Breaking the misconceptions: An analysis of the effects financial liberalization on financial development using index measures

This paper examines the link between financial openness and financial development through a panel data analysis on advanced and emerging market countries. Using index measures for financial openness and financial development, we show that financial openness together with institutional, educational and macroeconomic variables can explain a large part of the variation in financial development across countries and over time. Our analysis shows that different kind of indexing strategies could aid in finding a better measure for financial openness and financial development. Additional robustness checks and the endogeneity analysis reveal that the findings are robust to different lag structures, time dummies, trends, and reductions in the sample size. Financial openness is found to have a positive effect on financial development independent from the lag structure chosen, and time dummies and trends used. The positive influence of financial openness carries out even when the sample size is reduced to developing countries.

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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 become a source of interest to many researchers. Financial development, defined generally as the channel for increasing the efficiency of financial markets and resources, monitoring investment projects, and the banking sector and improving on the overall importance of the financial system, is viewed as a major element influencing economic growth and welfare.[1]

As the role of financial development on economic growth is recognized, there has become a wide spread debate on the effects of financial liberalization on growth and financial development. Financial liberalization described as the alleviation of capital controls, allowance of capital flows within and across countries, deregulation of domestic financial markets and liberalization of capital accounts should reduce macroeconomic volatility and thereby help promote financial sector development. Studies have shown that financial liberalization can endorse economic growth and enhance welfare through opportunities for a better and more efficient allocation of resources, through portfolio and risk diversification and higher profitability of investment given that there exist appropriate controls, frameworks and regulatory apparatus.[2] [3]

Although the literature provides a broad examination of financial liberalization and economic growth, the link between financial liberalization and financial development has been overlooked. We believe that a proper analysis of this link will help clarify the ambiguity in the relationship between financial liberalization and economic growth.

The small strand of literature generally attempts to answer the question regarding the effects of trade and capital account openness on financial development and analyzes the possible influence of economic institutions, legal and country specific variables, and educational attainment measures on financial development. Various authors from Chinn and Ito (2002) and (2006), Ito (2006), Baltagi, Demetriades and Law (2007), Demetriades and Law (2006), Demetriades and Andrianova (2005) and Huang (2007) examine the effect of capital account liberalization on the development of equity markets controlling for legal systems and institutions among mostly developed and emerging market economies. The results of the panel data analysis by and large demonstrate 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. The results also show that opening up capital accounts can be beneficial for financial development only if the country under examination has attained a threshold level of legal and institutional development.[4] Trade openness and banking sector development are found to be preconditions for financial openness and financial development in most studies.

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[1] Huang, Wei, "Emerging Markets, Financial Openness, and Financial Development", *University of Bristol Discussion Paper*, 2006 – 588, pp. 2

[2] Aziakpono, Jesse Meshach, "Effects of Financial Integration on Financial Development and Economic Performance of the SACU countries", *Paper presented at the ECA/ADB African Economic Conferences*, (2007), pp. 2

[3] Ibid., pp. 2

[4] Ibid., pp. 12

The literature shows that there are three main issues in examining the relationship between financial liberalization and financial development. First, the choice of indicators has been a topic of concern. One needs a broad indicator that can incorporate different aspects of various measures suggested for financial liberalization. Studies lack a comprehensive indicator that can bring together all features of financial development such as the banking system, the stock and bond markets. With different measures used for financial openness, the most prominent measure of financial liberalization, and for financial development the results obtained seem unconvincing. Another concern with different measures is that the results from various studies become hardly comparable due to particular choice of individual measures used by the authors and the country and time coverage selected for the study. Building 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 economists use developed countries in their estimations, which highly influence the results. Third, 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 the control variables can influence the link between financial openness and financial development. The correct specification of control variables can lead to a better examination of these concepts.

The issues regarding the measurement and the choice of financial openness, financial development and control variables thereby remain to be thoroughly explored. The essential point, however, is to explore whether differences in terms of absorbing the benefits of financial liberalization among countries result due to the ability of countries through different institutions, policies and regulations to convert financial openness into financial development. One can argue that if financial openness can lead to the development of a stable financial system, alongside well-functioning financial markets, this process can then bring about an increase in the welfare of the society which can even enhance economic growth. The question of the necessity of financial liberalization to translate into financial development so as to achieve economic growth and welfare remains to be at the core of this study.

This paper, by this means, aims to examine the link between financial openness and financial development through a panel study of developed and emerging market countries. Using index measures we show that financial openness together with institutional, educational and macroeconomic variables can explain a large part of the variation in financial development across countries and over time. Principal component type index measures provide better results in terms of economic and statistical significances. The results after the inclusion of the interaction term show that there is a negative relationship between financial development and the simultaneous opening of financial and goods markets. The robustness checks and the endogeneity analysis show that the findings are robust to different lag structures, time dummies, trends, and reductions in the sample size.

We add to the literature on three aspects. First, we give a comparative view on different index measures 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 index measures. Lastly we explicitly study one of the main problems of panel data models; endogeneity issues.

Our paper, to our knowledge, is the first one to compare different index measures for financial openness and financial development with the hope of identifying the relationship among the two. We complement Huang's (2006) work by suggesting additional principal components type indices for financial openness and financial development and by offering a broad comparison among the different types of indices used in the analysis.

This paper is organized as follows. Section 2 introduces the data used in the analysis and briefly describes the aggregate indices of financial openness and financial development. Section 3 explains the empirical model and emphasizes on the estimation procedure. Section 4 reports the estimation results. Section 5 discusses the robustness checks and further issues related to our sample. Section 6 concludes by summarizing our findings.

2. The Data

This section introduces the variables used as measures of financial openness and financial development. We first discuss the individual indicators and then construct aggregate index measures with different groups of these measures.

One main problem in obtaining financial data for numerous countries is the tradeoff between having a large estimation period and a wide number of countries. As the estimation period for the panel data enlarges the number of countries for which the indicators of financial openness and financial development are available reduces. In order to avoid this difficulty we choose 61 countries for which we have data over the 1970 – 2007 period. However, for the main analysis we use a subgroup of the data, 1996 – 2007 period, in order to avoid as many missing values as possible.

The analysis is based on annual data obtained primarily from Beck, Demirguc-Kunt, and Levine's database (referred as *BDL* from onwards), the World Bank's *World Development Indicators (WDI)*, *World Governance Indicators, Edstats* which extracts data from the UNESCO Institute for Statistics, and the IMF's *International Financial Statistics*. We, hereby, summarize the individual and aggregate measures for financial openness and financial development along with the control variables used in our analysis.

2.1 Individual Measures

2.1.1 Financial Openness Indicators

Financial openness is measured with *market capitalization of listed companies (% of GDP)*, *foreign direct investment (% of GDP)*, *number of domestic companies listed (per million population)*, *portfolio investment flows (% of GDP)*, and *international debt issues (% of GDP)*.

Our first measure of financial openness, *market capitalization of listed companies (% of GDP),* is equal to the value of listed shares divided by GDP and is regarded as a measure of the size of stock markets relative to the economy.[5] It is most frequently used as a measurement of the corporate size of companies. The second measure, *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.[6]

The third financial openness indicator is the *number of domestic companies listed per million population*. The World Bank defines this variable as the domestically incorporated companies listed on the country's stock exchanges at the end of the year.[7] This indicator is another measure of market size. The fourth measure of financial openness, *portfolio investment flows (% of GDP)*, is the sum of portfolio debt flows (private and publicly guaranteed and private nonguaranteed bond issues purchased by foreign

[5] Demirguc-Kunt, Asli, and Ross Levine, Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development, MIT Press, 2001, pp. 195
[6] World Bank, 2007 World Development Indicators, International Bank for Reconstruction and Development/The World Bank Press, 2007, pp. 319
[7] Ibid., pp. 279

investors) and non-debt-creating portfolio equity flows which are equal to the sum of country funds, depository receipts, and direct purchases of shares by foreign investors.[8] Portfolio investment constitutes one of the main elements of capital flows and we believe that the inclusion of this variable will help determine the role played by portfolio investment across countries.

The fifth and last measure of financial openness is *international debt issues (% of GDP)* introduced by *BDL* in their latest database. International debt flows measures "the net flow of international bond issues relative to a country's economic activity".[9]

The literature suggests the use of market capitalization of companies, gross foreign direct investment, gross private capital flows, and some independent indices as measures of financial openness. Among these indicators we employ the market capitalization of companies and foreign direct investment as our prospective 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. Portfolio investment flows, which were one of the main determinants of private capital flows, are utilized to highlight the importance of portfolio investment across countries. Different from the literature we also make use of indicators such as the number of domestic companies listed per million population and international debt issues. We believe that the inclusion of both of these variables as measures of financial openness will be essential in determining the optimal estimator of financial openness.

As summarized by Kose et.al (200.) financial openness indicators are divided into two mainstream measures; de jure measures which depend on the removal of legal restrictions on cross-border capital flows, and the removal of controls on prices, quantities and foreign equity holdings and de facto measures which observe countries' integrations into the world capital and financial markets in all practical terms.[10] De jure measures are typically based on IMF indicators such as the Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) and illustrate the number of years for which a country's capital accounts have been open and free from restrictions and controls. The AREAER measure along with Chinn and Ito's (2005) principal component based financial openness measure, Quinn's capital account openness index (1997, 2003), Mody and Murshid's (2005) and Edwards's (2005) measures on capital and current account restrictions are mostly based on narrative and discrete 0-1 type variables, "indicating full openness or closedness".[11] De jure measures have long been accused of not being able to fully reflect the degree of financial or capital account openness due to their reliance on the removal of restrictions associated with foreign exchange transactions.[12] Even though these measures rely on the elimination of controls and restrictions on capital account they do not particularly capture "the degree of enforcement or the effectiveness of enforcement" of these restrictions.[13]

[8] Ibid., pp. 343
[9] Beck, Thorsten, and Asli Demirguc-Kunt, "Financial Institutions and Markets Across Countries and Over Time – Data and Analysis", *World Bank Working Paper*, (2009), pp. 15
[10] Kose, Ayhan, Eswar Prasad, Kenneth Rogoff, and Shang-Jin Wei, "Financial globalization: a reappraisal", *NBER Working Paper No. 12484*, (2006), pp. 12
[11] Ibid., pp. 11
[12] Ibid., pp. 13
[13] Ibid., pp. 13

Despite the fact that these types of indices are developed to measure financial globalization in terms of openness of capital and financial markets, they do not represent the degree of integration into the global markets. Alternatively, de facto measures which are grouped into price differential and quantity based indicators examine the applied side by taking into account both legal restrictions and capital flows. However, due to the difficulty in interpreting and utilizing price differential based de facto measures, quantity based indicators of financial openness are more frequently used. Although the quantity based de facto measures such as gross capital flows, may bring measurement errors and may create difficulty in overcoming endogenity and causality issues, they remain to be the superior measure of financial integration.[14] For all the above reasons, we restrain from using discrete de jure measures and prefer to use stock and flow variables to measure financial openness. We believe that through the use of de facto openness indicators we will be able to examine the full aspect of financial and capital markets in all practical terms.

2.1.2 Financial Development Indicators

Due to a wide range of financial development indicators used in this analysis we group the data into several different categories. We consider that the combination of these categories will help determine the aggregate effect of financial openness on financial development.

a) Banking sector development indicators:

We use six indicators to measure the development of the banking sector. These variables are *liquid liabilities (% of GDP), private credit by deposit money banks and other financial institutions (% of GDP), the ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages), total bank assets (% of GDP),* deposit *money bank assets to central bank assets ratio (in percentages), and domestic credit provided by the banking sector (% of GDP).* All data used for this category is available from the Financial Structure database by *BDL* and the World Bank's *WDI*. The data specified is annual and can be obtained online.

Liquid liabilities (% of GDP) equals the ratio of liquid liabilities of bank and nonbank financial intermediaries to GDP.[15] This variable is commonly used as an overall measure of financial sector development and a typical measure of financial depth.

Private credit by deposit money banks and other institutions (% of GDP) is an indicator for the overall development in private banking markets.[16] This variable refers to financial resources provided to the private sector by deposit money banks and other financial institutions and it solely measures the credit provided to the private sector.

[14] Ibid., pp. 14

[15] Demirguc-Kunt, Asli, and Ross Levine, Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development, MIT Press, 2001, pp. 84

[16] Chinn, Menzie, and Hiro Ito, "What matters for financial development? Capital controls, institutions, and interactions", *Journal of Development Economics*, (2006), pp. 5

The ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages) is used to show the weight of deposit money bank assets among total assets. It reflects the importance of private lending compared to total lending.[17]

Deposit money bank assets to central bank assets ratio (in percentages) highlights the importance of private lending to government lending.[18]

Total bank assets (% of GDP) is used as a measure of financial depth. It is used to represent 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 loans to state enterprises but excludes credit to the central government.[19] This indicator is a measure of banking sector depth and financial sector development in terms of size.[20]

The variables used to determine the banking sector development indicators correspond to the ones used in the literature. We believe that a wide range of different variables will help us capture all possible aspects of banking sector development. We include a broader selection of variables here in order to fully capture the importance of the banking sector on overall financial development.

b) Stock market development indicators:

We use three different variables to measure development in stock markets. These three variables are *stock market capitalization (% of GDP), stock market turnover ratio (in percentages),* and *stock market total value traded (% of GDP).* The data listed below is annual and is extracted from the Financial Structure database of *BDL*.

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.[21] 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.[22]

[17] Huang, Wei, "Emerging Markets, Financial Openness, and Financial Development", *University of Bristol Discussion Paper*, 2006 – 588, pp. 10
[18] Ibid., pp. 10
[19] World Bank, 2007 World Development Indicators, International Bank for Reconstruction and Development/The World Bank Press, 2007, pp. 241
[20] Ibid., pp. 283
[21] Demirguc-Kunt, Asli, and Ross Levine, Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development, MIT Press, 2001, pp. 32
[22] Ibid., pp. 32

Stock market development indicators used also correspond to the ones found in the literature. The three indicators are the most frequently used indicators to measure stock market development and we believe that they will summarize all prospects of stock market development.

c) 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. Data is reported annually from the Financial Structure database of *BDL*.

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)* on the other hand 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 used in the literature on financial openness and financial development. Even though these indicators have been employed excessively in equity market development literature, due to the short period of data availability they have not been used as indicators for financial development. Since we consider a sub period in our analysis in order to obtain a broader perspective of the effects of financial openness on financial development we propose using the bond market development indicators so as to capture the efficiency and the effectiveness of bond markets on the overall level of financial development.

2.1.3 Control Variables

In order to examine the effect of financial openness on financial development we introduce a broad range of control variables. These variables allow us to analyze the true impact of financial openness on financial development as we control for possible influential effects. The control variables used in this paper include *GDP per capita, GDP growth, trade openness, secondary school enrollment rate,* and *legal and institutional variables.* The data is available from the World Bank's *WDI* and the *World Governance Indicators*, and *Edstats* databases by the World Bank.

Logarithm of GDP per capita (in constant 2000 US dollars) and *GDP growth (in annual percentages)* are used as measures for economic performance among countries. We employ these measures to control for the demand of finance and to monitor the differences in performances and productivities across countries.

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 enrolment 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 there has not been a study that utilizes an educational attainment indicator as a control variable in the financial openness and financial development literature, we believe that the inclusion of such a variable can also alter our findings. If the wide educational gaps that are observed between developed, emerging market and less developed 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 educational attainment indicators used in the economic growth literature we take secondary school gross enrollment rate as a possible determinant for why we examine differences across countries in terms of grasping the benefits of financial liberalization.

Lastly *legal and institutional variables* are used to measure the economic institutions and the overall quality of legal systems. We employ four different measures to control for institutional, legal, political and economic factors that may affect the overall level of financial development. These indicators are based on both subjective and perceptions-based data that reflect views of a range of respondents, agencies and organizations. They are constructed as a first tool for cross-country comparisons, and examination of ongoing trends over time.[23] These indicators are *government effectiveness*, *regulatory quality, rule of law,* and *control corruption* and they are measured through a range from-2.5 to 2.5 where higher values correspond to better governance outcomes.[24] Following Baltagi, Demetriades and Law (2007), Huang (2006) and Chinn and Ito (2005), we use institutional and legal variables to determine their influence on the relationship between financial openness and financial development. Differently from the authors mentioned we employ four different measures from the *World Governance Indicators* due to better data availability and greater country coverage.

The institutional quality variables used in our analysis are time-invariant. Given that our analysis is based on panel data specifications that can show variations across time, the use of time-invariant control variables may constitute a main drawback. However, as Chinn and Ito (2005) explain, the inclusion of these time-invariant factors do not pose a substantial problem for our analysis since the characteristics given by institutional quality variables are likely to change very slowly.[25] On this note, due to the time invariability of these indicators, we take the averages of two consecutive years to replace the missing years' data in the *World Governance Indicators* database for the four legal/institutional quality variables.

2.2 Aggregate Index Measures

Aggregating different measures of financial openness and financial development into a single index aids in summarizing the comprehensive nature of the financial sector.

[23] Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi, "Governance Matters VIII: Governance Indicators for 1996-2008*", World Bank Policy Research*, (2009), pp. 7
[24] World Governance Indicators (WGI) dataset, World Bank, http://info.worldbank.org/governance/wgi/index.asp
[25] Chinn, Menzie, and Hiro Ito, "What matters for financial development? Capital controls, institutions, and interactions", *Journal of Development Economics*, (2005), pp. 10

2.2.1 Equally weighted index measure

We first construct equally weighted indicators for financial openness, banking sector, bond and stock market, and overall financial development as well as for institutional quality. Our final equally weighted indicators are averages of the banking sector, bond and stock market, and financial development indicators. The biggest problem with equally weighted indicators is that different measures of financial openness and financial development may have different weights and equally weighted indicators may over-or-underestimate the importance of such measures. This could potentially bias our results. In order to avoid this possibility we construct indices using other approaches.

2.2.2 Coefficient of variation type index measure

The second methodology followed in constructing indices uses the coefficient of variation approach.[26] The weights for the indices 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 the variables to be used in the index. The weights following this method will be constructed as follows:

$$x_i = \frac{cv_i}{scv_i}$$

where scv_i is the sum of all coefficients of variations for the given number of variables, and cv_i denotes the coefficient of variation of each variable and can be found by:

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

where μ_i and σ_i are the mean and standard deviation of these residuals respectively.

This procedure, thereby, allows for weighing each variable differently in the financial openness, financial development and institutional quality indices. It helps avoid the potential bias that may occur when using equal weights as described previously.

We can then construct indices for financial openness, financial development, and institutional quality as:

$$CFO = \sum_{i=1}^{5} x_i \, (meas)_i$$

where x_i is the relative weight of each variable in the financial openness index and $meas_i$ denotes each of the measures used for constructing the financial openness index. $meas_i$ is market capitalization of

[26] For more information please refer to: Ullah, Aman, and Davide E. A Giles, *Handbook of Applied Economic Statistics*, Marcel Dekker, Inc., N.Y. 1998, and Sheret, Michael, "The Coefficient of Variation: Weighting Considerations", *Social Indicators Research*, (1984), Vol. 15, No. 3

listed companies (% of GDP), foreign direct investment (% of GDP), listed domestic companies (per million population), international debt issues (% of GDP) and portfolio investment flows (% of GDP) respectively.

Similarly, banking sector, bond and stock market and financial development, and institutional quality indices are constructed as weighted averages of the corresponding variables as described previously.

2.2.3 Principal Component Analysis for an index measure

The third methodology used in constructing index measures is the principal component analysis. 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 which we call principal components. This type of analysis has two main objectives; reducing the dimensionality of the data set, and identifying new meaningful variables.[27]

Our dataset contains a large number of variables which summarize the information for both financial openness and financial development. Principal component analysis here aids in determining the weights of the variables to be included in an index arbitrarily by constructing in such a way that "the resulting components account for a maximal amount of variance in the data set".[28] This method has been shown to be more efficient in establishing the optimal weights of variables in comparison to other type of methods where variables are given equal or subjective weights according to the method employed.

The theory behind the principal components analysis is as follows:

Suppose that y_1 is a principal component of $x_1, x_2, x_3, \ldots, x_p$, such that:

$$y_1 = a_{11}x_1 + a_{12}x_2 + \cdots + a_{1p}x_p = \sum_{i=1}^{p} a_{1i}\,x_i$$

Then the variance of y_1 is maximized given the constraint that the sum of the squared weights of $x_1, x_2, x_3, \ldots, x_p$ is equal to one.[29] That is:

$$\sum_{i=1}^{p} a_{1i}^2 = 1$$

The random variables, x_i can be standardized scores or deviations from the mean scores.[30] Using principal component analysis we can find the optimal weight vector ($a_{11}, a_{12}, \ldots, a_{1p}$) and the associated

[27] http://www.fon.hum.uva.nl/praat/manual/Principal_component_analysis.html
[28] Principal component analysis, pp. 7, http://support.sas.com/publishing/pubcat/chaps/55129.pdf
[29] Ibid., pp. 11
[30] A score is "a linear composite of the optimally-weighted observed variables". We use standardized scores or deviations of the observed variables from their means in order to obtain observations with zero mean and unit variance in each column. Principal component analysis, pp. 11, http://support.sas.com/publishing/pubcat/chaps/55129.pdf

variance of y_1 that is usually expressed as λ_1.[31] Similarly for the second principal component, y_2, we follow the same procedure of finding a second a weight vector, ($a_{21}, a_{22}, \ldots, a_{2p}$) such that the variance of :

$$y_2 = a_{21}x_1 + a_{22}x_2 + \cdots + a_{2p}x_p = \sum_{i=1}^{p} a_{2i}x_i$$

is maximized subject to the constraints that it is uncorrelated with the first principal component and

$$\sum_{i=1}^{p} a_{2i}^2 = 1$$

This shows that y_2 has the next largest sum of squared correlations with the original variables. Note that the sum of squared correlations with the original variables or in other words the variances of the principal components become smaller as we extract successive principal components from our model.[32] The variable weights for a particular principal component are used in interpreting the principal component factor, and the magnitude of the variances calculated for principal components depicts how well the variables account for the variability of the data.[33] The weight vectors associated with each principal component express the relative amounts of variation explained in the variables by the principal components.[34] One major problem using principal component analysis in indexing 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 first score indices to extract the information from the first component which accounts for the maximal amount of variance among the observed variables.[35] The first component is useful in our analysis since it is more likely to be correlated with at least some of the observed variables if not many. However, in order to avoid particular bias we suggest a second principal component method that relies on using information from all components.

We use the principal components analysis to score index measures for financial openness, financial development and institutional quality. For financial development we also use the principal component analysis to construct three sub indices, banking sector development index, stock market development index and bond market development index. We make use of two different approaches of indexing with the principal components analysis.

(a) First Score Principal Component indices

In order to construct our indices using the first approach we score the first principal component of the five individual measures of financial openness described previously and we denote it as the principal

[31] Ibid., pp. 11
[32] Ibid., pp. 11
[33] Ibid., pp. 12
[34] Ibid., pp. 12
[35] Ibid., pp. 7

component index measure of financial openness, PCFO. Similarly the index measures of financial development, PCFD, will be determined by the first principal component of the combination of three different development indicators, a total of 11 variables. Excluding deposit money bank assets to central bank assets ratio from our analysis, we also construct another financial development index with 10 variables, PCFD4. We construct first principal component indices for banking sector development, PCBD, stock market development, PCSMD, and bond market development, PCBMD. Institutional quality index, PCINSQUA, is constructed using the first score of the four variables that compromise this index.

(b) Principal Components analysis type indices that take into account information in all components

In order to ensure whether our first score principal component type indices are underestimating the strength of the link between financial openness and financial development we utilize an additional principal component indexing strategy to take into account all possible components so as not to discard any information that could potentially affect our estimations.

This new principal component indexing strategy proposed by Bo and Woo (2008) offers a new method for calculating weights for individual measures to be used in a principal component type index.[36] According to this methodology the weights for each indicator to be used in the index are given by the following formula:

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

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.[37] Supposing that $\lambda_1 > \lambda_2 > \lambda_3 > \ldots > \lambda_p$ and denoting the i^{th} principal component as PC_i then:

$$PC_i = X\alpha^i$$

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, as Bo and Woo (2008) convey, that the first principal component, is the linear combination of the initial indicators, and has the largest variance, and following the order, 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. Thereby, the p^{th} principal component is a linear combination of the indicators and has the smallest variance.

[36] Bo, Chen, and Yuen Pau Woo, "A Composite Index of Economic Integration in the Asia-Pacific Region", *Asia Pacific Foundation of Canada Working Paper*, 2008, pp. 7
[37] Ibid., pp. 7

The index, then, is constructed taking into account the relative importance, in other words "the accountability of the variance" in 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* that is previously expressed. All the variables that constitute the j^{th} column of the matrix X, x_j are standardized. One important remark to make is that the sum of the weights expressed by the formula above does not necessarily have to be equal to unity. This is due to the fact that the principal component analysis in its underlining structure normalizes the mode of each eigenvector to unity hence the weights could be very close to but not always equal to unity in general.[38]

Following this methodology we take into account all the components for financial openness, banking sector, stock and bond market development and financial development indicators. This method makes use of all the eigenvectors and proposes to use weights depending on the eigenvectors and eigenvalues for each of these given categories. Similarly the institutional quality index is constructed following the same method. By doing so, we hope to reduce any bias that may have occurred when examining the results using the first score of the principal components.

[38] Ibid., pp. 7

3. Empirical Model

Panel data models with cross sectional and time series data have been commonly used in financial liberalization, economic growth and financial development literature. These models provide a powerful approach in bringing together large number of countries across time to analyze and identify country-specific effects that control for missing or unobserved variables.[39] Unfortunately there are disadvantages in using panel data models. Panel data models can cause complexities in the estimation procedure. These types of models cannot be fully relied on determining the causal link between financial liberalization and economic performance measures such as growth.[40] There may also be large finite sample biases when the instruments selected are weak.[41] However, in our context, using panel data models and in particular dynamic panel data estimation techniques will allow our financial development and financial openness indicators to (partially) adjust to their long run equilibrium values within a specified number of years.[42] Via dynamic panel data models our estimates will no longer be biased by any omitted variables such as country specific effects, and using instruments will assist in overcoming problems of endogeneity and measurement error. With dynamic panel data models we will not only be examining the cross-country variation in the data but also observing the effects of time-series variation.

There have been various approaches employed in literature for the estimation of the link between financial openness and financial development. While Chinn and Ito (2006) utilize simple, point estimate OLS models, Huang (2006) argues for fixed effects estimation with levels, OLS estimation with first differenced variables, and Arellano-Bond dynamic panel data model approach with GMM estimators. Baltagi, Demetriades, and Law (2007) find dynamic panel data estimation models using the GMM case suggested by Arellano-Bond more appropriate, whereas Demetriades and Law (2006) use two dynamic panel data models, a first differenced panel GMM model, and the pooled mean group model.

In a standard static specification of the problem, we have that[43]:

$$FD_{it} = \alpha_i + \beta FO_{it} + \sum_{j=1}^{s} \lambda_j \, Control_{jit} + \varepsilon_{it}$$

[39] Judson, Ruth A., and Ann L. Owen, "Estimating Dynamic Panel Data Models: A Practical Guide for Macroeconomists", *Federal Reserve Board of Governors*, (1996), pp. 2

[40] Aziakpono, Jesse Meshach, "Effects of Financial Integration on Financial Development and Economic Performance of the SACU countries", *Paper presented at the ECA/ADB African Economic Conferences*, (2007), pp. 3

[41] Bond, Stephen R., Anke Hoeffler, and Jonathan Temple, "GMM Estimation of Empirical Growth Models", *University of Oxford Economics Papers*, 2001, pp. 5

[42] Baltagi, Badi, Panicos Demetriades, and Siong Hook Law, "Financial Development, Openness, and Institutions: Evidence from Panel Data", *Paper presented at the IMF Conference on New Perspectives on Financial Globalization*, 2007, pp. 11

[43] Huang, Wei, "Emerging Markets, Financial Openness, and Financial Development", *University of Bristol Discussion Paper*, 2006 – 588, pp. 15

where FD_{it} is the financial development measure, FO_{it} is the financial openness measure, $Control_{jit}$ is the group of all control variables; trade openness, GDP growth, logarithm of GDP per capita, secondary school enrollment rate, and institutional quality variables. The term α_i is given to represent a country specific effect that is captured neither by the financial openness indicators nor by the control variables. This country fixed effect is used as a control for unobserved heterogeneity and is thought to differ among countries. [44] β is the coefficient on financial openness measures which we expect to be positive. β captures the total effect of financial openness on financial development and helps determine the effectiveness of the link between the two. The error term ε_{it} is assumed to satisfy the Gauss-Markov conditions.[45] Dealing with unobserved heterogeneity that is present in the above model one can refer to the within-group fixed effects estimator and first differences regression model. Unfortunately neither model captures the partial adjustment property that accounts for the new information that explanatory variables can bring to the dependent variable of financial development.[46] Given that the dynamic panel data models include this property, we prefer to use this type of a model in comparison to within-group fixed effects estimators, or first differences regression models. Dynamic panel data model introduces a method for modeling partial adjustment of variables. In order to obtain consistency in dynamic panel data estimations we use the Arellano-Bond GMM panel data procedure to avoid the Nickell bias which occurs when the lagged dependent variable is correlated with the disturbance. The country fixed effects that are included in the dynamic panel data model suffer from this bias which disappears only if the time variable T tends to infinity.[47] Ultimately our Arellano-Bond (DIF – GMM) panel data model of 61 countries and twelve years, 1996 – 2007, can be given 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, and β denotes the short run effect of the first difference of financial openness on the first difference of financial development. Any influence of financial openness is now conditioned on the history controlled by the first differenced lagged dependent variable.[48]

The above model no longer has a country specific effect. The Arellano-Bond dynamic panel data model accounts for the individual effects. We can observe that all terms have been differenced in order to elude the Nickell bias. The inclusion of the lagged dependent variable helps remove any autocorrelation that is present in the model. The moment conditions require that:

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[44] Ibid., pp. 15
[45] Ibid., pp. 15
[46] Ibid., pp. 19
[47] Baltagi, Badi, Panicos Demetriades, and Siong Hook Law, "Financial Development, Openness, and Institutions: Evidence from Panel Data", *Paper presented at the IMF Conference on New Perspectives on Financial Globalization*, 2007, pp. 11
[48] Huang, Wei, "Emerging Markets, Financial Openness, and Financial Development", *University of Bristol Discussion Paper*, 2006 – 588, pp. 17

$$E[FD_{it-k}\Delta\varepsilon_{it}] = 0 \text{ for } \forall k \geq 2$$

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. The moment conditions in the Arellano-Bond dynamic panel data model increase with the time horizon, T.[49] Two diagnostic tests for serial correlation are derived by the model. These tests explore first order and second order serial correlation in error terms. The null hypothesis in these tests supposes no serial correlation in disturbances. In our tests we expect to find first order serial correlation in the first differenced residuals because $\Delta\varepsilon_{it}$ and $\Delta\varepsilon_{it-1}$ contain the same term, that is ε_{it-1}.[50] Second order and higher serial correlations could create further problems because then we would not be able to verify the validity of the moment conditions.

To test for the over identifying restrictions in our model we perform Sargan tests. Since using a large number of moment conditions may introduce bias while increasing efficiency we allow for one lag of the dependent variable to be used as a right hand side regressor, and one lag of the variables other than the dependent variable to be used as instruments for our moment conditions. We do not use the dependent variable as an instrument in our estimations.

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

I. (a) Do both trade and financial openness influence financial development and what happens to financial development when we control for trade openness?

(b) Is simultaneous opening of both trade and capital accounts a necessary condition for financial development? [51]Do we examine a complementarity between the two? If the latter is true we will then need to introduce an interaction term into the regression analysis to account for this simultaneity factor.

II. (a) What are the effects of economic and legal institutions on financial development over and above the effects of openness?[52]

(b) Do educational indicators affect financial development?

Following these two hypotheses with two similar extensions, we can specify the following dynamic equations for financial development:

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[49] Baltagi, Badi, Panicos Demetriades, and Siong Hook Law, "Financial Development, Openness, and Institutions: Evidence from Panel Data", *Paper presented at the IMF Conference on New Perspectives on Financial Globalization*, 2007, pp. 11

[50] Huang, Wei, "Emerging Markets, Financial Openness, and Financial Development", *University of Bristol Discussion Paper*, 2006 – 588, pp. 18

[51] Baltagi, Badi, Panicos Demetriades, and Siong Hook Law, "Financial Development, Openness, and Institutions: Evidence from Panel Data", *Paper presented at the IMF Conference on New Perspectives on Financial Globalization*, 2007, pp. 5

[52] Ibid., pp. 5

Model (a): (without an interaction term)

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

Model (b): With an interaction term

$$\Delta FD_{it} = \gamma \Delta FD_{it-1} + \beta \Delta FO_{it} + \lambda_1 \Delta TO_{it} + \lambda_2 \Delta GDPgro_{it} + \lambda_3 \Delta logGDPpc_{it} + \lambda_4 \Delta INSQUA_{it} + \lambda_5 \Delta SECSCHOOL_{it} + \lambda_6 \{\Delta FO_{it} \times \Delta TO_{it}\} + \Delta \varepsilon_{it} \quad (2)$$

The two models specified above aid in shedding light on the simultaneity hypothesis between financial and trade openness and stress the importance of the link between financial openness and financial development. We can see that if λ_4 and λ_5 are positive in either model, then, improvements in institutions, the quality of legal systems and education will enhance financial development. The first hypothesis (a) requires both β and λ_1 to be positive and significant. Only if both of these coefficients are positive and significant will a simultaneous opening of both trade and financial accounts benefit financial development in a positive manner. As Baltagi et. al (2007) express, this is not a necessary but a sufficient condition for the first hypothesis to hold.[53] We should never underestimate the importance of the effects of the control variables on the dependent variable even when testing for the simultaneity hypothesis. In order to rule out the possibility of the effects of control variables overtaking our analysis of simultaneity, we allow for specifications where the control variables of institutional quality and educational attainment are excluded from the model respectively. Note that even if both coefficients β and λ_1 are positive, due to the effects of institutional quality and educational attainment variables on financial development, we may still observe a positive impact on financial development without the simultaneous opening of both financial and goods markets. Nevertheless, our main goal is to examine whether the effect of simultaneous opening of both markets is larger, in positive terms, than the opening of either market on its own.[54]

To test for the second part, part (b), of the necessity of the simultaneity hypothesis we introduce an interaction term into the model as shown in Model (b). This interaction term represents the significance of opening both markets at the same time. If λ_6 is found to be positive we can state that the simultaneity hypothesis between financial openness and trade openness is a necessary condition for any further enhancements in financial development.

Both models serve to advance the literature in terms of the methods used in the estimation process. Our model argues for a broader range of countries with a wide range of variables affecting both financial openness and financial development. The index measures in estimation of the above hypotheses have not been used previously to our knowledge. With the confidence that the index measures described in

[53] Baltagi, Badi, Panicos Demetriades, and Siong Hook Law, "Financial Development, Openness, and Institutions: Evidence from Panel Data", *Paper presented at the IMF Conference on New Perspectives on Financial Globalization*, 2007, pp. 8

[54] Ibid., pp. 8

the previous section avoid any problems that may result due to measurement errors[55], we believe that our results will provide a more advanced view of the effects of financial openness on financial development. We hope to complement the work by Baltagi, Demetriades, and Law (2007) by a more thorough examination of the simultaneity effect with our new unbiased index measures for financial openness and financial development and by further studying the relationship between the two concepts. Given our initial 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 see differences among countries in terms of extracting the advantages of financial liberalization, our analysis stands as a major starting point for determining the transition mechanism between financial liberalization and financial development.

There remain to be a few drawbacks to our estimation model. The literature shows that in many cross-sectional studies both developing and developed countries are lumped together in the same sample.[56] 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 developed and developing countries, would undermine the study's ability to interpret the data.[57] In order to correct the problem, we first estimate our model with a full sample and then divide the sample into two components, developing and developed countries so as to compare the results obtained in both estimation procedures. Another possible drawback occurs due to the heavy influence of the control variables on financial development. As stated previously the effect of financial development may be highly influenced by institutional quality and educational attainment measures rather than the financial openness variable in which we are mostly interested. In order to avoid this problem of mixing effects of the explanatory variables on the dependent variable we exclude institutional quality and educational attainment indicators in some of our estimations. We believe that by doing so we can obtain a better estimate for the actual effect of financial openness on financial development.

[55] Our index measures allow the data to tell us how to measure the concepts of financial openness and financial development. By avoiding any particular individual choices regarding measures for these two concepts and by examining the effects of different sectors on financial openness and financial development, we strongly argue that index measures will help avoid measurement problems that have been brought to the literature with particular use of individual measures.

[56] Henry, Peter, "Capital Account Liberalization: Theory Evidence, and Speculation", *CDDRL Working Paper*, (2006), pp. 16

[57] Ibid., pp. 16

4. Empirical Results

We discuss the results of the dynamic panel data models introduced previously in this section. Table 1 in the Appendix gives a brief summary of the variables used in our estimation procedure.

Examining the summary table reported in the Appendix, we can see that among all of our indices the equally weighted banking sector development index, EBD, the equally weighted financial development index, EFD, the coefficient of variation type banking sector development index, CBD, and the coefficient of variation type financial development index, CFD, have the highest variabilities. This is caused by the high volatility of deposit money bank assets to central bank assets ratio. This variability could be explained by the behavior of individuals demanding deposit money bank assets under certain conditions and revising their decisions once faced with uncertainty which can be triggered by recessionary periods. In order to avoid this bias from causing mis-measurement problems in our indices we construct equally weighted, coefficient of variation type and principal component type indices for financial development which discard the deposit money bank assets to central bank assets ratio. [58]

Tables 2 (a) to (d) show the relations of the index measures and the control variables. In Table 2 (a) we can observe that the equally weighted financial openness index is positively correlated to all of our equally weighted development indices. One surprising finding is to remark that the equally weighted financial development index, EFD, is determined fully by the effect of the equally weighted banking sector development index, EBD. Once deposit money bank assets to central bank assets ratio is excluded from our index measures, the problem of one-to-one correlation between financial development and banking sector development indices disappears, however, there still remain to be high correlations among the two indices in comparison to the bond and stock market development indices. Even though the results of the pairwise correlations reported in Table 2 (a) may have strong implications for our estimations we argue here that these results may occur due to improper indexing techniques. An equally weighted index measure may not be the best indicator to use but note that this problem could also be caused by the large variability of the banking sector indicators as a whole. Consequently, some of the individual variables used to construct the equally weighted banking sector development indicator may not be appropriate in this context.

Table 2 (b) shows the pairwise correlation results for coefficient of variation type indices. We again examine a one-to-one correlation between coefficient of variation type banking sector development index, CBD, and the financial development index, CFD. Another important remark to make concerns the negative correlations of GDP growth with banking sector development index excluding deposit money bank assets to central bank assets ratio, CBD1, bond market development index, CBMD, and financial development index excluding the deposit money bank assets to central bank assets ratio, CFD4.

In Table 2 (c) we are given the pairwise correlations between first score principal component type indices and control variables. The results show that all index measures have high correlations among each other,

[58] The tables in the Supplementary Analysis show that the deposit money bank assets to central bank assets ratio have a 1-to-1 correlation with the equally weighted and coefficient of variation type banking sector development indices. Since this variable is found to have a great influence on our banking sector development indices, we presume that the exclusion of this variable will resolve any problems related to mis-measurement.

with financial openness index having a higher correlation for banking sector and overall financial development indices. The banking sector development indices seem to have higher correlations with the overall financial development indices which match the results found by Huang (2006). GDP growth again is shown to have a high correlation with most of our indexing measures. The interaction term is found to be positively correlated with both openness measures.

Lastly Table 2 (d) gives the pairwise correlations between principal component type indices that take into account the information from all components and control variables. The financial openness index is again found to be highly correlated with banking sector and overall financial development indices. There still remain to be high correlations between financial development and banking sector development indices however the results are more settled in comparison to those found in Table 2 (a).

4.1 Results using equally weighted index measures

Our empirical estimations for equally weighted indices are presented in Table 4 (a). In the benchmark dynamic GMM estimations, all variables other than the lags of the dependent variable are treated as exogenous. This method bares the assumption that all the right hand side regressors are uncorrelated with the error term.[59] We employ six different dependent variables in our regressions. The dependent variables of the equally weighted indexing measure include the banking sector, bond and the stock market, and financial development indices.

61 developing and advanced countries are covered in our analysis and the regressions are over a 12 year period. The t-statistics reported in our regressions are based on standard errors. In addition to reporting the results of dynamic panel data regressions, we also report the test for first and second order serial correlation in disturbances, and the Sargan test for over-identifying restrictions.

The results in Table 4 (a) show that the equally weighted financial openness index, EFO, is statistically significant for all dependent variables. Financial openness index enters with a positive coefficient for the banking sector, bond and stock market and overall financial development indices when the most volatile variable of banking sector is excluded from our analysis. This finding agrees with Huang (2006) where he shows the equally weighted financial openness index to be mostly significant when regressed against the first score principal component indices of banking sector, stock market and overall financial development. Baltagi et. al (2007) report that for individual measures of banking sector development, their financial openness index of total foreign assets and liabilities (%of GDP) is found to be positive and significant only when private credit, domestic credit, and liquid liabilities are used as measures of banking sector development. Law and Demetriades (2006) show that private capital flows which is used as a capital account openness indicator along side to institutional quality variable and real GDP per capita all have a positive significant impact on banking sector development indicator which is compromised of liquid liabilities, private sector credit and domestic credit provided by the banking sector. The authors also find a positive and significant relationship between the capital account openness measure of private capital inflows and stock

[59] Baltagi, Badi, Panicos Demetriades, and Siong Hook Law, "Financial Development, Openness, and Institutions: Evidence from Panel Data", *Paper presented at the IMF Conference on New Perspectives on Financial Globalization*, 2007, pp. 11

market development indicators of stock market capitalization, total share value traded and the number of companies listed using pooled mean group estimates. Their results indicate that the coefficients of real GDP per capita and institutional quality variable are positive and statistically significant throughout. Trade openness is found to be significantly influencing the stock market development when stock market capitalization and number of companies listed are used as the main indicators.

The rest of our results from Table 4 (a) indicate that the trade openness is positive and significant for banking sector, EBD1, bond and stock market development, EBMD and ESMD, and financial development, EFD4 indices, whereas GDP growth is significant for all dependent variables with changing magnitudes. GDP growth has positive coefficients for stock market and overall financial development indices and negative coefficients for banking sector and bond market development indices. This may imply that higher growth leads to a decline in banking sector and bond market development. As Baltagi et. al (2007) express, the negative coefficient of GDP growth may be related to counter-cyclicality of monetary policy.[60] This could be result of the sample being dominated by the advanced economies that face smaller GDP growth rates but have well developed bond markets.

Both secondary school enrollment rate and equally weighted institutional quality index are found to be negatively significant for almost all dependent variables. This finding contravenes the literature which states that the effects of higher development in terms of institutions should be carried out to all sources of financial development. Baltagi et. al (2007) using individual dependent variables find institutional quality variable to be positive whenever it is significant, so our finding stands against the literature and remains to be unresolved. We believe that our finding maybe the result of our indexing methodology, or due to the choice of our institutional quality variables.

The results of the diagnostic tests show that in four out of six cases the first order serial autocorrelation is rejected whereas the second order is accepted, and the Sargan test cannot reject the null hypothesis in all cases thereby implying identification of our model.

Our results are in line with those found in the literature. We propose an addition of the bond market into our financial development structure and the findings also highlight the importance of the link between financial openness and bond market development.

4.2 Results using coefficient of variation type index measures

Table 4 (b) depicts the results of coefficient of variation type index measures. Financial openness index is found to be significant for all dependent variables however the coefficients are positive only when banking sector development that excludes the deposit money bank assets to central bank assets ratio, stock market development, and both financial development indices are used as dependent variables. Similarly trade openness is found to be positively significant for stock and bond market, and banking sector and financial development indices that exclude the most volatile variable of the banking sector. GDP growth is shown to have a negative coefficient for almost all cases with an exception of stock market and overall financial development index, CFD4. Secondary school enrollment rate is again found to be negatively significant for

[60] Ibid., pp. 12

all cases with the exception of bond market development whereas the coefficient of variation type institutional quality index is negative and significant for all cases. The first order serial correlation is rejected in four out of six cases and the Sargan test cannot reject the null hypothesis of over-identification for all cases.

The coefficient of variation type indices depict similar results to the ones found using equally weighted indices. Given that the structure of these indices depend greatly on standard deviations of individual variables used in compiling index measures we would expect to find clearer relationships between openness and development measures. However, the results show that the financial openness and development link is better captured when using equally weighted indices.

4.3 Results using principal component analysis type index measures

In order to formally apply the principal component analysis to construct indices for financial openness, financial development and institutional quality we first need to verify whether the individual variables that are to be used in our indices are correlated. Our results show that we have positive correlations among most of our individual variables. Following these results, we proceed on to using the principal component analysis in constructing index measures.

4.3.1 Results using first principal components

We construct principal component indices using the first components (scores). Following this methodology we score the first principal component of financial openness, PCFO, which consists of five individual measures as described previously in Section 3. Similarly the index measure of financial development, PCFD, will be determined by the first principal component of the combination of three different development indicators, a total of 11 variables. We also score index measures using the first components for banking sector development, PCBD, stock market development, PCSMD, and bond market development, PCBMD. In order to examine whether the results are highly influenced by the most volatile variable of the banking sector development index, deposit money bank assets to central bank assets ratio, we score index measures for banking sector development, PCBD1 and financial development, PCFD4, that exclude this particular variable.

The results for the first principal component of financial openness, in Table 3 (a), show that this component captures 26.56% - 58.06 % of the total variation of individual measures depicted in terms of eigenvectors. The total variation here refers to the maximal amount of variation in all five observed variables. PCFO, the first component of financial openness index, is shown to capture 49.67% of the entire variance of 5 individual indicators of financial openness. Since most of these variables are observed to have similar eigenvectors which represent their respective weights in the principal component analysis structure, constructing an index measure of financial openness using the first principal component measure yields accurate and sensible results.[61] Given similar weights that are expressed by eigenvectors which range from 0.2656 – 0.5806, using any single measure to study the impact of financial openness on financial

[61] Huang, Wei, "Emerging Markets, Financial Openness, and Financial Development", *University of Bristol Discussion Paper*, 2006 – 588, pp. 12

development would bias our results. We thereby use the first principal component to score a proper and an efficient index for financial openness.

Similarly the results of the principal component analysis for banking sector development in Table 3 (b) show that the first principal component of banking sector development captures 27.89 % - 48.92 % of the total variation of individual measures. One must note that the deposit money bank assets to central bank assets ratio is found to have a negative sign in the first principal component of the PCBD, the first principal component of banking sector development index. PCBD, overall, captures 60.72% of the entire variance of 6 individual indicators of banking sector development. Excluding deposit money bank assets to central bank assets ratio from the individual variables that compromise the banking sector development index increases the overall significance of the first component of banking sector development index, as shown in Table 3 (c). Without deposit money bank assets to central bank assets ratio the first principal component of banking sector development, PCBD1, captures 28.03% - 48.94 % of the total variation of individual measures. PCBD1, summarizes 72.77% of the entire variance of 5 individual indicators of banking sector development compared to the 60.72% that PCBD index captures.

The results of principal components analysis on bond market development depicted in Table 3 (d) show that the first component explains 67.26% of the total variation of the two individual indicators. Since the number of individual variables forming this index is relatively small we are assured that the first component will be enough in capturing the total effects of the principal component analysis.

The first principal component of stock market development in Table 3 (e), on the other hand, is found to capture 48.64% - 68.59 % of the total variation of individual measures. PCSMD, the first component of stock market development index, overall, captures 65.57% of the entire variance of 3 individual indicators of the stock market development.

Lastly the results of the principal component analysis for financial development, in Table 3 (f), show that the first principal component of the financial development index explains 46.28% of the total variation of 11 variables that construct banking sector, stock market and bond market development indices. The eigenvectors of the first principal component of financial development are all positive and similar, capturing 12.22 % - 41.01% of the total variation of individual measures. Among all 11 measures only deposit money bank assets to central bank assets ratio has a negative eigenvector. When we exclude this variable from our principal component index of financial development, in Table 3 (g), the proportion explained by the first component rises up to 50.82% and all the eigenvectors in the first component are found to be positive.

For the institutional quality index we score the first principal component of government effectiveness, regulatory quality, rule of law, and control of corruption. The total proportion, the variance, explained by the first component, is 95.90% as shown in Table 3 (h). The eigenvectors are also found to be very similar ranging between 49.35% - 50.41%.

The results strongly verify our choice of principal component type indices for financial openness, banking sector, bond and stock market, financial development and institutional quality indices. We observe eigenvectors which suggest that using individual variables in our analysis to examine the link between

financial openness and financial development would not gather all the information that can possibly be captured through the use of principal component indices.

Table 4 (c) shows our first results of principal component indices. The results show that the financial openness index, PCFO, is found to be significant in all cases with the exception of bond market development index. In all five cases the financial openness index has a positive and statistically significant coefficient which argues that financial openness contributes to the development of banking sector, stock market and overall development of financial markets. Likewise trade openness is found to be positive and significant for all dependent variables. This could imply 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. The estimated coefficients for trade and financial openness for all dependent variables suggest that the openness indices are economically meaningful.

The control variables of institutional quality index and secondary school enrollment rate are mostly found to be significant however with differing magnitudes. Secondary school enrollment rate enters with a positive coefficient in three out of six cases, whereas institutional quality is once again found to be negatively significant in four out of six cases. The diagnostics are satisfactory for all dependent variables used. The absence of first order serial correlation is rejected and the Sargan test results cannot reject the over-identification restrictions.

Overall, our findings show that there is a significant link between financial openness and financial development when we index both measures using principal component analysis. The results also demonstrate that working with first score principal component indices, the link between financial openness and financial development becomes more comprehensible. We obtain better and economically more meaningful results using the first score principal component analysis in comparison to using equally weighted and coefficient of variation type indices. GDP growth and secondary school enrollment rate enter with positive and highly significant coefficients under first score principal component indices than under equally weighted or coefficient of variation type indices. However, one intricate observation is that with first score principal component indices we can no longer find a link between financial openness and bond market development.

Huang (2006) reports similar results to our initial estimations. He finds financial openness index constructed using the first principal components to be positive and significant for stock market, banking sector and financial development. Nevertheless, our estimations using the first score of the principal component analysis match well with the results obtained in the literature.

4.3.2 Results using a new methodology of principal components

Using the corresponding weights determined by the principal component analysis taking into account all components and their corresponding eigenvalues, we construct our indices taking the standardized individual measures and multiplying them with these corresponding weights. This method allows us to have all variables in a range of values and avoids any potential problem that could arise as a result of using different scales or units of measurement.

The results in Table 4 (d) indicate that the financial openness index is significant for all dependent variables. Trade openness is also found to be significant and positive for all cases. GDP growth is significant for all cases with an exception of the second banking sector index, PCABD1,whereas logarithm of GDP per capita is significant and positive for banking sector and stock market indices. First order serial autocorrelation tests are rejected for all cases, while the Sargan test of over-identification cannot reject the null hypothesis in all cases.

Our results show that using further components in our indexing strategy appears to offer similar findings in examination of the link between financial openness and financial development to using the first principal component indexing strategy. Due to the similarity of the results employing both types of principal component indices, it is difficult to identify one methodology as the ideal procedure in constructing index measures. Further examination of Tables 4 (c) and (d) shows that while first score indices give higher significances in terms of t-statistics, the new methodology provides better results in terms of magnitudes and stands to be more economically meaningful in terms of interpretations. As a result, we restrain from using other type of indices such as equally weighted and coefficient of variation for further results, and we report the following results using our most efficient methodology of principal components.

4.4 Adding the interaction term

In order to examine the effect of a simultaneous opening of both trade and financial markets on financial development, we estimate our Model (b) given in equation (2). The results for new methodology of principal components are reported in Table 5.

The results from Table 5 demonstrate that the financial and trade openness index are positive and significant under all regressions. GDP growth is positive and significant for banking sector, stock market and financial development indices and logarithm of GDP per capita is positive and significant only for banking sector development indices. Institutional quality index is negatively significant for bond and stock market development indices and positively significant for financial development index, PCAFD4 whereas secondary school enrollment rate is positively significant for banking sector development index, and negatively significant for stock market and financial development indices. The interaction term between financial and trade openness is shown to be significant but negative in all cases. This finding is intriguing as it implies that a simultaneous opening of both markets leads to a decline in banking sector, stock, bond and overall financial development. This may be due to the effects of financial openness and trade openness being picked up separately by each variable and not particularly by the interaction term. Our results mostly agree with those found in the literature. Baltagi et. al (2007) find the interaction term to be statistically significant together with financial and trade openness when the stock market development indicator is taken to be the number of companies listed. Using banking sector development measures as the dependent variable, the authors find the interaction term to be significant and negative for private credit, liquid liabilities and domestic credit. Interestingly their results show that the coefficients of the financial openness terms are positive and large whereas the interaction term has negative coefficients. Law and Demetriades (2006) find the interaction term, trade openness and capital account openness measured by private capital flows to be statistically significant and positive when stock market capitalization, total share value traded and the number of companies listed are used as individual indicators of stock market development.

Our findings suggest that the use of index measures is beneficial in examining the link between financial openness and financial development. In order to check sensitivity of our results to potential outliers we proceed to robustness checks.

5. Robustness checks and further issues

We carry out a large number of robustness checks in order to examine sensitivity of our results to alternative specifications and methods. Here, we only report a subset of these robustness checks. A further issue that complicates our findings is also considered in this section. Below we discuss the results when the issue of endogeneity in our sample is taken under examination. Breaking the data set into developing and advanced countries we investigate whether our results hold when only developing countries are taken into consideration.

5.1 Robustness checks

The first set of robustness checks involves adjusting variables by their respective means. Dividing each individual variable in index measures by their means we can construct new indices for financial openness, financial development and institutional quality. Adjusting variables by their means, we can obtain principal component indices employing the new methodology suggested in section 3. However, due to the structure used by principal component analysis the mean adjusted indices depict the same components as the non-mean adjusted original ones. Adjusting the variables by their respective means before using the principal components strategy does not alter the eigenvectors and eigenvalues used in construction of principal components. The results (not reported here)[62] match well with our previous findings, however, financial openness index enters with a significantly negative coefficient for banking sector and bond market development indices. For these three dependent variables we also find GDP growth and secondary school enrollment rate to have negative coefficients. For stock market and financial development indices we observe similar results to those given in Table 4 (d). The diagnostics for the Arellano-Bond serial autocorrelation tests depict disappointing results for the first two dependent variables which help us confide in our initial estimations using principal components and standardized variables in comparison to mean adjusted ones.[63]

The second test of robustness checks concentrates on the number of observations used in our analysis. Due to the data availability, some indices include a larger number of variables in comparison to others. Using financial development indices as dependent variables, we would like to examine the results when the number of observations for each dependent variable used in our estimations is equalized. By doing so, we aim to minimize the bias that may result among different dependent variables as a result of problems of missing observations. Table 6 depicts the results for this case. The results are similar to those found in Table 4 (d). When the number of observations for each regression is equalized only minor changes take place according to the use of different dependent variables. Some control variables such as secondary school enrollment rate and institutional quality index alter signs in Table 6.

[62] Please refer to the Supplementary Appendix for the results of the mean adjusted indices.

[63] Checking the robustness of equally weighted, coefficient of variation type and first score principal component type indices we find that the results are similar to the ones reported in Table 4. Similarly exclusion of institutional quality and secondary school enrollment rates from the regressions using these three index measures gives robust results. The exclusion of secondary school enrollment rate leads the trade openness term to take on a negative coefficient so we believe that this variable is of vital importance to our regressions. We can thereby confirm that our other index measures are robust to different estimation techniques.

Following up on robustness checks, we also seek to examine whether the exclusion of control variables of secondary school enrollment rate and institutional quality index make a difference to our proposed model. The exclusion of institutional quality index from our regressions whilst using the principal components type indices of financial openness and financial development does not affect our initial findings. Similarly the estimations with the exception of the secondary school enrollment rate show that trade openness loses significance for some dependent variables and GDP growth and institutional quality index become more significant with a negative coefficient for other 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 is enough to make our findings less economically meaningful. 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.[64]

Further tests regarding the structure of the variables have also been taken into account. For brevity of the discussion these results are not reported here. Treating all 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 results. Lastly we examine the effects of treating openness variables as endogenous. The results show large similarities to the ones reported on Table 4 (d). We thereby confirm that the assumption of treating the right hand side regressors as exogenous variables is not a restrictive one in our case.[65]

Another important issue considered is the time series versus cross sectional effects that influence our model. 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 try a higher lag model to observe whether our results are sensitive to different lag structures. Table 7 depicts the results when three lags of the dependent variable are used as right hand side regressors and three lags of the variables other than the dependent variable are used as instruments. The results show that adding lags does not change our main findings. With further lags being used both as right hand side regressors and as instruments we find that trade openness becomes insignificant for banking sector development index, PCABD, and negatively significant for bond market development index. The dependent variables of development indices show high time series persistence. GDP growth, logarithm of GDP per capita, institutional quality and secondary school enrollment rate alter signs for some dependent variables. Nevertheless, our results show improvement in diagnostics with Arellano-Bond serial autocorrelation tests. Using other lag specifications and allowing for dependent variables to be used as instruments does not change our main findings. We have restrained from using dependent variables as instruments in our main analysis due to their unsuccessful diagnostics in terms of Sargan tests in comparison to the methods shown in this paper. We have experimented that using other variables as instruments gives higher significances and better diagnostic results than using dependent variables as instruments. However, our robustness checks

[64] The table of results for the exclusion of institutional quality index and secondary school enrollment rate are not reported in this paper due to space limitations. The results are available in the Supplementary Appendix.
[65] The results for all variables being treated as predetermined and endogenous can be found in the Supplementary Appendix.

with further lags do not modify our results. Our analysis with higher lags demonstrates that the qualitative nature of our results is robust to alternative specifications and estimation methods.

We lastly explore how our benchmark results change when we consider not only time series effects but also cross sectional effects in our model. In order to observe the changes we add time series dummies and a country-specific time trend to account for differences across countries. The results are given in Table 8. We do not report the entire set of results for all time dummies from 1996 to 2007. Due to collinearity dummies for 1996 and 1997 are dropped. The results show that trade openness is only significant for stock and bond market development when time dummies and a trend are included in the model to account for cross sectional and time series dimensions. Logarithm of GDP per capita enters with negative signs in all cases. The trend has a positive and significant coefficient for all dependent variables and the time dummy for the year 1998 is positive and significant for four cases out of six. This implies that both cross-sectional and time series effects have high influences on our model. By adding a trend we account for the differences across countries in our sample. Examination of the time dummies not reported here[66] shows that these dummies are negatively significant for banking sector development indices whereas for stock and bond market, and overall financial development indices some time dummies are found to be negatively and some positively significant. The diagnostics are better when time dummies and a trend are included in our estimation process. On the other hand adding more lags with time dummies gives similar results but further improves the Arellano-Bond serial correlation and Sargan test results. By this means we confirm that our benchmark results are robust to alternative estimation methods. Adding lags and time dummies to incorporate time series effects and a trend variable to account for cross-sectional variation does not change the qualitative nature of our results.

On a final note we examine the results when the most frequently used individual measures of financial openness and financial development are regressed against index measures. Although it is not reported here[67] the findings convey mixed results for the relationship between financial openness and financial development. Using individual measures as dependent variables for financial development, or using individual variables as measures of financial openness we cannot find the clear link that we observe between financial openness and financial development whilst using index measures. The results clearly demonstrate that depending on the variables chosen, the relationship between financial openness and financial development alters. This finding, once again, strengthens our argument that using index measures we can evidently find a positive link between financial openness and financial development.

5.2 Further issues

As a last robustness check we examine the endogeneity problem that is existent in our model. As previously explained, the use of developing and advanced countries together in our benchmark analysis can create a drawback to our estimated model. Even though large number of observations in a joint sample brings 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 our joint data set. In order to

[66] Please refer to the Supplementary Appendix for the full table with time series dummies and a linear trend, time series dummies and higher lags with time series dummies and a linear trend.
[67] The results using individual measures can be found in the Supplementary Appendix.

avoid complications and to clarify the issue regarding the endogeneity problem we split our data set into developing and advanced countries[68] and examine the results when the developing country sample is used in estimations.

The developing country sample includes 31 countries over the same twelve year period. Our results using the same estimation methodology are reported in Table 9. The results show that financial openness is positive and significant for all dependent variables used. The results are similar to those in Table 4 (d) in terms of sign and significance for most variables; however, some variables such as trade openness, GDP growth and secondary school enrollment are different in magnitudes. The diagnostics given in Table 9 satisfy both Arellano –Bond serial correlation tests and the Sargan test of over-identification. The results, overall, confirm that we do not have an endogeneity 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 of the importance of opening up financial markets in order to develop banking sector, bond and stock markets in developing countries. We hereby reveal that financial openness does influence financial development in both developing and advanced countries and the link between these two is more likely to affect growth and welfare of these countries. The relationship examined here is important and should not be disregarded in an analysis of welfare and growth differences across countries. Having shown that the discrepancies among countries in terms of financial development might arise as a result of not fully opening up financially we leave the analysis of financial openness, economic growth and welfare to another study.

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

6. Concluding remarks

Even though the link between financial liberalization and economic growth has been widely examined, the relationship between financial liberalization and financial development has yet to be thoroughly discussed. Our main goal in this paper was to construct comprehensive indicators for financial openness and financial development. By addressing the measurement problem through the use of index measures we were able to thoroughly study this link.

Given the goal of using broad indicators for both financial openness and financial development through the aid of aggregate indices in a large panel data set containing both developing and advanced countries we studied the relationship between financial openness and financial development to the best of our knowledge. Our results using aggregate indices with equal weights, coefficient of variation and two different principal component type methodologies show that the relationship between financial openness and financial development exists and it is more significant than what the literature has previously shown. Further examination of our benchmark Arellano-Bond GMM results depict that the principal component indices using all components provide higher significances and economically more meaningful interpretations. In all estimations, independent of the development indices chosen, financial openness is always found to be a positive and significant factor influencing financial development. The addition of an interaction term, which is proposed to be an influential factor in determining whether the simultaneous opening of financial and goods markets have further effects on financial development, brings intriguing results. Our findings show that the interaction term is negatively significant implying that a simultaneous opening of financial and goods markets may not be fully beneficial on financial development.

Additional robustness checks demonstrate that financial openness has a positive effect on financial development independent from the lag structure chosen, and time dummies and trends used. The positive influence of financial openness carries out even when the sample size is reduced to developing countries. By breaking the sample into developing and advanced countries and by examining the results from the developing country sample we can confirm that the link between financial openness and financial development exists and this link is likely to be an influential factor in bringing about enhancements to economic growth and welfare across countries. Even though our findings mostly report negatively significant results for institutional quality, secondary school enrollment rate and GDP growth, we believe that these variables are the most probable causes for the discrepancies across countries in terms of development following financial liberalization.

On a last note, we have shown that using index measures with a large country sample and a broad selection of control variables, 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. By this means, we will be able to clearly examine the link between financial openness and financial development, as well as economic growth and welfare through a sound model that has the foundations to match macroeconomic theory with the results of estimations that stem from the use of comprehensive financial indicators as reported here.

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APPENDIX

Table 1: Summary of the variables used in the analysis

Variable	Obs.	Mean	Std. Dev.	Min	Max
Financial Openness Indicators					
Market capitalization of listed Companies	731	72.34478	70.24649	1.893907	561.1667
Foreign direct investment to GDP	653	13.19179	71.82348	-10.30521	1095.277
Listed domestic companies	731	25.58524	35.09791	0.44351	216.8098
International debt issues to GDP	719	19.90163	24.88576	0	210.6782
Portfolio investment flows to GDP	699	0.99554	19.38728	-24.78496	311.8403
Financial Development Indicators					
Banking Sector Development					
Liquid Liabilities to GDP	687	70.81914	51.8645	12.85222	393.6903
Private credit by domestic money banks and other financial institutions to GDP	708	71.22753	49.47556	4.7678	202.4169
Deposit money bank assets to central bank and deposit money bank assets ratio	663	91.46819	11.49604	22.97533	99.99999
Total bank assets to GDP	642	82.39304	47.92993	12.41812	257.47
Deposit money bank assets to central bank assets ratio	642	1957728	3480649	32.57632	6672430
Domestic credit provided by the banking Sector	719	91.07568	60.65812	-72.99422	313.4882
Bond Market Development					
Private bond market capitalization to GDP	504	23.96339	26.85921	0	148.9159
Public bond market capitalization to GDP	504	35.09477	23.52496	0.54743	159.9066
Stock Market Development					
Stock market capitalization to GDP	730	68.2403	66.00559	2.08703	500.5284
Stock market turnover ratio	731	58.7599	66.56872	0.13829	622.4248
Stock market total value traded to GDP	730	46.49077	65.76845	0.07947	443.5691
Control Variables					
Trade Openness	711	83.77158	62.47997	14.93284	462.4626
GDP growth	727	3.826403	3.079174	-13.12672	18.28661

Logarithm of GDP per capita	732	8.663568	1.432136	5.692045	10.93648
Equally weighted institutional quality index	732	0.6341623	0.9484365	-1.318051	2.163274
Coefficient of variation type institutional quality Index	732	0.6283253	0.9612731	-1.339431	2.174959
First component type institutional quality index	732	-3.59e-09	1.958547	-4.048484	3.159742
Principal components type institutional quality Index	732	-2.08e-09	1.878269	-3.885972	3.030562
Secondary school gross enrollment rate	596	88.66284	26.89146	19.23193	161.6618
EINTTERM	607	3483.256	9660.145	24.38186	111752.2
CINTTERM	607	1358.327	8393.893	-1102.678	119561.3
PCINTTERM	607	48.00054	424.5129	-114.2138	5936.962
PCAINTTERM	607	34.87337	223.3835	-61.08068	2610.134
Aggregate Financial Openness Indicators					
EFO	625	28.0098	31.86907	0.7654639	355.3975
CFO	625	8.241917	28.89686	-11.68674	435.9293
PCFO	625	-1.15e-09	1.57587	-1.210495	19.15864
PCAFO	625	0.045734	0.8730596	-0.7020968	8.327331
Aggregate Financial Development Indicators					
EBD	626	334688.4	58745627	21.86888	1.11e+08
EBD1	626	79.17437	36.76283	18.82029	218.416
EBMD	504	29.52908	20.68183	0.94297	99.34933
ESMD	730	57.85477	53.00298	2.77598	340.9882
EFD	441	258737.3	3816446	23.5662	6.07e+07
EFD4	441	70.31392	32.58671	15.96684	170.8896
CBD	626	1718606	3.02e+07	32.88932	5.71e+08
CBD1	626	77.35924	40.31263	17.02597	232.3751
CBMD	504	28.12919	21.49721	0.7057942	103.3851
CSMD	730	56.45435	54.01583	2.433007	341.6929
CFD	441	1939978	2.86e+07	59.27051	4.55e+08
CFD4	441	65.96435	35.55365	10.03436	191.8877
PCBD	626	-2.23e-09	1.908784	-3.814938	6.996721
PCBD1	626	-1.11e-09	1.907513	-3.825652	6.998653
PCBMD	504	-9.38e-10	1.159784	-1.629052	4.141945
PCSMD	730	5.87e-10	1.40254	-1.408052	7.832292
PCFD	441	-1.26e-09	2.256198	-4.285069	5.926059

PCFD4	441	-1.26e-09	2.254396	-4.29558	5.926441
PCABD	626	-0.0640462	1.103597	-3.124777	3.57485
PCABD1	626	-0.0768389	1.303059	-3.447167	4.338953
PCABMD	504	-1.58e-09	0.8237887	-0.975333	3.208189
PCASMD	730	0.0006213	0.9618987	-0.9404376	5.754432
PCAFD	441	0.2059946	1.015499	-2.031706	3.105923
PCAFD4	441	0.2194182	1.141676	-1.944969	3.345601

Notes: The data above is for the period of 1996 – 2007. The countries used in this analysis are as follows: Argentina, Australia, Austria, Belgium, Bangladesh, Brazil, Barbados, Botswana, Canada, Switzerland, Chile, China, Cote d'Ivoire, Colombia, Cyprus, Germany, Denmark, Egypt, Spain, Finland, France, U.K., Ghana, Greece, Hong Kong, Hungary, Indonesia, India, Israel, Italy, Jamaica, Jordan, Japan, Kenya, Republic of Korea, Sri Lanka, Luxembourg, Morocco, Mexico, Mauritius, Malaysia, Nigeria, Netherlands, Norway, New Zealand, Pakistan, Peru, Philippines, Poland, Portugal, Russian Federation, Saudi Arabia, Singapore, Sweden, Thailand, Trinidad and Tobago, Tunisia, Turkey, U.S., Venezuela, South Africa. EFO = Equally weighted financial openness index, EBD = Equally weighted banking development index, EBMD = Equally weighted bond market development index, ESMD = Equally weighted stock market development index, EFD = Equally weighted financial development index, EFD4 = Equally weighted financial development index that excludes the deposit money bank assets to central bank assets ratio, EINTTERM = Equally weighted interaction term between financial and trade openness, CBD = Coefficient of variation type banking sector development index, CBD1 = Coefficient of variation type banking sector development index that excludes the deposit money banks to central bank assets ratio, CBMD = Coefficient of variation type bond market development index, CSMD = Coefficient of variation type stock market development index, CFD = Coefficient of variation type financial development index, CFD4 = Coefficient of variation type financial development index that excludes the deposit money bank assets to central bank assets ratio, CINTTERM = Coefficient of variation type interaction term between financial and trade openness, PCFO = First component financial openness index, PCBD = First component banking sector development index, PCBD1 = First component banking sector development index that excludes the deposit money banks to central bank assets ratio, PCBMD = First component bond market development index, PCSMD = First component stock market development index, PCFD = First component financial development index, PCFD4 = First component financial development index that excludes the deposit money bank assets to central bank assets ratio, PCINTTERM = First component interaction term between financial and trade openness, PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCAFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio, PCAINTTERM = Principal components interaction term between financial and trade openness.

Table 2 (a): Pairwise correlations between equally weighted indices and control variables

Variables	EFO	EBD	EBD1	EBMD	ESMD	EFD	EFD4	INSQUA	TO	GDPGRO	LOGGDP	SECSC~	EINT~
EFO	1.0000												
EBD	0.0860*	1.0000											
EBD1	0.5575*	-0.0660	1.0000										
EBMD	0.2173*	-0.0741	0.6164*	1.0000									
ESMD	0.4221*	-0.0327	0.5725*	0.2768*	1.0000								
EFD	0.0638	1.0000*	-0.0897	-0.0741	-0.0561	1.0000							
EFD4	0.6949*	-0.0889*	0.9030*	0.6818*	0.8107*	-0.0889	1.0000						
INSQUA	0.4766*	-0.0539	0.6960*	0.5228*	0.4723*	-0.0842	0.6455*	1.0000					
TO	0.6092*	-0.0300	0.2065*	0.0446	0.2560*	-0.0281	0.2173*	0.3064*	1.0000				
GDPGRO	0.0129	0.0868*	-0.2056*	-0.2051*	0.0296	0.1071*	-0.1256*	-0.1517*	0.0861*	1.0000			
LOGGDP~	0.4469*	-0.0264	0.5975*	0.6126*	0.4350*	-0.0596	0.6184*	0.8048*	0.2388*	-0.1684*	1.0000		
SECSC~	0.2488*	0.0177	0.4804*	0.4464*	0.3127*	-0.0010	0.3118*	0.7705*	0.0599	-0.2253*	0.6836*	1.0000	
EINTTERM	0.9108*	0.0365	0.2737*	0.0014	0.2789*	0.0203	0.3100*	0.2841*	0.7588*	0.0752*	0.2741*	0.0595	1.0000

*5% significance levels of correlation coefficients are starred. LOGGDP~ : Logarithm of GDP per capita, SECSC~: Secondary school enrollment rate, EFO = Equally weighted financial openness index, EBD = Equally weighted banking sector development index, EBD1 = Equally weighted banking sector development index excluding deposit money bank assets to central bank assets ratio, EBMD = Equally weighted bond market development index, ESMD = Equally weighted stock market development index, EFD = Equally weighted financial development index, EFD4 = Equally weighted financial development index excluding the deposit money bank assets to central bank assets ratio, EINTTERM = Equally weighted interaction term between financial and trade openness, TO = Trade openness variable, INSQUA = Equally weighted institutional quality index.

Table 2 (b): Pairwise correlations between coefficient of variation type indices and control variables

Variables	CFO	CBD	CBD1	CBMD	CSMD	CFD	CFD4	CINSQUA	TO	GDPGRO	LOGGDP	SECSC~	CINTTERM
CFO	1.0000												
CBD	0.0247	1.0000											
CBD1	0.2656*	-0.0680	1.0000										
CBMD	0.2172*	-0.0689	0.6250*	1.0000									
CSMD	0.0480*	-0.0343	0.5651*	0.3239*	1.0000								
CFD	0.0037	1.0000*	-0.0913*	-0.0689	-0.0577	1.0000							
CFD4	0.4875*	-0.0846*	0.8218*	0.6491*	0.8924*	-0.0846*	1.0000						
CINSQUA	0.2007*	-0.0546	0.6900*	0.5518*	0.4613*	-0.0847	0.6056*	1.0000					
TO	0.3681*	-0.0300	0.2075	0.0584	0.2289*	-0.0281	0.1951*	0.3026*	1.0000				
GDPGRO	0.0206	0.0868*	-0.2074*	-0.2082*	0.0278	0.1071*	-0.0832*	-0.1510*	0.0861*	1.0000			
LOGGDP~	0.2095*	-0.0264	0.5950*	0.6289*	0.4306*	-0.0596	0.5777*	0.8041*	0.2388*	-0.1684*	1.0000		
SECSC~	0.0793*	0.0177	0.4695*	0.4481*	0.3076*	-0.0010	0.2740*	0.7693*	0.0599	-0.2253*	0.6836*	1.0000	
CINTTERM	0.9894*	0.0181	0.1517	0.0345	0.0278	0.0073	0.2567*	0.1637*	0.4097*	0.0368	0.1771*	0.0332	1.0000

*5% significance levels of correlation coefficients are starred. LOGGDP~ : Logarithm of GDP per capita, SECSC~: Secondary school enrollment rate, CFO = Coefficient of variation type financial openness index, CBD = Coefficient of variation type banking sector development index, CBD1 = Coefficient of variation type banking sector development index excluding deposit money bank assets to central bank assets ratio, CBMD = Coefficient of variation type bond market development index, CSMD = Coefficient of variation type stock market development index, CFD = Coefficient of variation type financial development index, CFD4 = Coefficient of variation type financial development index excluding the deposit money bank assets to central bank assets ratio, CINTTERM = Coefficient of variation type interaction term between financial and trade openness, TO = Trade openness variable, CINSQUA = Coefficient of variation type institutional quality index.

Table 2 (c): Pairwise correlations between first score principal components type indices and control variables

Variables	PCFO	PCBD	PCBD1	PCBMD	PCSMD	PCFD	PCFD4	PCINSQUA	TO	GDPGRO	LOGGDP	SECSC~	PCINT~
PCFO	1.0000												
PCBD	0.5097*	1.0000											
PCBD1	0.5097*	0.9997*	1.0000										
PCBMD	0.2982*	0.6018*	0.6013*	1.0000									
PCSMD	0.2460*	0.5774*	0.5776*	0.2682*	1.0000								
PCFD	0.6415*	0.9617*	0.9615*	0.6993*	0.6862*	1.0000							
PCFD4	0.6416*	0.9613*	0.9616*	0.6989*	0.6864*	0.9998*	1.0000						
PCINSQUA	0.3996*	0.7097*	0.7097*	0.5105*	0.4785*	0.6974*	0.6971*	1.0000					
TO	0.4904*	0.2195*	0.2191*	0.0406	0.2642*	0.2489*	0.2489*	0.3090*	1.0000				
GDPGRO	-0.0258	-0.1942*	-0.1924*	-0.2032*	0.0281	-0.1690*	-0.1671*	-0.1526*	0.0861*	1.0000			
LOGGDP~	0.3951*	0.5974*	0.5978*	0.6050*	0.4426*	0.6794*	0.6795*	0.8050*	0.2388*	-0.1684*	1.0000		
SECSC~	0.2242*	0.4973*	0.4989*	0.4436*	0.3135*	0.3769*	0.3778*	0.7703*	0.0599	-0.2253*	0.6836*	1.0000	
PCINTTERM	0.9552*	0.2580*	0.2580*	0.0576	0.1324*	0.3940*	0.3941*	0.2275*	0.4959*	0.0339	0.2395*	0.0634	1.0000

*5% significance levels of correlation coefficients are starred. LOGGDP~ : Logarithm of GDP per capita, SECSC~: Secondary school enrollment rate, PCFO = First score principal components type financial openness index, PCBD = First score principal components type banking sector development index, PCBD1 = First score principal components type banking sector development index excluding deposit money bank assets to central bank assets ratio, PCBMD = First score principal components type bond market development index, PCSMD = First score principal components type stock market development index, PCFD = First score principal components type financial development index, PCFD4 = First score principal components type financial development index excluding the deposit money bank assets to central bank assets ratio, PCINTTERM = First score principal components type interaction term between financial and trade openness, TO = Trade openness variable, PCINSQUA = First score principal components type institutional quality index.

Table 2 (d): Pairwise correlations between principal components (new methodology) type indices and control variables

Variables	PCAFO	PCABD	PCABD1	PCABMD	PCASMD	PCAFD	PCAFD4	PCAINSQUA	TO	GDPGRO	LOGGDP	SECSC~	PCAINTTERM
PCAFO	1.0000												
PCABD	0.5672*	1.0000											
PCABD1	0.5662*	0.9957*	1.0000										
PCABMD	0.2679*	0.6039*	0.6110*	1.0000									
PCASMD	0.2243*	0.4863*	0.4912*	0.3336*	1.0000								
PCAFD	0.6694*	0.9292*	0.9231*	0.6962*	0.6749*	1.0000							
PCAFD4	0.6347*	0.8827*	0.8912*	0.7783*	0.7054*	0.9798*	1.0000						
PCAINSQUA	0.5189*	0.7224*	0.7243*	0.5584*	0.3946*	0.6845*	0.6761*	1.0000					
TO	0.6209*	0.2129*	0.2162*	0.0668	0.1072*	0.2320*	0.2052*	0.3097*	1.0000				
GDPGRO	-0.0098	-0.1579*	-0.1712*	-0.2071*	0.0270	-0.1182*	-0.1370*	-0.1529*	0.0861*	1.0000			
LOGGDP~	0.4762*	0.5871*	0.5921*	0.6299*	0.3742*	0.6570*	0.6711*	0.8050*	0.2388*	-0.1684*	1.0000		
SECSC~	0.2917*	0.5354*	0.5271*	0.4419*	0.2792*	0.3676*	0.3644*	0.7701*	0.0599	-0.2253*	0.6836*	1.0000	
PCAINTTERM	0.9069*	0.2738*	0.2736*	0.0206	0.1285*	0.3048*	0.2784*	0.2862*	0.6922*	0.0613	0.2817*	0.0641	1.0000

*5% significance levels of correlation coefficients are starred. LOGGDP~ : Logarithm of GDP per capita, SECSC~: Secondary school enrollment rate, PCAFO = Principal components type financial openness index, PCABD = Principal components type banking sector development index, PCABD1 = Principal components type banking sector development index excluding deposit money bank assets to central bank assets ratio, PCABMD = Principal components type bond market development index, PCASMD = Principal components type stock market development index, PCAFD = Principal components type financial development index, PCAFD4 = Principal components type financial development index excluding the deposit money bank assets to central bank assets ratio, PCAINTTERM = Principal components type interaction term between financial and trade openness, TO = Trade openness variable, PCAINSQUA = Principal components type institutional quality index.

Table 3 (a): Summary of Principal Component Analysis for the Financial Openness Index

Variables	Eigenvectors				
	PC1	*PC2*	*PC3*	*PC4*	*PC5*
Market capitalization (% of GDP)	0.2828	0.6416	-0.2664	-0.6584	0.0619
FDI (% of GDP)	0.5806	-0.2532	0.2177	-0.1538	-0.7265
Number of listed companies	0.2656	0.6268	0.5141	0.5205	0.0377
International debt issues (% of GDP)	0.4695	-0.0112	-0.7310	0.4919	0.0560
Portfolio flows (% of GDP)	0.5403	-0.3622	0.2881	-0.1734	0.6811
Eigenvalues	2.48337	1.35377	0.638936	0.45766	0.0662666
Cumulative Proportions:	0.4967	0.7674	0.8952	0.9867	1.0000
Number of observations: 625					
Number of components: 5					
Weights for variables*:	0.220688	0.223927	0.415463	0.18251	0.200257
Weights for variables:**	0.271869	0.131552	0.294463	0.081838	0.258766

***Notes**: PC denotes the principal components of each individual variable. Weights for variables represent the weights used in constructing principal components (new methodology) type indices. * represents the weights for the entire sample while ** represents the weights for the developing country sample.*

Table 3 (b): Summary of Principal Component Analysis for the Banking Sector Development Index

Variables	Eigenvectors					
	PC1	*PC2*	*PC3*	*PC4*	*PC5*	*PC6*
Liquid liabilities (% of GDP)	0.4524	-0.0280	-0.1863	0.7825	0.2998	-0.2400
Private credit (% of GDP)	0.4871	0.0244	0.0384	-0.5171	0.0825	-0.6975
Deposit money bank~	0.2789	0.3251	0.8802	0.1222	-0.0345	0.1599
Total bank assets (% of GDP)	0.4890	-0.0550	-0.2089	0.0411	-0.8199	0.2006
Deposit money bank assets~	-0.0428	0.9422	-0.3317	-0.0189	-0.0056	-0.0019
Domestic credit (% of GDP)	0.4892	-0.0463	-0.1880	-0.3214	0.4794	0.6246
Eigenvalues	3.64346	1.02264	0.775641	0.342712	0.130448	0.0851036
Cumulative Proportions:	0.6072	0.7777	0.9070	0.9641	0.9858	1.0000
Number of observations: 626						
Number of components: 6						
Weights for variables*:	0.29367	0.267275	0.347055	0.24793	0.09049	0.265793
Weights for variables:**	0.330091	0.268812	0.132193	0.316745	0.200221	0.290658

***Notes**: PC denotes the principal components of each individual variable. Deposit money bank~: Deposit money bank assets to the sum of central bank assets and deposit money bank assets, Deposit money bank assets~: Deposit money bank assets to central bank assets ratio. Weights for variables represent the weights used in constructing principal components (new methodology) type indices. * represents the weights for the entire sample while ** represents the weights for the developing country sample.*

Table 3 (c): Summary of Principal Component Analysis for the Banking Sector Development Index excluding the deposit money bank assets to central bank assets ratio

Variables	Eigenvectors				
	PC1	*PC2*	*PC3*	*PC4*	*PC5*
Liquid liabilities (% of GDP)	0.4528	-0.1830	0.7837	0.2997	-0.2400
Private credit (% of GDP)	0.4875	0.0420	-0.5170	0.0826	-0.6975
Deposit money bank~	0.2803	0.9383	0.1194	-0.0350	0.1597
Total bank assets (% of GDP)	0.4892	-0.2163	0.0418	-0.8197	0.2008
Domestic credit (% of GDP)	0.4894	-0.1939	-0.3202	0.4799	0.6246
Eigenvalues	3.6386	0.802872	0.342941	0.130476	0.0851069
Cumulative Proportions:	0.7277	0.8883	0.9569	0.9830	1.0000
Number of observations: 626					
Number of components: 5					
Weights for variables*:	0.357615	0.316331	0.364641	0.306163	0.326203
Weights for variables:**	0.36642	0.341067	0.337296	0.326477	0.311329

***Notes**: PC denotes the principal components of each individual variable. Deposit money bank~: Deposit money bank assets to the sum of central bank assets and deposit money bank assets. Weights for variables represent the weights used in constructing principal components (new methodology) type indices. * represents the weights for the entire sample while ** represents the weights for the developing country sample.*

Table 3 (d): Summary of Principal Component Analysis for the Bond Market Development Index

Variables	Eigenvectors	
	PC1	*PC2*
Private bond market capitalization (% of GDP)	0.7071	0.7071
Public bond market capitalization (% of GDP)	0.7071	- 0.7071
Eigenvalues	1.3451	0.6549
Cumulative Proportions:	0.6726	1.0000
Number of observations: 504		
Number of components: 2		
Weights for variables*:	0.7071	0.24402
Weights for variables:**	0.707099	0.150402

***Notes**: PC denotes the principal components of each individual variable. Weights for variables represent the weights used in constructing principal components (new methodology) type indices.* represents the weights for the entire sample while ** represents the weights for the developing country sample.*

Table 3 (e): Summary of Principal Component Analysis for the Stock market development index

Variables	Eigenvectors		
	PC1	*PC2*	*PC3*
Stock market capitalization (% of GDP)	0.5412	-0.6568	0.5250
Stock market turnover ratio (in percentages)	0.4864	0.7538	0.4417
Stock market total value traded (% of GDP)	0.6859	-0.0163	-0.7275
Eigenvalues	1.96712	0.892612	0.140268
Cumulative Proportions:	0.6557	0.9532	1.0000
Number of observations: 730			
Number of components: 3			
Weights for variables*:	0.183993	0.563871	0.410884
Weights for variables:**	0.165746	0.550619	0.401326

***Notes**: PC denotes the principal components of each individual variable. Weights for variables represent the weights used in constructing principal components (new methodology) type indices. * represents the weights for the entire sample while ** represents the weights for the developing country sample.*

Table 3 (f): Summary of Principal Component Analysis for the Financial Development Index

Variables	Eigenvectors										
	PC1	*PC2*	*PC3*	*PC4*	*PC5*	*PC6*	*PC7*	*PC8*	*PC9*	*PC10*	*PC11*
Liquid liabilities (% of GDP)	0.3718	-0.2705	-0.0363	0.0112	-0.2036	0.3889	0.0114	0.3803	-0.0615	0.5545	-0.3721
Private credit (% of GDP)	0.4101	0.0209	0.1146	-0.0949	0.1025	0.0289	-0.2748	-0.4908	-0.0907	-0.3157	-0.6112
Deposit money bank~	0.2234	0.0038	0.4272	-0.0595	0.7073	0.1635	0.4636	-0.0007	-0.0257	0.0912	0.1145
Total bank assets (% of GDP)	0.3869	-0.2454	-0.0003	-0.0335	-0.0330	0.3030	-0.1948	0.3405	0.3191	-0.5761	0.3295
Deposit money bank assets~	-0.0445	0.0402	0.5679	0.7864	-0.2007	0.0516	-0.1076	-0.0134	-0.0043	-0.0288	-0.0008
Domestic credit (% of GDP)	0.4090	-0.1744	-0.0610	0.0255	-0.1109	-0.0142	-0.1836	-0.4797	-0.2899	0.3012	0.5890
Private bond market~	0.3023	0.0789	-0.0799	0.1648	0.3535	-0.6518	-0.3842	0.3353	0.1465	0.1922	-0.0241
Public bond market~	0.2015	-0.3801	-0.3985	0.3935	-0.0630	-0.2891	0.5912	-0.1056	0.0211	-0.1941	-0.1218
Stock market~	0.2908	0.2667	0.3129	-0.2727	-0.4441	-0.2589	0.3000	-0.1144	0.5355	0.1305	0.0286
Stock market turnover~	0.1222	0.5648	-0.4614	0.3325	0.1683	0.3840	-0.0008	-0.1700	0.3486	0.1248	0.0302
Stock total value traded~	0.3054	0.5415	-0.0285	-0.0159	-0.1989	-0.0600	0.1977	0.3205	-0.6093	-0.2320	0.0485
Eigenvalues	5.09043	1.35958	1.1467	0.934689	0.775953	0.672766	0.584361	0.16068	0.127049	0.10182	0.04597
Cumulative Proportions:	0.4628	0.5864	0.6906	0.7756	0.8461	0.9073	0.9604	0.9750	0.9866	0.9958	1.0000
Num. of obs.: 441											
Num. of components: 11											
Weights for variables*:	0.15424	0.176953	0.2288670	0.1563950	0.093165	0.1399730	0.128250	0.04383	0.151599	0.14465	0.19243
Weights for variables:**	0.21694	0.163011	0.074862	0.193194	0.083358	0.176872	0.181118	0.13584	0.14052	0.15856	0.18567

***Notes**: PC denotes the principal components of each individual variable. Deposit money bank~: Deposit money bank assets to the sum of central bank assets and deposit money bank assets, Deposit money bank assets~: Deposit money bank assets to central bank assets ratio, Private bond market~: Private bond market capitalization (% of GDP), Public bond market~: Public bond market capitalization (% of GDP), Stock market~: Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock total value traded~: Stock market total value traded (% of GDP). Weights for variables represent the weights used in constructing principal components (new methodology) type indices. * represents the weights for the entire sample while ** represents the weights for the developing country sample.*

Table 3 (g): Summary of Principal Component Analysis for the Financial Development Index excluding deposit money bank assets to central bank assets ratio

Variables	Eigenvectors									
	PC1	*PC2*	*PC3*	*PC4*	*PC5*	*PC6*	*PC7*	*PC8*	*PC9*	*PC10*
Liquid liabilities (% of GDP)	0.3720	-0.2704	0.0570	-0.2052	-0.3816	0.0306	0.3840	-0.0594	0.5541	-0.3722
Private credit (% of GDP)	0.4104	0.0189	-0.1464	0.0798	-0.0399	-0.2824	-0.4926	-0.0913	-0.3125	-0.6110
Deposit money bank~	0.2246	-0.0059	-0.4402	0.7114	-0.1708	0.4460	-0.0019	-0.0258	0.0882	0.1144
Total bank assets (% of GDP)	0.3870	-0.2453	-0.0032	-0.0503	-0.3072	-0.1891	0.3383	0.3163	-0.5781	0.3297
Domestic credit (% of GDP)	0.4092	-0.1736	0.0789	-0.1110	0.0140	-0.1785	-0.4777	-0.2876	0.3067	0.5889
Private bond market~	0.3026	0.0792	0.1332	0.3788	0.6392	-0.4006	0.3369	0.1469	0.1904	-0.0242
Public bond market~	0.2013	-0.3744	0.5442	0.0120	0.3120	0.6014	-0.1066	0.0204	-0.1935	-0.1217
Stock market~	0.2916	0.2609	-0.3952	-0.4584	0.2710	0.2995	-0.1135	0.5361	0.1278	0.0285
Stock market turnover~	0.1218	0.5728	0.5523	0.1992	-0.3808	0.0146	-0.1680	0.3496	0.1258	0.0302
Stock total value traded~	0.3058	0.5418	0.0157	-0.1927	0.0687	-0.2016	0.3182	-0.6108	-0.2312	0.0485
Eigenvalues	5.0823	1.35905	1.07573	0.784147	0.673569	0.588792	0.160829	0.12706	0.102543	0.04597
Cumulative Proportions:	0.5082	0.6441	0.7517	0.8301	0.8975	0.9564	0.9724	0.9851	0.9954	1.0000
Num. of obs.: 441										
Num. of components: 10										
Weights for variables*:	0.12784	0.167244	0.137605	0.13228	0.169106	0.23718	0.163332	0.14751	0.193161	0.22733
Weights for variables:**	0.18507	0.191976	0.183899	0.16247	0.19464	0.161879	0.155323	0.20263	0.12997	0.23771

***Notes**: PC denotes the principal components of each individual variable. Deposit money bank~: Deposit money bank assets to the sum of central bank assets and deposit money bank assets, Private bond market~: Private bond market capitalization (% of GDP), Public bond market~: Public bond market capitalization (% of GDP), Stock market~: Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock total value traded~: Stock market total value traded (% of GDP). Weights for variables represent the weights used in constructing principal components (new methodology) type indices. * represents the weights for the entire sample while ** represents the weights for the developing country sample.*

Table 3 (h): Summary of Principal Component Analysis for the Institutional Quality Index

Variables	Eigenvectors			
	PC1	*PC2*	*PC3*	*PC4*
Government effectiveness	0.5021	-0.2055	-0.7095	0.4498
Regulatory quality	0.4935	0.8576	0.1347	0.0533
Rule of law	0.5003	-0.4158	0.6839	0.3303
Control of corruption	0.5041	-0.2223	-0.1039	-0.8281
Eigenvalues	3.8359	0.0882176	0.0458957	0.0458957
Cumulative Proportions:	0.9590	0.9810	0.9925	1.0000
Number of observations: 732				
Number of components: 4				
Weights for variables*:	0.4722	0.494113	0.480928	0.471117
Weights for variables:**	0.432668	0.490725	0.43863	0.424311

***Notes**: PC denotes the principal components of each individual variable. Weights for variables represent the weights used in constructing principal components (new methodology) type indices. * represents the weights for the entire sample while ** represents the weights for the developing country sample.*

Table 4 (a): Equally weighted financial development and financial openness indices

	Dependent Variables					
	ΔEBD_t	$\Delta EBD1_t$	$\Delta EBMD_t$	$\Delta ESMD_t$	ΔEFD_t	$\Delta EFD4_t$
ΔDependent variable$_{t-1}$	0.2845***	0.7562***	0.90998***	0.44510***	0.28298***	0.45164***
	(.)	(217.40)	(44.50)	(369.80)	(3223.17)	(51.07)
ΔEFO_t	-93.036***	0.2246***	0.03258***	0.62337***	-111.80***	0.546318***
	(-37.38)	(67.38)	(5.94)	(58.45)	(-30.14)	(16.06)
ΔTO_t	-242.69***	0.0144***	0.01432***	0.40555***	-138.53***	0.19058***
	(-96.70)	(4.59)	(2.94)	(65.72)	(-37.84)	(10.18)
ΔGDP Growth$_t$	-345.43***	-0.2016***	-0.36048***	1.70748***	-133.29***	0.51149***
	(-61.46)	(-18.12)	(-81.96)	(55.36)	(-9.33)	(10.10)
ΔLog GDP per capita$_t$	43960.9***	4.0250***	1.76236	23.0330***	20470.5***	0.6941521
	(140.12)	(7.51)	(1.47)	(10.51)	(69.79)	(0.36)
ΔInstitutional Quality	-20769***	-2.1281***	-3.51560***	-26.3674***	-12041.7***	2.309163
	(-219.51)	(-6.20)	(-10.30)	(-18.27)	(-141.78)	(0.74)
ΔSecondary School Enrollment	-361.04***	-0.0187***	0.00931***	-0.22233***	-217.422***	-0.037890***
	(-200.49)	(-4.76)	(2.71)	(-12.02)	(-45.95)	(-4.49)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -0.88 Pr > z = 0.3783**	**z = -1.82 Pr > z = 0.0690**	**z = -2.14 Pr > z = 0.0320**	**z = -2.19 Pr > z = 0.0283**	**z = -0.94 Pr > z = 0.3486**	**z = -2.17 Pr > z = 0.0300**
Arellano – Bond test for AR(2) in first differences:	**z = -1.00 Pr > z = 0.3173**	**z = -1.47 Pr > z = 0.1413**	**z = -0.93 Pr > z = 0.3526**	**z = -0.98 Pr > z = 0.3275**	**z = -0.99 Pr > z = 0.3209**	**z = -0.92 Pr > z = 0.3579**
Sargan test:	**$Chi^2(54)$ = 48.14 Prob > chi^2 = 0.6987**	**$Chi^2(54)$ = 42.51 Prob > chi^2 = 0.8709**	**$Chi^2(54)$ = 38.92 Prob > chi^2 = 0.9392**	**$Chi^2(54)$ = 51.82 Prob > chi^2 = 0.5588**	**$Chi^2(54)$ = 29.73 Prob > chi^2 = 0.9971**	**$Chi^2(54)$ = 29.63 Prob > chi^2 = 0.9972**

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. (The estimations use the Stata xtabond command). The dependent variable is an equally weighted development index. The variables are defined as follows: EFO = Equally weighted financial openness index, EBD = Equally weighted banking sector development index, EBD1 = Equally weighted*

banking sector development index that excludes the deposit money banks to central bank assets ratio, EBMD = Equally weighted bond market development index, ESMD = Equally weighted stock market development index, EFD = Equally weighted financial development index, EFD4 = Equally weighted financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the equally weighted indexing procedure. Figures in brackets are t-statistics and the stars represent the significant t statistics for 1%, 5%, and 10% confidence levels respectively.

Table 4 (b): Coefficient of variation type financial development and financial openness indices

	Dependent Variables					
	ΔCBD_t	$\Delta CBD1_t$	$\Delta CBMD_t$	$\Delta CSMD_t$	ΔCFD_t	$\Delta CFD4_t$
ΔDependent variable$_{t-1}$	0.28745***	0.80089***	0.89815***	0.43401***	0.28804***	0.36762***
	(.)	(128.23)	(64.59)	(416.73)	(5485.95)	(33.80)
ΔCFO_t	-155.89***	0.09445***	-0.01544**	0.13981***	293.114***	0.95850***
	(-28.46)	(24.13)	(-2.36)	(14.19)	(23.20)	(34.59)
ΔTO_t	-1405.6***	0.07587***	0.03514***	0.70369***	-1410.37***	0.46417***
	(-215.79)	(13.16)	(6.25)	(83.77)	(-138.69)	(24.83)
ΔGDP Growth$_t$	-1712.1***	-0.24926***	-0.34054***	1.75160***	-1127.96***	0.77060***
	(-73.53)	(-13.71)	(-68.66)	(48.57)	(-26.13)	(8.29)
ΔLog GDP per capita$_t$	208992***	12.2716***	2.79637**	35.8328***	132876***	8.71828***
	(327.17)	(13.21)	(2.21)	(17.16)	(125.59)	(4.64)
ΔC Institutional Quality	-111119***	-4.6047***	-4.66715***	-33.5282***	-96394.6***	-13.1181***
	(-149.64)	(-13.35)	(-19.18)	(-41.08)	(-166.34)	(-3.50)
ΔSecondary School Enrollment	-1820.87***	-0.0530***	-0.00227	-0.264363***	-1693.067***	-0.143120***
	(-323.71)	(-5.88)	(-1.09)	(-15.80)	(-118.65)	(-8.18)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -0.88 Pr > z = 0.3798**	**z = -1.86 Pr > z =0.0625**	**z = -2.47 Pr > z = 0.0136**	**z = -2.22 Pr > z =0.0266**	**z = -0.91 Pr > z=0.3625**	**z = -2.13 Pr > z=0.0333**
Arellano – Bond test for AR(2) in first differences:	**z = -1.00 Pr > z = 0.3176**	**z = -1.30 Pr > z =0.1928**	**z = -1.26 Pr > z =0.2088**	**z = -0.84 Pr > z=0.4033**	**z = -0.99 Pr > z=0.3204**	**z = -1.20 Pr > z=0.2304**
Sargan test:	**$Chi^2(54)$ = 46.60 Prob > chi^2 = 0.7524**	**$Chi^2(54)$ = 42.25 Prob > chi^2 = 0.8768**	**$Chi^2(54)$ = 37.02 Prob > chi^2 = 0.9624**	**$Chi^2(54)$ = 49.98 Prob > chi^2 = 0.6300**	**$Chi^2(54)$ = 33.89 Prob > chi^2 = 0.9854**	**$Chi^2(54)$ = 31.03 Prob > chi^2 = 0.9949**

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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed using the coefficient of variation methodology. The variables are defined as follows: CFO = Coefficient of variation type financial openness index, CBD = Coefficient of variation type banking sector development index, CBD1 = Coefficient of variation type*

banking sector development index that excludes the deposit money banks to central bank assets ratio, CBMD = Coefficient of variation type bond market development index, CSMD = Coefficient of variation type stock market development index, CFD = Coefficient of variation type financial development index, CFD4 = Coefficient of variation type financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the coefficient of variation methodology. Figures in brackets are t-statistics and the stars represent the significant t-statistics for 1%, 5%, and 10% confidence levels respectively.

Table 4 (c): Principal component (first score) type financial development and financial openness indices

	Dependent Variables					
	$\Delta PCBD_t$	$\Delta PCBD1_t$	$\Delta PCBMD_t$	$\Delta PCSMD_t$	$\Delta PCFD_t$	$\Delta PCFD4_t$
ΔDependent variable$_{t-1}$	0.84142***	0.84160***	0.92066***	0.42830***	0.667014***	0.667159***
	(182.19)	(182.68)	(62.26)	(177.54)	(29.32)	(29.27)
$\Delta PCFO_t$	0.18781***	0.18776***	0.0093879	0.15977***	0.736175***	0.737196***
	(25.37)	(25.49)	(0.85)	(14.52)	(28.38)	(28.38)
ΔTO_t	0.00160***	0.00160***	0.00121***	0.01620***	0.002751***	0.00273***
	(4.99)	(5.01)	(5.45)	(31.17)	(3.64)	(3.61)
ΔGDP Growth$_t$	-0.00599***	-0.00599***	-0.019022***	0.033782***	0.007632***	0.00760***
	(-5.90)	(-5.83)	(-40.46)	(17.06)	(4.02)	(3.98)
ΔLog GDP per capita$_t$	0.30583***	0.30595***	0.11204*	0.676070***	0.627617***	0.63129***
	(4.64)	(4.64)	(1.81)	(7.99)	(3.32)	(3.33)
ΔPC Institutional Quality	-0.0595***	-0.0592***	-0.102456***	-0.129736***	0.0079044	0.007503
	(-2.91)	(-2.89)	(-14.25)	(-6.41)	(0.23)	(0.22)
ΔSecondary School Enrollment	0.00080***	0.0008***	0.00099***	-0.006746***	-0.001244**	-0.001251**
	(3.53)	(3.48)	(4.04)	(-39.30)	(-2.26)	(-2.26)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.08 Pr > z =0.0380**	**z = -2.08 Pr > z=0.0378**	**z = -2.17 Pr > z =0.0300**	**z = -2.24 Pr > z =0.0252**	**z = -2.89 Pr > z=0.0038**	**z = -2.89 Pr > z=0.0038**
Arellano – Bond test for AR(2) in first differences:	**z = -1.52 Pr > z =0.1294**	**z = -1.52 Pr > z=0.1292**	**z = -1.11 Pr > z=0.2689**	**z = -0.90 Pr > z=0.3669**	**z = -1.74 Pr > z=0.0826**	**z = -1.74 Pr > z=0.0823**
Sargan test:	**$Chi^2(54)$ = 44.42 Prob > chi^2 = 0.8207**	**$Chi^2(54)$ = 44.42 Prob > chi^2 = 0.8206**	**$Chi^2(54)$ = 34.56 Prob > chi^2 = 0.9818**	**$Chi^2(54)$ = 45.20 Prob > chi^2 = 0.7975**	**$Chi^2(54)$ = 26.54 Prob > chi^2 = 0.9994**	**$Chi^2(18)$ = 26.58 Prob > chi^2 = 0.9994**

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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed using the first principal component. The variables are defined as follows: PCFO = First component financial openness index, PCBD = First component banking sector development index, PCBD1 = First component banking sector development index that excludes*

the deposit money banks to central bank assets ratio, PCBMD = First component bond market development index, PCSMD = First component stock market development index, PCFD = First component financial development index, PCFD4 = First component financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the first principal component of the individual institutional quality measures. Figures in brackets are t-statistics and the stars represent the significant t-statistics for 1%, 5%, and 10% confidence levels respectively..

Table 4 (d): Principal component analysis (new methodology) type financial development and financial openness indices

	Dependent Variables					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	0.86929***	0.871759***	0.84670***	0.304918***	0.60474***	0.44201***
	(89.11)	(77.41)	(65.73)	(120.67)	(72.78)	(30.34)
$\Delta PCAFO_t$	0.16546***	0.204118***	0.11894***	0.255378***	0.73309***	0.85960***
	(12.95)	(14.72)	(13.01)	(10.96)	(27.56)	(45.65)
ΔTO_t	0.000669**	0.000651*	0.00060***	0.007924***	0.00387***	0.00493***
	(2.26)	(1.71)	(4.38)	(42.70)	(15.30)	(11.44)
ΔGDP Growth$_t$	0.001170**	0.0000948	-0.010550***	0.033182***	0.01664***	0.01589***
	(2.42)	(0.17)	(-21.10)	(33.19)	(11.43)	(9.47)
ΔLog GDP per capita$_t$	0.08265***	0.09658***	0.0294515	0.138069***	-0.10891*	-0.0490796
	(3.16)	(2.78)	(1.43)	(2.44)	(-1.93)	(-0.63)
ΔPCA Institutional Quality	-0.0138673	-0.025017	-0.080613***	-0.136876***	0.0637***	0.04465***
	(-1.35)	(-1.51)	(-18.02)	(-10.00)	(4.45)	(3.02)
ΔSecondary School Enrollment	0.000656***	0.00074***	-0.000501**	-0.004251***	-0.0005151	0.00064**
	(3.17)	(3.00)	(-2.57)	(-11.52)	(-1.19)	(2.36)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.54 Pr > z = 0.0110**	**z = -2.45 Pr > z =0.0141**	**z = -2.28 Pr > z =0.0226**	**z = -2.00 Pr > z =0.0458**	**z = -2.51 Pr >z=0.0121**	**z = -2.27 Pr >z=0.0235**
Arellano – Bond test for AR(2) in first differences:	**z = -1.70 Pr > z = 0.0886**	**z = -1.66 Pr > z =0.0973**	**z = -1.31 Pr > z=0.1900**	**z = -1.00 Pr > z=0.3164**	**z = -1.02 Pr >z=0.3093**	**z = -0.97 Pr >z=0.3333**
Sargan test:	**$Chi^2(54)$ = 45.51 Prob > chi^2 = 0.7878**	**$Chi^2(54)$ = 45.54 Prob > chi^2 = 0.7869**	**$Chi^2(54)$ = 34.65 Prob > chi^2 = 0.9812**	**$Chi^2(54)$ = 43.86 Prob > chi^2 = 0.8362**	**$Chi^2(54)$ = 28.36 Prob > chi^2 = 0.9984**	**$Chi^2(54)$ = 31.25 Prob > chi^2 = 0.9944**

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 =*

Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent the significant t-statistics for 1%, 5%, and 10% confidence levels respectively.

Table 5: Principal components type financial development and financial openness indices with an interaction term

	Dependent Variables					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	0.85446***	0.8620***	0.84623***	0.32281***	0.60399***	0.4529***
	(85.45)	(68.99)	(57.18)	(153.86)	(53.68)	(39.94)
$\Delta PCAFO_t$	0.35994***	0.40162***	0.17283***	0.86655***	0.77409***	0.96244***
	(17.31)	(13.66)	(15.19)	(22.11)	(8.55)	(16.44)
ΔTO_t	0.00081***	0.000879**	0.00155***	0.01127***	0.00416***	0.00505***
	(3.29)	(2.12)	(12.90)	(23.07)	(11.51)	(13.05)
ΔGDP Growth$_t$	0.001262**	0.0002943	-0.01073***	0.03565***	0.01496***	0.01812***
	(2.30)	(0.46)	(-30.62)	(27.78)	(6.67)	(18.63)
ΔLog GDP per capita$_t$	0.068112*	0.08619**	0.0101808	-0.29693***	0.0016911	-0.10107*
	(1.93)	(2.55)	(0.44)	(-4.71)	(0.02)	(-1.85)
ΔPCA Institutional Quality	-0.0126023	-0.0181944	-0.06996***	-0.023527**	0.024028	0.03030*
	(-1.05)	(-1.05)	(-14.40)	(-2.05)	(0.97)	(1.83)
ΔSecondary School Enrollment	0.000551*	0.0004819	-0.000254	-0.00335***	-0.00094***	0.0004794
	(1.95)	(1.60)	(-1.48)	(-5.47)	(-2.67)	(1.50)
ΔPCA Interaction term	-0.00204***	-0.002077***	-0.000486***	-0.00221***	-0.001485*	-0.00132**
	(-6.17)	(-5.04)	(-7.91)	(-28.80)	(-1.81)	(-2.16)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.38 Pr > z = 0.0174**	**z = -2.35 Pr > z =0.0188**	**z = -2.24 Pr > z = 0.0249**	**z = -2.00 Pr > z =0.0454**	**z = -2.49 Pr > z=0.0126**	**z = -2.35 Pr > z=0.0187**
Arellano – Bond test for AR(2) in first differences:	**z = -1.68 Pr > z = 0.0922**	**z = -1.64 Pr > z =0.1002**	**z = -1.40 Pr > z =0.1611**	**z = -1.08 Pr > z=0.2814**	**z = -0.95 Pr > z=0.3426**	**z = -0.97 Pr > z=0.3337**
Sargan test:	**$Chi^2(54)$ = 42.61 Prob > chi^2 = 0.8683**	**$Chi^2(54)$ = 44.44 Prob > chi^2 = 0.8201**	**$Chi^2(54)$ = 36.14 Prob > chi^2 = 0.9706**	**$Chi^2(54)$ = 47.87 Prob > chi^2 = 0.7086**	**$Chi^2(54)$ = 24.53 Prob > chi^2 = 0.9998**	**$Chi^2(54)$ = 31.42 Prob > chi^2 = 0.9940**

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use*

the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio, PCA Interaction term = Interaction term between financial and trade openness. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent the significant t-statistics for 1%, 5%, and 10% confidence levels respectively.

Table 6: Principal component analysis type financial development and financial openness indices; equal number of observations

	Dependent Variables					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	0.84937***	0.85652***	0.89333***	0.23594***	0.60474***	0.44201***
	(52.33)	(46.71)	(78.51)	(33.84)	(72.78)	(30.04)
$\Delta PCAFO_t$	0.18475***	0.22587***	0.11560***	0.82008***	0.733089***	0.85960***
	(11.97)	(13.00)	(14.17)	(15.91)	(27.56)	(45.65)
ΔTO_t	0.00091*	0.00098*	0.00073***	0.012714***	0.00387***	0.00494***
	(1.95)	(1.72)	(5.30)	(10.66)	(15.30)	(11.44)
ΔGDP Growth$_t$	0.003296***	0.0020122	-0.01167***	0.050189***	0.01664***	0.01589***
	(3.46)	(1.62)	(-25.92)	(15.95)	(11.43)	(9.47)
ΔLog GDP per capita$_t$	0.141977***	0.1531***	0.0192021	-1.035414***	-0.10891*	-0.0490796
	(4.38)	(3.88)	(0.65)	(-6.50)	(-1.93)	(-0.63)
ΔPCA Institutional Quality	-0.0375527	-0.0502778	-0.07103***	-0.000703	0.06371***	0.044646***
	(-1.53)	(-1.47)	(-12.42)	(-0.03)	(4.45)	(3.02)
ΔSecondary School Enrollment	0.00072***	0.0006584	0.00047***	-0.00579***	-0.0005151	0.000642**
	(2.78)	(1.38)	(5.41)	(-3.26)	(-1.19)	(2.36)
Number of observations:	**262**	**262**	**262**	**262**	**262**	**262**
Number of groups:	**38**	**38**	**38**	**38**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.22 Pr > z = 0.0261**	**z = -2.16 Pr > z=0.0308**	**z = -2.30 Pr > z =0.0214**	**z = -1.83 Pr > z =0.0672**	**z = -2.51 Pr > z=0.0121**	**z = -2.27 Pr > z=0.0235**
Arellano – Bond test for AR(2) in first differences:	**z = -1.58 Pr > z = 0.1131**	**z = -1.56 Pr > z=0.1177**	**z = -1.24 Pr > z=0.2152**	**z = -1.08 Pr > z=0.2801**	**z = -1.02 Pr > z=0.3093**	**z = -0.97 Pr > z=0.3333**
Sargan test:	**$Chi^2(54)$ = 34.44 Prob > chi^2 = 0.9825**	**$Chi^2(54)$ = 34.00 Prob > chi^2 = 0.9848**	**$Chi^2(54)$ = 31.49 Prob > chi^2 = 0.9939**	**$Chi^2(54)$ = 32.23 Prob > chi^2 = 0.9919**	**$Chi^2(54)$ = 28.36 Prob > chi^2 = 0.9984**	**$Chi^2(54)$ = 31.25 Prob > chi^2 = 0.9944**

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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 =*

Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent the significant t-statistics for 1%, 5%, and 10% confidence levels respectively.

Table 7: Principal components type financial development and financial openness indices; Changing lag structure

	Dependent Variable					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	1.1523***	1.18634***	0.61001***	0.28054***	0.6298***	0.4557***
	(52.33)	(54.34)	(37.86)	(72.78)	(41.00)	(30.11)
ΔDependent variable$_{t-2}$	-0.37445***	-0.41223***	-0.05154***	-0.12178***	-0.0166138	-0.0361***
	(-18.53)	(-19.93)	(-6.67)	(-54.85)	(-0.88)	(-3.78)
ΔDependent variable$_{t-3}$	0.175743***	0.187105***	0.26057***	-0.03571***	-0.037569*	-0.04683***
	(13.46)	(14.74)	(41.93)	(-21.21)	(-1.84)	(-4.30)
$\Delta PCAFO_t$	0.11923***	0.144244***	0.170878***	0.18679***	0.67608***	0.77633***
	(11.34)	(10.58)	(19.04)	(7.19)	(19.19)	(20.22)
ΔTO_t	-0.0000824	0.000119	-0.000427***	0.01077***	0.00453***	0.00641***
	(-0.29)	(0.36)	(-3.06)	(42.12)	(5.39)	(11.37)
ΔGDP Growth$_t$	-0.0012265	-0.002734***	-0.005479***	0.01812***	0.01120***	0.00801***
	(-1.44)	(-2.80)	(-26.25)	(11.46)	(4.71)	(4.84)
ΔLog GDP per capita$_t$	0.029558	0.0333947	-0.0381062	-0.10212*	-0.0483269	0.0536694
	(0.89)	(0.95)	(-1.65)	(-1.81)	(-0.36)	(0.54)
ΔPCA Institutional Quality	-0.0158656	-0.0210246	-0.061534***	-0.22297***	0.0459***	-0.0045433
	(-0.82)	(-0.98)	(-15.11)	(-9.47)	(3.00)	(-0.31)
ΔSecondary School Enrollment	0.0000946	0.0002335	-0.001693***	-0.00267***	-0.0017***	-0.00116**
	(0.46)	(1.03)	(-8.69)	(-5.65)	(-2.97)	(-2.16)
Number of observations:	**289**	**289**	**273**	**343**	**225**	**225**
Number of groups:	**49**	**49**	**40**	**53**	**37**	**37**
Arellano – Bond test for AR(1) in first differences:	**z = -2.86 Pr > z = 0.0042**	**z = -2.87 Pr > z =0.0041**	**z = -1.40 Pr > z = 0.1614**	**z = -2.00 Pr > z=0.0455**	**z = -2.33 Pr >z=0.0201**	**z = -2.13 Pr >z=0.0333**
Arellano – Bond test for AR(2) in first differences:	**z = 0.27 Pr > z = 0.7866**	**z = 0.32 Pr > z =0.7523**	**z = 1.12 Pr > z =0.2637**	**z = 1.37 Pr >z=0.1706**	**z = 1.00 Pr >z=0.3163**	**z = 1.23 Pr >z=0.2204**
Sargan test:	**$Chi^2(49)$ = 39.43 Prob > chi^2 = 0.8338**	**$Chi^2(49)$ = 39.38 Prob > chi^2 = 0.8354**	**$Chi^2(49)$ = 34.36 Prob > chi^2 = 0.9440**	**$Chi^2(49)$ = 44.93 Prob > chi^2 = 0.6389**	**$Chi^2(49)$ = 26.66 Prob > chi^2 = 0.9961**	**$Chi^2(49)$ = 30.32 Prob > chi^2 = 0.9834**

***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 to be used as instruments, and 3 lags of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent the significant t-statistics for 1%, 5%, and 10% confidence levels respectively.*

Table 8: Principal components type financial development and financial openness indices with time dummies and a trend

	Dependent Variables					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	0.83676***	0.84076***	0.84836***	0.20578***	0.542303***	0.37039***
	(41.77)	(47.18)	(29.71)	(19.30)	(10.66)	(9.63)
$\Delta PCAFO_t$	0.06092***	0.07447***	0.05074***	0.19594***	0.50007***	0.500101***
	(3.25)	(3.40)	(3.06)	(2.75)	(4.29)	(5.02)
ΔTO_t	0.0003533	0.0001158	0.00061**	0.00344***	-0.0004846	-0.0008197
	(0.76)	(0.16)	(2.21)	(4.12)	(-0.45)	(-0.55)
ΔGDP Growth$_t$	0.00338***	0.0015139	-0.01092***	0.03458***	0.014096***	0.01439***
	(2.82)	(0.92)	(-16.04)	(10.87)	(3.02)	(2.92)
ΔLog GDP per capita$_t$	-0.5009***	-0.5607***	-0.325298**	-1.31945***	-0.86522**	-1.46589***
	(-5.03)	(-5.45)	(-2.62)	(-5.14)	(-2.56)	(-4.75)
ΔPCA Institutional Quality	-0.019566	-0.0060993	-0.05024***	-0.0449965	0.101523***	0.119196***
	(-0.81)	(-0.22)	(-4.97)	(-0.99)	(-3.03)	(3.38)
ΔSecondary School Enrollment	0.0009415	0.0010695	0.00085***	-0.00405***	-0.0004843	0.0017803
	(1.61)	(1.55)	(3.04)	(-3.10)	(-0.35)	(1.31)
Δt	0.02317***	0.02661***	0.019334***	0.09192***	0.04594***	0.08129***
	(8.29)	(7.02)	(5.77)	(9.82)	(3.32)	(6.56)
Δyear1998	0.018689*	0.01992*	0.05967***	-0.0553**	-0.0207526	0.0251502
	(1.81)	(1.77)	(8.40)	(-2.20)	(-1.17)	(1.42)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.19 Pr > z =0.0284**	**z = -2.17 Pr > z=0.0303**	**z = -2.27 Pr > z = 0.0234**	**z = -1.87 Pr > z=0.0612**	**z = -2.38 Pr > z=0.0173**	**z = -2.29 Pr > z=0.0222**
Arellano – Bond test for AR(2) in first differences:	**z = -1.69 Pr > z =0.0913**	**z = -1.67 Pr > z=0.0955**	**z = -0.76 Pr > z =0.4461**	**z = -1.32 Pr >z=0.1875**	**z = -1.16 Pr > z=0.2471**	**z = -1.15 Pr > z=0.2512**
Sargan test:	**$Chi^2(54)$ = 31.40 Prob > chi^2 = 0.9941**	**$Chi^2(54)$ = 32.06 Prob > chi^2 = 0.9924**	**$Chi^2(54)$ = 28.54 Prob > chi^2 = 0.9983**	**$Chi^2(54)$ = 42.75 Prob > chi^2 = 0.8651**	**$Chi^2(54)$ = 28.49 Prob > chi^2 = 0.9983**	**$Chi^2(54)$ = 24.02 Prob > chi^2 = 0.9999**

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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent the significant t-statistics for 1%, 5%, and 10% confidence levels respectively.*

Table 9: Principal components type financial development and financial openness indices for the developing country sample

	Dependent Variables					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	0.844134***	0.75831***	0.60517***	0.23144***	0.46032***	0.58921***
	(37.54)	(24.67)	(13.54)	(43.53)	(8.45)	(3.38)
$\Delta PCAFO_t$	0.05967***	0.06260***	0.02662***	0.38857***	0.08031***	0.13934***
	(7.95)	(5.79)	(2.31)	(15.70)	(7.95)	(6.74)
ΔTO_t	-0.00183***	-0.001274*	-0.0008384	0.00775***	0.0027243	0.0000593
	(-5.00)	(-1.68)	(-1.57)	(5.28)	(1.12)	(0.01)
ΔGDP Growth$_t$	-0.00775***	-0.0047189	-0.00651***	0.013346***	-0.00881***	-0.007631*
	(-3.74)	(-1.40)	(-6.61)	(10.98)	(-6.27)	(-1.68)
ΔLog GDP per capita$_t$	0.39747***	0.3801***	-0.0886657	-0.63521***	0.277662	0.2301466
	(4.22)	(2.32)	(-0.59)	(-4.60)	(1.31)	(0.31)
ΔPCA Institutional Quality	-0.04267**	-0.0203214	-0.19296***	-0.21788***	-0.1873293	-0.25922***
	(-2.22)	(-0.77)	(-4.65)	(-5.06)	(-1.04)	(-4.15)
ΔSecondary School Enrollment	-0.00358***	-0.0015018	0.00505***	-0.00367*	0.0015686	-0.00807**
	(-3.77)	(-0.72)	(4.19)	(-1.93)	(0.58)	(-2.22)
Number of observations:	**152**	**152**	**111**	**163**	**100**	**100**
Number of groups:	**25**	**25**	**18**	**27**	**16**	**16**
Arellano – Bond test for AR(1) in first differences:	**z = -1.76 Pr > z = 0.0778**	**z = -1.93 Pr > z =0.0537**	**z = -1.69 Pr > z = 0.0920**	**z = -1.79 Pr > z =0.0741**	**z = -1.81 Pr > z=0.0701**	**z = -1.79 Pr > z=0.0729**
Arellano – Bond test for AR(2) in first differences:	**z = 1.19 Pr > z = 0.2347**	**z = 0.99 Pr > z =0.3239**	**z = 1.95 Pr > z =0.0510**	**z = -1.62 Pr > z=0.1049**	**z = -0.04 Pr > z=0.9680**	**z = -0.28 Pr > z=0.7760**
Sargan test:	**$Chi^2(54)$ = 22.78 Prob > chi^2 = 0.9999**	**$Chi^2(54)$ = 20.19 Prob > chi^2 = 1.0000**	**$Chi^2(54)$ = 9.28 Prob > chi^2 = 1.0000**	**$Chi^2(54)$ = 15.54 Prob > chi^2 = 1.0000**	**$Chi^2(54)$ = 8.00 Prob > chi^2 = 1.0000**	**$Chi^2(54)$ = 11.93 Prob > chi^2 = 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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 =

Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent the significant t-statistics for 1%, 5%, and 10% confidence levels respectively.

ADDITIONAL WEB APPENDICES

DATA APPENDIX

Financial openness indicators:

Market capitalization of listed companies (% of GDP): This variable represents the openness of the stock market and the public consensus regarding the value of equities of companies as countries become more globalized. It is equal to the value of listed shares divided by GDP. It is mostly used to represent a company's net worth and it is a decisive variable for stock valuation.[69] *Source: World Bank's World Development Indicators Database (2007)*

Foreign direct investment: It is the sum of net inflows and outflows of foreign direct investment recorded as a percentage of GDP. This indicator is brings together equity capital, reinvestment earning and other short and long-term capital. It is one of the most frequently used indicators in the capital flows, financial openness/globalization literature. *Source: World Bank's World Development Indicators Database (2007)*

Number of domestic companies listed per million population: This variable is defined as the domestically incorporated companies listed on the country's stock exchanges at the end of the year.[70] Domestic companies listed do not include investment companies, mutual funds, or other collective investment vehicles. As Baltagi, Demetriades and Law (2007) express, the number of domestic companies listed provides a range of access to the capital market by new companies as financial liberalization takes place.[71] It is another measure for market size. Number of domestic companies listed and market capitalization of listed companies both facilitate in observing the overall financial system as the barriers to entry of foreign firms are being lifted. These two measures serve in understanding the stock market perspective of the openness debate. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Portfolio investment flows (% of GDP): These flows sum portfolio debt flows (public and publicly guaranteed and private nonguaranteed bond issues purchased by foreign investors) and non-debt-creating portfolio equity flows which are equal to the sum of country funds, depository receipts, and direct purchases of shares by foreign investors.[72] They exclude the liabilities constituting foreign authorities' reserves. Portfolio investment flows are used as an indicator for private capital flows. Portfolio flows are divided by the GDP in current US dollars obtained from the World Bank's *World Development Indicators* and are represented as a percentage of GDP. Portfolio investment flows together with foreign direct investment represent the incoming stream of investment and capital opportunities that the countries attract as a result of opening up

[69] Huang, Wei, "Emerging Markets, Financial Openness, and Financial Development", *University of Bristol Discussion Paper*, 2006 – 588, pp. 9

[70] World Bank, 2007 World Development Indicators, International Bank for Reconstruction and Development/The World Bank Press, 2007, pp. 279

[71] Baltagi, Badi, Panicos Demetriades, and Siong Hook Law, "Financial Development, Openness, and Institutions: Evidence from Panel Data", *Paper presented at the IMF Conference on New Perspectives on Financial Globalization*, 2007, pp. 10

[72] World Bank, 2007 World Development Indicators, International Bank for Reconstruction and Development/The World Bank Press, 2007, pp. 343

their financial markets. These types of flow variables are particularly useful in determining an efficient financial openness measure. *Source: World Bank's World Development Indicators Database (2007)*

International debt issues (% of GDP): International debt flows measures the net flow of international bond issues relative to a country's economic activity.[73] This variable increases in the income level. Examining country wide data we can observe that high-income countries are the group with the highest issues of international debt relative to GDP. This indicator measures "the degree to which a country's financial system is interlinked with international financial markets".[74] This variable assists in examining the net flows of bond issues and in bringing a view from the bond market. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Financial development indicators

a) Banking sector development indicators:

Liquid liabilities (% of GDP): It is the sum of currency, demand and interest bearing liabilities of banks and other financial intermediaries divided by GDP represented as a percentage. Liquid liabilities is the broadest indicator of financial intermediation due its inclusion of three financial sectors. [75] *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Private credit by deposit money banks and other institutions (% of GDP): It is an indicator for the overall development in private banking markets.[76] This variable refers to financial resources provided to the private sector by deposit money banks and other financial institutions through loans, purchases of nonequity securities, and trade credits. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

The ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages): It is equal to the deposit money bank assets divided by the sum of deposit money bank assets and central bank assets. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Deposit money bank assets to central bank assets ratio (in percentages): It is measured as the ratio of deposit money bank claims on domestic nonfinancial real sector to central bank claims on domestic nonfinancial real sector. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Total bank assets (% of GDP): It is the sum of central bank assets to GDP and deposit money bank assets to GDP. It is used to represent the overall size of the banking sector. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

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[73] Beck, Thorsten, and Asli Demirguc-Kunt, "Financial Institutions and Markets Across Countries and Over Time – Data and Analysis", *World Bank Working Paper*, (2009), pp. 15
[74] Ibid., pp. 15
[75] Ibid., pp. 22
[76] Chinn, Menzie, and Hiro Ito, "What matters for financial development? Capital controls, institutions, and interactions", *Journal of Development Economics*, (2006), pp. 5

Domestic credit provided by the banking sector (% of GDP): It 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 loans to state enterprises but excludes credit to the central government. *Source: World Bank's World Development Indicators Database (2007)*

b) Stock market development indicators:

Stock market capitalization (% of GDP): It is equal to the value of listed shares divided by GDP. It is an indicator of the size of the stock market. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Stock market turnover ratio (in percentages): It is used as the efficiency indicator of stock markets.[77] Stock market turnover ratio measures "the activity or liquidity of a stock market relative to its size".[78] Note that small and active stock markets will have a larger turnover ratio based on the above definition whereas large and less liquid stock markets will have a lower turnover ratio. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Stock market total value traded (% of GDP): It 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.[79] *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

c) Bond market development indicators:

Private bond market capitalization (% of GDP): It is equal to the total amount of outstanding domestic debt securities issued by financial institutions and corporations as a share of GDP. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Public bond market capitalization (% of GDP): It is equal to the total amount of public domestic securities issued by governments as a share of GDP. *Source: Beck, Demirguc-Kunt and Levine's Database on Financial Development and Structure (2007)*

Control Variables

Logarithm of GDP per capita: It is measured in constant 2000 US dollars and we take the logarithm. *Source: World Bank's World Development Indicators Database (2007)*

GDP growth (in annual percentages): It is used as a measure for economic performance among countries. *Source: World Bank's World Development Indicators Database (2007)*

Trade openness (% of GDP): It is the sum of imports and exports of goods and services. *Source: World Bank's World Development Indicators Database (2007)*

[77] Demirguc-Kunt, Asli, and Ross Levine, Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development, MIT Press, 2001, pp. 32
[78] Ibid., pp. 32
[79] Ibid., pp. 32

Secondary school gross enrolment rate (% of population): It is used as an indicator that controls for differences in educational attainment across countries. We take secondary school gross enrollment rate as a possible determinant for why we examine differences across countries in terms of grasping the benefits of financial liberalization. *Source: World Bank's Edstats Database*

Legal and institutional variable: They are used to measure the economic institutions and the overall quality of legal systems. We employ four different measures to control for institutional, legal, political and economic factors that may affect the overall level of financial development. The four variables used reflect the "statistical compilation of responses on the quality of governance given by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries, as reported by a number of survey institutes, think tanks, non-governmental organizations, and international organizations".[80] These indicators are *government effectiveness*, *regulatory quality, rule of law,* and *control corruption* and are measured through a range from-2.5 to 2.5 where higher values correspond to better governance outcomes. *Source: World Bank's World Governance Indicators*

[80] World Governance Indicators (WGI) dataset, World Bank, http://info.worldbank.org/governance/wgi/index.asp

SUPPLEMENTARY APPENDIX

Table 1 (a): Summary of pairwise correlations for the financial openness variables and indices

Variables	Market cap.	FDI	List of dom. Com.	Int. debt issues	Portfolio investment	EFO	CFO	PCFO	PCAFO
Market Capitalization	1.0000								
FDI	0.1961*	1.0000							
List of domestic companies	0.5267*	0.2031*	1.0000						
International debt issues	0.3212*	0.5409*	0.2204*	1.0000					
Portfolio investment	0.0722	0.9224*	0.1053*	0.4588*	1.0000				
EFO	0.7003*	0.7985*	0.5746*	0.6433*	0.6837*	1.0000			
CFO	0.2525*	0.9812*	0.2548*	0.5622*	0.9620*	0.8361*	1.0000		
PCFO	0.4457*	0.9149*	0.4186*	0.7399*	0.8514*	0.9428*	0.9471*	1.0000	
PCAFO	0.6224*	0.7501*	0.7229*	0.6332*	0.6535*	0.9706*	0.7999*	0.9226*	1.0000

Notes: *Market capitalization: market capitalization of listed companies (% of GDP), FDI= Foreign direct investment (% of GDP), List of domestic companies = number of domestic companies listed (per million population), international debt issues (% of GDP), portfolio investment = portfolio investment flows (% of GDP), EFO = Equally weighted financial openness index, CFO = Coefficient of variation type financial openness index, PCFO = First score principal component type financial openness index, PCAFO= Principal component type financial openness index. * represents the significances at the %5 percent level.*

Table 1 (b): Summary of pairwise correlations for the banking sector development variables and indices

Variables	Liq. Liability~	Private credit~	Deposit money~	Total bank~	Deposit Money bank~	Domestic Credit~	EBD	EBD1	CBD	CBD1	PCBD	PCBD1	PCABD	PCABD1
Liq. Liability~	1.0000													
Private credit~	0.6432*	1.0000												
Deposit money~	0.3487*	0.4864*	1.0000											
Total bank~	0.8126*	0.8387*	0.3265*	1.0000										
Deposit money bank~	-0.0550	-0.0589	0.0424	-0.073	1.0000									
Domestic credit~	0.6475*	0.8826*	0.3343*	0.8730*	-0.0698	1.0000								
EBD	-0.0549	-0.0590	0.0425	-0.0752	1.0000*	-0.0709	1.0000							
EBD1	0.8612*	0.9314*	0.4676*	0.9405*	-0.0660	0.9522*	-0.0660	1.0000						
CBD	-0.0549	-0.0590	0.0425	-0.0752	1.0000*	-0.0709	1.0000*	-0.0660	1.0000					
CBD1	0.8667*	0.9290*	0.4433*	0.9392*	-0.0680	0.9548*	-0.0680	0.9995*	-0.068	1.0000				
PCBD	0.8636*	0.9297*	0.5325*	0.9335*	-0.082*	0.9337*	-0.082*	0.9966*	-0.082*	0.9941*	1.0000			
PCBD1	0.8637*	0.9298*	0.5347*	0.9331*	-0.0593	0.9335*	-0.0593	0.9966*	-0.059	0.9941*	0.9997*	1.0000		
PCABD	0.8240*	0.9151*	0.6694*	0.8826*	0.0389	0.8872*	0.0389	0.9654*	0.0389	0.9583*	0.9793*	0.9818*	1.0000	
PCABD1	0.8379*	0.9236*	0.6396*	0.9000*	-0.0475	0.9038*	-0.0475	0.9784*	-0.048	0.9724*	0.9910*	0.9916*	0.9957*	1.0000

Notes: *Liq. Liability~: Liquid liabilities (% of GDP), Private credit~: Private credit by deposit money banks and other institutions (% of GDP), Deposit money~: The ratio of deposit money bank assets to the sum of deposit money bank assets and central bank assets (in percentages), Total bank~: Total bank assets (% of GDP), Deposit money bank~: Deposit money bank assets to central bank assets ratio (in percentages), Domestic credit~: Domestic credit provided by the banking sector (% of GDP), EBD = Equally weighted banking sector development index, EBD1 = Equally weighted banking sector development index excluding deposit money bank assets to central bank assets ratio, CBD = Coefficient of variation type banking sector development index, CBD1 = Coefficient of variation type banking sector development index excluding deposit money bank assets to central bank assets ratio, PCBD = First score principal components type banking sector development index, PCBD1 = First score principal components type banking sector development index excluding deposit money bank assets to central bank assets ratio, PCABD = Principal components type banking sector development index, PCABD1 = Principal components type banking sector development index excluding deposit money bank assets to central bank assets ratio. * represents the significances at the %5 percent level.*

Table 1 (c): Summary of pairwise correlations for the bond market development variables and indices

Variables	Private bond~	Public bond~	EBMD	CBMD	PCBMD	PCABMD
Private bond market capitalization	1.0000					
Public bond market capitalization	0.3451*	1.0000				
EBMD	0.8456*	0.7928*	1.0000			
CBMD	0.9232*	0.6794*	0.9858*	1.0000		
PCBMD	0.8201*	0.8201*	0.9989*	0.9770*	1.0000	
PCABMD	0.9606*	0.5924*	0.9607*	0.9936*	0.9469*	1.0000

Notes: *Private bond~:Private bond market capitalization (% of GDP), Public bond~: Public bond market capitalization (% of GDP), EBMD = Equally weighted bond market development index, CBMD = Coefficient of variation type bond market development index, PCBMD = First score principal components type bond market development index, PCABMD = Principal components type bond market development index. * represents the significances at the %5 percent level.*

Table 1 (d): Summary of pairwise correlations for the stock market development variables and indices

Variables	Stock market caitalization	Stock market turnover	Stock market total value traded	ESMD	CSMD	PCSMD	PCASMD
Stock market capitalization	1.0000						
Stock market turnover	0.1084*	1.0000					
Stock market total value traded	0.6862*	0.6003*	1.0000				
ESMD	0.7443*	0.7120*	0.9498*	1.0000			
CSMD	0.7156*	0.7279*	0.9593*	0.9987*	1.0000		
PCSMD	0.7591*	0.6822*	0.9620*	0.9987*	0.9978*	1.0000	
PCASMD	0.5480*	0.8635*	0.9104*	0.9656*	0.9735*	0.9561*	1.0000

Notes: *Stock market capitalization: Stock market capitalization (% of GDP), Stock market turnover ratio (in percentages), Stock market total value traded (% of GDP), ESMD = Equally weighted bond market development index, ESMD = Equally weighted stock market development index, CSMD = Coefficient of variation type stock market development index, PCSMD = First score principal components type stock market development index, PCASMD = Principal components type stock market development index. * represents the significances at the %5 percent level.*

Table 2: Principal component type financial development and financial openness indices adjusted by their means

	Dependent Variables					
	$\Delta MEPCABD_t$	$\Delta MEPCABD1_t$	$\Delta MEPCABMD_t$	$\Delta MEPCASMD_t$	$\Delta MEPCAFD_t$	$\Delta MEPCAFD4_t$
ΔMean adjusted dependent variable$_{t-1}$	0.76194***	0.77124***	0.91726***	0.3343***	0.42044***	0.39434***
	(67.47)	(135.2)	(137.9)	(142.3)	(68.12)	(44.87)
$\Delta MEPCAFO_t$	-0.00494***	-0.00657***	-0.00150***	0.0107***	0.05291***	0.06108***
	(-7.668)	(-5.760)	(-3.466)	(6.819)	(26.13)	(20.90)
ΔTO_t	0.00172***	0.00199***	0.00198***	0.0130***	0.0117***	0.0126***
	(12.50)	(13.80)	(15.42)	(67.62)	(21.13)	(20.92)
ΔGDP Growth$_t$	-0.00370***	-0.00444***	-0.0119***	0.0430***	0.0144***	0.0170***
	(-13.09)	(-9.464)	(-52.07)	(43.46)	(7.533)	(7.357)
ΔLog GDP per capita$_t$	0.20176***	0.23933***	0.0430***	0.5721***	0.33211***	0.44315***
	(13.70)	(14.20)	(2.650)	(17.55)	(5.552)	(7.264)
ΔMEPCA Institutional Quality	-0.02367***	-0.02541***	-0.0666***	-0.224***	-0.0881***	-0.1234***
	(-21.86)	(-15.73)	(-39.10)	(-26.38)	(-5.516)	(-8.988)
ΔSecondary School Enrollment	-0.000650***	-0.0009***	-0.000829***	-0.00547***	-0.00331***	-0.00314***
	(-3.762)	(-3.881)	(-12.56)	(-15.01)	(-14.95)	(-9.030)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -1.36 Pr > z = 0.1737**	**z = -1.40 Pr > z=0.1624**	**z = -2.39 Pr > z =0.0167**	**z = -2.09 Pr > z =0.0370**	**z = -2.21 Pr >z=0.0268**	**z = -2.23 Pr >z=0.0260**
Arellano – Bond test for AR(2) in first differences:	**z = -1.30 Pr > z = 0.1919**	**z = -1.29 Pr > z=0.1979**	**z = -1.55 Pr > z=0.1219**	**z = -0.89 Pr > z=0.3742**	**z = -0.86 Pr >z=0.3871**	**z = -0.80 Pr >z=0.4243**
Sargan test:	**$Chi^2(54)$ = 45.71 Prob > chi^2 = 0.7815**	**$Chi^2(54)$ = 44.52 Prob > chi^2 = 0.8178**	**$Chi^2(54)$ = 37.22 Prob > chi^2 = 0.9603**	**$Chi^2(54)$ = 49.01 Prob > chi^2 = 0.6669**	**$Chi^2(54)$ = 31.07 Prob > chi^2 = 0.9984**	**$Chi^2(54)$ = 30.74 Prob > chi^2 = 0.9955**

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. All index measures are mean adjusted. These index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: MEPCAFO =Mean adjusted principal components financial openness index, MEPCABD = Mean adjusted principal components banking sector development index, MEPCABD1 = Mean adjusted principal components banking sector development index that*

excludes the deposit money banks to central bank assets ratio, MEPCABMD = Mean adjusted principal components bond market development index, MEPCASMD = Mean adjusted principal components stock market development index, MEPCAFD = Mean adjusted principal components financial development index, MEPCFD4 = Mean adjusted principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. MEPCA Institutional quality= Mean adjusted principal component type institutional quality index. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.

Table 3: Principal component type financial development and financial openness indices, excluding control variables of institutional quality index and secondary school enrollment rate

	$\Delta PCABD_t$		$\Delta PCABD1_t$		$\Delta PCABMD_t$		$\Delta PCASMD_t$		$\Delta PCAFD_t$		$\Delta PCAFD4_t$	
Models	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
ΔDependent variable$_{t-1}$	.8646*** (103.33)	.87120*** (204.77)	.86717*** (118.23)	.87304*** (179.23)	.8632*** (117.84)	.8292*** (62.00)	.3103*** (180.44)	.25195*** (119.63)	.5962*** (58.30)	.58840*** (89.11)	.46342*** (69.81)	.43659*** (30.84)
$\Delta PCAFO_t$	.1754*** (24.99)	.02923*** (3.08)	.21763*** (30.10)	.04433*** (2.63)	.1497*** (16.41)	.0785*** (7.09)	.2298*** (11.89)	.19711*** (11.97)	.7063*** (23.31)	.42352*** (41.93)	.84526*** (51.16)	.54748*** (22.31)
ΔTO_t	.0008*** (3.43)	-.0000977 (-0.47)	.00098*** (4.02)	.0002797 (1.27)	.0005*** (2.74)	.0005*** (3.16)	.0080*** (38.32)	.0002215 (1.08)	.0037*** (9.12)	.00201*** (12.60)	.00507*** (17.77)	.00194*** (4.97)
ΔGDP Growth$_t$	.0013*** (2.91)	-.00129** (-1.90)	.0001143 (0.26)	-.0023*** (-3.43)	-.0114*** (-45.15)	-.010*** (-34.44)	.0330*** (40.62)	.03340*** (45.12)	.0137*** (-7.52)	.0121909 (8.00)	.01729*** (16.99)	.00716*** (3.25)
ΔLog GDP per capita$_t$	.0692*** (2.59)	.3563*** (13.10)	.0818*** (2.73)	.38187*** (10.38)	-.02965** (-1.48)	.06491** (2.27)	.10383** (1.71)	1.078*** (26.27)	.0225963 (0.32)	.4431226 (6.77)	-.0939*** (-2.60)	.64371*** (8.83)
ΔPCAInstitutio-nal Quality	-	-.02005** (-1.68)	-	-.0449*** (-5.24)	-	-.082*** (-24.67)	-	-.1699*** (-15.52)	-	.0235216 (1.54)	-	.0091028 (0.64)
ΔSecondary School Enrollment	.0010*** (5.30)	-	.00110*** (5.07)	-	-.00037** (-2.15)	-	-.004*** (-8.98)	-	-.0013*** (-3.28)	-	.00055** (2.15)	-

Number of observations:	329	420	329	420	300	385	373	496	262	328	262	328
Number of groups:	50	51	50	51	41	42	54	57	38	39	38	39
Arellano – Bond test for AR(1) in first differences: Arellano – Bond test for AR(2) in first differences:	z = -2.52 Pr > z = 0.0118 z = -1.68 Pr > z = 0.0923	z = -2.87 Pr > z = 0.0042 z = -2.06 Pr > z = 0.0394	z = -2.44 Pr > z = 0.0146 z = -1.64 Pr > z = 0.1010	z = -2.83 Pr > z = 0.0047 z = -2.01 Pr > z = 0.0443	z = -2.33 Pr > z = 0.0198 z = -1.23 Pr > z = 0.2173	z = -2.58 Pr > z = 0.0098 z = -1.75 Pr > z = 0.804	z = -2.01 Pr > z = 0.0447 z = -0.97 Pr > z = 0.3309	z = -2.63 Pr > z = 0.0086 z = -0.99 Pr > z = 0.3244	z = -2.45 Pr > z = 0.0142 z = -1.05 Pr > z = 0.2923	z = -2.67 Pr > z = 0.0076 z = -0.52 Pr > z = 0.6056	z = -2.35 Pr > z = 0.0189 z = -0.98 Pr > z = 0.3263	z = -2.47 Pr > z =0.0137 z = -0.49 Pr > z = 0.6216
Sargan test:	$Chi^2(54)$ = 44.28 Prob >chi^2 = 0.8246	$Chi^2(54)$ = 44.06 Prob >chi^2 =0.8308	$Chi^2(54)$ = 43.88 Prob >chi^2 = 0.8356	$Chi^2(54)$ = 43.54 Prob >chi^2 = 0.8449	$Chi^2(54)$ = 38.26 Prob >chi^2 = 0.9482	$Chi^2(54)$ = 40.28 Prob>chi^2 = 0.9172	$Chi^2(54)$= 46.12 Prob>chi^2 = 0.7684	$Chi^2(54)$= 51.22 Prob>chi^2 = 0.5823	$Chi^2(54)$= 26.77 Prob>chi^2 = 0.9993	$Chi^2(54)$= 30.56 Prob >chi^2 = 0.9958	$Chi^2(54)$= 33.25 Prob>chi^2 = 0.9882	$Chi^2(54)$ = 27.30 Prob >chi^2 = 0.9991

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. Model (a) excludes the institutional quality index whereas Model (b) excludes the secondary school enrollment rate. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.*

Table 4: Principal component type financial development and financial openness indices, predetermined variables

	Dependent Variables					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	0.85356***	0.85302***	0.83843***	0.30953***	0.66462***	0.50773***
	(98.27)	(117.36)	(33.69)	(44.25)	(25.46)	(25.54)
$\Delta PCAFO_t$	0.20042***	0.27345***	0.10854***	0.16656***	0.85077***	1.08361***
	(8.95)	(11.00)	(7.23)	(4.91)	(41.51)	(28.70)
ΔTO_t	-0.000513	-0.00116***	-0.00098***	0.01166***	0.00310***	0.00384***
	(-1.26)	(-2.82)	(-4.32)	(23.56)	(7.07)	(7.16)
ΔGDP Growth$_t$	-0.000572	-0.00162**	-0.00756***	0.02164***	0.01519***	0.01262***
	(-0.83)	(-2.13)	(-21.13)	(6.52)	(6.89)	(5.58)
ΔLog GDP per capita$_t$	0.15938***	0.18541***	0.13306***	0.18515**	-0.10165	-0.10732**
	(6.03)	(6.00)	(5.56)	(1.90)	(-1.26)	(-1.73)
ΔPCA Institutional Quality	-0.07817***	-0.05497**	-0.081705***	-0.37460***	0.10857**	0.07534**
	(-2.40)	(-1.90)	(-39.10)	(-19.68)	(1.83)	(1.79)
ΔSecondary School Enrollment	0.00063*	0.00012***	-0.001066***	-0.014225***	-0.000829	-0.00056
	(1.29)	(0.23)	(-4.02)	(-20.18)	(-1.12)	(-0.84)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.49 Pr > z = 0.0129**	**z = -2.43 Pr > z =0.0149**	**z = -2.26 Pr > z =0.0240**	**z = -1.92 Pr > z =0.0553**	**z = -2.54 Pr >z=0.0110**	**z = -2.32 Pr >z=0.0201**
Arellano – Bond test for AR(2) in first differences:	**z = -1.80 Pr > z = 0.0716**	**z = -1.73 Pr > z =0.0840**	**z = -1.34 Pr > z=0.1739**	**z = -1.01 Pr > z=0.3113**	**z = -1.04 Pr >z=0.2987**	**z = -1.05 Pr >z=0.2937**
Sargan test:	**$Chi^2(108)$ = 41.34 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 44.40 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 39.58 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 49.55 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 34.13 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 33.10 Prob > chi^2 = 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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. All variables with the exception of the lag of the dependent variable are treated as being predetermined. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that*

excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.

Table 5: Principal component type financial development and financial openness indices, endogenous variables

	Dependent Variables					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	0.8753***	0.8738***	0.84279***	0.29763***	0.61170***	0.4478***
	(81.67)	(79.90)	(39.11)	(47.18)	(36.48)	(18.85)
$\Delta PCAFO_t$	0.22080***	0.2804***	0.08947***	0.19891***	0.94161***	1.1869***
	(10.49)	(11.53)	(5.97)	(5.20)	(25.04)	(24.26)
ΔTO_t	-0.00265***	-0.00296***	-0.00054**	0.01140***	0.001502**	0.00276***
	(-5.67)	(-5.84)	(-1.95)	(21.97)	(1.84)	(2.44)
ΔGDP Growth$_t$	0.00174***	0.00081*	-0.00990***	0.03574***	0.01662***	0.01751***
	(3.28)	(1.29)	(-21.49)	(12.22)	(8.09)	(21.80)
ΔLog GDP per capita$_t$	0.22506***	0.24787***	0.14803***	-0.136158	-0.10941	-0.146371*
	(10.85)	(9.92)	(5.41)	(-1.08)	(-1.01)	(-1.56)
ΔPCA Institutional Quality	0.01308	0.00368	-0.09542***	-0.39572***	0.06084	-0.004402
	(0.65)	(0.17)	(-8.61)	(-15.19)	(1.18)	(-0.12)
ΔSecondary School Enrollment	-0.00167**	-0.00189**	-0.000773**	-0.01631***	-0.00239**	0.00124
	(-2.22)	(-2.03)	(-1.78)	(-9.23)	(-2.10)	(1.10)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.74 Pr > z = 0.0062**	**z = -2.65 Pr > z =0.0080**	**z = -2.35 Pr > z =0.0187**	**z = -1.94 Pr > z =0.0526**	**z = -2.49 Pr >z=0.0129**	**z = -2.26 Pr >z=0.0241**
Arellano – Bond test for AR(2) in first differences:	**z = -1.78 Pr > z = 0.0744**	**z = -1.74 Pr > z =0.0827**	**z = -1.29 Pr > z=0.1972**	**z = -1.09 Pr > z =0.2762**	**z = -1.17 Pr >z=0.2406**	**z = -1.17 Pr >z=0.2439**
Sargan test:	**$Chi^2(108)$ = 43.76 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 43.66 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 38.26 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 50.35 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 34.37 Prob > chi^2 = 1.0000**	**$Chi^2(108)$ = 34.99 Prob > chi^2 = 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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. All variables with the exception of the lag of the dependent variable are treated as being endogenous. The variables are defined as follows: PCAFO = Principal components financial*

openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.

Table 7: Principal components type financial development and financial openness indices with time dummies and a trend, complete results

	Dependent Variables					
	$\Delta PCABD_t$	**$\Delta PCABD1_t$**	**$\Delta PCABMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCAFD_t$**	**$\Delta PCAFD4_t$**
ΔDependent variable$_{t-1}$	0.83676***	0.84076***	0.84836***	0.20578***	0.54231***	0.370383***
	(41.77)	(47.18)	(29.71)	(19.30)	(10.66)	(9.63)
$\Delta PCAFO_t$	0.06092***	0.07447***	0.05074***	0.19594***	0.50007***	0.500101***
	(3.25)	(3.40)	(3.06)	(2.75)	(4.29)	(5.02)
ΔTO_t	0.00035	0.00012	0.00061**	0.00345***	-0.000485	-0.00082
	(0.76)	(0.16)	(2.21)	(4.12)	(-0.45)	(-0.55)
ΔGDP Growth$_t$	0.00339***	0.001514	-0.01092***	0.03458***	0.014096***	0.014397***
	(2.82)	(0.92)	(-16.04)	(10.87)	(3.02)	(2.92)
ΔLog GDP per capita$_t$	-0.5008***	-0.5607***	-0.32530***	-1.31945***	-0.86522***	-1.4659***
	(-5.03)	(-5.45)	(-2.62)	(-5.14)	(-2.56)	(-4.75)
ΔPCA Institutional Quality	-0.01957	-0.006099	-0.05024***	-0.044997	0.101523***	0.119196***
	(-0.81)	(-0.22)	(-4.97)	(-0.99)	(-3.03)	(3.38)
ΔSecondary School Enrollment	0.00095*	0.00107*	0.00085***	-0.00405***	-0.000484	0.00178*
	(1.61)	(1.55)	(3.04)	(-3.10)	(-0.35)	(1.31)
Δt	0.02317***	0.02661***	0.019334***	0.09192***	0.045942***	0.081290***
	(8.29)	(7.02)	(5.77)	(9.82)	(3.32)	(6.56)
Δyear1998	0.01869**	0.01992**	0.059673***	-0.05529**	-0.020753	0.02515*
	(1.81)	(1.77)	(8.40)	(-2.20)	(-1.17)	(1.42)
Δyear1999	0.00053	-0.00358	0.04228***	0.01682	-0.01383	0.01019
	(0.05)	(-0.32)	(5.88)	(0.77)	(-0.68)	(0.45)
Δyear2000	-0.03869***	-0.04979***	0.02196***	0.2315***	0.079936**	0.15812***
	(-3.24)	(-3.80)	(2.72)	(8.02)	(2.08)	(4.06)
Δyear2001	-0.04605***	-0.06332***	-0.01744***	-0.016997	-0.07876***	-0.04232**
	(-3.96)	(-4.78)	(-3.31)	(-0.87)	(-2.87)	(-1.46)
Δyear2002	-0.06098***	-0.07984***	0.00581	-0.08750***	-0.10275***	-0.09588***
	(-4.80)	(-5.63)	(-1.04)	(-5.05)	(-3.26)	(-3.37)
Δyear2003	-0.05774***	-0.07636***	-0.00195	-0.30872***	-0.18427***	-0.22524***
	(-4.87)	(-5.36)	(-0.32)	(-17.35)	(-5.59)	(-8.04)
Δyear2004	-0.0802***	-0.09628***	0.01858***	-0.3462***	-0.16925***	-0.19748***
	(-7.82)	(-8.85)	(3.15)	(-21.26)	(-6.47)	(-9.61)

Δyear2005	-0.04020***	-0.04678***	-0.03087***	-0.26550***	-0.11033***	-0.145713***
	(-4.83)	(-5.77)	(-4.25)	(-18.18)	(-5.76)	(-7.75)
Δyear2006	-0.03723***	-0.04563***	-0.0257***	-0.25209***	-0.09977***	-0.11913***
	(-6.22)	(-6.55)	(-3.59)	(-17.51)	(-5.69)	(-8.69)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.19 Pr > z =0.0284**	**z = -2.17 Pr > z=0.0303**	**z = -2.27 Pr > z = 0.0234**	**z = -1.87 Pr > z =0.0612**	**z = -2.38 Pr > z=0.0173**	**z = -2.29 Pr > z=0.0222**
Arellano – Bond test for AR(2) in first differences:	**z = -1.69 Pr > z =0.0913**	**z = -1.67 Pr > z=0.0955**	**z = -0.76 Pr > z =0.4461**	**z = -1.32 Pr > z=0.1875**	**z = -1.16 Pr > z=0.2471**	**z = -1.15 Pr > z=0.2512**
Sargan test:	**$Chi^2(54)$ = 31.40 Prob > chi^2 = 0.9941**	**$Chi^2(54)$ = 32.06 Prob > chi^2 = 0.9924**	**$Chi^2(54)$ = 28.54 Prob > chi^2 = 0.9983**	**$Chi^2(54)$ = 42.75 Prob > chi^2 = 0.8651**	**$Chi^2(54)$ = 28.49 Prob > chi^2 = 0.9983**	**$Chi^2(54)$ = 24.02 Prob > chi^2 = 0.9999**

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The model above includes a linear time trend and time dummies. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.*

Table 8: Principal components type financial development and financial openness indices with time dummies

	Dependent Variables					
	$\Delta PCABD_t$	$\Delta PCABD1_t$	$\Delta PCABMD_t$	$\Delta PCASMD_t$	$\Delta PCAFD_t$	$\Delta PCAFD4_t$
ΔDependent variable$_{t-1}$	0.84355***	0.83795***	0.8301***	0.20455***	0.58265***	0.4327927***
	(34.10)	(41.39)	(24.96)	(14.72)	(11.25)	(10.14)
$\Delta PCAFO_t$	0.06913***	0.07702***	0.05142***	0.18548***	0.46010***	0.5292751***
	(3.76)	(3.40)	(3.16)	(3.27)	(7.61)	(5.65)
ΔTO_t	-0.00002	0.00029	0.00086**	0.00355***	-0.00007	0.0001039
	(-0.03)	(0.50)	(3.00)	(7.27)	(-0.06)	(0.06)
ΔGDP Growth$_t$	0.00308***	0.00218**	-0.01145***	0.03567***	0.01384***	0.0133873***
	(3.60)	(1.66)	(-20.58)	(7.67)	(3.03)	(2.74)
ΔLog GDP per capita$_t$	-0.50117***	-0.55298***	-0.175442***	-1.54424***	-0.89022***	-1.541898***
	(-4.97)	(-5.19)	(-2.57)	(-3.57)	(-2.82)	(-4.01)
ΔPCA Institutional Quality	0.00936	0.00089	-0.05432***	-0.04045	0.07048**	0.1185935***
	(0.33)	(0.04)	(-5.34)	(-0.86)	(2.06)	(3.08)
ΔSecondary School Enrollment	0.00143***	0.00173***	0.00095***	-0.004243***	0.00005	0.0021574*
	(2.63)	(2.55)	(2.86)	(-3.43)	(0.04)	(1.51)
Δyear1998	0.04342***	0.05636***	0.06710***	0.027654	0.043610**	0.118667*
	(4.35)	(4.88)	(7.15)	(1.13)	(1.85)	(4.40)
Δyear1999	0.05849***	0.05676***	0.05962***	0.20274***	0.08914***	0.1793196
	(5.26)	(3.67)	(6.73)	(5.81)	(2.92)	(4.52)
Δyear2000	0.03964***	0.03173*	0.05660***	0.52527***	0.236972***	0.3919676***
	(2.58)	(1.47)	(6.47)	(8.86)	(3.55)	(5.60)
Δyear2001	0.06601***	0.04323**	0.02940***	0.38038***	0.12899**	0.2927506**
	(3.56)	(1.72)	(2.47)	(5.55)	(2.12)	(4.07)
Δyear2002	0.07551***	0.05667**	0.06186***	0.40316***	0.154927***	0.3287523***
	(3.74)	(1.96)	(5.16)	(5.45)	(2.53)	(4.54)
Δyear2003	0.10026***	0.08451***	0.07904***	0.28146***	0.138351**	0.2983793***
	(4.33)	(2.72)	(6.04)	(3.49)	(2.07)	(3.65)
Δyear2004	0.1014***	0.08759***	0.11577***	0.34050***	0.20772***	0.4086914***
	(3.97)	(2.40)	(8.40)	(3.59)	(2.43)	(4.22)
Δyear2005	0.16715***	0.162413***	0.07756***	0.52375***	0.30428***	0.5295226***
	(5.86)	(3.88)	(4.56)	(4.74)	(3.26)	(4.94)

Δyear2006	0.19302***	0.19025***	0.09414***	0.62694***	0.36305***	0.6203395***
	(6.31)	(4.05)	(4.83)	(4.99)	(3.32)	(4.97)
Δyear2007	0.2544***	0.26396***	0.13716***	0.98286***	0.49498***	0.7966474
	(7.84)	(4.80)	(7.18)	(6.98)	(4.10)	(5.94)
Number of observations:	**329**	**329**	**300**	**373**	**262**	**262**
Number of groups:	**50**	**50**	**41**	**54**	**38**	**38**
Arellano – Bond test for AR(1) in first differences:	**z = -2.32 Pr > z =0.0203**	**z = -2.18 Pr > z =0.0290**	**z = -2.29 Pr > z =0.0220**	**z = -1.85 Pr >z=0.0640**	**z = -2.44 Pr >z=0.0149**	**z = -2.54 Pr > z=0.0111**
Arellano – Bond test for AR(2) in first differences:	**z = -1.70 Pr > z =0.0892**	**z = -1.64 Pr > z =0.1007**	**z = -0.73 Pr > z=0.4638**	**z = -1.32 Pr >z=0.1870**	**z = -1.12 Pr > z=0.2645**	**z = -1.07 Pr > z=0.2835**
Sargan test:	**$Chi^2(54)$ = 31.81 Prob > chi^2 = 0.9931**	**$Chi^2(54)$ = 33.76 Prob > chi^2 = 0.9860**	**$Chi^2(54)$ = 26.76 Prob > chi^2 = 0.9993**	**$Chi^2(54)$ = 41.53 Prob > chi^2 = 0.8928**	**$Chi^2(54)$ = 22.09 Prob > chi^2 = 1.0000**	**$Chi^2(54)$ = 19.93 Prob > chi^2 = 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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The model above includes time dummies. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.*

Table 9: Principal components type financial development and financial openness indices with time dummies and a trend

	Dependent Variables					
	$\Delta PCABD_t$	$\Delta PCABD1_t$	$\Delta PCABMD_t$	$\Delta PCASMD_t$	$\Delta PCAFD_t$	$\Delta PCAFD4_t$
ΔDependent variable$_{t-1}$	1.1304***	1.16364***	0.53056***	0.21979***	0.68672***	0.48552***
	(39.42)	(39.68)	(12.86)	(25.98)	(11.42)	(12.45)
ΔDependent variable$_{t-2}$	-0.3912***	-0.39947***	-0.02324	-0.15466***	-0.022323	-0.05661***
	(-11.70)	(-12.98)	(-1.07)	(-35.16)	(-0.75)	(-2.58)
ΔDependent variable$_{t-3}$	0.17724***	0.17827***	0.24188***	-0.000901	0.04210	0.08282**
	(9.86)	(10.89)	(11.95)	(-0.15)	(1.05)	(2.26)
$\Delta PCAFO_t$	0.03264*	0.07336***	0.09571***	0.08576***	0.40269***	0.41688***
	(1.46)	(2.25)	(6.51)	(1.76)	(7.06)	(6.37)
ΔTO_t	-0.00054	-0.000062	0.00008	0.00565***	0.00227	0.00236
	(-0.89)	(-0.07)	(0.29)	(8.66)	(1.22)	(1.27)
ΔGDP Growth$_t$	0.000734	-0.000657	-0.00613***	0.02261***	0.00089	0.00496
	(0.45)	(-0.36)	(-6.95)	(8.53)	(0.22)	(1.09)
ΔLog GDP per capita$_t$	-0.590112***	-0.58476***	-0.316264***	-2.48431***	-0.8957**	-1.8038***
	(-4.16)	(-2.79)	(-4.71)	(-9.12)	(-2.16)	(-3.88)
ΔPCA Institutional Quality	0.06757***	0.09809***	-0.036513***	-0.090751***	0.10820**	0.12416***
	(2.52)	(2.76)	(-4.94)	(-3.52)	(2.31)	(2.74)
ΔSecondary School Enrollment	0.000763*	0.00082*	-0.000793***	-0.00284**	-0.00020	0.00107
	(1.27)	(1.30)	(-2.47)	(-2.30)	(-0.12)	(0.64)
Δt	0.02638***	0.0272***	0.01420***	0.12764***	0.03793***	0.07253***
	(5.42)	(3.66)	(6.28)	(11.85)	(2.90)	(4.33)
Δyear2000	-0.056317***	-0.06269***	-0.009492**	0.214588***	0.12310***	0.13789***
	(-4.38)	(-3.68)	(-2.29)	(11.38)	(5.29)	(4.13)
Δyear2001	-0.043154***	-0.040735***	-0.036021***	-0.071995***	-0.11285***	-0.09596***
	(-4.07)	(-3.00)	(-7.02)	(-4.63)	(-2.87)	(-4.47)
Δyear2002	-0.054824***	-0.042994**	-0.02323***	-0.11637***	-0.10517***	-0.09558***
	(-3.64)	(-2.33)	(-3.74)	(-8.84)	(-3.06)	(-2.83)
Δyear2003	-0.063674***	-0.06433***	-0.01583**	-0.3560***	-0.166744***	-0.21296***
	(-4.80)	(-3.89)	(-2.21)	(-29.12)	(-4.88)	(-4.79)
Δyear2004	-0.08588***	-0.08723***	0.0087*	-0.37503***	-0.123284***	-0.15444***
	(-9.18)	(-7.19)	(1.35)	(-31.23)	(-4.56)	(-4.24)

Δyear2005	-0.027871***	-0.02496**	-0.02421***	-0.32904***	-0.08308***	-0.118708***
	(-2.95)	(-2.28)	(-3.38)	(-24.48)	(-3.86)	(-4.12)
Δyear2006	-0.04543***	-0.05348***	-0.02485***	-0.288475***	-0.07656***	-0.09518***
	(-8.48)	(-8.23)	(-4.28)	(-19.86)	(-4.80)	(-4.47)
Number of observations:	**289**	**289**	**273**	**343**	**225**	**225**
Number of groups:	**49**	**49**	**40**	**53**	**37**	**37**
Arellano – Bond test for AR(1) in first differences:	**z = -2.96 Pr > z = 0.0031**	**z = -2.79 Pr > z=0.0053**	**z = -0.80 Pr > z = 0.4262**	**z = -2.02 Pr > z =0.0437**	**z = -2.91 Pr > z=0.0036**	**z = -2.74 Pr > z=0.0062**
Arellano – Bond test for AR(2) in first differences:	**z = 0.12 Pr > z = 0.9058**	**z = -0.12 Pr > z =0.9067**	**z = 1.97 Pr > z =0.0487**	**z = 1.32 Pr > z =0.1870**	**z = 2.61 Pr > z=0.0090**	**z = 2.65 Pr > z=0.0080**
Sargan test:	**$Chi^2(49)$ = 26.95 Prob > chi^2 = 0.9956**	**$Chi^2(49)$ = 26.96 Prob > chi^2 = 0.9956**	**$Chi^2(49)$ = 24.36 Prob > chi^2 = 0.9988**	**$Chi^2(49)$ = 43.10 Prob > chi^2 = 0.7101**	**$Chi^2(49)$ = 17.77 Prob > chi^2 = 1.0000**	**$Chi^2(49)$ = 17.73 Prob > chi^2 = 1.0000**

***Notes**: All regressions are estimated using the Arellano – Bond dynamic panel GMM estimation with three lags of the dependent variable to be included in the model, 0 lags of the dependent variable to be used as instruments, and three lags of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The model above includes a higher lag structure, a linear time trend and time dummies. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.*

Table 10: Principal component type financial openness index and individual financial development measures

	Dependent Variables							
	$\Delta LLGDP_t$	**$\Delta PCRDBGDP_t$**	**$\Delta DBACBA_t$**	**$\Delta TBAGDP_t$**	**$\Delta DCBBS_t$**	**$\Delta STMCGDP_t$**	**$\Delta STTURNOVE_t$**	**$\Delta STVALTRA_t$**
ΔDependent variable$_{t-1}$	0.9484***	0.6245***	0.7389***	0.6091***	0.9791***	0.48753***	0.1629***	0.5426***
	(269.02)	(179.62)	(173.46)	(118.74)	(119.93)	(158.46)	(151.25)	(778.89)
$\Delta PCAFO_t$	-0.2575***	5.8303***	-1.8459***	13.214***	-0.8766***	24.863***	0.1963	29.407***
	(-3.43)	(50.17)	(-43.14)	(58.04)	(-5.02)	(60.84)	(0.44)	(252.41)
ΔTO_t	0.05661***	0.103***	-0.0082**	0.12481***	0.1105**	0.4622***	0.2915***	0.7901***
	(5.06)	(25.37)	(-7.20)	(15.78)	(10.87)	(39.03)	(35.74)	(301.68)
ΔGDP Growth$_t$	-0.3198***	-0.3558***	0.26929***	-0.3193***	-0.616***	0.1813***	3.0142***	1.4736***
	(-11.02)	(-19.37)	(46.06)	(16.59)	(-17.47)	(4.12)	(100.49)	(108.62)
ΔLog GDP per capita$_t$	12.582***	16.679***	3.0382***	4.6974***	12.394***	42.572***	-68.44***	56.534***
	(7.01)	(17.90)	(30.97)	(4.12)	(5.98)	(32.46)	(-118.99)	(81.28)
ΔPCA Institutional	0.013	-2.3829	0.3805***	1.8137***	-6.504***	-15.882***	-11.976***	-7.8398***
Quality	(0.65)	(-16.58)	(6.19)	(16.65)	(-22.06)	(-47.02)	(-12.32)	(-45.74)
ΔSecondary School	-4.118**	-0.0874***	0.0202***	0.0061	-0.115***	0.00424	-0.345***	-0.3870***
Enrollment	(-11.82)	(-15.28)	(28.41)	(0.90)	(-15.16)	(0.31)	(-22.64)	(-65.02)
Number of observations:	**353**	**361**	**340**	**331**	**364**	**373**	**373**	**373**
Number of groups:	**53**	**53**	**51**	**50**	**54**	**54**	**54**	**54**
Arellano – Bond test for AR(1) in first differences:	**z = -0.43 Pr > z=0.6677**	**z = 0.14 Pr > z=0.8868**	**z = -3.43 Pr >z=0.0006**	**z = 0.79 Pr > z=0.4323**	**z = -1.99 Pr >z =0.0469**	**z = 0.33 Pr >z=0.7420**	**z = -1.55 Pr>z=0.1209**	**z = -1.98 Pr >z=0.0473**
Arellano – Bond test for AR(2) in first differences:	**z = -1.97 Pr>z=0.0489**	**z = -1.61 Pr > z=0.1081**	**z = -1.76 Pr >z=0.0787**	**z = -1.48 Pr > z=0.1390**	**z = 1.43 Pr >z =0.1514**	**z = -2.24 Pr >z=0.0254**	**z = -1.13 Pr>z=0.2584**	**z = 0.26 Pr >z=0.7941**
Sargan test:	**$Chi^2(54)$ = 50.15 Prob >chi^2 = 0.6238**	**$Chi^2(54)$ = 46.19 Prob >chi^2 = 0.7660**	**$Chi^2(54)$ = 46.30 Prob >chi^2 = 0.7624**	**$Chi^2(54)$ = 44.00 Prob > chi^2 = 0.8323**	**$Chi^2(54)$ = 48.76 Prob > chi^2 = 0.6759**	**$Chi^2(54)$ = 51.69 Prob > chi^2 = 0.5641**	**$Chi^2(54)$ = 50.98 Prob > chi^2 = 0.5917**	**$Chi^2(54)$ = 50.97 Prob > chi^2 = 0.5921**

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are*

defined as follows: LLGDP = Liquid liabilities (%of GDP), PCRDBOFGDP = Private credit by deposit money banks and other institutions (% of GDP), DBACBA = The ratio of deposit money bank assets to the sum of deposit money bank assets to central bank assets (in percentages), TBAGDP = Total bank assets (% of GDP), DCBBS = Domestic credit provided by the banking sector (% of GDP), STMCGDP = Stock market capitalization (% of GDP), STTURNOVER = Stock market turnover ratio (in percentages), STVALTRA = Stock market total value traded (% of GDP), PCAFO = Principal components financial openness index. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t statistics and the stars represent the significant t-statistics for 1%, 5%, and % 10 confidence levels.

Table 11 (a): Principal component type financial development indices and individual financial openness measures

	Dependent Variables				
	$\Delta PCABD_t$	**$\Delta PCABD_t$**	**$\Delta PCABD_t$**	**$\Delta PCABD_t$**	**$\Delta PCABD_t$**
$\Delta PCABD_{t-1}$	0.570***	0.530***	0.585***	0.577***	0.937***
	(57.93)	(98.44)	(72.53)	(122.2)	(134.2)
$\Delta mcaplicom_t$	0.00102***				
	(8.790)				
ΔFDI_t		0.00255***			
		(12.41)			
$\Delta lidopc_t$			-0.00398***		
			(-6.690)		
$\Delta intldebt_t$				0.00346***	
				(8.011)	
$\Delta portinv_t$					-0.00691***
					(-28.00)
ΔTO_t	0.00292***	0.00401***	0.00367***	0.00205***	0.000917***
	(15.97)	(27.27)	(19.00)	(10.13)	(2.759)
ΔGDP Growth$_t$	-0.00534***	-0.00186***	-0.00576***	-0.00432***	-0.00206***
	(-10.73)	(-4.608)	(-15.50)	(-9.147)	(-4.505)
ΔLOG GDP per capita$_t$	0.530***	0.651***	0.692***	0.655***	0.130***
	(7.373)	(30.50)	(22.84)	(18.46)	(6.091)
ΔPCA Institutional quality	-0.0539***	-0.0789***	-0.0616***	-0.0269***	-0.0158*
	(-9.569)	(-6.107)	(-9.991)	(-2.952)	(-1.712)
ΔSec. school enrollment	5.10e-06	6.64e-05	-0.000293	0.00158***	0.000570***
	(0.0185)	(0.251)	(-1.111)	(11.01)	(4.711)
Observations	369	339	370	368	361
Number of groups	54	52	54	53	53
Arellano – Bond test for	z = -1.09	z = -1.01	z = -1.11	z = -1.11	z = -1.77
AR(1) in first differences:	Pr > z = 0.2749	Pr > z = 0.3106	Pr > z = 0.2666	Pr > z = 0.2690	Pr > z = 0.0774
Arellano – Bond test for	z = 0.88	z = 0.94	z = 0.89	z = 0.89	z = -1.81
AR(2) in first differences:	Pr > z = 0.3792	Pr > z = 0.3466	Pr > z = 0.3749	Pr > z = 0.3735	Pr > z = 0.0703

Sargan test:	$Chi^2(54)$ = 50.09 Prob > chi^2 = 0.6258	$Chi^2(54)$ = 47.21 Prob > chi^2 = 0.7316	$Chi^2(54)$ = 50.80 Prob > chi^2 = 0.5986	$Chi^2(54)$ = 49.25 Prob > chi^2 = 0.6577	$Chi^2(54)$ = 49.88 Prob > chi^2 = 0.6339

__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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: mcaplicom: market capitalization of listed companies (% of GDP), FDI = Foreign direct investment (% of GDP), lidopc = number of domestic companies listed (per million population), intldebt = international debt issues (% of GDP), portinv = portfolio investment flows (% of GDP), PCABD = Principal components banking sector development index. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.

Table 11 (b): Principal component type financial development indices and individual financial openness measures

	Dependent Variables				
	$\Delta PCABD1_t$	**$\Delta PCABD1_t$**	**$\Delta PCABD1_t$**	**$\Delta PCABD1_t$**	**$\Delta PCABD1_t$**
$\Delta PCABD1_{t-1}$	0.684***	0.606***	0.692***	0.663***	0.966***
	(83.94)	(105.4)	(87.85)	(92.03)	(75.07)
$\Delta mcaplicom_t$	0.00130***				
	(11.07)				
ΔFDI_t		0.00338***			
		(12.52)			
$\Delta lidopc_t$			-0.00300***		
			(-7.590)		
$\Delta intldebt_t$				0.00466***	
				(13.04)	
$\Delta portinv_t$					-0.00603***
					(-15.27)
ΔTO_t	0.00244***	0.00425***	0.00374***	0.00169***	0.000831**
	(11.07)	(21.54)	(14.37)	(6.102)	(2.192)
$\Delta GDP\ Growth_t$	-0.00701***	-0.00335***	-0.00733***	-0.00585***	-0.00426***
	(-11.41)	(-6.373)	(-10.50)	(-9.677)	(-9.134)
$\Delta Log\ of\ GDP\ per\ capita_t$	0.252***	0.608***	0.484***	0.488***	0.0875***
	(4.050)	(20.95)	(13.17)	(9.370)	(3.268)
ΔPCA Institutional quality	-0.0487***	-0.0782***	-0.0517***	-0.00489	-0.0186**
	(-5.048)	(-4.628)	(-6.043)	(-0.466)	(-2.332)
ΔSec. school enrollment	-0.000766***	-0.000253	-0.00106***	0.00118***	0.000230
	(-2.682)	(-0.788)	(-4.768)	(6.148)	(1.481)
Observations	369	339	370	368	361
Number of groups	54	52	54	53	53
Arellano – Bond test for	z = -1.05	z = -1.04	z = -1.06	z = -1.05	z = -2.79
AR(1) in first differences:	Pr > z = 0.2934	Pr > z = 0.2988	Pr > z = 0.2903	Pr > z = 0.2954	Pr > z = 0.0052

Arellano – Bond test for	z = 0.85	z = 0.91	z = 0.85	z = 0.86	z = -1.77
AR(2) in first differences:	Pr > z = 0.3974	Pr > z = 0.3616	Pr > z = 0.3935	Pr > z = 0.3907	Pr > z = 0.0759
Sargan test:	$Chi^2(54)$ = 50.49 Prob > chi^2 = 0.6104	$Chi^2(54)$ = 46.81 Prob > chi^2 = 0.7454	$Chi^2(54)$ = 50.92 Prob > chi^2 = 0.5939	$Chi^2(54)$ = 49.70 Prob > chi^2 = 0.6409	$Chi^2(54)$ = 49.98 Prob > chi^2 = 0.6303

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: mcaplicom: market capitalization of listed companies (% of GDP), FDI = Foreign direct investment (% of GDP), lidopc = number of domestic companies listed (per million population), intldebt = international debt issues (% of GDP), portinv = portfolio investment flows (% of GDP), PCABD1 = Principal components banking sector development index excluding the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.*

Table 11 (c): Principal component type financial development indices and individual financial openness measures

	Dependent Variables				
	$\Delta PCABMD_t$	$\Delta PCABMD_t$	$\Delta PCABMD_t$	$\Delta PCABMD_t$	$\Delta PCABMD_t$
$\Delta PCABMD_{t-1}$	0.894***	0.886***	0.873***	0.808***	0.861***
	(71.51)	(69.98)	(68.99)	(53.04)	(70.68)
$\Delta mcaplicom_t$	0.000292***				
	(4.70)				
Δfdi_t		-0.000237***			
		(-3.390)			
$\Delta lidopc_t$			0.00126***		
			(12.29)		
$\Delta intldebt_t$				0.00175***	
				(6.650)	
$\Delta portinv_t$					-0.000787***
					(-4.275)
ΔTO_t	0.00138***	0.00200***	0.00170***	0.000938***	0.00170***
	(10.92)	(15.22)	(12.31)	(6.793)	(8.726)
$\Delta GDP\ Growth_t$	-0.0128***	-0.0111***	-0.0119***	-0.0101***	-0.0117***
	(-44.59)	(-46.76)	(-32.24)	(-28.13)	(-24.55)
$\Delta Log\ GDP\ per\ capita_t$	0.0337	0.00628	0.0261	0.0547*	0.0323**
	(1.632)	(0.322)	(1.632)	(1.823)	(2.031)
ΔPCA Institutional quality	-0.0764***	-0.0800***	-0.0654***	-0.0439***	-0.0614***
	(-12.30)	(-16.15)	(-11.55)	(-11.47)	(-14.11)
ΔSec. school enrollment	-0.000471***	-0.000595***	-0.000619***	0.000172*	-0.000476***
	(-3.242)	(-3.947)	(-5.541)	(1.942)	(-4.758)
Observations	317	301	318	318	316
Number of groups	41	41	41	41	41

Arellano – Bond test for AR(1) in first differences:	z = -2.48 Pr > z = 0.0131	z = -2.54 Pr > z = 0.0109	z = -2.58 Pr > z = 0.0098	z = -2.43 Pr > z = 0.0152	z = -2.52 Pr > z = 0.0119
Arellano – Bond test for AR(2) in first differences:	z = -1.66 Pr > z = 0.0962	z = -1.41 Pr > z = 0.1598	z = -1.68 Pr > z = 0.0932	z = -1.66 Pr > z = 0.0974	z = -1.62 Pr > z = 0.1047
Sargan test:	$Chi^2(54)$ = 35.11 Prob > chi^2 = 0.9783	$Chi^2(54)$ = 34.29 Prob > chi^2 = 0.9833	$Chi^2(54)$ = 34.38 Prob > chi^2 = 0.9828	$Chi^2(54)$ = 35.51 Prob > chi^2 = 0.9756	$Chi^2(54)$ = 33.25 Prob > chi^2 = 0.9882

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: mcaplicom: market capitalization of listed companies (% of GDP), FDI = Foreign direct investment (% of GDP), lidopc = number of domestic companies listed (per million population), intldebt = international debt issues (% of GDP), portinv = portfolio investment flows (% of GDP), PCABMD = Principal components bond market development index. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.*

Table 11 (d): Principal component type financial development indices and individual financial openness measures

	Dependent Variables				
	$\Delta PCASMD_t$	**$\Delta PCASMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCASMD_t$**	**$\Delta PCASMD_t$**
$\Delta PCASMD_{t-1}$	0.346***	0.297***	0.300***	0.316***	0.303***
	(240.9)	(95.18)	(220.4)	(198.1)	(205.1)
$\Delta mcaplicom_t$	0.00485***				
	(78.23)				
ΔFDI_t		0.000620***			
		(5.660)			
$\Delta lidopc_t$			-0.00915***		
			(-20.62)		
$\Delta intldebt_t$				0.00792***	
				(20.95)	
$\Delta portinv_t$					0.00118***
					(4.036)
ΔTO_t	0.00555***	0.00984***	0.0113***	0.00818***	0.0104***
	(20.54)	(36.55)	(43.98)	(43.40)	(32.07)
$\Delta GDP\ Growth_t$	0.0328***	0.0309***	0.0296***	0.0357***	0.0309***
	(85.27)	(24.62)	(36.78)	(46.87)	(41.45)
$\Delta Log\ of\ GDP\ per\ capita_t$	-0.233***	0.367***	0.520***	0.253***	0.396***
	(-6.360)	(8.371)	(13.40)	(5.852)	(9.542)
ΔPCA Institutional quality	-0.0551***	-0.147***	-0.0883***	0.00223	-0.112***
	(-7.230)	(-10.93)	(-11.91)	(0.137)	(-9.381)
ΔSecondary school enrollment	-0.00689***	-0.00474***	-0.00634***	-0.00367***	-0.00548***
	(-26.87)	(-17.86)	(-26.38)	(-9.463)	(-15.45)
Observations	425	388	425	418	411
Number of groups	58	56	58	57	57
Arellano – Bond test for AR(1) in first differences:	z = -2.12 Pr > z = 0.0340	z = -1.96 Pr > z = 0.0504	z = -2.03 Pr > z = 0.0421	z = -2.07 Pr > z = 0.0382	z = -2.00 Pr > z = 0.0459
Arellano – Bond test for	z = -0.89	z = -0.96	z = -0.95	z = -1.00	z = -0.97

AR(2) in first differences:	Pr > z = 0.3730	Pr > z = 0.3388	Pr > z = 0.3428	Pr > z = 0.3175	Pr > z = 0.3342
Sargan test:	$Chi^2(54)$ = 50.66 Prob > chi^2 = 0.6038	$Chi^2(54)$ = 46.56 Prob > chi^2 = 0.7537	$Chi^2(54)$ = 48.13 Prob > chi^2 = 0.6991	$Chi^2(54)$ = 50.31 Prob > chi^2 = 0.6175	$Chi^2(54)$ = 50.00 Prob > chi^2 = 0.6294

***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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: mcaplicom: market capitalization of listed companies (% of GDP), FDI = Foreign direct investment (% of GDP), lidopc = number of domestic companies listed (per million population), intldebt = international debt issues (% of GDP), portinv = portfolio investment flows (% of GDP), PCASMD = Principal components stock market development index. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.*

Table 11 (e): Principal component type financial development indices and individual financial openness measures

	Dependent Variables				
	ΔPCAFD	**ΔPCAFD**	**ΔPCAFD**	**ΔPCAFD**	**ΔPCAFD**
$\Delta PCAFD_{t-1}$	0.529***	0.546***	0.470***	0.535***	0.444***
	(69.27)	(51.05)	(42.59)	(62.71)	(33.20)
$\Delta mcaplicom_t$	0.00307***				
	(15.56)				
ΔFDI_t		0.00639***			
		(7.854)			
$\Delta lidopc_t$			-0.00151		
			(-0.775)		
$\Delta intldebt_t$				0.00681***	
				(12.51)	
$\Delta portinv_t$					0.00325***
					(5.083)
ΔTO_t	0.00579***	0.00633***	0.00744***	0.00420***	0.00936***
	(12.12)	(11.62)	(13.59)	(11.83)	(16.38)
$\Delta GDP\ Growth_t$	0.00719***	0.0108***	0.00607***	0.0145***	0.00542**
	(3.720)	(5.879)	(3.646)	(11.15)	(2.577)
$\Delta Log\ of\ GDP\ per\ capita_t$	0.370***	0.601***	0.997***	0.414***	0.777***
	(3.332)	(7.789)	(9.999)	(9.176)	(9.698)
ΔPCA Institutional Quality	0.0164	-0.0275	-0.00390	0.0935***	0.000669
	(1.252)	(-1.193)	(-0.553)	(10.84)	(0.0383)
ΔSec. school enrollment	-0.000480	-0.00131***	-0.000518	0.00184***	-0.00129***
	(-0.828)	(-3.985)	(-1.565)	(4.254)	(-2.973)
Observations	276	262	276	276	275
Number of groups	38	38	38	38	38
Arellano – Bond test for	z = -2.68	z = -2.44	z = -2.51	z = -2.68	z = -2.28
AR(1) in first differences:	Pr > z = 0.0073	Pr > z = 0.0146	Pr > z = 0.0120	Pr > z = 0.0075	Pr > z = 0.0229
Arellano – Bond test for	z = -0.20	z = -0.59	z = -0.49	z = -0.56	z = -0.79
AR(2) in first	Pr > z = 0.8415	Pr > z = 0.5553	Pr > z = 0.6272	Pr > z = 0.5784	Pr > z = 0.4282

differences:					
Sargan test:	$Chi^2(54)$ = 31.55 Prob > chi^2 = 0.9937	$Chi^2(54)$ = 30.46 Prob > chi^2 = 0.9960	$Chi^2(54)$ = 29.58 Prob > chi^2 = 0.9972	$Chi^2(54)$ = 33.09 Prob > chi^2 = 0.9889	$Chi^2(54)$ = 26.14 Prob > chi^2 = 0.9995

__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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: mcaplicom: market capitalization of listed companies (% of GDP), FDI = Foreign direct investment (% of GDP), lidopc = number of domestic companies listed (per million population), intldebt = international debt issues (% of GDP), portinv = portfolio investment flows (% of GDP), PCAFD = Principal components financial development index. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.

Table 11 (f): Principal component type financial development indices and individual financial openness measures

	Dependent Variables				
	$\Delta PCAFD4_t$	**$\Delta PCAFD4_t$**	**$\Delta PCAFD4_t$**	**$\Delta PCAFD4_t$**	**$\Delta PCAFD4_t$**
$\Delta PCAFD4_{t-1}$	0.503***	0.432***	0.443***	0.393***	0.436***
	(35.39)	(33.68)	(33.71)	(35.94)	(34.85)
$\Delta mcaplicom_t$	0.00339***				
	(31.59)				
ΔFDI_t		0.00756***			
		(7.557)			
$\Delta lidopc_t$			-0.000933		
			(-0.541)		
$\Delta intldebt_t$				0.0111***	
				(19.24)	
$\Delta portinv_t$					0.00678***
					(11.25)
ΔTO_t	0.00706***	0.00734***	0.00992***	0.00373***	0.00999***
	(10.51)	(9.652)	(15.69)	(6.443)	(12.11)
$\Delta GDP\ Growth_t$	0.00945***	0.00835***	0.00936***	0.0153***	0.00922***
	(6.649)	(4.267)	(5.713)	(7.776)	(7.752)
$\Delta Log\ of\ GDP\ per\ capita_t$	0.155	0.663***	0.553***	0.401***	0.558***
	(1.437)	(10.48)	(8.847)	(4.395)	(4.479)
ΔPCA Institutional quality	-0.0164	-0.0520*	-0.0343***	0.0875***	-0.0531***
	(-1.419)	(-1.862)	(-3.481)	(6.432)	(-3.206)
ΔSec. school enrollment	-0.000375	-0.000777*	-0.000247	0.00248***	-0.00128***
	(-1.065)	(-1.791)	(-0.749)	(4.122)	(-4.907)
Observations	276	262	276	276	275
Number of label	38	38	38	38	38
Arellano – Bond test for	z = -2.36	z = -2.29	z = -2.22	z = -2.29	z = -2.20
AR(1) in first differences:	Pr > z = 0.0181	Pr > z = 0.0223	Pr > z = 0.0265	Pr > z = 0.0219	Pr > z = 0.0278
Arellano – Bond test for	z = -0.11	z = -0.47	z = -0.36	z = -0.48	z = -0.71
AR(2) in first differences:	Pr > z = 0.9087	Pr > z = 0.6378	Pr > z = 0.7167	Pr > z = 0.6283	Pr > z = 0.4750

Sargan test:	$Chi^2(54)$ = 32.86 Prob > chi^2 = 0.9898	$Chi^2(54)$ = 30.86 Prob > chi^2 = 0.9953	$Chi^2(54)$ = 35.34 Prob > chi^2 = 0.9768	$Chi^2(54)$ = 32.90 Prob > chi^2 = 0.9896	$Chi^2(54)$ = 35.71 Prob > chi^2 = 0.9740

__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 to be used as instruments, and one lag of the other variables to be used as instruments. The results reported here use the twostep estimator. The index measures are constructed following the principal component methodology that utilizes all components. The variables are defined as follows: mcaplicom: market capitalization of listed companies (% of GDP), FDI = Foreign direct investment (% of GDP), lidopc = number of domestic companies listed (per million population), intldebt = international debt issues (% of GDP), portinv = portfolio investment flows (% of GDP), PCAFD4 = Principal components financial development index excluding the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.

Table 12: Principal component type financial development and financial openness indices, fixed effects in levels

	Dependent Variables					
	$PCABD_t$	**$PCABD1_t$**	**$PCABMD_t$**	**$PCASMD_t$**	**$PCAFD_t$**	**$PCAFD4_t$**
$PCAFO_t$	0.34825***	0.45020***	0.25722***	0.41546***	0.60681***	0.71384***
	(4.22)	(4.67)	(4.86)	(4.24)	(7.36)	(8.00)
TO_t	-0.00240	-0.00294	-0.00130	0.0098***	0.0009	0.0024
	(-1.24)	(-1.30)	(-1.23)	(3.73)	(0.40)	(1.06)
GDP $Growth_t$	-0.0171***	-0.0213***	-0.00424	0.00353	-0.00692	-0.00629
	(-3.19)	(-3.40)	(-1.15)	(0.37)	(-1.23)	(-1.04)
Log GDP per $capita_t$	1.8698***	2.120***	0.5264***	0.7684***	1.7430***	1.578***
	(9.67)	(9.38)	(4.64)	(2.73)	(8.18)	(6.84)
PCA Institutional Quality	0.00538	-0.0023	-0.129***	0.06699	0.02515	-0.01507
	(0.09)	(-0.03)	(-3.31)	(0.66)	(0.40)	(-0.22)
Secondary School	-0.00186	-0.0024***	0.00355***	-0.0078***	-0.0037**	-0.004**
Enrollment	(-0.88)	(-0.97)	(2.93)	(-2.42)	(-1.73)	(-1.57)
Constant	-15.898***	-17.96***	-4.8891***	-6.7945***	-15.296***	-13.850***
	(-9.78)	(-9.44)	(-4.84)	(-2.83)	(-8.18)	(-6.85)
Number of observations:	**453**	**453**	**401**	**506**	**360**	**360**
Number of groups:	**51**	**51**	**41**	**56**	**38**	**38**
R-square:						
Within:	**0.3530**	**0.3526**	**0.2299**	**0.1935**	**0.4927**	**0.4774**
Between:	**0.4429**	**0.4414**	**0.3690**	**0.1254**	**0.5073**	**0.5230**
Overall:	**0.4000**	**0.3993**	**0.3576**	**0.1228**	**0.4797**	**0.4986**
F-test for u_i=0	**F(50,396) = 51.82**	**F(50,396) = 54.47**	**F(40,354) = 130.04**	**F(55,444) = 19.60**	**F(37, 316) = 44.43**	**F(37,316) = 52.82**

Notes: All regressions are estimated using fixed effects. The index measures are constructed following the principal component methodology that utilizes all components. The model above includes a higher lag structure, a linear time trend and time dummies. The variables are defined as follows: PCAFO = Principal components financial openness index, PCABD = Principal components banking sector development index, PCABD1 = Principal components banking sector

development index that excludes the deposit money banks to central bank assets ratio, PCABMD = Principal components bond market development index, PCASMD = Principal components stock market development index, PCAFD = Principal components financial development index, PCFD4 = Principal components financial development index that excludes the deposit money bank assets to central bank assets ratio. Institutional quality index is constructed using the principal components methodology. Figures in brackets are t-statistics and the stars represent t-statistics for 1%, 5%, and %10 confidence levels.