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Financial Openness and Financial Development: Evidence from Emerging Countries

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Abstract

We investigate the potential relation between financial openness and financial development for 27 emerging countries for the period between 1996 and 2016. We focus on three dimensions of financial openness: capital account openness, trade openness, and stock-market openness. In this study, we propose alternative measures for capital account and trade openness. Moreover, we offer capital flow and valuation-based measures for stock-market openness as a potential determinant of financial development. Our findings indicate that capital account openness and trade openness are the key drivers of financial development. These results are not sensitive to the use of alternative financial openness and financial development measures, and are robust after being controlled for institutional quality and its components. Our results have implications for policymakers in emerging countries who try to increase the depth of their financial markets for an easier and cheaper access to funds.

Keywords

Financial Development, Trade Openness, Capital Account Openness, Stock Market Openness

Introduction

A growing line of research documents a positive link between economic growth and financial development in developed and emerging countries and reports that countries that have developed their financial systems tend to grow faster (Levine, Loayza & Beck, 2000; Valickova, Havranek & Horvath, 2015). This research question is especially important for policymakers in emerging countries trying to develop their financial system to raise much-needed capital to finance economic growth. Moreover, financial development decreases poverty and inequality by widening access to finance for the poor and powerless groups, increases investments and enhances productivity. (World Bank, 2017). Financial development is also important for the survival of small and medium-sized enterprises (SMEs) as these enterprises can raise funds

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from more diverse fund sources and at reasonable costs in the presence of a well-established financial system. SMEs are labour intensive rather than capital intensive and therefore create most of the jobs especially in emerging economies that host numerous SMEs. Finally, a well-functioning financial system shaped by strong financial sector policies avoids financial crises or at least attenuates the deteriorating effects of such a crisis. In sum, due to the vital effects of financial development on several dimensions of an economy, understanding how to achieve and maintain sustainable financial development is of great importance for financial policy makers in emerging countries.

This study examines the potential relationship between financial openness and financial development by employing a panel of 27 emerging countries for the period 1996 to 2016. In search of such a relationship, we use the fixed effect least-squares dummy variable (LSDV) approach, which accounts for time-invariant country-specific effects. The LSDV model enables heterogeneity among countries by allowing each country to have its own intercept value (Gujarati and Porter, 2009). We offer several measures both for financial openness and for financial development. The three building blocks of financial openness we focus on are; capital-account openness, trade openness and stock-market openness. To proxy financial development, we use four different measures such as the ratios of stock market capitalisation, liquid liabilities, and private credits to GDP, and a multi-dimensional measure of financial development. The main objective of this study is to find out whether financial openness stimulates financial development and, if so, which types of financial openness are more important for establishing a deeper financial system.

The studies so far have embarked on the importance of only two dimensions of financial openness which are trade openness and capital-account openness. For instance, Rajan and Zingales (2003) argue that trade openness fosters financial development, which enlarges investment opportunities and increases competition in the economy by bringing foreign investors to domestic markets. Huang and Temple (2005) show that if the degree of trade openness for the goods market increases, financial development will improve. Law (2009) states that trade openness and capital flows are important drivers of financial development in emerging countries. Law and Habibullah (2009) emphasise that trade openness supports the development of financial markets.

It is also discussed that enhancing capital account openness plays an essential role for successful financial development. Chinn and Ito (2006) concentrate on the effects of capital account openness on financial development for emerging markets. They report that removing capital controls enables foreign and domestic investors to diversify their portfolios internationally. Due to the global pricing of assets, stemming from international diversification, expected returns and thus the cost of capital can decrease. This increases the likelihood of projects ending up with net profits. Klein and Olivei (2008) show a positive link between the

degree of capital account openness and the level of financial development, indicating that liberalising capital accounts triggers financial development.

In addition to the well-known dimensions of financial openness such as trade openness and capital account openness, stock-market openness can also be an important component of financial development. A well-functioning stock market can lower the cost of equity by providing an easy access to funds, which in turn increases returns and investment, especially in emerging markets (Stulz, 1999; Bekaert & Harvey, 2000; Henry, 2000a, 2000b; Bekaert, Harvey & Lundblad, 2005; Kim & Singal, 2000; Jayasuriya, 2005). Stock market liberalisation can attract foreign investors to take part in the local financial system of a country and to finance profitable local projects, which leads to financial deepening. From this perspective, the degree of stock-market openness can be a potential factor in the transition from an emerging to an advanced financial system. On the other hand, if stock market openness is not binding, it can have no impact on financial development. Due to the political instability and economic policies of emerging countries, foreign investors may not prefer to trade local stocks even when the stock market is liberalised for foreign investment. In summary, it can be difficult to determine whether stock-market openness affects financial development or not. Therefore, clarifying this issue is an empirical matter. Interestingly, as far as we are aware, there are no studies investigating the association between stock market openness and financial development. In this study, we try to fill this gap. We proxy stock-market openness by capital flow-based and valuation-based measures. More specifically, the capital flow-based measure suggested by Umutlu, Akdeniz and Altay-Salih (2010) is calculated as the ratio of foreign equity liabilities in a stock market to market capitalisation of that stock exchange. On the other hand the valuation-based measure suggested by Bekaert, Harvey, Lundblad and Siegel (2011) indicates the degree of segmentation of a stock market with respect to the world market, which is the opposite of the degree of stock-market integration.

This study further adds to the current literature by using alternative measures for trade openness and capital account openness, which are composite trade share and an alternative measure of capital account openness measure of Chin and Ito (2006), respectively. Composite trade share blends two components: i) Trade share, showing the volume of exports and imports of goods and services divided by GDP, and ii) World trade share, showing the total trade with respect to the total world trade. In the construction of an alternative measure of capital account openness, we use binary coding for restrictions on capital accounts presented in 13 subcategories in the IMF's Annual Reports on Exchange Arrangements and Exchange Restrictions (AREAER). We take the average of the binary values for 13 subcategories to obtain a restriction-based measure and then subtract the average from one to convert the restriction-based measure to a measure for capital accounts openness.

We find that out of three financial openness measures, trade openness and capital account openness play the most significant roles in promoting financial development. We check the

robustness of our results by using alternative financial openness and financial development measures and obtain similar results. Moreover, our results remain unchanged after controlling for institutional quality and its components. Our results are also valid for a longer sample period, which is obtained by dropping some alternative measures with fewer time-series observations. We further show that the global financial crisis caused a contraction in the availability of liquid liabilities and private credit whereas it had an increasing impact on share prices in emerging markets. The effect of the crisis lasted for two years. Our results have implications for policymakers in emerging markets who try to increase the depth of their financial markets for gaining an easier and cheaper access to funds. For instance, policymakers can take steps to facilitate trade and capital account openness at the highest priority.

This paper adds to the literature in the following ways. Our first contribution is the examination of stock market openness as a potential determinant of financial development. We use both a capital flow-based variable and a valuation-based variable separately to measure stock market openness. The ratio of foreign equity liabilities to the market capitalisation of the stock exchange *(FEL)* is the capital flow-based measure while the degree of segmentation of a stock market *(SEG)* is the valuation-based measure. To the best of our knowledge, there is no other study that uses these measures to explain financial development. Our second contribution is the use of alternative measures of trade openness and capital account openness, which are composite trade share and an alternative measure of capital account openness and use them to examine the reliability of our results.

The remainder of the study is outlined as follows. Section 2 surveys the literature. Section 3 defines data sources and variables. Section 4 shows the model specification and methodology. Section 5 presents findings and a discussion of the results. The final section provides concluding remarks.

Literature Review

As the improvement in the level of financial development and economic development go hand in hand, ways of achieving financial development has become an interesting subject in emerging countries. Many researchers conducted studies on the determinants of financial development and found that financial openness is a strong determinant of financial development. The studies reporting a link between financial openness and financial development can be categorised into two groups. The first group of studies proxy financial openness as trade openness.

For instance, Huang and Temple (2005) studied the relationship between trade openness and financial development by using both time series and cross-country variation in openness. They used panel data for 81 countries between the years 1960 and 1999. Their results show that there is a positive relationship between goods market openness and financial depth. Kim,

Lin, and Suen (2010) analysed the effects of trade openness on financial development for 88 countries in the period of 1960 to 2005 and found that trade openness has a significant role in promoting financial development. Motelle (2011) examined the effects of remittances on financial development in Lesotho and showed that both in the short and long run, trade openness and inflation have significant impacts on financial development. Results also show that remittances affect financial development only in the long run.

The second group of studies measures financial openness as capital account openness. The most widely known study in this group is that of Chin and Ito (2006). Chin and Ito (2006) considered the potential relationship between capital account liberalisation and financial development in a model that controls for the level of legal/institutional development, particularly in equity markets. They used panel data analysis, which included 108 countries between the years 1980 and 2000. Their findings demonstrate that shareholder protection levels are important for financial development and creditor protection influences financial development in equity and banking sectors. Their results also showed that capital account openness contributes to equity market development once a threshold level of legal/institutional development is attained especially in emerging markets. In addition, they found out that an improvement in trade openness is a prerequisite for capital account openness and thus for financial development.

Klein and Olivei (2008) examined whether there is a relationship between capital account openness and financial development in a cross-section of developed and developing countries for the periods between 1976–1995 and 1986–1995, respectively. They demonstrated that the countries allowing capital account openness have more developed financial markets than the countries restricting capital accounts. Ahmed (2013) also investigated the role of capital account openness on financial development and economic growth in Sub-Saharan African countries (SSA) over the period of 1981 to 2009. Their results showed that capital account openness has a positive impact on financial development in the SSA region.

Additionally, Rajan and Zingales (2003) used panel data regression to examine 24 industrialised countries over the period 1913 to 1999. They indicated that opening both trade and capital accounts at the same time are the key factors for being successful in financial development. In other words, trade openness promotes financial development especially when the capital flow has free mobility across countries. They also indicate that trade openness without capital account openness is unlikely to boost the financial development of a country. In the light of the findings of Rajan and Zingales (2003), Baltagi et al. (2009) tried to answer the question of whether trade and capital account openness can jointly explain the recent progress in financial development. They employed data from both developing and industrialised countries. Their results showed that both trade and capital account openness are statistically significant determinants of the development of banking sectors. Moreover, they showed that

capital account openness and trade openness are negatively related to each other. That is the capital account openness decreases the benefits of trade openness and vice versa. Their results also showed that comparatively closed economies benefit more by opening up their capital accounts and/or trade accounts. In spite of being able to achieve more by opening both trade and capital accounts, the countries in their study still obtain gains by opening up one without the other in the banking sector. In other words, Baltagi et al. (2009) did not find any evidence supporting the view that having only one type of openness without the other has a negative effect on financial sector development.

This paper adds to the literature in the following ways. Our first contribution is the examination of stock market openness as a potential determinant of financial development. Although the relationship between stock market openness and several variables such as cost of capital, return volatility, liquidity etc. are investigated previously (Chari and Henry, 2004; Umutlu, Altay-Salih, and, Akdeniz, 2010; and Bayar and Önder, 2005), whether stock market openness is associated with financial development has not been examined yet. We both use a capital flow-based variable and a valuation-based variable to measure stock market openness. The ratio of foreign equity liabilities to the market capitalisation of the stock exchange *(FEL)* is the capital flow-based measure while the degree of segmentation of a stock market with respect to the world market *(SEG)* is the valuation-based measure. To the best of our knowledge, this paper is the first to use these measures to explain financial development. Our second contribution is the use of alternative measures of trade openness and capital account openness, which are composite trade share and an alternative measure of capital account openness and we use them to check the robustness of our results.

Data and Variables

Because of its extensive scope, it is not easy to quantify financial development (Rajan & Zingales, 2003). Although there is no single correct variable to represent financial development, some standard quantitative variables like the relative size of stock market, liquid liabilities, and private credits by banks with respect to the size of economy have been commonly used to represent financial development in many empirical studies. In line with the literature, we employ these three different proxies for modelling financial development. More specifically, these measures are Private Credit by Deposit Money Banks, Stock Market Capitalisation and Liquid Liabilities all of which are expressed as a share of GDP. Private Credit is defined as credits or loans granted by banks to the private sector (Levine et al. 2000). Stock Market Capitalisation to GDP shows the relative size of stock markets with respect to the size of the overall economy and is calculated as the ratio of the value of all listed shares to GDP. Liquid Liabilities to GDP shows currency plus demand and interest-yielding liabilities of all financial intermediaries as a percentage of GDP. It is briefly known as broad money and generally used for the measurement

of financial depth (Beck, Demirgüç-Kunt & Levine, 2010). The data for these measures are provided by the World Bank's Global Financial Development Database (GFDD).

We use Institutional Quality and its components separately as control variables in our regression specifications to examine whether our results are robust. The components of Institutional Quality include; Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability. Each component represents a different aspect of governance. Control of Corruption acquires perceptions of how much public power is being used for private gain, comprising the "seizure" of the state by personal and elite interests. Government Effectiveness includes perceptions about the quality of public and civil services, which is not affected by political oppression. It also involves policy creation and implementation quality of the government. Political Stability and Absence of Violence/Terrorism indicates the political instability of a country and/or violence that is politically supported. Regulatory Quality shows the government's aptitude for systemizing and applying principles and strategies that allow and foster the development of the private sector. Rule of Law shows how much society complies with the rules, how society is bound up with rules and whether the enforcement is equal to all members of societies. Voice and Accountability describe the independence of association and expression as well as free media tools in a country where citizens can take part in the election of their government (World Governance Index, 2018). The data for six components of institutional quality are obtained from the World Governance Index (WGI) on a scale of -2.5 to +2.5. We take the average of these six components to construct the combined Institutional Quality (*INST_QUAL*) measure. We either use Institutional Quality measure alone or its components in different regression specifications.

Variables for Financial Openness

One of the aims of this paper is to find out which types of financial openness are more important for financial depth. We use three financial openness measures, which are Trade Openness *(TO)*, Capital Account Openness *(KAOPEN)* and stock market openness measured as Foreign Equity Liabilities *(FEL)*. We use those variables as the base-case financial openness measures in regression specifications.

Trade Openness *(TO)* is described as exports plus imports of goods & services (BoP, current US$) divided by GDP (current US$). *TO* data is taken from World Development Indicators (WDI).

Chinn and Ito (2006) introduce an index called the Financial Openness Index of Capital Account Openness *(KAOPEN)*. We use the normalised version of the *KAOPEN* Index that ranges between zero and one, and the data is obtained from Chinn and Ito (2006). The *KAOPEN* index is derived from four dummy variables; multiple exchange rates, restrictions on

current account transactions, restrictions on capital account transactions, and the requirement of the surrender of export proceeds, which are taken from the IMF's Annual Reports on Exchange Arrangements and Exchange Restrictions (AREAER). Chin and Ito (2006) take the reverse of these binary variables to indicate the degree of financial openness. Hence, *KAOPEN* takes higher values if there are cross-border financial transactions.

Lane and Milesi-Ferretti (2007) used a capital flow-based measure to explain the extent of financial liberalisation. Their measure demonstrated the sum of foreign equity assets and liabilities and the foreign direct investment assets and liabilities of a country as a share of the GDP. Umutlu, Akdeniz, Altay-Salih (2010) introduced a modified version of the Lane and Milesi-Ferretti measure that concentrates on the extent of openness of a stock market to foreign equity investment. They defined a new measure called Foreign Equity Liabilities *(FEL)*, which is computed as the ratio of equity liabilities portfolio to the market capitalisation of the stock exchange.

$$FEL = \frac{Portfolio Equity Liabilities}{Market Cap. of Local Stock Exchange} \quad (1)$$

We employ *FEL* as the measure for stock market openness. The data for *FEL* is retrieved from Lane and Milesi-Ferretti (2007).

Alternative Variables for Financial Openness

We try to explain the association between financial openness and financial depth by using alternative measures of financial openness. For each of our base-case variables *(TO, KAOPEN*, and *FEL)*, their corresponding alternatives are used to examine whether the main results are sensitive to different definitions of financial openness measures.

Our alternative measure for trade openness is Composite Trade Share *(CTS)* offered by Squalli and Wilson (2011). *CTS* combines two dimensions of trade: Trade Share and World Trade Share. The first dimension, Trade Share *(TS)*, is calculated as the volume of exports and imports of goods and services of a country divided by its GDP.

TS is computed as below:

$$TS_i = \frac{(X+M)_i}{GDP_i} \quad (2)$$

where X is exports and M is imports of goods and services. *TS* lies in the range of zero and positive infinity.

The second dimension of *CTS*, World Trade Share *(WTS)*, is calculated by the volume of exports and imports of goods and services of a country, divided by the total world export and import.

$$WTS_i = \frac{(X+M)_i}{\sum_{i=1}^{n}(X+M)_i} \qquad (3)$$

i: country, *n:* number of countries in the world in year *t*.

WTS shows the ratio of country *i*'s total trade to the total world trade.

Finally, Squalli and Wilson (2011) combined *TS* and *WTS* to construct *CTS*:

$$CTS_{it} = \frac{(X+M)_i}{\frac{1}{n}\sum_{i=1}^{n}(X+M)_i} \frac{(X+M)_i}{GDP_i} \qquad (4)$$

We calculate *CTS* for each country and for each year and use it as an alternative to the *TO* measure. The data to construct *CTS* is from WDI.

Our second alternative measure is *ALT_KAOPEN*. We use the AREAER to calculate *ALT_ KAOPEN*, which is an alternative to the Chinn-Ito *KAOPEN* index. The AREAER provides information on the presence or lack of 13 restraints for capital accounts, which allows us to track the overall capital account openness for a country. AREAERs are publicly available on the official website of the IMF. We employ a binary coding to identify restrictions in a country. More specifically, we assign one if there is a restriction for a restriction category and zero otherwise. Next, we calculate the average of all binary values belonging to 13 categories. This average represents the degree of restrictions. In the last step, we deduct the average from 1 so that we obtain an openness (not a restriction) measure for capital accounts. We name this variable as *ALT_KAOPEN*. Our measure is similar to that of Miniane (2004), in the sense that both measures use binary coding for restrictions. *ALT_KAOPEN* differs from Miniane's measure in the number of restriction categories used. We use 13 categories for capital restrictions and dropped the 14th category used by Miniane (2004), which reflects multiple exchange rate arrangements as we only focus on restrictions. Our measure is also different from that of Miniane (2004) as it is a measure for openness whereas Miniane's measure indicated the degree of restrictions. Furthermore, we extend the index of Miniane (2004), which ends in 2000, to 2016 for the emerging countries in our sample.

We calculate *ALT_KAOPEN* for all countries and for all years from 1996 to 2016 by manually collecting the data on restriction categories from IMF's annual reports on AREAER. We cannot construct *ALT_KAOPEN* before 1996 as the annual reports have a different report format before this date and do not document 13 subcategories.

Finally, our alternative measure for stock market openness is the World Equity Market Segmentation *(SEG),* which was first proposed by Bekaert et al. (2011). A country's degree of segmentation is the opposite of its degree of integration. If the market is more segmented, it means that it is less open to foreign investors and thus less diversified in terms of fund

sources. Therefore, we expect a negative association between segmentation and financial development. Bekaert et al. (2011) defined *SEG* as the absolute difference between local and global earnings-to-price ratios of industries. This measure reflects the contributions of both time-series and cross-sectional variations in segmentation.

Equity Market Segmentation for country *i* in year *t* is defined as:

$$SEG = \sum_{j=1}^{N} IW_{i,j,t} \left| EY_{i,j,t} - EY_{w,j,t} \right| \qquad (5)$$

*i:*country*, j:* industry*, t:* year*, w:* global market*, N:* number of industries

where $IW_{i,j,t}$ indicates the weight of industry *j* in country *i* at year *t* and $\left| EY_{i,j,t} - EY_{w,j,t} \right|$ indicates the absolute value of the difference between earnings-to-price ratio of industry *j* in country *i* ($EY_{i,j,t}$) and that in global market portfolio ($EY_{w,j,t}$).

The idea behind the *SEG* measure rests on the following argument. If financial markets are fully integrated, then the same industries around the world should provide similar earnings yield, therefore the difference between earnings yields should converge to zero. Oppositely, if the markets are segmented local industries, they will provide a different earnings yield depending on the local conditions and the difference between the earnings yield will divert from zero. In summary, the *SEG* shows to what extent countries are actually integrated or segmented.

We calculate the *SEG* in the following manner. First, we assume that each country index is the weighted average of N industries for each year and define the weight of industry *j* in country *i* as the ratio of the market capitalisation of the industry to that of country $IW_{i,j,t}$. Then, we calculate $EY_{i,j,t}$ as the reciprocal of price-to-earnings ratio for industry *j* in country *i*. Next, we calculate $EY_{w,j,t}$ similarly for the Global market portfolio. Finally, we compute the weighted average of the absolute value of differences between local and global earnings-to-price ratio for each country and for each year in the sample period.

Our sample of equity industries involves twenty different sectors, which are Automobile & Parts, Banks, Basic Resources, Chemicals, Construction and Materials, Financial Services 3, Financial Services 4, Food & Beverages, Health Care, Industrial Goods & Services, Insurance, Media, Oil & Gas, Personal & Household Goods, Real Estate, Retail, Technology, Telecom, Travel & Leisure and Utilities. We calculate the *SEG* for 27 emerging countries for the period between 1996 to 2016, using an annual price-to-earnings ratio and market value data for industries from DataStream and add it to our regressions to examine its potential relationship with financial development.

Table 1 shows descriptive statistics for all variables including the dependent and independent variables employed in the analysis for 27 emerging countries listed in Appendix from 1996 to 2016. Table 2 provides information about variables' data availability and data source.

Table 1
Basic Statistics

	Mean	Median	Std. Dev.	Max	Min	Observation
Market Cap.	0.4920	0.3391	0.4637	3.2808	0.0001	758
Liquid Liab.	0.4553	0.3745	0.2856	1.9781	0.0575	1282
Private Credit	0.3698	0.2774	0.2749	1.6321	0.00223	1263
TO	0.6914	0.5669	0.4246	2.5109	0.0908	994
CTS	0.8277	0.4087	1.1692	8.2436	0.0209	939
FEL	0.2160	0.1369	0.7906	15.8558	0	709
SEG	0.0776	0.0277	0.1968	1.5997	0.0026	632
ALT_KAOPEN	0.2924	0.2307	0.2484	0.9230	0	567
KAOPEN_N	0.0755	-0.1355	1.5576	2.3599	-1.9104	1141
KAOPEN	0.4650	0.4156	0.3647	1	0	1141
INST_QUAL	0.0574	-0.0042	0.5605	1.2870	-1.1782	513

In previous literature, it is documented that trade openness and capital account openness play important roles in triggering financial development. Therefore, we expect positive signs for trade openness and capital account openness measures *(TO, CTS, KAOPEN, ALT_KAOPEN)*. In addition, a strong institutional environment can facilitate financial development so we anticipate a positive correlation between *INS_QUAL* and financial deepening. The *FEL* indicates the degree of integration of stock markets whereas market segmentation *(SEG)*, as the name implies, shows the opposite of integration, therefore, we anticipate the *FEL* and the *SEG* to move in opposite directions. Hence, the *FEL* is anticipated to be positively linked to financial development while the *SEG* is expected to exert a negative influence.

Table 2
Summary of Variables

Variables	Period	Data Source
Stock Market Capitalization	1975-2017	GFDD
Liquid Liabilities	1960-2016	GFDD
Private Credit	1960-2016	GFDD
SEG	1973-2018	DataStream
CTS	1960-2017	WDI
ALT_KAOPEN	1996-2016	IMF (AREAER)
FEL	1975-2015	Lane-Milesi Ferretti
TO	1960-2017	WDI
KAOPEN	1970-2016	Chin-Ito
INST_QUAL	1996-2017	WGI

Model Specification and Methodology

We investigate whether financial openness exerts any impact on financial depth in emerging countries. Our empirical model includes trade openness *(TO)*, capital account openness *(KAOPEN)* and stock market openness *(FEL)* as the base-case variables of financial openness. As a robustness test, we employ the alternative versions of *TO, KAOPEN,* and *FEL*,

which are *CTS, ALT_KAOPEN,* and *SEG*, respectively. In addition to independent variables of interest, we used several control variables including the components of institutional quality. Besides these individual quality measures, we also use a single overall quality measure (*INST_QUAL*) by averaging the individual measures.

The dependent variable, financial development, is proxied by three alternative indicators: Stock Market Capitalisation to GDP, Liquid Liabilities to GDP, and Private Credit by Deposit Money Banks to GDP. For each dependent variable, we estimate four different regression specifications and provide the results for panel regressions including i) base-case variables, ii) alternative variables, and iii) a combination of both.

Since our sample has both time-series (years) and cross-sectional (countries) dimensions, we use panel data regression in our study. We use the fixed effects model to cope with country effects.

In the first set of regression specifications, we estimate the following models of financial development with base-case variables of financial openness in Eqs. (6), (7), and (8). In each of these equations, an alternative definition of the dependent variable is used.

$$MarketCap_{it}=\alpha+ \beta_1 FEL_{it}+ \beta_2 TO_{it}+ \beta_3 KAOPEN_{it}+ \beta_4 CC_{it}+ \beta_5 GE_{it}+ \beta_6 PS_{it}+ \beta_7 RQ_{it}$$
$$+\beta_8\, VA_{it}+ \beta_9\, RL_{it}+ \varepsilon_{it} \qquad (6)$$

$$LiquidLiab_{it}=\alpha+\beta_1 FEL_{it}+\beta_2 TO_{it}+\beta_3 KAOPEN_{it}+\beta_4 CC_{it}+\beta_5 GE_{it}+\beta_6 PS_{it}+\beta_7 RQ_{it}$$
$$+\beta_8\, VA_{it}+\beta_9\, RL_{it}+\varepsilon_{it} \qquad (7)$$

$$Private_{it}=\alpha+\beta_1 FEL_{it}+\beta_2 TO_{it}+\beta_3 KAOPEN_{it}+\beta_4 CC_{it}+\beta_5 GE_{it}+\beta_6 PS_{it}+\beta_7 RQ_{it}$$
$$+\beta_8\, VA_{it}+\beta_9\, RL_{it}+\varepsilon_{it} \qquad (8)$$

*i:*country*, t*=year

In the second set of specifications, we estimate panel regressions with base-case variables for financial openness along with the combined institutional quality measure, *INST_QUAL*, as shown in Eqs. (9), (10), and (11).

$$MarketCap_{it}=\alpha+\beta_1 FEL_{it}+\beta_2 TO_{it}+\beta_3 KAOPEN_{it}+\beta_4 INST\_QUAL_{it}+\varepsilon_{it} \quad (9)$$

$$LiquidLiab_{it}=\alpha+\beta_1 FEL_{it}+\beta_2 TO_{it}+\beta_3 KAOPEN_{it}+\beta_4 INST\_QUAL_{it}+\varepsilon_{it} \quad (10)$$

$$Private_{it} = \propto + \beta_1 FEL_{it} + \beta_2 TO_{it} + \beta_3 KAOPEN_{it} + \beta_4 INST\_QUAL_{it} + \varepsilon_{it} \quad (11)$$

Next, we estimate the modified version of Eqs. (6) to (11) in which financial openness is measured by alternative measures of *CTS, ALT_KAOPEN*, and *SEG*. Lastly, we estimate the analogs of the above-mentioned equations in which alternative variables of *SEG* and *CTS*, and the base-case variable of *KAOPEN* are simultaneously used along with the control variable of *INST_QUAL*.

Before proceeding further, we perform some diagnostic checks. Firstly, we examine whether multicollinearity problem exists for the estimated models. Variance Inflation Factors (VIF) are scattered around 1 for most of our base case variables. VIF estimates of the variables ranging between 1 for *CTS* and 9.73 for the *Control of Corruption* variable are below the common cutoff threshold of 10 (Hair et al., 2009) and show that there is no serious multicollinearity problem in our models. Next, we investigate the cross-section dependency of the variables by using the Pesaran (2004) CD test. CD-test statistics ranging between -2.04 (for the *Regulatory Quality* variable) and 81.10 (for the *Overall Financial Development Index* variable) indicate that the null hypothesis of cross-section independence is rejected for the variables except *INST_QUAL* (CD-test statistics 0.41 with a p-value of 0.685), *Government Effectiveness* (CD-test statistics -0.11 with a p-value of 0.914), and *Rule of Law* (CD-test statistics 0.76 with a p-value of 0.444). Finally, we check the slope homogeneity for each of the estimated models by using the Peseran and Yamagata (2008) test. The adjusted delta values for every model estimated range from 4.271 to 23.339 and reject the null hypothesis that the slope coefficients are homogeneous. In light of these tests, we employ the cross-section SUR setting as an alternative estimation approach that allows for contemporaneous correlation between cross-sections clustering by periods. As this framework requires a balanced panel, there is a considerable loss of observations from both the cross-section and the time-series dimensions. However, the results obtained from this approach are qualitatively the same with the results obtained from the panel data estimation with the least squares method, and the quantitative results are even stronger. Therefore, we employ the main estimation approach utilising the full set of observations and report the results based on this approach in the forthcoming sections.

Findings and Discussion

Results of the Base-Case Regression Specification

Table 3 reports the results of regressions including the base-case variables of financial openness for three alternative dependent variables. Each panel shows the results for a different dependent variable. The coefficients of the *FEL* in Panel A are negative and insignificant while they are positive and significant in Panels B and C. The inconsistent slope estimates on

the *FEL* in different specifications do not provide strong evidence in favour of a relationship between the *FEL* and financial development. On the other hand, the *TO* and the *KAOPEN* have significantly positive coefficients in all of the specifications in which they are included, suggesting that they are exerting a positive influence on the dependent variable. These findings indicate that both trade openness and capital account openness are important drivers of financial deepening even after controlling for other financial openness and institutional quality variables.

The institutional quality components provide mixed results in the different panels of Table 3. The coefficients on some of these variables either change sign in different panels or are not consistently significant in all of the regression specifications. Because of the mixed results provided by these control variables, we combine them into one variable and use Institutional Quality *(INST_QUAL)* as a standalone control variable. The results of regressions including *INST_QUAL* are presented in Specification (2) of all panels.

Table 3
Results of Panel Regressions with Base-Case Variables for Financial Openness

	Panel A Stock Market Cap. / GDP		Panel B Liquid Liabilities / GDP		Panel C Private Credit / GDP	
	(1)	(2)	(1)	(2)	(1)	(2)
FEL	-0.0948	-0.0917	0.1215c	0.1294c	0.1337c	0.1430c
	(-0.74)	(-0.70)	(1.86)	(1.87)	(1.73)	(1.82)
TO	0.2050a	0.2754a	0.1131a	0.1145a	0.1591a	0.1500a
	(2.60)	(3.46)	(2.80)	(2.72)	(3.35)	(3.15)
KAOPEN	0.1318c	0.1803a	0.0880b	0.1185a	0.1763a	0.1976a
	(1.87)	(2.70)	(2.45)	(3.35)	(4.17)	(4.95)
INST_QUAL	-	0.0556	-	-0.0516	-	0.0768
		(0.69)		(-1.21)		(1.59)
Control of Corruption	-0.1504b	-	-0.0017	-	0.0346	-
	(-2.00)		(-0.04)		(0.76)	
Government Effectiveness	0.1022	-	0.2120a	-	0.0412	-
	(1.38)		(5.62)		(0.92)	
Political Stability	0.1093a	-	-0.0579a	-	0.0052	-
	(2.97)		(-3.08)		(0.23)	
Regulatory Quality	0.2125a	-	-0.1162a	-	-0.0460	-
	(3.11)		(-3.32)		(-1.12)	
Voice and Accountability	-0.0620	-	-0.0892a	-	-0.1419a	-
	(-0.92)		(-2.61)		(-3.52)	
Rule of Law	-0.2357b	-	0.1254a	-	0.1951a	-
	(-2.50)		(2.61)		(3.44)	
Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.8324	0.8231	0.9074	0.8955	0.8628	0.8565
Observation	416	416	413	413	416	416
Sample Period	1996-2015	1996-2015	1996-2015	1996-2015	1996-2015	1996-2015

a, b, and c show regression parameters that are significant at 1%, 5%, and 10% .

The effects of the *TO, the KAOPEN,* and the *FEL* on financial development remain unchanged after controlling for *INST_QUAL*. While *the FEL* has inconsistent slope estimates,

the *TO* and the *KAOPEN* continue to have significantly positive slopes regardless of how financial development is measured as evident in Panels A, B, and C. The slope on *INST_QUAL* is indistinguishable from zero in each of the three panels. This is not surprising as the components of *INST_QUAL* were found to provide mixed results in the Specification (1) of each panel in Table 3.

Results of Regressions with Alternative Financial Openness Variables

The analyses in the previous subsection employ various measures for financial development. This subsection employs alternative variables for explanatory variables. Table 4 reports the results of regressions with alternative variables of stock market openness (*SEG*), trade openness (*CTS*), and capital account openness (*ALT_KAOPEN*). Institutional characteristics are represented by six different variables in Specification (1), while the combined version of institutional characteristics (*INST_QUAL*) is used in Specification (2).

Table 4
Results of Panel Regressions with Alternative Variables for Financial Openness

	Panel A Stock Market Cap. / GDP		Panel B Liquid Liabilities / GDP		Panel C Private Credit / GDP	
	(1)	(2)	(1)	(2)	(1)	(2)
SEG	-0.2512c	-0.2451c	-0.0553	-0.0417	-0.0361	0.0053
	(-1.78)	(-1.71)	(-0.75)	(-0.55)	(-0.39)	(0.05)
CTS	0.0755a	0.0815a	0.0543a	0.0687a	0.0442a	0.0505a
	(5.39)	(6.13)	(7.44)	(9.80)	(4.83)	(5.88)
ALT_KAOPEN	0.1694b	0.1986b	-0.0342	-0.0029	0.1700a	0.1845a
	(2.14)	(2.51)	(-0.84)	(-0.07)	(3.34)	(3.64)
INST_QUAL	-	0.0592	-	-0.0748b	-	0.0391
		(0.82)		(-2.02)		(0.85)
Control of Corruption	-0.1592b	-	-0.1154a	-	-0.0816c	-
	(-2.09)		(-3.02)		(-1.69)	
Government Effectiveness	-0.0223	-	0.1773a	-	-0.0071	-
	(-0.29)		(4.54)		(-0.14)	
Political Stability	0.1123a	-	-0.0515a	-	-0.0042	-
	(3.12)		(-2.78)		(-0.18)	
Regulatory Quality	0.2576a	-	-0.0798b	-	0.0274	-
	(3.75)		(-2.25)		(0.61)	
Voice and Accountability	-0.0157	-	-0.0477	-	-0.0944b	-
	(-0.24)		(-1.41)		(-2.21)	
Rule of Law	-0.2268b	-	0.1206a	-	0.1850a	-
	(-2.48)		(2.62)		(3.18)	
Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.8470	0.8394	0.9147	0.9077	0.8556	0.8556
Observation	414	414	418	418	422	422
Sample Period	1996-2016	1996-2016	1996-2016	1996-2016	1996-2016	1996-2016

a, b, and c show regression parameters that are significant at 1%, 5%, and 10% .

As shown in Table 4, *SEG* has a marginally negative significant slope with a t-statistic of -1.78 in Panel A while it has no longer a significant impact on financial development in Panels

B and C. These findings suggest that the alternative stock market openness measure *SEG* is not capable of explaining financial development. This result supports the previous result that stock market openness based on the *FEL* is not a reliable determinant of financial development. The alternative trade openness variable of the *CTS* persistently explains financial development no matter how financial development is measured as evidenced by significant slopes on the *CTS* in all panels. Moreover, the *CTS* produces positive significant slopes in all the regression specifications it is included in , suggesting that it explains financial development. This result reinforces the previously obtained result that trade openness based on the *TO* is significantly associated with financial development. The alternative capital account variable *ALT_KAOPEN* yields positive significant slopes in all the panels except Panel B where the dependent variable is the Liquid Liabilities to GDP ratio. Apart from this finding, the slopes on capital account openness in Tables 3 and 4 are alike. Finally, just like the results in Table 3, the slopes on six components of institutional quality are not consistent in the different panels of Table 4 and do not point out a reliable link between institutional quality measures and financial development.

The regression results when institutional quality measures are represented by one single variable are shown in the second specifications of Table 4. The signs and significance levels of slopes on the *SEG, the CTS,* and the *ALT_KAOPEN* in Table 4 are very similar to those on the *FEL*, the *TO* and the *KAOPEN* in Table 3. The *SEG* has a negative significant slope in Panel A whereas it has insignificant slopes in Panels B and C. *The CTS* has persistently positive significant slopes in all the specifications and in all the panels. The *ALT_KAOPEN* produces positive significant slopes in Panels A and C. Supporting the results in Table 3, *INST_QUAL* generates mixed results about the association between institutional quality and financial development. Overall, the similar results obtained in Table 3 and Table 4 indicate that using alternative explanatory variables does not materially change our main results.

Results of Regression Specifications Combining Base-case and Alternative Variables

In this part, we present the results of panel regressions obtained by mixing the base-case variables with alternative variables for financial openness. We mainly focus on the impact of openness measures on the dependent variable. In the full specification, we employ the base-case variable *KAOPEN* and the alternative variables *SEG* and *CTS*.

The results in Table 5 show that using base-case variables and alternative variables in different combinations does not change our results. As found earlier, stock market openness is not linked to financial development whereas trade openness and capital account openness are strongly associated with financial development no matter how the financial openness variables are measured.

Table 5
Results of Panel Regressions Obtained by Combining Base-Case Variables with Alternative Variables

	Panel A Stock Market Cap. / GDP	Panel B Liquid Liabilities / GDP	Panel C Private Credit / GDP
SEG	-0.2406c (-1.68)	-0.0419 (-0.56)	0.0099 (0.11)
CTS	0.0792a (5.96)	0.0655a (9.35)	0.0454a (5.41)
KAOPEN	0.1809a (3.09)	0.0765b (2.46)	0.2249a (6.08)
INST_QUAL	0.0398 (0.55)	-0.0927b (-2.51)	0.0110 (0.24)
Fixed Effect	Yes	Yes	Yes
Adjusted R^2	0.8407	0.9091	0.8591
Observation	414	418	422
Sample Period	1996-2016	1996-2016	1996-2016

a, b, and c show regression parameters that are significant at 1%, 5%, and 10% .

Robustness Tests

To uncover whether our results are time specific, we extend the research period by removing the variables that have time constraints. The data for *INST_QUAL* was available on the WGI official web site only after 1996. It is also not possible to calculate an alternative measure for the *KAOPEN* for the pre-1996 period because the data for 13 sub-categories do not exist in AREAER. Therefore, we remove the variables of *INST_QUAL* and *ALT_KAOPEN* from our analyses and re-run panel regressions with variables that have longer time-series data.

Specification (1) of Table 6 presents the results of panel regressions including base-case variables *(FEL, TO, and KAOPEN)* for a longer research period. The results in Table 6 can be summarised as follows. Both Trade Openness *(TO)* and Capital Account Openness *(KAOPEN)* have both positive and significant effects on financial development in all specifications and in all panels. However, the coefficient on *FEL* is insignificant in Panel A and significant in Panels B and C.

Table 6
Results for a Longer Sample

	Panel A Stock Market Cap. / GDP		Panel B Liquid Liabilities / GDP		Panel C Private Credit / GDP	
	(1)	(2)	(1)	(2)	(1)	(2)
FEL	0.1140 (1.48)	-	0.1657a (4.40)	-	0.1520a (3.77)	-
TO	0.5851a (9.68)	-	0.2555a (8.59)	-	0.3277a (10.32)	-
KAOPEN	0.1498a (3.25)	-	0.0543b (2.39)	-	0.1236a (5.10)	-
SEG	-	-0.3126b (-2.27)	-	-0.0290 (-0.49)	-	-0.0835 (-1.17)
CTS	-	0.1029a (8.09)	-	0.0860a (15.57)	-	0.0743a (11.31)
KAOPEN_N	-	0.0440a (3.60)	-	0.0048a (0.92)	-	0.0405 (6.42)
Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.6954	0.7253	0.8349	0.8852	0.8013	0.8314
Observation	680	571	677	577	679	580
Sample Period	1975-2015	1977-2016	1975-2015	1977-2016	1975-2015	1977- 2016

a, b, and c show regression parameters that are significant at 1%, 5%, and 10% .

In the second specifications of Table 6, we only use two of the alternative variables *(SEG and CTS)* that were used before. Instead of *ALT_KAOPEN*, we use Chin and Ito (2006)'s non-normalised version of the Financial Openness Index of Capital Account Openness *(KAOPEN_N)*, which has longer time-series data. The results show that *CTS* and *KAOPEN_N* are persistently and positively associated with financial development whereas *SEG* continues to yield mixed results. These findings confirm our main results. In short, the results in Table 6 show that our main results are not time specific and robust to the use of a longer research period.

Further Tests

As a further robustness check, we also use an alternative measure of financial development recently developed by Svirydzenka (2016), which is also known as the IMF index of financial development. Svirydzenka (2016) creates three sub-indices based on depth, access, and efficiency to determine to what extent financial institutions and financial markets are developed. Aggregating these three sub-indices for financial institutions and financial markets separately, she created two indices, namely the development index of financial institutions and the development index of financial markets. In the final step, these two higher-level indices are aggregated to form the overall financial development index of a country. The strong side of this measure over the traditional ones is that it accounts for several different aspects of financial development. Hence, this multi-dimensional measure aims to capture financial development more comprehensively.

Table 7
Results of Panel Regressions with Base-Case Variables for Multi-dimensional Indices of Financial Development

	Panel A Overall financial development index	Panel B Development index for financial institutions	Panel C Development index for financial markets
FEL	0.0809[b] (2.00)	0.0869[b] (2.17)	0.0731 (1.24)
TO	0.0746[a] (3.03)	0.0654[a] (2.69)	0.0822[b] (2.29)
KAOPEN	0.0881[a] (4.28)	0.0586[a] (2.87)	0.1158[a] (3.86)
INST_QUAL	-0.0204 (-0.82)	-0.0431[c] (-1.75)	0.0026 (0.07)
Fixed Effect	Yes	Yes	Yes
Adjusted R^2	0.7870	0.8285	0.6839
Observation	416	416	416
Sample Period	1996-2015	1996-2015	1996-2015

a, b, and c show regression parameters that are significant at 1%, 5%, and 10% .

We employ an overall financial development index, the development index for financial institutions and the development index for financial markets as dependent variables in panel regressions and report the results in Panels A, B, and C of Table 7 respectively. The results indicate that our main message remains unchanged. Trade openness measured by the *TO* and capital account openness measured by the *KAOPEN* are the most important determinants of financial development no matter how financial development is defined as evident by significant coefficients in all regression specifications. Stock market openness proxied by *FEL* is significantly associated with financial development in Panels A and B, but not in Panel C.

Table 8
Results of Panel Regressions with Year Dummies

	Panel A Stock Market Cap. / GDP	Panel B Liquid Liabilities / GDP	Panel C Private Credit / GDP
FEL	-0.1402 (-1.08)	0.1076 (1.50)	0.1253 (1.54)
TO	0.2333[b] (3.03)	0.1350[a] (3.17)	0.1734[a] (3.61)
KAOPEN	0.1612[b] (2.50)	0.1139[a] (3.19)	0.1872[a] (4.66)
INST_QUAL	0.0688 (0.87)	-0.0459 (-1.08)	0.0873[c] (1.81)
Year2007	0.2466[a] (6.43)	-0.0371[c] (-1.75)	-0.0443[c] (-1.85)
Year2008	0.0706[c] (1.78)	-0.0189 (-0.86)	-0.0052 (-0.21)
Year2009	0.0479 (1.22)	0.0380[c] (1.76)	0.0542[b] (2.22)
Fixed Effect	Yes	Yes	Yes
Adjusted R^2	0.8400	0.8967	0.8588
Observation	416	413	416
Sample Period	1996-2015	1996-2015	1996-2015

a, b, and c show regression parameters that are significant at 1%, 5%, and 10% .

Lastly, we examine the behaviour of financial development during the global financial crisis spanning from 2007 to 2009. The financial system can be seriously affected during a crisis and it is natural to ask which dimensions of financial development were most affected and how long it took the financial sector to recover. To answer these questions, we include time dummies for the years 2007, 2008, and 2009 in panel regressions. The results with time dummies are presented in Table 8 show that liquid liabilities and private credit were the most negatively influenced dimensions of financial development during the crisis. The time dummies for 2007 are significantly negative for these two measures of financial development while the time dummies for 2008 are negative but not significant any more. The positive 2009 time dummies indicate that the deteriorating effects of the financial crisis on liquid liabilities and private credit were recovered in 2009. Interestingly, the significant rise in Stock Market Cap. to GDP ratio in the years 2007 and 2008 suggests a share price appreciation in emerging markets. This is probably due to the flow of hot capital from developed markets, which were the epicentres of the global financial crisis, to emerging markets that remained relatively stable during the crisis. In 2009, share price appreciation stopped as evidenced by an insignificant coefficient on the time dummy. To sum up, the global financial crisis caused a contraction in the availability of liquid liabilities and private credit whereas it had an increasing impact on share prices in emerging markets. The effects of the crisis lasted for two years.

Concluding Remarks

Emerging markets need foreign investment to boost their economies more than developed markets do. Desperately searching for foreign funds, policymakers in emerging markets may not care much about the way they attract these foreign resources. This paper aims to reveal some clues on how to prioritise various forms of financial openness to improve financial development that is expected to attract foreign funds.

We test whether a relation between financial openness measured in three different forms and financial development exist by using a panel of 27 emerging markets spanning the period of 1996-2016. Examining the determinants of financial development is especially crucial for policymakers in emerging markets trying to develop their financial system for a broad and low-cost access to funds.

In this study, we employ stock-market openness as another proxy for financial openness along with the widely used proxies of trade openness and capital account openness. We measure stock-market openness both with a capital flow-based and a valuation-based variable. Although these variables and their variants were used before to examine their link with aggregate total volatility, economic growth and market returns, their relationship with financial development was not investigated previously.

Moreover, we use an alternative variable for trade openness offered by Squalli and Wilson (2011), which was not used to explain financial development before. We also form an alternative measure of capital account openness in the sense of Miniane (2004), using the binary coding provided for capital account restrictions in the annual reports of the IMF. Again, this alternative variable of capital account openness was not used to determine financial development before. Moreover, we employ several metrics of financial development to check the robustness of our results.

Our results indicate a statistically positive and significant effect of trade openness and capital accounts openness on financial development. We do not detect a robust and consistent impact of stock-market openness on financial development. These results are not sensitive to the alternative definitions of financial openness and financial development. Furthermore, these results are robust to the addition of control variables such as institutional quality and its components. Our results also hold for a longer research period obtained by dropping the variables with a fewer number of time-series observations. Lastly, we show that the global financial crisis caused a deterioration in the availability of liquid liabilities and private credits but led to share price increases probably due to the flow of hot capital from the severely affected stock markets of developed markets to the relatively less affected stock markets of emerging markets. The crisis effects were apparent in emerging markets for a period of two years extending from 2007 to 2008.

Our results have implications for policymakers. Since stock-market openness is not as important as other forms of financial openness for a deeper financial system, policymakers can first focus on establishing and maintaining trade openness and capital account openness.

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APPENDIX

Appendix 1
Country list (27 countries)

Argentina	Indonesia	Philippines
Bahrain	Israel	Poland
Brazil	Korea	Qatar
Chile	Kuwait	Russia
China	Malaysia	South Africa
Czech	Mexico	Thailand
Egypt	Morocco	Turkey
Hungary	Oman	UAE
India	Pakistan	Vietnam