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Financial Development, Openness and Institutions: Evidence from Panel Data*

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Abstract

Using dynamic panel data techniques and several data sets, we provide new evidence on the contribution of openness and economic institutions to the variation of financial development across countries and over time. Our findings suggest that both are potentially very important factors for different aspects of financial development. However, they provide limited support to the hypothesis of Rajan and Zingales (2003) that the simultaneous opening of both trade and capital accounts is necessary to promote financial development in a contemporary setting.

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Keywords: Financial development, Trade Openness, Financial Openness, Financial Liberalisation, Dynamic Panel Data Analysis.

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1.0 Introduction

It is now widely accepted that financial development constitutes a potentially important mechanism for long run growth (Levine, 2003; Demetriades and Andrianova 2004; Goodhart, 2004). The frontier of the literature in this field is, therefore, shifting towards providing answers to the question of why some countries are more financially developed than others. Four influential hypotheses have emerged in recent literature, which directly or indirectly are able to provide plausible answers to this question. These are (i) the endowment hypothesis; (ii) the law and finance hypothesis; (iii) the simultaneous openness hypothesis; (iv) the economic institutions hypothesis. Briefly, the essential ingredients of each of the three hypotheses are as follows:[1]

(i) The endowment hypothesis introduced by Acemoglu *et al* (2001) acknowledges the importance of strong institutions for financial development and argues that institutional quality varies across countries because of varying initial endowments. In simple terms, this hypothesis suggests that the disease environment encountered by European colonising powers in past centuries – proxied in empirical studies by settler mortality - was a major retarding factor for the establishment of institutions that would promote long run prosperity. Thus, it is argued that European colonial powers established extractive institutions that are unsuitable for long-term growth where the environment was unfavourable and institutions that were better suited for growth where they encountered favourable environments.

(ii) The law and finance hypothesis due to La Porta *et al* (1997) puts forward the idea that common law based systems, originating from English law, are better suited than civil law based systems for the development of capital markets. This is because English law evolved to protect private property from the crown while French law was developed with the aim of addressing corruption of the judiciary and enhancing the powers of the state. Over time this meant that English law protected small investors a lot better than French law, which is thought to have been conducive to the development of capital markets.[2]

[1] These hypotheses may contain some common elements. We introduce them separately to clarify the exposition.

[2] Beck et al (2003a) provide evidence which suggests that both these two hypotheses have some merit in explaining cross-country variations in financial development but find more evidence in favour of the endowments one.

(iii) The simultaneous openness hypothesis put forward by Rajan and Zingales (2003), postulates that interest groups, specifically industrial and financial incumbents, frequently stand to lose from financial development, because it usually breeds competition, which erodes their rents. They argue that incumbents' opposition will be weaker when an economy is open to both trade and capital flows, hence the simultaneous opening of both the trade and capital accounts holds the key to successful financial development. This is not only because trade and financial openness limit the ability of incumbents to block the development of financial markets but also because the new opportunities created by openness may generate sufficient new profits for them that outweigh the negative effects of increased competition.

(iv) *The economic institutions hypothesis* recently put forward by Acemoglu *et al* (2004), which builds on the endowment hypothesis, proposes a dynamic political economy framework in which economic differences in economic institutions are the fundamental cause of differences in economic development. Economic institutions, which determine the incentives and constraints of economic agents, are social decisions that are chosen for their consequences. Political institutions and income distribution are the dynamic forces that combine to shape economic institutions and outcomes. It is argued that growth promoting economic institutions emerge when political institutions (a) allocate power to groups with interests in broad based property rights enforcement, (b) create effective constraints on power holders and when there are few rents to be captured by power holders.

The first two hypotheses, by emphasising historical factors that are time invariant can, at best, only explain some of the cross-country variation in financial development.[3] The third and fourth hypotheses could go some way in explaining both the cross-country and the time series variation in financial development, since they are both dynamical in nature, in that they emphasize factors that may be changing over time. Even though both these hypotheses acknowledge the importance of political elites, they nevertheless emphasize different mechanisms of financial development. The third hypothesis emphasizes the importance of simultaneous current account and capital account openness and as such also

[3] These hypotheses cannot be tested using panel data fixed effects or first differenced models, since the factors that they emphasise are time invariant and are either spanned by the country dummies or are differenced away and cannot be identified.

has clear contemporary policy implications.[4] The fourth hypothesis suggests that even though complex political mechanisms may be at work (including social conflict emanating from changing political forces such as the rise of mass democracy and the changes in the distribution of income), economic institutions provide a useful summary statistic that helps to shape economic development at any point in time.

The importance of understanding the factors behind the time series variation in financial development, alongside those that shape the cross-country variation, cannot be overemphasised. Consider, for example, the case of South Korea, a well known success story in terms of financial and economic development. During 1960-2004, South Korea's ratio of private credit to GDP rose from 12.29 (per cent of GDP) to 98.21 (per cent of GDP), representing an eight-fold increase in one of the most important indicators of financial development in less than half a century.[5] This massive leap forward constitutes a significant closing of the gap between South Korea and the 15 high income OECD countries, whose private credit to GDP ratio climbed from 66 per cent of GDP in 1960 to 185 per cent of GDP in 2004. Thus, South Korea's credit to GDP ratio rose from 18% of the average of the world leaders in 1960 to 53% by 2004.[6] While it may be argued that Korea's spectacular financial development is exceptional, examining the norm suggests that the time series variation in financial development over the same period has been quite substantial: the worldwide average of private credit to GDP increased by 54% during the same period. This figure masks wide regional variation from 435% in South Asia to 165% in North Africa-Middle East and 37% in the Latin American-Caribbean region.

Given the importance of the time-series variation in financial development in modern times, an empirical investigation into its determinants must be able to account for its variation both across countries and over time. We therefore utilise panel data techniques to shed light on the determinants of financial development in these two dimensions. The specification of our empirical model is informed by the third and fourth hypotheses, both of which acknowledge the role of political economy factors but emphasize different mechanisms of (financial and economic) development.

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[4] Interestingly these policy implications are not consistent with the sequencing literature, which advocates that trade liberalisation should precede financial liberalisation and that capital account opening should be the last stage in the liberalisation process (e.g. McKinnon, 1991).

[5] All the data quoted in the Introduction are obtained from World Development Indicators 2005.

[6] Neither the legal origin nor the endowment hypothesis, both of which focus on pre-determined historical factors, can explain cases such as South Korea. Interestingly, South Korea's legal tradition is based on civil law traditions, via Japan and Germany.

While it is highly plausible – indeed almost tautological - that political economy factors have a key influence in shaping policies and institutions that affect the development of financial markets, providing empirical evidence that tests the two hypotheses directly is not straightforward. For a start, appropriate political economy measures of the interests and power of elites are not directly observable.[7] Observable political variables, such as political system or political orientation, are too crude to capture the intrigues that help to shape policies and institutions that affect financial development.[8] Thus, the best that can be established empirically is whether the evidence is consistent with the economic implications of the two hypotheses by using the (reduced form) mechanisms suggested by Rajan and Zingales (2003) and Acemoglu et al (2004). To this end, this paper tests the following two, complementary, hypotheses:

I. (a) Do both trade *and* financial openness matter for financial development? (b) To what extent is the simultaneous opening of both trade and capital accounts necessary for financial development? Put differently, is trade (financial) openness without financial (trade) openness conducive to financial development?

II. Do economic institutions have a positive influence on financial development over and above the effects of openness?

The first hypothesis is a two part reformulation of the Rajan-Zingales hypothesis (henceforth RZ). The first part is a minimal test of RZ: if either trade or financial openness is not a statistically significant determinant of financial development, RZ can be rejected outright. The second part is a test of the simultaneity aspect of the RZ hypothesis, which is of course a much stronger requirement. Importantly, RZ stipulates that trade openness without financial openness may result in greater financial repression of new firms as well as loan subsidies, so that industrial incumbents have sufficient cheap finance to face competition. It also suggests that financial openness alone will allow the largest domestic firms to tap foreign funds – which they may not actually need – but will not allow small or potential domestic firms access to funds. The domestic financial sector may see its profits threatened since industrial incumbents have access to international finance and may therefore push for liberalising access. However, it will face opposition by industrial

[7] Kauffman and Vicente (2005) have recently produced an indicator of 'corporate legal corruption' for 2004, which would have been well suited for our purpose had it been available longitudinally.
[8] Abiad and Mody (2005) find that political factors are not statistically significant determinants of the probability of financial reforms.

incumbents who will continue to oppose financial development in order to prevent competition. Thus, "…cross border capital flows alone are unlikely to convince both our interest groups to push for financial development."(Rajan and Zingales 2003, p.22). Hypothesis I (a) may therefore be thought as a necessary condition for RZ to be true while I (b) could be interpreted, albeit somewhat stringently given the loose language used by RZ, as a sufficient condition.

The second hypothesis, while not inconsistent with RZ, is much closer to the core of the Acemoglu *et al* (2004) thesis which postulates that economic institutions are the fundamental cause of long run growth.[9] Indeed, Rajan and Zingales recognise the importance of economic institutions, such as respect for property rights, accounting and disclosure standards, contract enforcement and regulation. However, they see these institutions as a mechanism driven by political economy factors, which are ultimately shaped by trade and financial openness. Since trade and financial openness variables are the ultimate determinants of financial development in RZ, including institutions alongside openness in the same equation is like including the same variable twice (i.e. double counting). This may lead to multicollinearity which may take away from the statistical significance of the openness variables. Thus, the econometric formulation of the second hypothesis needs to take this possibility into account in order to shed as much light as is possible on each of the two hypotheses.[10]

The empirical evidence on the influence of either openness or institutions, or indeed both, on financial development remains thin. The sample of countries and the period used by Rajan and Zingales was dictated by their desire to explain reversals in financial development through a historical perspective, covering the period 1913-1999. Notwithstanding the importance and contribution of their empirical exercise, their cross-country snapshots at specific points in time do not utilise the time dimension to explain the

[9]Many other authors of course have emphasised the importance of institutions for economic growth and the development of financial markets (e.g. North and Weingast, 1989; Arestis and Demetriades, 1997; Demetriades and Andrianova, 2004).

[10] Even if economic institutions are found to be important for financial development (and economic growth) it does not necessarily follow that elites have a decisive influence on whether such institutions are adopted. The political economy factors at play may reflect much wider considerations than the interests of industrial and financial incumbents. For example, they may include the ability of the Breton Woods institutions to instigate institutional reform or introduce policy reform. Importantly, they may also reflect the political desire of a country to be admitted in prestigious 'clubs' like the OECD or the European Union, such as Korea in the 1990s.

variation of financial development over time. Other authors have examined related questions[11] but have not examined the openness or institutions hypothesis directly.[12]

The paper is organised as follows. Section 2 explains the empirical model and econometric methodology. Section 3 explains the data employed in the analysis and Section 4 reports and discusses the econometric results. Finally, Section 5 summarises and concludes.

2. **The Empirical Model**

We specify the following dynamic log-linear equation for financial development:

$$\ln FD_{it} = \beta_{0i} + \gamma \ln FD_{it-1} + \beta_1 \ln Y_{it} + \beta_2 \ln TO_{it} + \beta_3 \ln FO_{it} + \beta_4 \ln INS_{it} + \varepsilon_{it} \qquad (1)$$

where *FD* is an indicator of financial development, *Y* is income, which acts as a control variable for the demand for financial services, *TO* is trade openness, *FO* is financial openness and *INS* is institutional quality. A lagged dependent variable is included to allow for the partial adjustment of *FD* to its long run equilibrium value.[13] Thus, all the beta coefficients represent short-run effects; the long-run effects can be derived by dividing each of the betas by 1- γ.

[11] Beck (2003) shows that countries with better-developed financial systems have higher shares of manufactured exports in GDP and in total merchandise exports. Svaleryd and Vlachos (2002) find that there is a positive interdependence between financial development and liberal trade policies. Levine (2001) finds that liberalising restrictions on international portfolio flows tends to enhance stock market liquidity, and allowing greater foreign bank presence tends to enhance the efficiency of the domestic banking system. Chinn and Ito (2002) show that there is a strong relationship between capital account liberalisation and financial development. Klein and Olivei (1999) show that capital account liberalisation has a substantial impact on growth via the deepening of a country's financial system in highly industrialised countries, but find little evidence of financial liberalisation promoting financial development outside the OECD.

[12] A recent exception is Huang and Temple (2005), which, however, focuses on the relationship between financial development and trade openness, but does not take into account capital account openness and institutions.

[13] Indicators that are asset based such as liquid liabilities, which measures the size of the banking system relative to GDP, are likely to display persistence: the size of the banking system this year has much to do with the size of the banking system in previous years. A similar argument can also be made for flow variables, such as bank credit. Even though it may be argued that the flow of credit can adjust more quickly to its equilibrium value than the stock of assets, the former also depends on its own history. A bank's customer base largely determines the demand for loans in a given year and that is not expected to fluctuate much from year to year. The same is true of bank loan supply, because the latter depends on the bank's scale of operations, proxied by the size of its balance sheet. It is therefore plausible to argue that on a year to year basis, all financial development indicators exhibit persistence, and adjust in accordance to a partial adjustment mechanism, captured by the lagged dependent variable in both equations. This is verified empirically in Section 4 below.

Equation (1) provides a test of Hypotheses I (a) and II, as formulated in the previous section. Starting from the second, if β_4 is positive and significant then improvements in economic institutions will influence financial development directly, over and above the effects of openness. Hypothesis I (a) requires *both* β_2 and β_3 to be positive and significant. If both these coefficients are significant and positive, then a simultaneous opening of the trade and capital accounts will have positive effects on financial development. This is a necessary but not a sufficient condition for the hypothesis to hold.[14] Even if both coefficients are positive and significant, financial development can still occur without the simultaneous opening of both trade and capital accounts. Simultaneous opening of both will, however, have larger effects on financial development than opening of either on its own.

Testing Hypothesis I (b) – the simultaneity hypothesis - requires a somewhat stronger test. This can be conducted if trade and financial openness are interacted and the interaction term is entered separately in the regression. The resulting specification is as follows:

$$\ln FD_{it} = \beta_{0i} + \gamma \ln FD_{it-1} + \beta_1 \ln Y_{it} + \beta_2 \ln TO_{it} + \beta_3 \ln FO_{it} + \beta_4 \ln INS_{it} + \beta_5 \{\ln FO_{it} \times \ln TO_{it}\} + \varepsilon_{it} \quad (2)$$

In this case, the (short-run) effects of trade and financial openness depend on the extent of financial and trade openness, respectively, as shown by the partial derivatives of financial development with respect to each of the openness variables:

$$\frac{\partial \ln FD_{it}}{\partial \ln TO_{it}} = \beta_2 + \beta_5 \ln FO_{it} \quad (3)$$

$$\frac{\partial \ln FD_{it}}{\partial \ln FO_{it}} = \beta_3 + \beta_5 \ln TO_{it} \quad (4)$$

The simultaneity hypothesis suggests that both derivatives given in (3) and (4) are positive for countries that are already open to trade and capital flows. An additional implication of RZ is that the marginal effect of greater trade (financial) openness is larger the more open the capital (trade) account.

3. Data and Methods

We utilise four data sets to estimate the two models, corresponding to two different measures of financial openness and two sets of financial development indicators. This section outlines the data and estimation methods.

[14] Assuming institutional quality is not a channel through which openness works its effects through. To rule this out, we also allow for specifications without the institutional quality variable.

The first measure of financial openness is the financial globalisation indicator constructed by Lane and Milesi-Feretti (2006), which we collect for 42 developing countries during 1980-2003. This indicator is defined as the volume of a country's foreign assets and liabilities (% of GDP). At any given point in time, this measure provides a useful summary of a country's history of financial openness, which for our purposes is an advantage over flow-based measures like the WDI measure of gross private capital flows, which place all the emphasis on the current observation.[15] This is because the political economy factors which we are trying to capture with this measure, such as the power of financial incumbents, are unlikely to display as much variability as private capital flows.

The second measure of financial openness is the financial liberalisation measure constructed by Abiad and Mody (2005), which is available annually for a group of 34 (developed and developing) countries for the period 1980-1996. This is an excellent measure of financial liberalisation, in that it captures six different aspects of liberalisation, comprising credit controls, interest rate controls, entry barriers, regulations, privatisation, and international transactions. It has a much wider range than most other indicators of financial liberalisation – from 0 to 18 – which is extremely useful for estimation purposes. Its main disadvantage is that it may be too broad for our specific purpose: 'international transactions' is just one of the six aspects of financial liberalisation. However, it could be argued that even domestic financial liberalisation contributes to financial openness; for example, removing entry barriers and regulations may create more competition for financial incumbents, even if it is from within. Moreover, the broadness of the indicator needs to be counter-balanced against its wide range: capital account liberalisation indicators are usually little more than 0-1 dummies, which are not very useful for estimation purposes.

The first set of financial development indicators contains three banking sector development indicators, namely *liquid liabilities*, *private credit* and *domestic credit* provided by the banking sector (all as % of GDP). The second set consists of three capital market development indicators, namely *stock value traded* (% of GDP), *stock market turnover* (% of *stock market capitalisation*) and *number of companies listed* (% of population in million).[16] The sources are the World Development Indicators and Beck *et al*. (2003b). Clearly, each of these indicators captures a different aspect of financial development and

[15] In an earlier version of the paper we did use the WDI measure of gross capital flows. The results were qualitatively not dissimilar even though, were somewhat less satisfactory in terms of diagnostics and significance of the interaction term.
[16] The sample period of the number of companies listed is 1988–2003.

has its own strengths and weaknesses. Among the banking indicators, *private credit* is probably the most relevant to measure opportunities for new firms, or as Rajan and Zingales put it "the ease with which any entrepreneur or company with a sound project can obtain finance" (p. 9). *Liquid liabilities* measures the ability of banks to mobilise funds or the size of the banking system relative to the economy, but the funds are not always used to finance new entrepreneurs, so this is not as good an indicator of financial development in the RZ sense. Domestic credit comprises private credit as well as credit to government, thus it is probably the least well suited to capture financial development in the RZ sense. Among the stock market indicators, the *number of companies listed* is probably the one that is closest to the RZ hypothesis, in that it reflects the degree of access to the capital market by new companies. *Stock value traded* - defined as the value of shares traded over GDP - varies with stock prices and the number of shares traded; as an indicator of market liquidity, it may capture the willingness of investors to participate in the stock market and, consequently could proxy the ability of firms to issue equity. This indicator, however, is susceptible to possible 'excess volatility' in stock prices; thus, its movement may have little to do with finance opportunities for new firms. It is also more susceptible to measurement error due to different international definitions of stock market transactions. We therefore also utilise *stock market turnover*, which is defined as *stock value traded* over *stock market capitalisation* – the latter defined as the value of listed companies over GDP. Since stock prices appear in both the numerator and denominator of this indicator, it is less susceptible to excess volatility and measurement error than *stock value traded*. However, even this indicator is unlikely to capture opportunities for new firms very well since stock market transactions frequently reflect trading of large stocks – those of long established listed companies.

Annual data on real GDP per capita, converted to US dollars based on 2000 constant prices, is also from the World Development Indicators. Trade openness is measured by the ratio of total trade to GDP, also from World Development Indicators. Institutional quality data is from the International Country Risk Guide (ICRG) – a monthly publication of Political Risk Services (PRS). Following Knack and Keefer (1995), five PRS indicators are used to measure economic institutions, namely: (i) *Corruption* (ii) *Rule of Law* (iii) *Bureaucratic Quality* (iv) *Government Repudiation of Contracts* and (v) *Risk of Expropriation*; higher values of these indicators - the first three of which are scaled from 0 to 6 and the other two from 0 to 10 - imply better institutional quality. Since all these aspects of the institutional

environment are likely to be relevant for the security of property rights, we bundle them into a single summary measure by summing them up (after appropriate re-scaling).[17]

The four data sets are summarised in Tables 1a-1d, each of which corresponds to the data set used in each of the four subsequent tables. Each of these tables provides the definition and source of each variable, its unit of measurement and summary statistics (mean, standard deviation, minimum and maximum values), the sample period and countries for which these variables are collected.

Dynamic Panel GMM Estimation

Equations (1) and (2) are estimated on the entire sample using the GMM estimator proposed by Arellano and Bond (1991). Given that the data are annual, a dynamic panel estimator is appropriate allowing the financial development indicators to partially adjust to their long run equilibrium values within one year.

Dynamic panel data estimation of equations (1) and (2) with country fixed effects suffers from the Nickell (1981) bias which disappears only if T tends to infinity. The preferred estimator in this case is GMM suggested by Arellano and Bond (1991) which basically differences the model to get rid of country specific effects or any time invariant country specific variable. This also gets rid of any endogeneity that may be due to the correlation of these country specific effects and the right hand side regressors. The moment conditions utilize the orthogonality conditions between the differenced errors and lagged values of the dependent variable. This assumes that the original disturbances in (1) and (2) are serially uncorrelated and that the differenced error is MA(1) with unit root. In fact, two diagnostics are computed using the Arellano and Bond GMM procedure to test for first order and second order serial correlation in the disturbances. One should reject the null of the absence of first order serial correlation and not reject the absence of second order serial correlation. A special feature of dynamic panel data GMM estimation is that the number of moment conditions increase with T. Therefore, a Sargan test is performed to test the over-identification restrictions. There is convincing evidence that too many moment conditions introduce bias while increasing efficiency. It is even suggested that a subset of these moment conditions be used to take advantage of the trade-off between the reduction in bias

[17] The scale of corruption, bureaucratic quality and rule of law was first converted to 0 to 10 (multiplying them by 5/3) to make them comparable to the other indicators. For robustness checks, we also used different weights for each indicator to construct the aggregate index. The estimates are similar and are available on request.

and the loss in efficiency, see Baltagi (2005, Ch.8) and the references cited there. For example, for the data set used in Table 2 with N=42 countries and T=22, we restrict the moment conditions to a maximum of two lags on the dependent variable. This yields a Sargan statistic that is asymptotically distributed as Chi-squared with 42 degrees of freedom, i.e., 42 over-identification restrictions. On the other hand for the data set underlying Table 5 with N=31 countries and T=7, using all the moment conditions implied by the Arellano and Bond GMM procedure yields 13 over-identification restrictions.

4. Empirical Results

The empirical results are presented in Tables 2-5. Each of the four tables corresponds to each of the four data sets summarised in Table 1. Table 2, for example, contains the results from the first data set, and so on. There are four different specifications for each of the three dependent variables in each table. The first three models in each table estimate equation 1 which does not include the interaction term. The next three models estimate equation 2, which includes the interactions. Version (a) of each model includes the institutional quality variable, while version (b) does not. Given the large number of results, we utilise statistical significance at the 10% level of (i) the interaction term and (ii) institutional quality as a criterion for deciding which specification to focus on. Hence, we focus most of our attention on the specification that contains both these terms only if both are statistically significant at the 10% level or lower. Otherwise, if neither of these terms is significant we focus on the specification that excludes both of them; if one of them is significant we focus on the specification that excludes the insignificant one. Thus, we focus on three specifications per table, but make comments on the other specifications whenever the results provide additional insights.

The first set of results are presented in Table 2. In all the twelve specifications presented all three diagnostic statistics are satisfactory. Specifically, the Sargan test does not reject the over-identification restrictions, the absence of first order serial correlation is rejected while the absence of second order serial correlation is not rejected. The most surprising result to emerge from observing the estimated coefficients is that real GDP appears with a negative and significant coefficient in all specifications. One possible explanation for this result relates to the counter-cyclicality of monetary policy. Indeed, the numerators of the indicators used as dependent variables in this table are frequently used by central banks either as an explicit or an implicit intermediate target of monetary policy, in conjunction

with movements in GDP (the denominator in these indicators). Thus, it should perhaps not be too surprising to observe a negative relationship between GDP and the banking indicators of financial development, especially at an annual frequency, which coincides with the workings of monetary policy.

Turning our attention to private credit in Table 2, we first focus on Model 4(a), since both the interaction term and institutional quality are statistically significant. The lagged dependent variable has an estimated coefficient of 0.856, with a standard error of 0.036, suggesting considerable persistence, albeit with a confidence interval that does not contain the unit root. GDP per capita appears with a negative coefficient that is statistically significant. Trade openness is positive and significant at the 1% level, as is institutional quality. However, financial openness is not statistically significant. The estimate of the interaction term (β_5) in equation (2) is negative and significant at the 5% level, but with a much smaller coefficient in absolute value than the estimate of β_2. Interestingly, if the institutional quality variable is excluded – specification 4b – the financial openness variable becomes significant at the 5% level and enters with a higher coefficient of 0.118. The diagnostics of the equation remain satisfactory and the size of the interaction term increases somewhat. This seems to suggest that some of the effects of financial openness on private credit may be working through institutional quality; however, the correlation coefficient between these two variables is 0.24. A final remark with the results for private credit relates to the importance of the interaction term. If this is excluded – as in specifications 1(a) and 1(b) – the coefficient of the financial globalisation indicator turns negative and significant. These models – which are clearly mis-specified – would suggest that financial openness has negative effects on private credit.

For liquid liabilities, we focus on Model 5b, since the interaction term is significant but institutional quality is not. The diagnostics are satisfactory, and the lagged dependent variable has an estimated coefficient of 0.315, with a standard error of 0.076, suggesting much faster adjustment than private credit. Both financial and trade openness appear with negative coefficients of -0.321 and -0.201, respectively, that are significant at the 1% level. The interaction term is positive and significant, albeit with a much smaller coefficient of 0.086. These coefficients do however provide the basis of support for RZ, as will be seen in the next section. If the interaction term is excluded – models 2(a) and 2(b) - it would appear that financial openness has no statistically significant effect on financial

development, which would be an erroneous conclusion due to mis-specification of the model.

For domestic credit we focus on model 6b, since the interaction term is significant at the 5% level, but institutional quality is not. The lagged dependent variable has an estimated coefficient of 0.528, with a very small standard error. Both trade and financial openness are positive and significant, the former at the 1% level while the latter at the 10% level. The interaction term, which has an estimated coefficient of -0.095, is significant at the 5% level. Once again if it is excluded – specifications 3(a) and 3(b) – it could be erroneously concluded that financial openness has negative effects on financial development.

In Table 3 all the diagnostics are once again satisfactory. The two sets of stock market liquidity equations do not however provide much support to the openness thesis, while there is somewhat stronger support from the equations that explain the number of listed companies. Starting with the stock value traded equations, in specification 10a the interaction term is significant at the 10% level, as are also financial and trade openness. The coefficients of the openness terms are positive and fairly large while the interaction term is negative, providing no support to RZ. When institutional quality, which is not significant, is dropped all the openness variables also lose significance. Thus, if anything, the presence of institutional quality in the equations helps boost the significance of the openness terms. In the specifications in which the interaction term is excluded, the openness terms are not significant, except in 7a where trade openness enters with a negative coefficient and is significant at the 10% level.

The stock market turnover equations are even more disappointing in that all the openness terms, as well as GDP per capita, are not significant. Specification 8a, on which we focus, is satisfactory in all other respects. It has a reasonable coefficient of the lagged dependent variable of 0.145 that is precisely estimated and suggests that institutional quality is the only statistically significant determinant of stock market liquidity. Its effect is evidently independent of the openness terms; even if institutional quality is excluded, the openness terms remain insignificant. Thus, neither trade nor financial openness appears to promote liquid stock markets, while improvements in institutional quality appear to do so.

The equations explaining the number of listed companies provide a refreshing contrast to those explaining stock market liquidity. Besides satisfactory diagnostics, the lagged dependent variable enters with reasonable coefficients that are precisely estimated and all

the openness terms, including the interaction term, are significant. Institutional quality is not significant so we focus on specification 12b. Interestingly, GDP per capita enters with a positive coefficient of 0.320 and is significant, suggesting that the number of listed companies increases with economic prosperity, as expected. Trade and financial openness enter with positive coefficients of 1.786 and 1.631 that are significant at the 10% and 5% levels, respectively. The interaction term is negative and significant, albeit with a smaller coefficient of 0.383, suggesting diminishing returns to openness, in so far as this indicator is concerned.

Tables 4 and 5 present the results using the financial liberalization measure of Abiad and Mody (2005) to proxy financial openness/policies. Once again, given the large number of specifications, we focus on specifications with significant interaction term and institutional quality. Thus, in Table 4 we focus on the models that contain the interaction term, which is significant throughout. For private credit we focus on specification 16a, since institutional quality is also significant. All three diagnostics are satisfactory, and the lagged dependent variable is significant and well below unity. Real GDP is positive and significant at the 1% level. Both trade and financial openness are positive and significant at the 1% level with sizeable coefficients. The interaction term is negative and significant, but with a much smaller coefficient, suggesting that the marginal effects of trade and financial openness are likely to be positive. Institutional quality has a positive coefficient and is significant at the 1% level. For liquid liabilities, we focus on specification 17b, since institutional quality is not significant in 17a. All three diagnostics are satisfactory, as is the lagged dependent variable, which enters with a coefficient of 0.605 with a standard error of 0.083. GDP per capita is positive but not significant. Both trade and financial openness are positive and significant at the 1% level. The interaction term has a negative and small coefficient, which is significant at the 1% level. In the case of the domestic credit indicator we focus on 18b since institutional quality is not significant. All the diagnostics are again satisfactory and the lagged dependent variable is positive and significant at the 1% level, with a coefficient of 0.672. GDP per capita appears with a positive but insignificant coefficient. Both trade and financial openness terms enter with positive and highly significant coefficient of just below and just above 0.30, respectively. The interaction term enters with a smaller negative coefficient of 0.102, which is also significant at the 1% level. Overall, the results presented in Table 4 suggest that both trade and financial openness are conducive to banking sector development. Institutional quality appears important for the development of

private credit, but not as important for the expansion of the banking sector as a whole. This latter result may hint at the importance of creditor protection for the development of bank lending.

Turning now to Table 5, we focus on specifications 19b, 20a and 24b. The stock value traded equation 19b has satisfactory diagnostics. The lagged dependent variable has a coefficient of 0.757 that is significant at the 1% level. GDP enters with a negative but insignificant coefficient. Trade openness enters with a positive but also insignificant coefficient while financial liberalization is positive and significant at the 1% level. Specification 20a, which refers to stock market turnover is even more problematic for RZ in that *neither* trade *nor* financial openness are significant. All three diagnostics are satisfactory and the lagged dependent term enters with a coefficient of 0.551, suggesting that the equation is well specified. GDP per capita is negative and institutional quality is positive and significant. Specification 24b offers little support to RZ. Even though both trade and financial openness have positive and sizeable coefficients that are highly significant, there is a negative and significant interaction term, which suggests that the benefits of trade (financial) openness diminish with financial (trade) openness. The equation is well behaved as suggested by the satisfactory diagnostics. In addition, GDP per capita appears with a positive and highly significant coefficient.

To sum up, the results presented in Table 5, suggest that financial openness, if proxied by financial liberalisation, may be conducive to the development of liquid stock markets, if market liquidity is measured relative to the size of the real economy. If however it is measured in relation to the stock market size, this effect disappears, suggesting that financial liberalization helps also to boost the value of listed companies to a similar degree as it does the value of shares traded. Importantly, both trade and financial openness are found to have positive effects on the number of companies listed, thereby stimulating competition. In these specifications, trade openness has a beneficial effect on the number of companies listed as was indeed the case with the results presented in Table 3.

Marginal Effects of Openness

In order to shed additional light on the quantitative importance of trade and financial openness for financial development, we calculate the partial derivatives of both types of openness (equations 3 and 4) using the preferred empirical specifications. Given that most

of the preferred specifications contain the interaction term, these derivatives typically vary depending on the level of financial or trade openness. To gauge the range of variation, we therefore calculate the derivatives of trade (financial) openness at the mean, minimum and maximum values of financial (trade) openness. These are presented respectively in Tables 6a and 6b. Table 6a suggests that at the mean of financial openness, the marginal effects of trade openness are on the whole positive. At the minimum level of financial openness, the effects of trade openness are typically much larger than at the mean, with the exception of specification 5b (liquid liabilities). At the opposite end of the spectrum, the marginal effects of trade openness are typically either negative or much smaller than at the mean of financial openness. There is of course the exception of specification 5b for liquid liabilities, which is the only one that provides support to RZ.

Table 6b reinforces the same conclusions, but what is new here is the fact that at the mean of trade openness, financial openness has negative marginal effects in eight out of twelve models; three of these are however calculated from statistically insignificant coefficients. At the maximum values of trade openness, the marginal effects of financial openness are typically smaller (more negative) than at the mean. It is only at the minimal values of trade openness, that financial openness appears to have mostly positive effects on financial development.

To sum up, Table 6 suggests that at low levels of trade and financial openness, opening up the trade and capital accounts can have a positive influence on financial development. However, this may not be true at high levels of openness, at which further openness may achieve the opposite effect. What is particularly striking is that at mean values of trade openness, the marginal effects of financial openness may be negative. Out of the twelve different empirical specifications, only one – namely liquid liabilities estimated using the financial globalization variable - provides support to the simultaneous openness hypothesis of Rajan and Zingales.

Additional Robustness Checks

Dynamic GMM addresses endogeneity to the extent that it arises from the correlation of country specific effects with the right hand side regressors. However, it does not address endogeneity that is due to the correlation between shocks to financial development and shocks to openness or other regressors. We therefore examine the sensitivity of our results

to the possibility of such correlation by treating the right hand side regressors as predetermined. In the interests of brevity, we report results using the financial development indicators that are most relevant to financing opportunities for new firms i.e. *private credit* and *number of listed companies*.[18]

The results of these estimations are presented in Table 7. For comparison purposes we also include the corresponding original models in which the regressors were assumed exogenous alongside the new results. Overall, there is little substantive change in the qualitative nature of our findings. The diagnostics remain satisfactory, the lagged dependent variables remain positive and significant with some relatively small changes in the estimated coefficients. The trade openness terms remain positive and significant throughout and their coefficients do not change much. There are some changes in the significance of the financial openness term, which becomes positive and significant in Model 4a (private credit with financial globalization indicator) but its level of significance drops from 1% to 10% in Model 24a (number of listed companies with financial liberalization indicator). There is little change in the interaction terms which remain negative and significant in three models but its significance level drops to 10% in Model 24a. The coefficient of GDP per capita in Model 4(a) changes from significant negative to insignificant positive; if anything this is an improvement in the results not least because a negative coefficient on GDP does not accord well with the finance-growth-finance feedback mechanism documented in the time-series literature on the topic[19]. Economic institutions remain positive significant in Model 4a, insignificant in Model 12a but become insignificant in Model 16a and turn from insignificant negative to positive and significant at the 10% level in Model 24a. In conclusion, therefore, it appears that our main finding that simultaneous trade and financial openness is not necessary for financial development is robust to treating the regressors as predetermined. Furthermore, the positive effect of trade openness on financial development is also robust, but the positive effects of financial openness and economic institutions is somewhat less robust.

Additional estimations were carried out to check whether there is overlap between openness and economic institutions as mechanisms of financial development. Briefly, these results suggest the following:

[18] The trade off that we face here is that when regressors are treated as predetermined the number of moment conditions increases substantially.

[19] See for example Demetriades and Hussein (1996) or Arestis and Demetriades (1997).

Private credit: If the institutions variable is excluded from models 4a and 16a and all the openness terms continue to be treated as pre-determined, there is little change in the results. The coefficients of trade and financial openness remain positive and significant while the interaction term remains negative and significant. If all the openness terms are dropped, institutions remains positive and significant in 4a and insignificant in 16a. Thus, openness and economic institutions appear to be robust determinants of banking system development and they seem to work relatively independently of each other.

Number of Listed Companies: If the institutions variable is dropped from models 12a and 24a, while the openness terms continue to be treated as predetermined, all three openness terms retain their signs and significance. If all the openness terms are dropped, the institutions variable becomes significant and positive at the 5% level. Thus, the econometric evidence suggests that openness is a robust channel of capital market development. A (mis-specified) model that excludes openness but includes economic institutions may, however, suggest that economic institutions is a significant determinant of capital market development. Such a model is likely to be capturing the influence of the omitted openness variables.

5. Concluding Remarks

The results presented in this paper suggest that openness, as well as economic institutions, can explain a large part of the variation in financial development across countries and over time since the 1980s. However, there is little evidence to suggest that a simultaneous opening of both trade and capital accounts has been necessary for financial development to take place. If anything, the balance of the evidence suggests the opposite: the marginal effects of trade (financial) openness have the highest values when the capital (trade) account has been least open. Moreover, the balance of the evidence also suggests that trade openness may have been considerably more effective in promoting financial development than financial openness.

Our findings, which are obtained utilising four different data sets, are robust to the measurement of financial development and the indicator of financial openness utilised. Moreover, they are not driven by unaccounted endogeneity, as is shown by our robustness checks that utilise the two main indicators of financial development (private credit and number of listed companies) and treat regressors as predetermined. Additional robustness checks suggest that openness and institutions may have operated as separate channels of

banking sector development but this may not be true for capital market development, where we find that there may have been an overlap between the two.

Our findings may be good news for policy makers, since the simultaneous opening of both trade and capital accounts is likely to be harder to accomplish politically than the opening of either.[20] This is because they clearly suggest that trade and financial openness may be substitute mechanisms of promoting financial development, not complements as suggested by RZ. An added bonus for policy makers is that economic institutions appear to have an independent influence on banking sector development – but not capital market development - over and above that of trade and financial openness. There may, therefore, be three relatively independent mechanisms that could promote banking sector development in a contemporary setting.

The empirical evidence presented in this paper highlights three important mechanisms of financial development that are already present in recent political economy literature (Rajan and Zingales 2003; Acemoglu *et al* 2004). However, it also suggests that these mechanisms are not exactly working in the ways envisaged by this literature. This may to some extent reflect the inherent imprecision of conceptual arguments which are not formalised in precise mathematical models. Such modelling would no doubt qualify the broad brush conclusions emanating from this literature, limiting their applicability to ranges of various important parameters and the validity of key assumptions; as such it would be a useful contribution to the existing literature. An alternative, perhaps more fruitful, avenue of further research is to develop political economy models that take on board both (trade and financial) openness and economic institutions as the likely fundamental mechanisms of financial development. Indeed, recent literature suggests that these mechanisms played a key role during the emergence of the 'mothers' of all western financial systems, i.e. London and Amsterdam[21].

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[20] The discussion in this paragraph – like any policy implications drawn from reduced form regressions - is subject to the usual caveat of the Lucas critique. To the extent that this critique is valid, a reduced form relationship may well evaporate into thin air if the policy maker attempts to exploit it.

[21] See, for example, Andrianova et al (2007).

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Table 1a: Summary of data set used in Table 2
Annual data: 1980-2003

Variable	Source	Unit of measurement	Mean	Standard deviation	Minimum	Maximum
Private credit	WDI	% of GDP	31.33	24.80	1.54	165.72
Liquid liabilities	WDI	% of GDP	41.40	24.64	3.80	141.93
Domestic credit	WDI	% of GDP	47.24	27.71	0.60	164.09
Real GDP per capita	WDI	US Dollars at 2000 prices	1800.00	1856.10	74.74	12235.67
Trade openness	WDI	% of GDP	63.62	27.09	6.32	209.49
Financial globalisation	Lane and Milesi-Ferreti (2006)	% of GDP	107.85	53.95	7.35	378.48
Institutional Quality	ICRG	Sum of corruption, rule of law, bureaucratic quality, government repudiation of contracts, risk of expropriation (each scaled 1 to 10).	27.22	8.43	8	45
Countries N=42	Algeria, Bangladesh, Bolivia, Botswana, Cameroon, Chile, Costa Rica, Ecuador, Egypt, El Salvador, Ethiopia, Gabon, Ghana, Guatemala, Honduras, India, Indonesia, Jamaica, Jordan, Kenya, Korea, Malawi, Malaysia, Mexico, Morocco, Nigeria, Niger, Pakistan, Paraguay, Philippines, Senegal, Sri Lanka, Syria, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uruguay, Venezuela, Zambia, Zimbabwe.				

Table 1b: Summary of data set used in Table 3
Annual data: 1988-2003

Variable	Source	Unit of measurement	Mean	Standard deviation	Minimum	Maximum
Stock market capitalisation	Beck et al. (2003b)	% of GDP	33.93	39.93	0.18	282.61
Value traded	Beck et al. (2003b)	% of GDP	15.87	31.26	0.01	229.71
Stock market turnover	constructed	% of stock market capitalisation	0.44	0.72	0.01	5.04
Number of (domestic) listed companies	WDI	% of (million) population	9.76	9.25	0.14	36.20
Real GDP per capita	WDI	US Dollars at 2000 prices	2628.84	2353.33	250.07	12235.67
Trade openness	WDI	% of GDP	68.48	38.95	15.71	228.88
Financial globalisation	Lane and Milesi-Ferreti (2006)	% of GDP	110.61	51.94	28.83	299.34
Institutional Quality	ICRG	Sum of: corruption, rule of law, bureaucratic quality, government repudiation of contracts, risk of expropriation (each scaled 1 to 10).	32.55	6.76	10.33	45
Countries N=21	Bangladesh, Chile, Egypt, India, Indonesia, Jamaica, Jordan, Korea, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Thailand, Trinidad &Tobago, Turkey, Uruguay, Venezuela, Zimbabwe.					

Table 1c: Summary of data set used in Table 4
Annual data 1980-1996

Variable	Source	Unit of measurement	Mean	Standard deviation	Minimum	Maximum
Private credit	WDI	% of GDP	51.33	38.81	0.96	184.65
Liquid liabilities*	WDI	% of GDP	51.78	31.94	9.84	199.88
Domestic credit	WDI	% of GDP	70.19	44.58	8.35	257.60
Real GDP per capita	WDI	US Dollars at 2000 prices	7325.42	8447.34	181.01	36650.89
Trade openness	WDI	% of GDP	46.82	24.94	6.32	192.11
Financial liberalisation	Abiad and Mody (2005)	Integer values from 0 to 18 (1 added to take logs)	9.36	5.49	1	19
Institutional Quality	ICRG	Sum of: corruption, rule of law, bureaucratic quality, government repudiation of contracts, risk of expropriation (each scaled 1 to 10).	30.98	10.51	10	50
Countries N=32	Argentina, Australia, Bangladesh, Brazil, Canada, Chile, Colombia, Egypt, France, Germany, Ghana, India, Indonesia, Israel, Italy, Japan, Korea, Malaysia, Mexico, Morocco, New Zealand, Pakistan, Peru, Philippines, South Africa, Sri Lanka, Thailand, Turkey, United Kingdom, United States, Venezuela, Zimbabwe.					

*Liquid liabilities not available for France and UK.

Table 1d: Summary of data set used in Table 5
Annual data 1988-1996

Variable	Source	Unit of measurement	Mean	Standard deviation	Minimum	Maximum
Stock market capitalisation	Beck et al. (2003b)	% of GDP	38.71	44.36	0.18	282.60
Value traded	Beck et al. (2003b)	% of GDP	16.61	26.16	0.00	229.71
Stock market turnover	constructed	% of stock market capitalisation	40.22	36.65	0.98	221.04
Number of (domestic) listed companies	WDI	% of (million) population	813.96	1429.59	24	8479
Real GDP per capita	WDI	US Dollars at 2000 prices	8158.50	9201.26	263.54	36650.89
Trade openness	WDI	% of GDP	49.19	27.40	13.24	192.11
Financial liberalisation	Abiad and Mody (2005)	Integer values from 0 to 18 (1 added to take logs)	11.51	4.75	1	19
Countries N=31	Argentina, Australia, Bangladesh, Brazil, Canada, Chile, Colombia, Egypt, France, Germany, India, Indonesia, Israel, Italy, Japan, Korea, Malaysia, Mexico, Morocco, New Zealand, Pakistan, Peru, Philippines, South Africa, Sri Lanka, Thailand, Turkey, United Kingdom, United States, Venezuela, Zimbabwe.					

Table 2: Banking Sector Development: Trade Openness, Financial Globalisation and Institutions, 1980 – 2003 (Annual Data)
Dependent Variable: Banking Sector Development (ln BD_{it})

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
BD_{it} Proxied by	**Private Credit**		**Liquid Liabilities**		**Domestic Credit**		**Private Credit**		**Liquid Liabilities**		**Domestic Credit**	
Specification ref	1(a)	1(b)	2(a)	2(b)	3(a)	3(b)	4(a)	4(b)	5(a)	5(b)	6(a)	6(b)
Constant	0.001 (0.001)	0.004*** (0.001)	0.004** (0.002)	0.005** (0.002)	0.005* (0.003)	0.006*** (0.002)	0.001 (0.001)	0.003*** (0.001)	0.005*** (0.002)	0.006*** (0.002)	0.006** (0.003)	0.006*** (0.002)
ln BD_{it-1}	0.872*** (0.042)	0.848*** (0.030)	0.352*** (0.072)	0.326*** (0.066)	0.530*** (0.023)	0.529*** (0.023)	0.856*** (0.036)	0.864*** (0.029)	0.331*** (0.059)	0.315*** (0.076)	0.535*** (0.025)	0.528*** (0.025)
ln $RGDPC_{it}$	-0.253*** (0.033)	-0.252*** (0.021)	-0.197*** (0.055)	-0.195*** (0.055)	-0.496*** (0.089)	-0.534*** (0.077)	-0.175*** (0.053)	-0.187*** (0.037)	-0.174*** (0.059)	-0.168*** (0.060)	-0.538*** (0.089)	-0.539*** (0.078)
ln TO_{it}	0.328*** (0.041)	0.343*** (0.035)	0.165*** (0.028)	0.163*** (0.028)	0.156*** (0.046)	0.173*** (0.042)	0.525*** (0.065)	0.613*** (0.051)	-0.191*** (0.074)	-0.201*** (0.074)	0.520*** (0.170)	0.593*** (0.155)
ln FG_{it}	-0.186*** (0.016)	-0.195** (0.012)	0.005 (0.022)	0.004 (0.023)	-0.133*** (0.024)	-0.149*** (0.017)	0.051 (0.087)	0.118** (0.054)	-0.315*** (0.064)	-0.321*** (0.064)	0.180 (0.144)	0.218* (0.122)
ln FG_{it} x ln TO_{it}	---	---	---	---	---	---	-0.055** (0.023)	-0.072*** (0.015)	0.085*** (0.018)	0.086*** (0.018)	-0.082** (0.035)	-0.095** (0.029)
ln INS_{it}	0.084*** (0.021)	---	0.032* (0.020)	---	0.039 (0.048)	---	0.083*** (0.022)	---	0.031 (0.023)	---	0.034 (0.048)	---
Sargan Test (p-value)	35.37 (0.755)	32.29 (0.860)	30.96 (0.895)	30.93 (0.896)	30.89 (0.897)	31.61 (0.879)	29.88 (0.920)	28.98 (0.936)	26.69 (0.968)	26.81 (0.967)	30.30 (0.910)	32.26 (0.861)
Autocovariance of Order 1 (p-value)	0.000	0.000	0.005	0.007	0.001	0.001	0.000	0.000	0.010	0.012	0.001	0.001
Autocovariance of Order 2 (p-value)	0.838	0.907	0.354	0.355	0.247	0.245	0.721	0.765	0.337	0.336	0.249	0.249

Notes

1. All models are estimated using the Arellano and Bond dynamic panel GMM estimations using a maximum of two lags of the dependent variable for use as instruments (Stata xtabond command). N = 42, T =22.
2. The variables are defined as follows: BD = Banking Sector Development; RGDPC = real GDP per capita (in US dollars, 2000 prices); TO = trade openness defined as total exports plus imports (% of GDP); INS = institutions (sum of corruption, rule of law, bureaucratic quality, government repudiation of contract and risk of expropriation indices); FG = financial globalisation indicator, defined as total foreign assets and liabilities (% of GDP).
3. Figures in parentheses are standard errors.
4. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Table 3: Capital Market Development: Trade Openness, Financial Globalisation and Institutions, 1990 – 2003 (Annual Data)
Dependent Variable: Capital Market Development (ln CD_{it})

	Model 7		Model 8		Model 9		Model 10		Model 11		Model 12	
CD_{it} Proxied by	**Stock Value Traded**		**Stock market turnover**		**No of Companies Listed**		**Stock Value Traded**		**Stock market turnover**		**No of Companies Listed**	
Specification ref	7a	7b	8a	8b	9a	9b	10a	10b	11a	11b	12a	12b
Constant	0.089** (0.044)	0.078* (0.044)	-0.046* (0.025)	0.011 (0.031)	-0.009** (0.004)	-0.009** (0.004)	0.152** (0.066)	0.104** (0.053)	-0.044 (0.029)	0.018 (0.039)	-0.010*** (0.004)	-0.010*** (0.004)
ln CD_{it-1}	0.656*** (0.071)	0.671*** (0.064)	0.145*** (0.059)	0.403*** (0.055)	0.706*** (0.083)	0.683*** (0.074)	0.570*** (0.084)	0.727*** (0.109)	0.168** (0.085)	0.411*** (0.052)	0.595*** (0.094)	0.575*** (0.087)
ln $RGDPC_{it}$	-2.184* (1.180)	-1.897 (1.366)	0.376 (0.959)	-0.349 (1.697)	0.423*** (0.160)	0.400*** (0.107)	-5.624** (2.327)	-3.361** (1.712)	0.453 (1.385)	-0.183 (2.200)	0.423*** (0.160)	0.320*** (0.142)
ln TO_{it}	-1.123* (0.660)	-0.320 (0.371)	0.427 (0.687)	0.789 (0.771)	-0.073 (0.111)	0.002 (0.023)	9.349* (5.402)	3.815 (3.381)	0.096 (7.735)	-0.223 (7.133)	2.269** (1.062)	1.786* (0.960)
ln FG_{it}	-0.159 (0.302)	-0.519 (0.358)	-0.139 (0.284)	-0.268 (0.361)	0.037 (0.040)	0.018 (0.018)	7.609* (4.249)	3.680 (3.231)	-0.178 (6.786)	-1.038 (6.287)	2.049** (0.919)	1.631** (0.824)
ln FG_{it} x ln TO_{it}	---	---	---	---	---	---	-1.926* (1.068)	-0.906 (0.757)	0.014 (1.641)	0.014 (1.641)	-0.484** (0.222)	-0.383** (0.199)
ln INS_{it}	0.070 (0.481)	---	1.660*** (0.340)	---	-0.0299 (0.065)	--	-0.660 (0.777)	---	1.691*** (0.327)	---	-0.112 (0.077)	---
Sargan Test (p-value)	16.43 (0.944)	17.62 (0.915)	13.10 (0.989)	15.41 (0.963)	13.67 (0.977)	13.01 (0.984)	14.35 (0.978)	16.72 (0.938)	13.09 (0.989)	15.74 (0.958)	8.76 (0.999)	9.86 (0.998)
Autocovariance of Order 1 (p-value)	0.004	0.003	0.020	0.003	0.026	0.023	0.000	0.004	0.025	0.003	0.035	0.032
Autocovariance of Order 2 (p-value)	0.929	0.935	0.276	0.261	0.783	0.667	0.882	0.938	0.292	0.256	0.898	0.831

Table Notes

1. All models are estimated using the Arellano and Bond dynamic panel GMM estimations (Stata xtabond command). N = 21, T =14.
2. The variables are defined as follows: CD = Capital Market Development; RGDPC = real GDP per capita (in US dollars, 2000 prices); TO = trade openness defined as total exports plus imports/GDP; INS = institutions (sum of corruption, rule of law, bureaucratic quality, government repudiation of contract and risk of expropriation indices); FG = financial globalisation indicator, defined as total foreign assets and liabilities (% of GDP).
3. Figures in the parentheses are standard errors.
4. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Table 4: Banking Sector Development: Trade Openness, Financial Liberalisation and Institutions, 1980 – 1996 (Annual Data)
Dependent Variable: Banking Sector Development (ln BD_{it})

	Model 13		Model 14		Model 15		Model 16		Model 17		Model 18	
BD_{it} Proxied by	**Private Credit**		**Liquid Liabilities**		**Domestic Credit**		**Private Credit**		**Liquid Liabilities**		**Domestic Credit**	
Specification ref	13a	13b	14a	14b	15a	15b	16a	16b	17a	17b	18a	18b
Constant	-0.009** (0.004)	-0.005 (0.004)	0.024*** (0.006)	0.027*** (0.006)	0.007*** (0.002)	0.006** (0.002)	-0.005 (0.004)	-0.005 (0.004)	0.031*** (0.006)	0.028*** (0.005)	0.005*** (0.002)	0.004** (0.002)
ln BD_{it-1}	0.634*** (0.047)	0.674*** (0.041)	0.713*** (0.085)	0.767*** (0.087)	0.690*** (0.033)	0.685*** (0.028)	0.562*** (0.042)	0.589*** (0.042)	0.607*** (0.070)	0.605*** (0.083)	0.661*** (0.028)	0.672*** (0.027)
ln $RGDPC_{it}$	0.294*** (0.087)	0.231*** (0.068)	0.316* (0.176)	0.401** (0.193)	-0.050 (0.086)	-0.010 (0.081)	0.359*** (0.082)	0.374*** (0.118)	0.106 (0.164)	0.191 (0.155)	0.060 (0.101)	0.067 (0.097)
ln TO_{it}	0.171*** (0.056)	0.202*** (0.050)	0.078** (0.037)	0.079** (0.036)	0.102*** (0.030)	0.130*** (0.021)	0.446*** (0.062)	0.486*** (0.099)	0.276*** (0.063)	0.238*** (0.056)	0.274*** (0.052)	0.284*** (0.054)
ln FL_{it}	0.055*** (0.020)	0.040* (0.024)	0.033* (0.018)	0.042** (0.020)	-0.026 (0.019)	-0.372*** (0.149)	0.723*** (0.164)	0.885*** (0.290)	0.490*** (0.098)	0.455*** (0.095)	0.376*** (0.105)	0.332*** (0.101)
ln FL_{it} x ln TO_{it}	---	---	---	---	---	---	-0.184*** (0.042)	-0.224*** (0.076)	-0.136*** (0.028)	-0.124*** (0.026)	-0.114*** (0.030)	-0.102*** (0.029)
ln INS_{it}	0.137*** (0.044)	---	-0.047 (0.035)	---	0.348 (0.033)	---	0.106*** (0.037)	---	-0.010 (0.043)	---	0.031 (0.024)	---
Sargan Test (p-value)	20.67 (0.839)	17.87 (0.929)	13.01 (0.993)	11.73 (0.997)	18.79 (0.905)	19.42 (0.885)	20.21 (0.857)	21.66 (0.797)	8.56 (0.999)	9.92 (0.999)	19.56 (0.880)	20.57 (0.843)
Autocovariance of Order 1 (p-value)	0.005	0.007	0.001	0.001	0.000	0.000	0.010	0.012	0.001	0.002	0.000	0.003
Autocovariance of Order 2 (p-value)	0.463	0.460	0.201	0.211	0.439	0.427	0.494	0.527	0.185	0.194	0.414	0.401

Notes

1. All models are estimated using the Arellano and Bond dynamic panel GMM estimations using a maximum of two lags of the dependent variable for use as instruments (Stata xtabond command). N = 32 for private credit, N=31 for domestic credit (Argentina dropped) and N= 30 for Liquid Liabilities (France and UK dropped), T =15.
2. The variables are defined as follows: BD = Banking Sector Development; RGDPC = real GDP per capita (in US dollars, 2000 prices); TO = trade openness defined as total exports plus imports/GDP; INS = institutions (sum of corruption, rule of law, bureaucratic quality, government repudiation of contract and risk of expropriation indices); FL = Financial liberalisation index from Abiad and Mody (2005).
3. Figures in the parentheses are standard errors.
4. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.
5. Significant time dummies were retained.

Table 5: Capital Market Development: Trade Openness, Financial Liberalisation and Institutions, 1990 – 1996 (Annual Data)
Dependent Variable: Capital Market Development (ln CD_{it})

	Model 19		Model 20		Model 21		Model 22		Model 23		Model 24	
CD_{it} Proxied by	**Stock Value Traded**		**Stock market turnover**		**No of Companies Listed**		**Stock Value Traded**		**Stock market turnover**		**No of Companies Listed**	
Specification ref	19a	19b	20a	20b	21a	21b	22a	22b	23a	23b	24a	24b
Constant	-0.249*** (0.098)	-0.252*** (0.096)	-0.125 (0.085)	-0.155* (0.087)	-0.001 (0.002)	-0.001 (0.002)	-0.250*** (0.098)	-0.251*** (0.096)	-0.128 (0.085)	-0.162* (0.086)	-0.009** (0.004)	0.003 (0.005)
ln CD_{it-1}	0.744*** (0.050)	0.757*** (0.045)	0.551*** (0.063)	0.645*** (0.057)	0.425*** (0.030)	0.401*** (0.019)	0.742*** (0.049)	0.754*** (0.044)	0.555*** (0.063)	0.655*** (0.055)	0.477*** (0.030)	0.431*** (0.024)
ln $RGDPC_{it}$	-0.687 (0.904)	-0.401 (0.896)	-0.122 (0.785)	-0.183 (0.769)	0.878*** (0.081)	0.868*** (0.065)	-0.785 (0.923)	-0.461 (0.918)	-0.190 (0.804)	-0.230 (0.785)	0.741*** (0.070)	0.805*** (0.071)
ln TO_{it}	0.184 (0.388)	0.021 (0.391)	0.019 (0.318)	0.047 (0.320)	0.190*** (0.032)	0.167*** (0.032)	-0.072 (0.666)	-0.111 (0.666)	0.351 (0.652)	0.385 (0.683)	0.375*** (0.046)	0.336*** (0.045)
ln FL_{it}	0.134* (0.071)	0.189*** (0.071)	-0.012 (0.079)	0.041 (0.076)	0.027*** (0.008)	0.024*** (0.007)	-0.327 (0.684)	-0.065 (0.690)	0.515 (0.771)	0.575 (0.812)	0.317*** (0.067)	0.277*** (0.058)
ln FL_{it} x ln TO_{it}	--	--	--	--	---	---	0.129 (0.184)	0.070 (0.185)	-0.144 (0.199)	-0.149 (0.211)	-0.087*** (0.020)	-0.074*** (0.018)
ln INS_{it}	0.240 (0.249)	--	0.905** (0.382)	--	-0.006 (0.029)	---	0.221 (0.248)	--	0.894** (0.380)	--	-0.017 (0.028)	---
Sargan Test (p-value)	20.09 (0.093)	19.68 (0.104)	13.77 (0.390)	15.56 (0.274)	22.08 (0.733)	17.88 (0.907)	20.37 (0.086)	19.78 (0.101)	13.77 (0.390)	15.55 (0.274)	20.41 (0.813)	17.81 (0.909)
Autocovariance of Order 1 (p-value)	0.002	0.002	0.001	0.001	0.051	0.059	0.002	0.002	0.001	0.001	0.020	0.040
Autocovariance of Order 2 (p-value)	0.514	0.542	0.786	0.664	0.231	0.241	0.537	0.553	0.786	0.702	0.222	0.234

Notes

1. All models are estimated using the Arellano and Bond dynamic panel GMM estimations (Stata xtabond command). N = 31, T = 7.
2. The variables are defined as follows: CD = Capital Market Development; RGDPC = real GDP per capita (in US dollars, 2000 prices); TO = trade openness defined as total exports plus imports/GDP; INS = institutions (sum of corruption, rule of law, bureaucratic quality, government repudiation of contract and risk of expropriation indices); FL = Financial liberalisation index from Abiad and Mody (2005).
3. Figures in the parentheses are standard errors.
4. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.
5. Significant time dummies were retained.

Table 6a: Partial Derivatives of Financial Development w.r.t. Trade Openness

Financial development indicator (Specification ref)	Evaluated at Financial Openness		
	Mean	Minimum	Maximum
Private credit (4a)	0.273	0.415	0.196
Private credit (16a)	0.034	0.446	-0.096
Liquid Liabilities (5b)	0.189	-0.029	0.510
Liquid Liabilities (17b)	-0.039	0.238	-0.127
Domestic Credit (6b)	0.161	0.403	0.291
Domestic Credit (18b)	0.056	0.284	-0.016
Stock Value Traded (10a)	0.285	2.875	-1.632
Stock Value Traded (19b)	0.021*	0.021*	0.021*
Stock market turnover (8a)	0.427*	0.427*	0.427*
Stock market turnover (20a)	0.019*	0.019*	0.019*
Number of Companies Listed (12b)	-0.016	0.499	-0.398
Number of Companies Listed (24b)	0.155	0.336	0.118

Table 6b: Partial Derivatives of Financial Development w.r.t. Financial Openness

Financial development indicator (Specification ref)	Evaluated at Trade Openness		
	Mean	Minimum	Maximum
Private credit (4a)	-0.175*	0.102*	-0.246*
Private credit (16a)	0.015	0.384	-0.244
Liquid Liabilities (5b)	0.029	-0.162	0.139
Liquid Liabilities (17b)	-0.022	0.226	-0.197
Domestic Credit (6b)	-0.168	0.043	-0.289
Domestic Credit (18b)	-0.060	0.144	-0.204
Stock Value Traded (10a)	-0.531	2.304	-2.855
Stock Value Traded (19b)	0.189	0.189	0.189
Stock market turnover (8a)	-0.139*	-0.139*	-0.139*
Stock market turnover (20a)	-0.012*	-0.012*	-0.012*
Number of Companies Listed (12b)	0.012	0.576	-0.450
Number of Companies Listed (24b)	-0.011	0.086	-0.112

- Indicates statistically insignificant coefficient(s) was (were) used to calculate the derivative.

Table 7. Robustness Checks: Openness, Institutions and GDP treated as pre-determined regressors

Financial Development Indicator	**Private Credit Model 4a N=42 T=22**		**No of Listed Companies Model 12a N=21 T=14**		**Private Credit Model 16a N=32 T=15**		**No of Listed Companies Model 24a N=31 T=7**	
Status of openness, institutions and GDP	Exogenous	Predetermined	Exogenous	Predetermined	Exogenous	Predetermined	Exogenous	Predetermined
Constant	0.001 (0.001)	- 0.009*** (0.003)	-0.010*** (0.004)	0.005** (0.002)	-0.005 (0.004)	-0.002 (0.009)	-0.009** (0.004)	-0.004 (0.007)
ln BD_{it-1}	0.856*** (0.036)	0.880*** (0.067)	0.595*** (0.094)	0.616*** (0.122)	0.562*** (0.042)	0.779*** (0.064)	0.477*** (0.030)	0.439*** (0.066)
ln $RGDPC_{it}$	-0.175*** (0.053)	0.251 (0.202)	0.423*** (0.160)	0.657*** (0.260)	0.359*** (0.082)	0.577** (0.260)	0.741*** (0.070)	0.739*** (0.218)
ln TO_{it}	0.525*** (0.065)	0.860*** (0.174)	2.269** (1.062)	1.928*** (0.741)	0.446*** (0.062)	0.390*** (0.138)	0.375*** (0.046)	0.344*** (0.087)
ln FG_{it}	0.051 (0.087)	0.434*** (0.160)	2.049** (0.919)	2.036*** (0.665)				
ln FG_{it} x ln TO_{it}	-0.055** (0.023)	-0.145*** (0.046)	-0.484** (0.222)	-0.445*** (0.144)				
ln FL_{it}					0.723*** (0.164)	0.502** (0.252)	0.317*** (0.067)	0.291* (0.171)
ln FL_{it} x ln TO_{it}					-0.184*** (0.042)	-0.159** (0.072)	-0.087*** (0.020)	-0.081* (0.049)
ln INS_{it}	0.083*** (0.022)	0.204*** (0.048)	-0.112 (0.077)	0.027 (0.073)	0.106*** (0.037)	0.065 (0.097)	-0.017 (0.028)	0.078* (0.045)
Sargan Test (p-value)	29.88 (0.920)	31.19 (1.00)	8.76 (0.999)	11.22 (1.00)	20.21 (0.857)	19.98 (1.00)	20.41 (0.813)	17.32 (1.00)
Autocovariance of Order 1 (p-value)	0.000	0.000	0.035	0.033	0.010	0.029	0.020	0.037
Autocovariance of Order 2 (p-value)	0.721	0.403	0.898	0.340	0.494	0.479	0.222	0.216

Notes

1. All models are estimated using the Arellano and Bond dynamic panel GMM estimations using a maximum of two lags of the dependent variable for use as instruments (Stata xtabond command).
2. The variables are defined as follows: BD = Banking Sector Development; RGDPC = real GDP per capita (in US dollars, 2000 prices); TO = trade openness defined as total exports plus imports (% of GDP); INS = institutions (sum of corruption, rule of law, bureaucratic quality, government repudiation of contract and risk of expropriation indices); FG = financial globalisation indicator, defined as total foreign assets and liabilities (% of GDP). FL = Financial liberalisation index from Abiad and Mody (2005).
3. Figures in parentheses are standard errors.
4. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.