: F36, F63, F65, O16
Keywords: Financial liberalization; Financial development; Financial openness; Financial markets; Principal component analysis; Dynamic panel data analysis

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1. Introduction

In the wake of the recent financial crisis, the role of financial development in emerging markets and developed countries has gained further interest among researchers. Financial development, the channel for increasing the efficiency of financial markets and resources and improving on the overall importance of the financial system, has become one of the main elements that influences economic growth and welfare (Huang, 2006).

Although the role of financial development on economic growth is newly recognized, a wide spread debate on the effects of financial liberalization on growth and financial development is ongoing. Studies have shown that financial liberalization through alleviation of capital controls and deregulation of financial markets can endorse economic growth and enhance welfare by creating opportunities for a better and more efficient allocation of resources and by portfolio and risk diversification under appropriate controls, frameworks and regulatory apparatus (Aziakpono, 2007; Chinn and Ito, 2006).

The literature provides a broad examination of financial liberalization and economic growth, nevertheless, the link between financial liberalization and financial development has been overlooked. A proper analysis of this link will help clarify the ambiguity in the relationship between financial liberalization and economic growth. Our paper, by this means, examines the effects of financial openness, the most prominent measure of financial liberalization, and financial development through a panel study of developed and emerging market countries. Using indices we show that financial openness together with institutional and educational variables explains a large part of the variation in financial development across countries and over time. Principal component type indices provide better results in terms of economic and statistical significances. The robustness checks and the heterogeneity analysis convey that findings are robust to different lag structures, specifications and reductions in the sample size.

The small strand of literature that we base our analysis on examines the effects of trade and capital account openness on financial development. Chinn and Ito (2002) and (2006), Ito (2006), Baltagi, Demetriades and Law (2007), Demetriades and Law (2006), Demetriades and Andrianova (2005) and Huang (2006) show that financial liberalization (capital account openness in most cases) contributes to financial development in equity and stock markets for both less developed and emerging market countries. There are, however, three main issues in examining the link between financial openness and financial development. First, the choice of indicators has been a topic of concern. Studies lack a comprehensive indicator that can bring together all features of financial development; the banking system, the stock and the bond markets. With different measures used for financial openness and for financial development, the results obtained seem unconvincing. Another concern is that the results from various studies become hardly comparable due to the particular choice of individual measures and due to the country and time coverage selected for the study. Constructing better financial openness and financial development indices will help resolve problems associated with particular choice of measures. Second, the number of countries included in most studies is limited. Due to the lack of data for many less developed and some emerging market countries, most studies use developed countries in their estimations, which highly influences the results. Lastly, what seems to be a minor issue, which in reality can affect almost all findings, is the choice of control variables. The literature shows that the choice of control variables can influence the link between financial openness and financial development. Correct specification of control variables can lead to a better examination of these concepts.

Compared to the existing literature we contribute in three aspects. First, we give a view on different indices for financial openness and financial development straining away from choosing individual variables which we believe do not fully represent the aspects of financial openness and financial development. Second, we examine the simultaneity hypothesis of opening financial and goods markets with indices. Lastly we explicitly study one of the main problems of panel data models; heterogeneity issues.

This paper is organized as follows. The next section introduces the data. Section 3 describes the construction of aggregate indices of financial openness and financial development. Section 4 provides a discussion of the empirical model. Section 5 reports our estimation results. Section 6 discusses the robustness checks and further issues related to our sample. Section 7 concludes.

2. Data

The analysis is based on annual data for 61 developing and advanced countries, over a 12 year period of 1996 - 2007. The data are obtained primarily from Beck, Demirguc-Kunt, and Levine's database on *Financial Development and Structure* (referred to as *BDL* from onwards), the World Bank's *World Development Indicators (WDI)*, *Worldwide Governance Indicators,* and *Edstats* which extracts data from the UNESCO Institute for Statistics.

2.1 Financial Openness Indicators

Financial openness is measured with *foreign direct investment (% of GDP)*, *portfolio investment flows (% of GDP)*, and *international debt issues (% of GDP)*.

Foreign direct investment, is the sum of net inflows and outflows of foreign direct investment recorded as a percentage of GDP. This indicator adds up equity capital, reinvestment of earnings and other short- and long-term capital (World Bank, 2007). *Portfolio investment flows (% of GDP)*, is the sum of portfolio debt flows (private and publicly guaranteed and private nonguaranteed bond issues purchased by foreign investors) and non-debt-creating portfolio equity flows. [1] *International debt issues (% of GDP)* measures "the net flow of international bond issues relative to a country's economic activity."(Beck and Demirguc-Kunt, 2009, 15).[2]

As summarized by Kose et al. (2006) financial openness indicators are divided into two mainstream measures; de jure measures which depend on the removal of legal restrictions and controls on cross-border capital flows, prices, quantities and foreign equity holdings; and de facto measures which observe countries' actual integration into the world capital and financial markets through flow variables. De jure measures such as the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) typically illustrate the number of years for which a country's capital accounts have been open and free from restrictions and controls. The AREAER measure, Chinn and Ito's (2005) capital openness measure, Quinn's capital account openness index (1997, 2003), Mody and Murshid's (2005) and Edwards' (2004) measures on capital and current account restrictions are based on narrative, discrete 0-1 type variables that demonstrate openness or closedness of capital accounts (Bussiere and Fratzscher, 2004). This type of measures have long been accused of not fully reflecting the degree of financial or capital account openness due to their reliance on the removal of restrictions associated with foreign exchange transactions (Kose et al. 2006). Although they aim to measure financial globalization in terms of openness of capital and financial markets, they do not represent the extent of integration into the global markets. Alternatively, de facto measures focus on legal restrictions and capital flows. Although these measures may cause measurement errors and create difficulty in overcoming endogenity and causality issues, they remain to be the superior measure of financial integration (Kose et al., 2006). For all these reasons, we restrain from using discrete de jure type measures and prefer to use stock and flow variables to measure financial openness.[3]

2.2 Financial Development Indicators

Financial development indicators consist of banking system, stock market and bond market measures.

Banking sector development indicators:

Liquid liabilities (% of GDP) equals the ratio of liquid liabilities of bank and nonbank financial intermediaries to GDP (Demirguc-Kunt, Levine, 2001). This variable is commonly used as a measure of financial sector development and is a typical measure of financial depth.

[1] Non-debt-creating portfolio equity flows are defined as the sum of country funds, depository receipts, and direct purchases of shares by foreign investors (World Bank, 2007).

[2] The literature suggests the use of gross foreign direct investment, gross private capital flows, and some de jure type indices as measures of financial openness. Gross private capital flows are excluded from our analysis and are replaced by portfolio investment flows due to their discontinuity by the World Bank.

[3] We only report the results for one of the most frequently used de jure type indices, the Chinn and Ito index of capital openness, for comparison reasons. We believe that these results guide in demonstrating the strength of our de facto type financial openness index in comparison to the individual de facto measures by the literature.

Private credit by deposit money banks and other institutions (% of GDP) is an indicator for the overall development in private banking markets (Chinn and Ito, 2006). This variable includes financial resources provided to the private sector by deposit money banks and other financial institutions. It measures the credit provided to the private sector.

The ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages) is used to demonstrate the weight of deposit money bank assets among total assets. It reflects the importance of private lending compared to total lending (Huang, 2006).

Total bank assets (% of GDP) is used as a measure of financial depth. It represents the overall size of the banking sector.

Domestic credit provided by the banking sector (% of GDP) includes credit extended to the private sector and general government, to the nonfinancial public sector in the form of investments in short- and long-term government securities, to banking and nonbank institutions and includes loans to state enterprises but excludes credit to the central government (World Bank, 2007). It is a measure of banking sector depth and financial sector development in terms of size (World Bank, 2007).

The variables for banking sector development correspond to those used in the literature. We believe that a wide range of different variables will help capture all aspects of banking sector development.

Stock market development indicators:

Stock market capitalization (% of GDP) is equal to the value of listed shares divided by GDP. It is an indicator of the size of the stock market. *Stock market turnover ratio (in percentages)* is used as the efficiency indicator of stock markets (Demirguc-Kunt and Levine, 2001). It is classified as the ratio of the value of total shares traded to stock market capitalization. *Stock market total value traded (% of GDP)* is equal to the total shares traded on the stock market exchange divided by GDP. This indicator measures the activity or liquidity of the stock markets (Demirguc-Kunt and Levine, 2001).

Stock market development indicators used correspond to the ones from the literature. We believe that these variables will summarize all prospects of stock market development.

Bond market development indicators:

Private bond market capitalization (% of GDP) and *public bond market capitalization (% of GDP)* are the two indicators used to measure bond market development.

Private bond market capitalization (% of GDP) is equal to the total amount of outstanding domestic debt securities issued by financial institutions and corporations as a share of GDP. *Public bond market capitalization (% of GDP)* is equal to the total amount of public domestic securities issued by governments as a share of GDP. Both of these indicators are used to determine the efficiency of bond markets.

Bond market development indicators have not been previously used in the literature on financial openness and financial development. Even though they have been employed extensively in the equity market development literature, due to their short period of availability they have not been used as indicators for financial development. In our analysis we propose using the bond market development indicators in order to capture the efficiency and the effectiveness of bond markets on the overall level of financial development.

2.3 Control Variables

To examine the effect of financial openness on financial development we introduce a broad range of control variables. The control variables include *GDP per capita, trade openness, secondary school enrollment rate,* and *legal and institutional variables.*

Logarithm of GDP per capita (in constant 2000 US dollars) is used as a measure of economic performance among countries. We employ this measure to control for the demand of finance and to monitor the differences in performances and productivities across countries.[4]

Trade openness (% of GDP) measured by the sum of imports and exports of goods and services is used to determine whether trade liberalization is a precondition for financial liberalization. Controlling for trade openness allows examining the direct effects of financial liberalization on financial development.

Secondary school gross enrollment rate (% of population) is used as an indicator that controls for differences in educational attainment across countries. We consider this measure as an important reason for why we observe disparities across countries in their levels of financial development. Even though an educational attainment indicator has not been used previously as a control variable in the financial openness and financial development literature, we believe that its inclusion can alter our findings. If wide educational gaps which are observed between advanced and developing countries affect the link between financial openness and financial development, then the exclusion of such a variable would certainly introduce a measurement bias. Following the examples of the educational attainment indicators from the economic growth literature we use secondary school gross enrollment rate as a control for educational attainment.

Lastly we employ four *legal and institutional measures* to control for institutional, legal, political and economic factors that may affect the overall level of financial development. These indicators are constructed using subjective, perceptions-based data that reflect views of respondents, agencies and organizations. We use *government effectiveness*, *regulatory quality, rule of law,* and *control corruption* as measures of legal and institutional quality. These variables do not fluctuate widely across time and are measured in a range from -2.5 to 2.5 where higher values correspond to better governance outcomes.[5] Given that our analysis is based on panel data specifications that vary across time, the use of almost time-invariant control variables may constitute a main drawback. However, as Chinn and Ito (2006) explain, the inclusion of these time-invariant factors do not pose a substantial problem for our analysis since the characteristics of the institutional quality variables are likely to change very slowly (Chinn and Ito, 2006). On this note, due to the relatively small fluctuation structure of these indicators, we take averages of two consecutive years to replace the missing years' data in the *Worldwide Governance Indicators* database for four legal/institutional quality variables.

3. Aggregate Indices

By combining different measures of financial openness and financial development into a single index we summarize the comprehensive nature of the financial sector. We describe four different indexing techniques below.

3.1 Equally weighted indices

We construct equally weighted indices for financial openness, banking sector, bond and stock market, and overall financial development as well as for institutional quality. The biggest concern with equally weighted indicators is that the weight structure may over-or-underestimate the importance of such measures which could potentially bias our results. In order to avoid this possibility we construct indices using other approaches.

3.2 Coefficient of variation type indices

The second methodology uses the coefficient of variation approach. The weights for financial openness, financial development, and institutional quality are calculated using the coefficient of variation for each variable and the sum of all coefficients of variation for all variables to be used in the index. Weights following this method are constructed as follows:

[4] Chinn and Ito (2006) argue that logarithm of GDP per capita is important in accentuating the link between financial deepening and rising income levels.

[5] Please refer to the Worldwide Governance Indicators (WGI) dataset. 1996 – 2009. World Bank. http://info.worldbank.org/governance/wgi/index.aspx#home

$$w_i = \frac{cv_i}{scv}$$

where scv is the sum of all coefficients of variations for variables, and cv_i is the coefficient of variation for each variable *i,* and is calculated as:

$$cv_i = \frac{\sigma_i}{\mu_i}$$

μ_i and σ_i in the above equation represent the mean and standard deviations of each variable *i*. This procedure allows for weighing each variable differently in the financial openness, financial development and institutional quality indices. It thereby helps avoid the potential bias that may occur when using equal weights.

We can construct an index for financial openness as:

$$Financial\ openness_{i,t} = \sum_{i=1}^{3} w_i\ (meas)_{i,t}$$

where w_i is the relative weight of each variable in the financial openness index and $meas_i$ denotes each of the measures used in constructing the financial openness index. $meas_i$ represents foreign direct investment (% of GDP), international debt issues (% of GDP) and portfolio investment flows (% of GDP). Similarly, banking sector, bond and stock market and financial development, and institutional quality indices are constructed as weighted averages of the corresponding variables following this methodology.

3.3 Principal component analysis for creating indices

Principal components analysis in its simplest form involves a mathematical procedure that helps transform a number of possibly correlated variables into a smaller number of uncorrelated ones.[6] This method has been shown to be more efficient in establishing optimal weights of variables in comparison to other methods where variables are given equal or subjective weights. One major problem in using principal component analysis is to decide how many components to retain. Four different criterions are suggested in the literature; eigenvalue-one criterion, the scree test, proportion of the variance accounted for by each component, and the interpretability criteria. In this analysis we use the first component which accounts for the maximal amount of variance among the observed variables (Hatcher, 1994). However, in order to avoid particular bias, we suggest a principal component method which relies on information from all components.

We construct principal components indices for financial openness, financial development and institutional quality. For financial development we construct three sub-indices; the banking sector development index, the stock market development index and the bond market development index.

(a) First score principal component índices

To construct our principal component type indices using the first approach we score the first principal component of three individual measures of financial openness. Similarly the index of financial development will be determined by the first principal component of a total of ten variables. We construct first principal component indices for banking sector, stock and bond market development. Institutional quality index is constructed using the first score of the four variables; government effectiveness, regulatory quality, rule of law and control of corruption.

(b) Principal components indices that account for information from all components

We use an additional principal component index that takes into account all possible components. By doing so, we do not discard any information that could potentially affect our estimations. This principal component index proposed by

[6] For a more in depth discussion of the principal component analysis please refer to Jackson (1991), Dunteman (1989) and Jolliffe (2002).

Bo and Woo (2008) offers a method for calculating weights for individual measures.[7] According to this methodology the weights for each measure of the index are constructed as follows:

$$w_j = \frac{\sum_{i=1}^{i=p} \lambda_i \alpha_j^i}{\sum_{i=1}^{i=p} \lambda_i}$$

where λ_i *(i =1,…,p)* is the *i*th eigenvalue and α^i_{px1} (*i = 1, …, p)* is the *i*th eigenvector of the correlation matrix R_{pxp} respectively (Bo and Woo, 2008). Supposing that $\lambda_1 > \lambda_2 > \lambda_3 > \ldots > \lambda_p$ and denoting the *i*th principal component as PC_i we obtain:

$$PC_i = X\alpha^i$$

where *X* represents a multi-dimensional matrix that is compromised of normalized transformations of the variables it includes and:

$$\lambda_i = var(PC_i)$$

This implies that the first principal component is the linear combination of the initial indicators, and has the largest variance (Bo and Woo, 2008). The second principal component has the second largest variance and is a linear combination of the indicators which is orthogonal to the first principal component, and the *p*th principal component is a linear combination of the indicators and has the smallest variance.

The index is constructed taking into account the relative importance of all indicators:

$$Index = \frac{\sum_{i=1}^{i=p} \lambda_i PC_i}{\sum_{i=1}^{i=p} \lambda_i} = \frac{\sum_{i=1}^{i=p} \sum_{j=1}^{i=p} \lambda_i \alpha_j^i x_j}{\sum_{i=1}^{i=p} \lambda_i} = \sum_{j=1}^{j=p} w_j \, x_j$$

where x_j (j = 1, …, p) is the *j*th column of the matrix X and w_j is the final weight of the indicator *j*. All variables that constitute the *j*th column of the matrix X, x_j, are standardized. The sum of the weights expressed by the formula above does not necessarily have to equal unity. This is due to the fact that the principal component analysis in its underlining structure normalizes the mode of each eigenvector to unity. The weights therefore could be very close to but not always equal to 1 (Bo and Woo, 2008).

Following this methodology and taking into account information from all components, we construct indices with standardized individual measures for financial openness, banking sector, stock and bond market development, financial development and institutional quality.[8] This avoids any potential problem that could arise as a result of different scales or units of measurement.

4. Empirical Model

Various estimation techniques have been employed in literature for the examination of the link between financial openness and financial development. While Chinn and Ito (2006) utilize simple, point estimate OLS, Huang (2006) argues for fixed effects estimation with levels, OLS estimation with first differences, and Arellano-Bond dynamic panel data model with GMM estimators. Baltagi, Demetriades, and Law (2007) and Demetriades and Law (2006) find dynamic panel data models more appropriate. Dealing with unobserved heterogeneity one can refer to the within-group fixed effects and first differences estimators. Unfortunately neither estimator captures the partial adjustment property that accounts for the new information that explanatory variables that carry out (Huang, 2006). To account for this property and obtain consistency in estimations we employ the dynamic Arellano-Bond GMM panel data procedure to overcome

[7] The principal components methodology of Bo and Woo (2008) is similar to that proposed by the United Nations Conference on Trade and Development (UNCTAD) for constructing the Trade and Development Index. Bo and Woo (2008/2010), Nagar and Basu (2002) and Klein and Ozmucur (2002/2003) provide different approaches in constructing indices analogous to the Trade and Development Index (TDI) with minor alterations.

[8] This method makes use of all eigenvectors and proposes to use weights depending on the eigenvectors and eigenvalues.

the Nickell bias that occurs when the lagged dependent variable is correlated with the disturbance. Ultimately our Arellano-Bond dynamic panel data model of 61 countries and twelve years can be represented as:

$$\Delta FD_{it} = \sum_{k=1}^{n} \gamma_k \, \Delta FD_{it-k} + \beta \Delta FO_{it} + \sum_{j=1}^{s} \lambda_j \, \Delta Control_{jit} + \Delta \varepsilon_{it}$$

where γ_k measures the speed of adjustment, β denotes the short-run effect of financial openness on financial development which we expect to be positive, and $Control_{jit}$ is the group of control variables of trade openness, logarithm of GDP per capita, secondary school enrollment rate, and institutional quality.[9]

The above model no longer has a country specific effect. The Arellano-Bond dynamic panel data model accounts for the individual effects. All terms in the above model have been differenced in order to elude the Nickell bias. Moment conditions require that:

$$E[FD_{it-k} \Delta \varepsilon_{it}] = 0 \text{ for } \forall k \geq n + 1$$

This condition guarantees the lagged dependent variable to be uncorrelated with the first difference of the error terms although the first difference of the lagged dependent variable could easily be correlated with the first difference of the error terms.

Two diagnostic tests for serial correlation are derived by the model. We expect to find first order serial correlation in first differenced residuals because $\Delta \varepsilon_{it}$ and $\Delta \varepsilon_{it-1}$ contain the same term, ε_{it-1}. Second order and higher serial correlations could create further problems due to the difficulty in verifying the validity of the moment conditions.[10]

Given our model background, following Baltagi, Demetriades, and Law (2007), we test for the following hypotheses:

(a) Do trade and financial openness influence financial development? What are the effects of economic and legal institutions on financial development over and above the effects of openness? Do educational indicators affect financial development?
(b) Does simultaneous opening of both financial and trade accounts bring additional benefits to financial development?

Following these two hypotheses, we specify the following dynamic equations for financial development:

Model (a): (Without an interaction term)

$$\Delta FD_{it} = \gamma \Delta FD_{it-1} + \beta \Delta FO_{it} + \lambda_1 \Delta TO_{it} + \lambda_2 \Delta logGDPpc_{it} + \lambda_3 \Delta INSQUA_{it} + \lambda_4 \Delta SECSCHOOL_{it} + \Delta \varepsilon_{it} \quad (1.1)$$

Model (b): (With an interaction term)

$$\Delta FD_{it} = \gamma \Delta FD_{it-1} + \beta \Delta FO_{it} + \lambda_1 \Delta TO_{it} + \lambda_2 \Delta logGDPpc_{it} + \lambda_3 \Delta INSQUA_{it} + \lambda_4 \Delta SECSCHOOL_{it} + \lambda_5 \{\Delta FO_{it} \times \Delta TO_{it}\} + \Delta \varepsilon_{it} \quad (1.2)$$

[9] Any influence of financial openness is now conditioned on the history controlled by the first differenced lagged dependent variable (Huang, 2006). This model is a restricted version of the static fixed effects specification and it includes dynamic effects through the lagged dependent variable that is included as a right hand side regressor.

[10] To test for overidentifying restrictions we perform Sargan tests. We do not include the lag of the dependent variable as an instrument. We utilize the Arellano-Bond two-step estimator to avoid any panel-specific autocorrelation and to obtain better diagnostics results.

where FD_{it} is the financial development index, FO_{it} is the financial openness index, TO_{it} is trade openness, $logGDPpc_{it}$ is the natural logarithm of GDP per capita, $INSQUA_{it}$ is the institutional quality index and $secschool_{it}$ is the secondary school enrollment rate.

The two models express the link between financial openness and financial development and examine whether a simultaneous effect of financial and trade openness leads to additional benefits in terms of financial development. In the first model, Model (a), we would expect to have positive and significant coefficients for both β and λ_1. Similarly if λ_3 and λ_4 are found to be positive then, improvements in institutions and the quality of legal systems and education will enhance financial development. To test for the second model, Model (b), we introduce an interaction term which represents the significance of opening both markets at the same time. If λ_5 is found to be positive, we can state that the simultaneity hypothesis between financial and trade openness has additional benefits for financial development.

Both models serve to advance the literature in terms of the methods used in the estimation process.
Given our objective of establishing the importance of financial development as an element influencing economic growth and welfare, and given that the literature has yet to find an answer to why we observe differences among countries in extracting the benefits of financial liberalization, our analysis stands as a starting point for determining the transition mechanism between financial openness and financial development.[11]

There remain to be a few drawbacks to our estimations. The literature shows that in many cross-sectional studies both developing and advanced countries, are lumped together into the same sample. As Henry (2006) explains, including both sets of countries increases the sample size and could lead to more efficient results in estimation. However, doing so without employing an empirical methodology, which particularly recognizes the fundamental theoretical difference between advanced and developing countries, would undermine the study's ability to interpret the data. In order to correct for the problem, we first estimate our model with a full sample and then subgroup the data into developing and advanced countries so as to compare the results obtained in both estimation procedures.

5. Empirical Results

We discuss the results of the dynamic panel data model.[12] Overall the results demonstrate that all indices have high correlations with each other while the banking sector development index has higher correlations with the financial development index.

5.1 Results using equally weighted indices

Our empirical estimations for equally weighted indices are presented in Table 1 (a).[13] In the benchmark dynamic GMM estimations, all variables other than the lags of the dependent variable are treated as exogenous. The four dependent variables used in our regressions are banking sector, bond and stock market, and financial development indices. Table 1 (a) shows that the equally weighted financial openness index is statistically significant for three columns. Financial openness has a positive coefficient for all dependent variables with the exception of the equally weighted bond market index.

The rest of the results from Table 1 (a) indicate that trade openness is positive and significant for all development indices, whereas logarithm of GDP per capita is significant and positive for all dependent variables with the exception of the equally weighted bond market index. The equally weighted institutional quality index is negatively significant for three dependent variables. This finding contravenes the one of the literature which states that the effects of higher

[11] Our indexing strategies allow the data to tell us how to measure financial openness and financial development. Our index measures help overcome the problem of the particular use/choice of individual measures that exists in the literature.
[12] Table 1 in the Supplementary Appendix gives a brief summary of the variables used in our estimation procedure. Tables 2 (a) to (d) depict the relations of the indices and the control variables. The Supplementary Appendix can be found at: https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnx6ZXluZXBvemtva3xneDo2ZTA3YmI0NDU4YmE5ZDVh
[13] In the benchmark dynamic GMM estimations, all variables other than the lags of the dependent variable are treated as exogenous.

development in terms of institutions should be carried out to all sources of financial development. Baltagi, Demetriades and Law (2007) using individual dependent variables find institutional quality to be positive whenever significant but negative when the stock market capitalization is used as the dependent variable. Similarly in Chinn and Ito (2006) institutional quality has altering signs depending on the measures chosen and the dependent variables to be used. Our finding could therefore reinforce the argument that a threshold level of institutional and legal development is needed in order for countries to benefit from financial openness. One possible explanation is that due to the dynamic structure of our model, our institutional quality indices depict changes of institutional differences. This then implies that if countries have passed a certain level of institutional development any further deviations may have negative impacts on overall level of banking sector, bond market, stock market and financial development.

The results of the diagnostic tests show that in all cases the first order serial autocorrelation is rejected and the second order is accepted. The Sargan test, on the other hand, cannot reject the null hypothesis in all cases. Our results are in line with those of the literature. Our initial findings highlight the link between financial openness and bond market development.

5.2 Results using coefficient of variation type indices

Table 1 (b) finds financial openness index to be significant for all dependent variables however the coefficients are positive only when the stock market development and financial development indices are used as dependent variables. Trade openness is shown to be positively significant for all indices. Logarithm of GDP per capita is positive and significant for all cases with the exception of the bond market development index. Secondary school enrollment rate enters with a negatively significant coefficient for all cases with the exception of the bond market development index, whereas the institutional quality index is negative and significant for all cases. Similarly the first order serial correlation is rejected in all cases and the Sargan test cannot reject the null hypothesis of over-identification for all cases.

5.3 Results using principal component analysis type indices

Results using first score principal components[14]

The results of the principal component analysis of financial openness, banking sector development, bond market development, stock market development, overall financial development and institutional quality depict that the first component captures a large percentage of the total variation of individual measures represented by the eigenvectors.[15] The analysis demonstrates similar weights for individual variables of financial openness and financial development. Using any single measure to study the impact of financial openness on financial development would therefore bias our results.[16] Nevertheless we use the first principal component to score a proper and an efficient indices for financial openness, financial development and institutional quality.

Table 2 (a) depicts our findings for first score principal component indices. The results show that the financial openness index is significant in all cases with the exception of the bond market development index. Likewise trade openness is positive and significant for all dependent variables. This could mean that trade openness affects the development of bond markets whereas financial openness does not have a significant effect on the overall enhancement of bond markets.

Control variables of institutional quality and secondary school enrollment rate are mostly significant however with differing magnitudes. Secondary school enrollment rate enters with a positive coefficient in two out of four cases, whereas institutional quality is found to be negatively significant for all cases. The diagnostics are satisfactory for all

[14] We verify that the individual variables used in our indices are correlated. Our results show that we have positive correlations among individual variables.

[15] The results can be found in the Supplementary Appendix.

[16] The examination of the eigenvectors portrays that the use of individual variables to examine the link between financial openness and financial development would potentially lead to selection bias.

dependent variables used. The absence of first order serial correlation is rejected and the Sargan test results cannot reject the over-identification restrictions.[17]

Overall, our findings show that there is a significant link between financial openness and financial development when both measures are constructed using first score of principal components. The results also demonstrate that the link between financial openness and financial development becomes more comprehensible with first score indices in comparison to equally weighted and coefficient of variation type indices.[18]

Results using principal components that take into account information from all components

The results in Table 2 (b) indicate that the financial openness index is significant for all dependent variables. Trade openness is also positively significant for all cases. Logarithm of GDP per capita is significant for all cases with the exception of the bond market development index. First order serial autocorrelation tests are rejected, while the Sargan test of over-identification cannot reject the null hypothesis in all cases.

Our results convey that using further components in our indices depicts similar findings for the link between financial openness and financial development. Due to the similarity of the results with both types of principal component indices, it is difficult to identify one methodology as the ideal procedure in constructing indices. In this context we choose the index measure that maximizes the goodness of fit of the linear model between financial openness and financial development. Further examination of Tables 2 (a) and (b) conveys that while first score indices depict higher significances in terms of t-statistics, this methodology of principal components provides better results in terms of magnitudes and interpretations. We thereby use this methodology in reporting the rest of our results.

5.4 Adding the interaction term

Findings from Table 3 which include the interaction term show that the effects of financial and trade openness indices are positive and significant for all dependent variables. Logarithm of GDP per capita is positive and significant for all dependent variables with the exception of the bond market development index. The institutional quality index is negatively significant for banking sector, bond and stock market development and positively significant for financial development whereas secondary school enrollment rate is positively significant for three dependent variables. The interaction term between financial and trade openness is significant in three out of four cases with changing magnitudes. It is positive and significant for the banking sector development index, whereas it is negative and significant for bond and stock market development indices. This finding implies that a simultaneous opening of financial and goods markets leads to a decline in bond and stock market development rates. This could potentially be the result of the effects of financial openness and trade openness being picked up separately by each variable and not by the interaction term. Our results however agree with those of the literature. Baltagi, Demetriades and Law (2007) find the interaction term to be statistically significant together with financial and trade openness.[19] Law and Demetriades (2006) find the interaction term, trade openness and capital account openness to be positively significant for stock market development.

6. Robustness checks and further issues

We carry out a large number of robustness checks in order to examine the sensitivity of our results to alternative specifications and methods. Here, we only report some robustness checks. Below we discuss the results when heterogeneity is taken under examination.

6.1 Robustness checks

[17] Huang (2006) reports similar results to our initial estimations. He finds the financial openness index constructed using the first principal components to be positive and significant for stock market, banking sector and financial development.

[18] One pitfall is that the link between financial openness and bond market development disappears as in the case with equally weighted indices.

[19] Using banking sector development measures as dependent variables, the authors find the interaction term to be significant and negative for private credit, liquid liabilities and domestic credit.

The first set of robustness examines whether the exclusion of control variables of secondary school enrollment rate and institutional quality index affect our proposed model. The exclusion of institutional quality index from our regressions, not reported here[20], does not affect our initial findings. Similarly exclusion of the secondary school enrollment rate causes trade openness to lose significance for some dependent variables. These results show that even though the exclusion of institutional quality does not remarkably change our results, the exclusion of secondary school enrollment rate does. We thereby, stress the importance of including both of these control variables in our analysis to examine the link between financial openness and financial development.

Further tests regarding the structure of the variables have been considered. In order to account for the fact causality we run robustness checks to examine the simultaneity and the endogeneity issues. Treating all right hand side variables as predetermined does not alter our main findings. With predetermined variables we find that trade openness enters with a negative coefficient when banking sector and bond market development indices are used as dependent variables. Similarly treating financial and trade openness as predetermined variables does not change our findings. Treating openness variables as endogenous we find similar results to those reported in Table 2 (b). This thereby confirms that the assumption of treating right hand side regressors as exogenous variables is not a restrictive one for this analysis.

Another important issue to be analyzed is the time series versus cross sectional effects. Due to the twelve year period selected in our model we believe that there may be time series effects that are not picked up by our one lag structure. In order to account for these effects we estimate a higher lag model to observe the sensitivity of our findings to different lag structures. Table 4 depicts the results when three lags of the dependent variable are used as right hand side regressors and three lags of variables explanatory variables are used as instruments. The results show that adding further lags does not change our main findings. With further lags we find trade openness to be insignificant for banking sector development index and negatively significant for the bond market development index.[21] Our analysis with higher lags demonstrates that the qualitative nature of our results is robust to alternative specifications and estimation methods.

6.2 Further issues

Heterogeneity problems

The use of developing and advanced countries together can create a drawback to our estimated model. Even though having a large number of observations in a joint sample leads to more efficient results we may not be able to fully differentiate whether the effects of financial openness on financial development follow due to the influence of advanced economies. In order to avoid complications and to clarify issues on heterogeneity we split our data set into developing and advanced countries and examine the results when the developing country sample is used in estimations.[22]

The developing country sample includes 31 countries over the twelve year period. The findings from Table 5 show that financial openness is positive and significant for banking sector, stock and bond market and financial development indices. The results are similar to those reported in Table 2 (b) in terms of sign and significance; however, trade openness, institutional quality and secondary school enrollment depict different magnitudes of coefficients. The results, overall, confirm that we do not have a heterogeneity problem that is not explicitly recognized by our estimation methods. The link between financial openness and financial development follows even when a subsample of developing countries is used in our analysis. This strengthens the argument regarding the importance of opening up financial markets so as to enhance banking sector, bond and stock markets in developing countries.

Additional results

To compare our results with earlier studies we run a series of regressions. To provide a better understanding of the effectiveness of our de facto type principal component indices we first present our results with de jure type capital

[20] Please refer to the Supplementary Appendix.

[21] Other lag specifications do not change our results.

[22] We rely on the World Bank's income group definition when splitting our data set into developing and advanced countries.

account openness index of Chinn and Ito. Chinn and Ito's capital account openness index is constructed using four binary dummy variables which represent restrictions on financial transactions across countries as reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (Baltagi, Demetriades and Law, 2009). The four binary variables (existence of multiple exchange rates, restrictions on current account, capital account transactions, and a variable for export proceeds) are summarized in an index using the first score of principal components (Chinn and Ito, 2006). Table 6 depicts results with our principal component type development indices and the Chinn and Ito index of capital account openness. Capital account openness index is found to be positively significant for banking sector and stock market development indices and negatively significant for bond market and financial development indices. These findings, which are different from our benchmark model of Table 2 (b), imply that the removal of restrictions from capital accounts and the allowance of capital movements across countries have a negative impact on bond market and overall financial development. It is interesting to note that the diagnostics fail to compete with the ones reported in Table 2 (b). In three out of four cases first order serial correlation is rejected and the Sargan test cannot reject the null hypothesis of over-identification although the Sargan test values remain to be less powerful in comparison to those of the benchmark case.

In Tables 7 and 8 we compare our previous results to cases where a de jure type financial openness measure (the Chinn and Ito capital account openness index) and our financial openness index is regressed against most frequently used individual financial development measures. Once again the findings demonstrate that our principal component index of financial openness provides more significant and economically profound results in comparison to the Chinn and Ito index. Yet, in both cases the findings for the first order serial correlation test and the Sargan test are weaker in contrast to those from Table 2 (b). Although the use of de jure type measures may be limiting in terms of interpretations, they help in resolving issues related to the simultaneity hypothesis. The results using the discrete de jure type financial openness index shows that the link goes in the direction of financial openness to financial development. Given that our index measures are stronger in terms of robustness, statistical significances and interpretations in comparison to the de facto measures which help resolve causality issues, we believe our indices also carry this property. Our previous results using endogenous financial openness indices depict similar findings to our benchmark regressions providing evidence that a causality issue is not undermining our analysis.

Additionally we estimate our model with individual financial openness and financial development measures. Our findings suggest mixed results.[23] Depending on the choice of financial development measures, the three indicators of financial openness; foreign direct investment (% of GDP), international debt issues (% of GDP) and portfolio investment (% of GDP) alter signs.

Lastly we analyze the results when individual financial openness measures of foreign direct investment, international debt issues and portfolio investment are regressed against principal component type indices for financial development. Our findings support our earlier argument on the choice of financial openness measures affecting the results. Using individual measures as dependent variables for financial development, or using individual variables as measures of financial openness (both de facto and de jure type individual measures) we cannot find the clear link that we observe between financial openness and financial development whilst using indices. The results clearly demonstrate that depending on the variables chosen, the relationship between financial openness and financial development alters. Nevertheless using principal components indices we can unmistakably find a positive link between financial openness and financial development which is robust to different lag structures, estimation techniques and subsamples.

Partial effects and possible policy implications

To calculate the total effect of opening up goods and financial markets we use partial derivatives of banking sector, bond and stock market and overall financial development with respect to trade and financial openness. Recalling Model (b) in equation (2) we evaluate the partial derivates of financial development with respect to trade and financial openness as:

[23] The results are reported in the Supplementary Appendix. Comparisons to the literature should be taken with caution due to a variety of reasons. Both models used in estimations, the choice of years and countries widely differ across studies.

$$\frac{\partial FD_{it}}{\partial TO_{it}} = \lambda_1 + \lambda_5 FO_{it}$$
$$\frac{\partial FD_{it}}{\partial FO_{it}} = \lambda_1 + \lambda_5 TO_{it}$$

Examining the results in Table 3 the partial derivative of the financial development index with respect to trade openness at the mean level of financial openness index is 0.006.[24] Alternatively at the mean level of trade openness, the partial derivative of financial development index with respect to financial openness index is 0.482.

Our findings show that both partial derivatives are positive even for the most closed economies implying that opening both trade and financial markets may have a large impact on overall financial development. However bond and stock market development indices have negative coefficients for the interaction term of financial and trade openness. Examining the partial derivatives for both bond and stock market development indices we find positive values.[25] Our results thereby suggest that a simultaneous opening could be beneficial in terms of banking sector, bond and stock markets and overall financial development. Nevertheless, possible implications of these results should be taken with great precaution.

We have shown that our principal component financial openness index influences banking sector, bond and stock market and overall financial development. We have demonstrated a clear positive link between financial openness and financial development using different lag structures, time dummies, models, and specifications. However, the results for the coefficients reported so far all represent short-run effects due to the presence of the lagged dependent variable in the models. In order to obtain long-run effects particularly for the financial openness index in Table 2 (b) we divide financial openness coefficients by 1 – γ, where γ is the coefficient of the lagged dependent variable from our regressions. The findings show that the link between financial openness and development indices is positive even when examining the long-run coefficients.[26] These results suggest that financial openness has a clear impact on long-run financial development.

7. Concluding remarks

The literature has broadly focused on the link between financial liberalization and economic growth nevertheless the relationship between financial liberalization and financial development lacked a thorough discussion. Our goal has been to construct comprehensive indicators for both financial openness and financial development and analyze this link.

Using a panel data set of developing and advanced countries our results with aggregate indices of equal weights, coefficient of variation and two different principal component type methodologies show that the relationship between financial openness and financial development exists and that it is more significant than what the literature has previously acclaimed. Further examination of our benchmark results depict that the principal component indices with information from all components provide higher significances and more meaningful interpretations. In all estimations, independent of the development variables chosen, the principal component index of financial openness is found to be positive and significant. The inclusion of an interaction term, to analyze whether the simultaneous opening of financial and goods markets have additional effects on financial development, brings intriguing results. Our findings show that the interaction term is positively significant for the banking sector development index and negatively significant for bond and stock market development indices. By splitting the sample we confirm that the link between financial openness and financial development exists even for developing countries.

[24] The same partial derivative evaluated at the minimum level of financial openness index is 0.005, and evaluated at the maximum value is 0.006. Alternatively at the minimum level of trade openness, the partial derivative of financial development index with respect to financial openness index is 0.48 and it is 0.489 at the maximum level of trade openness.
[25] Calculations are available upon request.
[26] The long-run coefficient for financial openness using the banking sector development index is 0.643. The coefficients for financial openness using the bond and stock market development indices are 0.505 and 0.107 whereas for the overall financial development index, it is 0.715.

Comparisons with the literature stress the strength and effectiveness of our indices. Principal component type indices provide more robust and stronger statistical conclusions on the link between financial openness and financial development. The partial derivatives and the long-run coefficients convey the positive link between financial openness and financial development validating our benchmark results.
On a last note, we have shown that using indices the link between financial openness and financial development is unambiguous. To this end, future work would call for a model that can provide theoretical underpinnings for the effects of financial openness on financial development.

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Appendix

Table 1 (a): Equally weighted financial openness and financial development indices

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.731***	0.887***	0.376***	0.311***
	(269.1)	(76.47)	(451.2)	(42.54)
	[0.00266]	[0.0116]	[0.000834]	[0.00731]
ΔFinancial openness	0.343***	0.005	0.136***	0.801***
	(31.67)	(0.713)	(21.43)	(21.13)
	[0.0108]	[0.00729]	[0.00635]	[0.0379]
ΔTrade Openness	0.024***	0.030***	0.712***	0.186***
	(4.133)	(5.885)	(112.4)	(16.90)
	[0.00575]	[0.00512]	[0.00633]	[0.0110]
ΔLog GDP per capita	3.422***	-3.614***	50.53***	14.24***
	(2.677)	(-3.845)	(36.19)	(17.80)
	[1.278]	[0.940]	[1.396]	[0.800]
ΔInstitutional Quality	-2.040***	-3.841***	-25.76***	0.542
	(-4.783)	(-5.017)	(-54.09)	(0.329)
	[0.427]	[0.766]	[0.476]	[1.650]
ΔSecondary School Enrollment	0.006**	0.008***	-0.239***	-0.041***
	(2.283)	(4.805)	(-16.42)	(-13.24)
	[0.00266]	[0.00171]	[0.0145]	[0.00308]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.07 Pr > z = 0.0381**	**z = -2.23 Pr > z = 0.0255**	**z = -1.96 Pr > z = 0.0500**	**z = -1.82 Pr > z = 0.0681**
Arellano – Bond test for AR(2) in first differences:	**z = -1.03 Pr > z = 0.3011**	**z = -1.48 Pr > z = 0.1395**	**z = -0.97 Pr > z = 0.3298**	**z = -1.16 Pr > z = 0.2445**

Sargan test:	**$Chi^2(54)$ = 48.43 Prob > chi^2 = 0.6883**	**$Chi^2(54)$ = 36.50 Prob > chi^2 = 0.9674**	**$Chi^2(54)$ = 51.02 Prob > chi^2 = 0.5901**	**$Chi^2(54)$ = 33.02 Prob > chi^2 = 0.9892**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. (The estimations use Stata's xtabond command). The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using equal weights in indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 1 (b): Coefficient of variation type financial openness and financial development indices

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.799***	0.883***	0.372***	0.296***
	(99.95)	(62.80)	(538.4)	(62.55)
	[0.00800]	[0.0141]	[0.000691]	[0.00474]
ΔFinancial openness	-0.021***	-0.0509***	0.102***	0.749***
	(-3.831)	(-7.189)	(8.597)	(38.82)
	[0.00548]	[0.00708]	[0.0119]	[0.0193]
ΔTrade openness	0.104***	0.0415***	0.775***	0.521***
	(17.46)	(5.303)	(115.7)	(31.22)
	[0.00595]	[0.00783]	[0.00670]	[0.0167]
ΔLog GDP per capita	4.875***	-3.427***	53.32***	21.21***
	(6.258)	(-2.770)	(46.46)	(14.45)
	[0.779]	[1.237]	[1.148]	[1.468]
Δ Institutional Quality	-6.319***	-5.337***	-27.96***	-11.94***
	(-65.43)	(-10.66)	(-49.14)	(-3.424)
	[0.0966]	[0.501]	[0.569]	[3.488]
ΔSecondary School Enrollment	-0.040***	0.0002	-0.264***	-0.149***
	(-4.041)	(0.194)	(-23.35)	(-24.93)
	[0.00989]	[0.000984]	[0.0113]	[0.00598]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -1.94 Pr > z =0.0522**	**z = -2.48 Pr > z = 0.0132**	**z = -2.07 Pr > z =0.0389**	**z = -1.86 Pr > z=0.0625**
Arellano – Bond test for AR(2) in first differences:	**z = -1.06 Pr > z =0.2897**	**z = -1.67 Pr > z =0.0943**	**z = -0.86 Pr > z=0.3913**	**z = -1.11 Pr > z=0.2677**
Sargan test:	**$Chi^2(54)$ = 44.48**	**$Chi^2(54)$ = 33.37**	**$Chi^2(54)$ = 50.18**	**$Chi^2(54)$ = 31.77**

	Prob > chi^2 = 0.8187	Prob > chi^2 = 0.9878	Prob > chi^2 = 0.6226	Prob > chi^2 = 0.9932

Notes: *All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed using the coefficient of variation methodology. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using coefficient of variation type indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 2 (a): First score financial openness and financial development indices

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.854***	0.865***	0.367***	0.696***
	(89.51)	(98.65)	(321.8)	(62.75)
	[0.00954]	[0.00876]	[0.00114]	[0.0111]
ΔFinancial openness	0.146***	0.0025	0.0691***	0.540***
	(13.23)	(0.306)	(9.956)	(17.46)
	[0.0110]	[0.00830]	[0.00694]	[0.0310]
ΔTrade openness	0.0026***	0.0014***	0.0206***	0.0077***
	(4.536)	(2.672)	(82.39)	(8.007)
	[0.00581]	[0.000504]	[0.000250]	[0.000957]
ΔLog GDP per capita	0.0787	-0.368***	0.883***	0.587***
	(1.184)	(-12.32)	(16.70)	(12.36)
	[0.0665]	[0.0298]	[0.0528]	[0.0475]
ΔInstitutional Quality	-0.0696***	-0.0803***	-0.116***	-0.0004
	(-4.401)	(-20.10)	(-8.887)	(-0.00870)
	[0.0158]	[0.00400]	[0.0131]	[0.0502]
ΔSecondary School Enrollment	0.0007**	0.0013***	-0.007***	-0.0019***
	(2.223)	(5.595)	(-32.81)	(-3.102)
	[0.000309]	[0.000229]	[0.000206]	[0.000596]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.22 Pr > z=0.0266**	**z = -2.15 Pr > z =0.0313**	**z = -2.06 Pr > z =0.0396**	**z = -2.67 Pr > z=0.0075**
Arellano – Bond test for AR(2) in first differences:	**z = -1.36 Pr > z=0.1733**	**z = -1.36 Pr > z=0.1726**	**z = -0.91 Pr > z=0.3652**	**z = -1.82 Pr > z=0.0692**
Sargan test:	**$Chi^2(54)$ = 47.26 Prob > chi^2**	**$Chi^2(54)$ = 33.82 Prob > chi^2**	**$Chi^2(54)$ = 49.02 Prob > chi^2**	**$Chi^2(54)$ = 31.87 Prob > chi^2**

	= 0.7300	= 0.9857	= 0.6666	= 0.9929

Notes: *All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using first score of principal components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 2 (b): Principal components (information from all components) type financial openness and financial development indices

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.847***	0.808***	0.230***	0.302***
	(84.07)	(60.21)	(309.8)	(80.46)
	[0.0101]	[0.0134]	[0.000741]	[0.00376]
ΔFinancial openness	0.0983***	0.0970***	0.0825***	0.499***
	(12.86)	(16.51)	(6.954)	(37.54)
	[0.00765]	[0.00588]	[0.0119]	[0.0133]
ΔTrade openness	0.0017***	0.00064***	0.0104***	0.0052***
	(4.218)	(6.969)	(55.70)	(9.015)
	[0.000397]	[0.000092]	[0.000187]	[0.000576]
ΔLog GDP per capita	0.131***	-0.147***	0.503***	0.477***
	(3.030)	(-6.496)	(19.32)	(9.976)
	[0.0431]	[0.00273]	[0.0260]	[0.0478]
ΔInstitutional Quality	-0.0088	-0.0551***	-0.106***	0.0359***
	(-1.378)	(-20.20)	(-13.01)	(5.299)
	[0.00638]	[0.00273]	[0.00812]	[0.00678]
ΔSecondary School Enrollment	0.0008***	0.00001	-0.0045***	0.0021***
	(4.181)	(0.274)	(-23.17)	(5.550)
	[0.000190]	[0.000120]	[0.000196]	[0.000386]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.47 Pr > z =0.0134**	**z = -2.39 Pr > z =0.0168**	**z = -1.90 Pr > z =0.0573**	**z = -1.99 Pr >z=0.0468**
Arellano – Bond test for AR(2) in first differences:	**z = -1.46 Pr > z =0.1435**	**z = -1.66 Pr > z=0.0974**	**z = -0.96 Pr > z=0.3386**	**z = -1.07 Pr >z=0.2854**
Sargan test:	**$Chi^2(54)$ = 42.13 Prob > chi^2**	**$Chi^2(54)$ = 37.89 Prob > chi^2**	**$Chi^2(54)$ = 44.36 Prob > chi^2**	**$Chi^2(54)$ = 33.49 Prob > chi^2**

	= 0.8795	= 0.9528	= 0.8222	= 0.9872

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 3: Principal components type financial openness and financial development indices with the interaction term

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.848***	0.808***	0.239***	0.312***
	(66.15)	(59.66)	(161.4)	(31.20)
	[0.0128]	[0.0135]	[0.00148]	[0.0100]
ΔFinancial openness	0.0752***	0.170***	0.384***	0.480***
	(2.722)	(16.39)	(19.58)	(17.70)
	[0.0276]	[0.0104]	[0.0196]	[0.0271]
ΔTrade openness	0.0015***	0.0011***	0.0102***	0.0055***
	(3.667)	(6.581)	(70.19)	(9.982)
	[0.000416]	[0.000163]	[0.000146]	[0.000547]
ΔLog GDP per capita	0.149***	-0.131***	0.448***	0.486***
	(2.968)	(-4.972)	(13.12)	(7.235)
	[0.0502]	[0.0263]	[0.0341]	[0.0672]
ΔInstitutional Quality	-0.0172	-0.0439***	-0.0387**	0.0505***
	(-1.323)	(-11.81)	(-5.265)	(4.214)
	[0.0130]	[0.00372]	[0.00735]	[0.0120]
ΔSecondary School Enrollment	0.0009***	0.000135	-0.0031***	0.00234***
	(5.709)	(0.818)	(-9.851)	(7.839)
	[0.000162]	[0.000165]	[0.000316]	[0.000299]
ΔInteraction term	0.00035*	-0.00086***	-0.0012***	0.00002
	(1.907)	(-11.98)	(-23.99)	(0.0763)
	[0.000182]	[0.0000716]	[0.0000487]	[0.000282]
Number of observations:	**333**	**301**	**376**	**262**
Number of groups:	**50**	**41**	**54**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.50 Pr > z =0.0126**	**z = -2.38 Pr > z = 0.0175**	**z = -1.91 Pr > z =0.0567**	**z = -2.03 Pr > z=0.0424**
Arellano – Bond test for AR(2) in first differences:	**z = -1.47 Pr > z =0.1415**	**z = -1.73 Pr > z =0.0844**	**z = -1.00 Pr > z=0.3163**	**z = -1.04 Pr > z=0.2990**

Sargan test:	**$Chi^2(54)$ = 47.62 Prob > chi^2 = 0.7173**	**$Chi^2(54)$ = 36.44 Prob > chi^2 = 0.9680**	**$Chi^2(54)$ = 47.84 Prob > chi^2 = 0.7096**	**$Chi^2(54)$ = 35.02 Prob > chi^2 = 0.9790**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using principal component indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 4: Principal components type financial openness and financial development indices; Changing lag structure

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lag 1)	1.1399***	0.4776***	0.2363***	0.3271***
	(46.01)	(20.75)	(122.07)	(41.72)
	[0.0247731]	[0.0230098]	[0.0019359]	[0.0078403]
ΔDependent variable (Lag 2)	-0.3948***	-0.0416***	-0.1279***	-0.0764***
	(-20.27)	(-7.32)	(-49.68)	(-6.38)
	[0.019475]	[0.0056819]	[0.0025747]	[0.0119731]
ΔDependent variable (Lag 3)	0.1837***	0.3101***	-0.0491***	-0.1181***
	(19.97)	(57.05)	(-21.95)	(-10.58)
	[0.0092001]	[0.0054356]	[0.0022359]	[0.0111681]
ΔFinancial openness	0.0947***	0.1237***	0.0689***	0.476***
	(8.03)	(13.86)	(4.08)	(12.13)
	[0.01177981]	[0.0089279]	[0.168978]	[0.0392724]
ΔTrade openness	0.0004	-0.0003**	0.0131***	0.0057***
	(0.68)	(-2.42)	(67.50)	(6.82)
	[0.000539]	[0.0001152]	[0.0001944]	[0.0008389]
ΔLog GDP per capita	0.0569*	-0.0807***	-0.1367**	0.617***
	(1.90)	(-2.90)	(-2.22)	(3.62)
	[0.0299644]	[0.0278365]	[0.0616486]	[0.1706641]
ΔInstitutional Quality	-0.01106	-0.04822***	-0.2413***	-0.0129
	(-0.45)	(-18.95)	(-8.50)	(-0.50)
	[0.0246444]	[0.0025442]	[0.028378]	[0.0257977]
ΔSecondary School Enrollment	0.0004	-0.0016***	-0.0027***	0.0005
	(1.48)	(-11.62)	(-5.13)	(1.05)
	[0.0002368]	[0.0001344]	[0.0004416]	[0.0004206]
Number of observations:	**289**	**274**	**346**	**225**
Number of groups:	**49**	**40**	**53**	**37**
Arellano – Bond test for	**z = -3.04** **Pr > z =0.0024**	**z = -1.40** **Pr > z = 0.1628**	**z = -1.96** **Pr > z=0.0501**	**z = -1.96** **Pr >z=0.0498**

AR(1) in first differences:	**z = 0.67**	**z = 1.03**	**z = 1.38**	**z = 1.11**
Arellano – Bond test for AR(2) in first differences:	**Pr > z =0.5006**	**Pr > z =0.3012**	**Pr >z=0.1689**	**Pr >z=0.2668**
Sargan test:	**$Chi^2(49)$ = 44.27 Prob > chi^2 = 0.6650**	**$Chi^2(49)$ = 32.75 Prob > chi^2 = 0.9640**	**$Chi^2(49)$ = 47.93 Prob > chi^2 = 0.5165**	**$Chi^2(49)$ = 31.29 Prob > chi^2 = 0.9771**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with 3 lags of the dependent variable to be included in the model, 0 lags of the dependent variable and 3 lags of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The indices are constructed following the principal component methodology that utilizes all components. The financial openness, banking sector development, bond and stock market development, financial development variables and institutional quality measures are constructed using principal component indices. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 5: Principal components type financial openness and financial development indices for the developing country sample

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.809***	0.5387***	0.2234***	0.414***
	(31.16)	(14.27)	(31.09)	(5.07)
	[0.0259655]	[0.0377382]	[0.0071859]	[0.0816462]
ΔFinancial openness	0.0334**	0.0055	0.0941***	0.1138***
	(2.09)	(0.56)	(6.28)	(4.94)
	[0.0160238]	[0.0098091]	[0.0149839]	[0.0230477]
ΔTrade openness	-0.0018**	-0.0013***	0.0118***	0.0029*
	(-2.55)	(-3.16)	(16.48)	(1.70)
	[0.0006937]	[0.0004178]	[0.0007136]	[0.0016757]
ΔLog GDP per capita	0.5396***	0.0541	0.3992**	0.7263***
	(3.98)	(0.57)	(2.42)	(5.81)
	[0.1357218]	[0.0943717]	[0.1648696]	[0.1250271]
ΔInstitutional Quality	0.0038	-0.2643***	-0.072***	-0.1168***
	(0.32)	(-18.88)	(-3.11)	(-3.32)
	[0.0119641]	[0.0140001]	[0.0231092]	[0.0351751]
ΔSecondary School Enrollment	-0.0029	0.0048***	-0.006***	-0.0015
	(-1.58)	(6.39)	(-5.44)	(-0.76)
	[0.0018469]	[0.0007486]	[0.0011049]	[0.0020077]
Number of observations:	**153**	**112**	**163**	**100**
Number of groups:	**25**	**18**	**27**	**16**
Arellano – Bond test for AR(1) in first differences:	**z = -2.04 Pr > z =0.0416**	**z = -1.90 Pr > z = 0.0571**	**z = -1.88 Pr > z =0.0603**	**z = -1.80 Pr > z=0.0726**
Arellano – Bond test for AR(2) in first differences:	**z = 1.32 Pr > z =0.1854**	**z = 1.33 Pr > z =0.1844**	**z = -1.31 Pr > z=0.1907**	**z = -0.08 Pr > z=0.9342**
Sargan test:	**$Chi^2(54)$ = 21.00 Prob > chi^2**	**$Chi^2(54)$ = 14.02 Prob > chi^2**	**$Chi^2(54)$ = 18.40 Prob > chi^2**	**$Chi^2(54)$ = 8.21 Prob > chi^2**

	= 1.0000	= 1.0000	= 1.0000	= 1.0000

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 6: Principal components type financial development indices and the Chinn and Ito index of capital account openness

	Dependent Variables			
	ΔBanking sector development	**ΔBond market development**	**ΔStock market development**	**ΔFinancial development**
ΔDependent variable (Lagged)	0.690***	0.908***	0.225***	0.388***
	(140.4)	(94.97)	(235.8)	(59.98)
	[0.00492]	[0.00956]	[0.000954]	[0.00647]
ΔKAOPEN	0.0965***	-0.0304***	0.0545***	-0.0273***
	(18.75)	(-13.22)	(5.969)	(-6.925)
	[0.00515]	[0.00230]	[0.00913]	[0.00395]
ΔTrade openness	0.0038***	0.0016***	0.0123***	0.0103***
	(20.82)	(13.62)	(74.08)	(23.23)
	[0.000180]	[0.000116]	[0.000166]	[0.000442]
ΔLog GDP per capita	0.181***	-0.218***	0.602***	0.674***
	(4.442)	(-10.62)	(29.70)	(15.10)
	[0.0408]	[0.0205]	[0.0203]	[0.0446]
ΔInstitutional Quality	-0.0873***	-0.0613***	-0.140***	-0.0425***
	(-24.19)	(-20.42)	(-19.23)	(-3.385)
	[0.00361]	[0.00300]	[0.00726]	[0.0125]
ΔSecondary School Enrollment	0.0001	-0.0002***	-0.0055***	-0.0004**
	(0.734)	(-3.004)	(-28.48)	(-2.447)
	[0.000185]	[7.04e-05]	[0.000193]	[0.000143]
Number of observations:	**373**	**318**	**420**	**276**
Number of groups:	**54**	**41**	**57**	**38**
Arellano – Bond test for	**z = -1.06**	**z = -2.50**	**z = -1.93**	**z = -2.07**
AR(1) in first differences:	**Pr > z = 0.2881**	**Pr > z = 0.0124**	**Pr > z = 0.0541**	**Pr > z = 0.0387**
Arellano – Bond test for	**z = 0.87**	**z = -2.03**	**z = -1.01**	**z = -0.45**
AR(2) in first differences:	**Pr > z = 0.3831**	**Pr > z = 0.0428**	**Pr > z = 0.3112**	**Pr > z = 0.6558**
Sargan test:	**$Chi^2(54)$= 51.66**	**$Chi^2(54)$= 36.78**	**$Chi^2(54)$= 51.03**	**$Chi^2(54)$= 35.27**
	Prob > chi^2	**Prob > chi^2**	**Prob > chi^2**	**Prob > chi^2**

	= 0.5651	**= 0.9648**	**= 0.5897**	**= 0.9773**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices for banking sector, bond and stock market and overall financial development are constructed following the principal component methodology that utilizes all components. KAOPEN is the Chinn and Ito index of capital account openness. The indices are constructed following the principal component methodology that utilizes all components. Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 7: Individual financial development measures and the Chinn and Ito index of capital account openness

	Dependent Variables							
	ΔLiquid Liabilities	**ΔPrivate credit**	**ΔDeposit bank assets**	**ΔTotal bank assets**	**ΔDomestic credit**	**ΔStock market capitalization**	**ΔTurnover ratio**	**ΔValue traded**
ΔDependent variable (Lagged)	0.601***	0.609***	0.150***	0.561***	0.982***	0.500***	0.0985***	0.485***
	(52.84)	(277.7)	(173.2)	(100.4)	(243.7)	(199.9)	(137.5)	(3,819)
	[0.0114]	[0.00219]	[0.000865]	[0.00559]	[0.00403]	[0.00250]	[0.000716]	[0.000127]
ΔKAOPEN	1.013***	1.362***	-1.113***	1.053***	0.676***	-8.854***	13.08***	-6.110***
	(6.273)	(13.17)	(-68.14)	(6.970)	(3.418)	(-29.47)	(37.62)	(-27.17)
	[0.162]	[0.103]	[0.0163]	[0.151]	[0.198]	[0.300]	[0.348]	[0.225]
ΔTrade openness	0.0656***	0.105***	-0.0283***	0.187***	0.0534***	0.553***	0.499***	1.096***
	(10.17)	(20.29)	(-84.20)	(39.09)	(9.375)	(35.09)	(57.29)	(1,256)
	[0.00645]	[0.00517]	[0.000336]	[0.00479]	[0.00569]	[0.0158]	[0.00870]	[0.000873]
ΔLog GDP per capita	6.465***	7.489***	17.83***	3.550*	-4.777***	64.59***	-50.81***	114.5***
	(9.703)	(8.143)	(208.3)	(1.942)	(-2.748)	(40.68)	(-61.01)	(512.4)
	[0.666]	[0.920]	[0.0856]	[1.828]	[1.738]	[1.588]	[0.833]	[0.223]
ΔInstitutional Quality	-2.448***	-2.168***	0.0457**	-0.414***	-4.953***	-10.84***	-14.48***	-6.836***
	(-16.67)	(-22.12)	(2.406)	(-3.957)	(-30.60)	(-31.90)	(-92.57)	(-42.26)
	[0.147]	[0.0980]	[0.0190]	[0.105]	[0.162]	[0.340]	[0.156]	[0.162]
ΔSecondary School Enrollment	-0.0517***	-0.0759***	0.0801***	0.0004	-0.0223***	-0.0150**	-0.442***	-0.458***
	(-13.58)	(-20.59)	(35.14)	(0.100)	(-6.438)	(-2.080)	(-99.89)	(-129.5)
	[0.00381]	[0.00369]	[0.00228]	[0.00426]	[0.00346]	[0.00722]	[0.00442]	[0.00354]
Number of observations:	**399**	**408**	**386**	**376**	**411**	**420**	**420**	**420**
Number of groups:	**56**	**56**	**55**	**54**	**57**	**57**	**57**	**57**
Arellano – Bond test for	**z = -0.78**	**z = 0.31**	**z = -0.97**	**z = 0.93**	**z = -2.12**	**z = 0.18**	**z = -1.54**	**z = -2.02**
AR(1) in first differences:	**Pr > z =0.4337**	**Pr > z = 0.7551**	**Pr > z = 0.3325**	**Pr > z = 0.3531**	**Pr > z = 0.0339**	**Pr > z = 0.8564**	**Pr > z = 0.1224**	**Pr > z = 0.0439**
Arellano – Bond test for	**z = -1.85**	**z = -1.79**	**z = 1.07**	**z = -1.66**	**z = 1.23**	**z = -1.96**	**z = -1.07**	**z = 0.18**
AR(2) in first differences:	**Pr > z =0.0641**	**Pr > z = 0.0732**	**Pr > z = 0.2883**	**Pr > z = 0.0961**	**Pr > z = 0.2174**	**Pr > z = 0.0495**	**Pr > z = 0.2865**	**Pr > z = 0.8570**
Sargan test:	**$Chi^2(54)$=53.57**	**$Chi^2(54)$= 52.70**	**$Chi^2(54)$= 48.90**	**$Chi^2(54)$= 49.00**	**$Chi^2(54)$= 53.78**	**$Chi^2(54)$= 52.34**	**$Chi^2(54)$= 52.55**	**$Chi^2(54)$= 53.93**
	Prob > chi^2	**Prob > chi^2**	**Prob > chi^2**	**Prob > chi^2**	**Prob > chi^2**	**Prob > chi^2**	**Prob > chi^2**	**Prob > chi^2**

	= 0.4909	**= 0.5247**	**= 0.6708**	**= 0.6673**	**= 0.4828**	**= 0.5386**	**= 0.5306**	**= 0.4770**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices for banking sector, bond and stock market and overall financial development are constructed following the principal component methodology that utilizes all components. KAOPEN is the Chinn and Ito index of capital account openness, the dependent variables are: Liquid liabilities (% of GDP), Private credit by deposit money banks and other institutions (% of GDP), Deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages), Total bank assets (% of GDP), Domestic credit provided by the banking sector (% of GDP), Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock market value traded (% of GDP). Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*

Table 8: Principal component type financial openness index and individual financial development measures

	Dependent Variables							
	ΔLiquid liabilities	**ΔPrivate credit**	**ΔDeposit bank assets**	**ΔTotal bank assets**	**ΔDomestic credit**	**ΔStock market capitalization**	**ΔTurnover ratio**	**ΔValue traded**
ΔDependent variable (Lagged)	0.8998***	0.6198***	0.7784***	0.572***	0.9748***	0.522***	0.0998***	0.5103***
	(454.64)	(143.51)	(481.82)	(149.82)	(102.77)	(173.98)	(361.07)	(1809.72)
	[0.0019791]	[0.004319]	[0.0016155]	[0.0038166]	[0.0094847]	[0.0029979]	[0.0002764]	[0.000282]
ΔFinancial openness	0.7643***	3.7167***	-1.158***	9.509***	0.0235	2.934***	4.9186***	6.661***
	(55.85)	(45.67)	(-76.08)	(53.13)	(0.21)	(27.67)	(32.15)	(52.82)
	[0.0136861]	[0.0813903]	[0.0152147]	[0.1789926]	[0.1123886]	[0.1060275]	[0.1530111]	[0.1261231]
ΔTrade openness	0.0730***	0.1259***	-0.0148***	0.1391***	0.1283**	0.7294***	0.3289***	1.0343***
	(9.28)	(14.75)	(-24.75)	(17.76)	(21.17)	(71.12)	(19.50)	(350.27)
	[0.0078662]	[0.0085404]	[0.0005986]	[0.0077456]	[0.0060617]	[0.0102561]	[0.0168636]	[0.0029528]
ΔLog GDP per capita$_t$	3.1754***	9.476***	5.831***	0.212	-1.81506	36.911***	-53.90***	95.845***
	(2.86)	(6.58)	(65.41)	(0.14)	(-1.26)	(30.61)	(-55.64)	(129.62)
	[1.111859]	[1.440603]	[0.0891392]	[1.530057]	[1.440914]	[1.205813]	[0.9687153]	[0.7394168]
ΔInstitutional Quality	-4.687***	-2.935***	1.0541***	2.631***	-7.934***	-15.222***	-12.961***	-3.973***
	(-16.31)	(-24.27)	(49.91)	(16.04)	(-25.33)	(-59.65)	(-46.04)	(-12.57)
	[0.2873217]	[0.1208917]	[0.021122]	[0.16396]	[0.313209]	[0.2551843]	[0.28153]	[0.3161314]
ΔSecondary School Enrollment	-0.0948**	-0.0628***	0.00366***	0.0695***	-0.092***	-0.01422*	-0.427***	-0.392***
	(-8.17)	(-15.35)	(17.00)	(36.40)	(-21.28)	(-1.88)	(-27.43)	(-119.80)
	[0.0115953]	[0.0040934]	[0.0002152]	[0.0019105]	[0.0042989]	[0.0075512]	[0.0155645]	[0.0032682]
Number of observations:	**357**	**365**	**344**	**335**	**368**	**376**	**376**	**376**
Number of groups:	**53**	**53**	**51**	**50**	**54**	**54**	**54**	**54**
Arellano – Bond test for AR(1) in first differences:	**z = -0.50 Pr > z=0.6200**	**z = -0.16 Pr > z=0.8734**	**z = -2.88 Pr >z=0.0039**	**z = 0.52 Pr > z=0.5997**	**z = -2.06 Pr >z =0.0390**	**z = 0.54 Pr >z=0.5878**	**z = -1.53 Pr>z=0.1256**	**z = -1.93 Pr >z=0.0539**
Arellano – Bond test for AR(2) in first differences:	**z = -1.63 Pr>z=0.1024**	**z = -1.55 Pr > z=0.1208**	**z = -1.63 Pr >z=0.1027**	**z = -1.29 Pr > z=0.1982**	**z = 1.67 Pr >z =0.0942**	**z = -2.20 Pr >z=0.0275**	**z = -1.06 Pr>z=0.2914**	**z = 0.25 Pr >z=0.8056**
Sargan test:	**Chi^2(54) = 50.84 Prob >chi^2**	**Chi^2(54) = 46.85 Prob >chi^2**	**Chi^2(54) = 44.53 Prob >chi^2**	**Chi^2(54) = 47.30 Prob >chi^2**	**Chi^2(54) = 51.00 Prob > chi^2**	**Chi^2(54) = 48.15**	**Chi^2(54) = 45.83 Prob > chi^2**	**Chi^2(54) = 50.40 Prob > chi^2**

	= 0.5970	= 0.7441	= 0.8175	= 0.7286	= 0.5908	Prob > chi^2 = 0.6984	= 0.7776	= 0.6139

Notes: *All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with one lag of the dependent variable to be included in the model, 0 lags of the dependent variable and one lag of other variables to be used as instruments. The results reported here use the twostep estimator. The indices are constructed following the principal component methodology that utilizes all components. The variables are: Liquid liabilities (% of GDP), Private credit by deposit money banks and other institutions (% of GDP), The ratio of deposit money bank assets to the sum of deposit money bank assets to central bank assets (in percentages), Total bank assets (% of GDP), Domestic credit provided by the banking sector (% of GDP), Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages),and Stock market total value traded (% of GDP). Figures in parentheses are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively. The figures in brackets depict the standard errors for the coefficients.*