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# Finance, institutions and human development: Evidence from developing countries

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The paper aims to examine the role of institutions and human development in financial development at early and developing stages of economic development, using data from 52 developing economies during 1985–2008. In order to provide a more comprehensive assessment, especially of the finance-institutions link, we decompose institutions into economic, political and social; and economic institutions into quality of government, intervention of government, and quality of the legal system. The results demonstrate that: (i) institutional quality can explain international differences in the level of banking sector development; (ii) economic institutions and human development are extremely significant for banking sector development; (iii) the legal system is the dominant dimension of economic institutions; and (iv) the combined reforms of economic institutions matter more than separate institutional reforms.

**Keywords:** banking sector development; institutions; trade openness; human development; financial openness; panel data analysis

**JEL Classification:** G29; F19; K49

## 1. Introduction

Since Schumpeter (1911), economists have been debating the role of the financial sector in the process of economic development. Although the channels and even the direction of causality have not been fully clarified, the argument that financial institutions might maximise economic growth is supported empirically by many researches in the financial development literature, from cross-country comparisons (King & Levine, 1993; Levine & Zervos, 1998), industry level studies (Rajan & Zingales, 1998), time-series research (Rousseau & Wachtel, 2000), and panel data analysis (Apergis, Filippidis, & Economidou, 2007).

Recently, the finance-growth literature has focused on the financial development policies issues, namely the sources of financial development. Apart from the traditional mechanisms that impact on financial development, such as capital account openness (Chinn & Ito, 2002), trade openness (Do & Levchenko, 2004), political decisions (Rajan & Zingales, 2003) and macroeconomic factors such as the level of inflation (Boyd, Levine, & Smith, 2001), there has been a growing emphasis on the institutional factors in the literature. A country's economic and political institutions, formed by a country's legal origin (La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998) or by a country's initial endowment

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(Acemoglu, Johnson, & Robinson, 2001, 2002), affects both creditor rights and private credit, and the extent of creditor rights protection has an independent effect on financial sector development.

With regard to this outline, we try to provide a more comprehensive assessment, especially of the finance-institutions link, by asking two interesting questions: first, which dimension of institutions (economic, political or social) matters more for financial development? It is important to distinguish between these dimensions since they have different initial hypotheses and different structural characteristics: political institutions include the type of government and the level of democracy; economic institutions include the presence and quality of markets and the regulatory structures; finally, social institutions include the social norms and practices.

Second, are there any structural components of economic institutions that impact more on financial development? In other words, is it the 'law and finance' theory by La Porta et al. (1997) – where countries have different institutions due to different law structures – or the 'settler mortality' hypothesis by Acemoglu et al. (2001) – where countries have different institutions due to different initial functioning of the economic/political system – that better explains institutional differences across countries? Although significant research tried to test these theories in the past, by separately testing on legal origin or settler mortality variables, new tools provide better measures of legal institutions and government efficiency, thus a more precise view of their causal relations.

Finally, we include the effect of human development, that enables us to comprehend in a upper level the determinants of the financial – and particularly the banking – system. Human development represents a broader concept than the GDP per capita variable that has been a common practice in the literature as a standard measure of development, since it measures the average achievements in three basic dimensions of a country's development: health, knowledge and development (GDP per capita).

To investigate these extensions of the literature, we employ dynamic panel techniques that allow us to avoid the known problems of heterogeneity and endogeneity of the traditional techniques and study the dynamics of adjustment (Baltagi, 2008). An underlying advantage of the dynamic GMM estimation is that all variables from the regression that are not correlated with the error term (including lagged and differenced variables) can be potentially used as valid instruments (Greene, 2008). More specifically, we employ the two-step System-GMM estimator by Arellano and Bover (1995), and Blundell and Bond (1998) that generally produces more efficient and precise estimates compared with Differenced GMM by improving precision and reducing the finite sample bias (Baltagi, 2008).

From the empirical results, we argue that economic institutions are of fundamental importance for banking sector development, while political institutions are statistically significant at lower levels of economic development; regarding the economic institutional dimensions, the legal system is the dominant dimension of economic institutions; and the combined reforms of economic institutions matter more than separate institutional reforms.

The rest of the paper is structured as follows: in the next section, there is a brief presentation of the related financial development literature; Section 3 describes the variables and the methodology used; in Section 4 we present the empirical results; and the final section provides a summary and relative conclusions.

## 2.  Brief review of the literature

There are a great many exogenous and endogenous factors that can explain the differences between financial developments among different countries. For simplicity, we can summarise these factors into four categories: liberalisation in the goods and capital markets; institutional reforms; political choices; and macroeconomic stabilisation.

First, liberalisation policy whether in the financial market or the goods market has a positive effect on financial development. Increased volume of trade may act as a propellant for the financial sector to grow, since trade openness by increasing the efficiency of technology (through knowledge spillovers) might increase the payoff to the financing young entrepreneurs, fostering the formation of active capital markets. On the other hand, freeing the financial system from government intervention allows a more efficient allocation of resources by various economic agents.

Using a panel of 24 countries, Rajan and Zingales (2003), establish that a combination of trade and account openness is prime for financial development, especially when cross-border capital flows are free. Baltagi, Demetriades, and Law (2009) verify the hypothesis of Rajan and Zingales (2003) from a bank sector development view. Their findings suggest that both financial openness and trade openness can independently lead to financial development. Similarly, Pham (2010) shows the existence of bi-directional causality between openness (trade and financial) and financial development. The opening of goods and service markets seems to be a precondition for financial development/openness; in turn, both financial development and financial openness encourage trade openness. From a long-run perspective, recently Kim, Lin, and Suen (2010), using a Pooled Mean Group on 88 countries with data spanning from 1960 to 2005, established a positive long-run link between trade openness and financial development. They, however, stressed the coexistence of negative short run coefficients.

Second, institutional quality is likely to affect financial development through the ability of the financial sector to channel resources to finance productive activities. In the absence of an adequate regulatory framework and supervision, the ability of financial markets to mobilise funds may be strongly undermined by a lack of depositors' confidence. This will cause funds to drift abroad and generally away from viable domestic investment opportunities. More broadly, well-defined rules and their smooth enforcement, i.e. better institutional quality, greatly reduce the transaction costs economic agents face and thus lead to more efficient outcomes (North, 1990, 1991).

Either under the scope of the 'law and finance' theory (La Porta et al., 1997, 1998) or the 'settler mortality' view (Acemoglu et al., 2001), the financial development literature provides evidence of the relative importance of both hypotheses. The quality of institutions is likely to affect financial development through the ability of the financial sector to channel resources to finance productive activities (Chinn & Ito, 2002; Baltagi et al., 2009; Law & Azman-Saini, 2008; Hooshmand, Hosseini, & Moghani, 2013). More specifically, Law and Azman-Saini (2008) show that institutional quality has a major influence on financial development, especially on the development of the banking sector. On the other hand, the development of the stock market does not seem to be influenced by institutions. Finally, the relationship between institutions and financial development seems to have the U form. In other words, the institutional framework affects the financial development only when the country has reached a certain level of institutional quality, a condition that occurs more in low-income countries.

The recent surveys of Law and Habibullah (2009), Huang (2010) and Ayadi, Arbak, Naceur, and De Groen (2013) also confirm the important role of institutions on financial

development. More specifically, using a sample of panel data for 90 countries for the period 1990–1999, Huang (2010) showed that the institutions-finance relationship is particularly strong in those countries with low incomes, ethnic inequalities and with a legal framework based on French law. Law and Habibullah (2009), using a dynamic panel model in a sample of 27 countries for the period 1980 to 2001, concluded that the quality of institutions is a statistically significant determinant of financial development, regardless if it is the banking sector or the stock market. Finally, Ayadi et al. (2013) using a sample of both northern and southern Mediterranean countries for the years 1985 to 2009, show that strong legal institutions, good democratic governance and adequate implementation of financial reforms can have a substantial positive impact on financial development only when they are present collectively.

Another way of looking at the divergent performance of countries is to look at the political system in which decisions about economic policies are made. Financial underdevelopment may be a deliberate policy choice by incumbents who shape policies and institutions in order to stay in power and enrich themselves ('politics and finance' view).[1] Established military / industrial elite may be advantaged in a system in which entry of new firms is restricted through limited access to financial capital by outsiders (Girma & Shortland, 2008; Haber & Perotti, 2008).

A first test of a political economy model of financial development was undertaken by Rajan and Zingales (2003). Their paper tests the hypothesis that political systems governed by narrow elites obstruct the development of the financial system. High international capital mobility and a high degree of trade openness are connected with higher levels of financial development, since capital mobility and open trade undermine both the ability and the incentive of incumbents to suppress domestic financial development. They show that the interaction term between trade openness and international capital mobility has had a significant and positive effect on financial development over the twentieth century.

The last group of factors of financial development is macroeconomic conditions and particularly inflation, which has a negative implication on financial development performance (Boyd et al., 2001). Recent theories demonstrate how increases in the rate of inflation have negative repercussions for financial sector performance. The common departure of these theories is that there are informational asymmetries in credit markets. As inflation increases, the real rate of return on money falls, credit market frictions are getting worse and credit rationing becomes more severe. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital investment.

## 3.   Variables and methodology

### 3.1.   *Variables*

The objective of this study is to examine the variables that may affect the financial development. In order to reach the full effect of the institutional change in the financial development, the model is estimated for the period 1985–2008 for 52 low, lower-middle and upper-middle economies. The diversification of work is that it seeks to address the three dimensions of the institutions (political, economic and social) and the possible effects of different aspects of economic institutions.

### 3.1.1.  Financial development

There is a large amount of literature discussing the possible measures of financial development. For measuring banking sector development, the most popular measure is the ratio of liquid liabilities to GDP (LL). Other standard measures are the ratio to GDP of credit issued to the private sector by banks and other financial intermediaries (PC) and the ratio of the commercial bank assets to the sum of commercial bank assets and central bank assets (DBA). Following Huang and Temple (2005), our measure is based on the combined effect of LL, PC and DBA, which captures the complete extent of bank-based intermediation (BSD).[2]

### 3.1.2.  Institutions

In order to provide a more comprehensive assessment, especially of the finance-institutions link, we decompose institutions into economic, political and social; and economic institutions into quality of government, intervention of government, and quality of the legal system. As such, the economic institutional quality is proxied by: (a) the quality of government (approached by the indicators of bureaucracy, corruption, legislative capacity and accountability of the government), in order to approach the 'settler mortality' hypothesis; (b) the quality of the legal system, in order to proxy the 'law and finance' view; and (c) the intervention of government, in order to proxy the 'politics and finance' view. We conduct our analysis using a general index and the three individual components with all possible combinations.

Following Haber and Perotti (2008), who suggested that a political system with more democratic accountability on the part of policy designers can achieve a higher level of financial development, we employ the Polity index,[3] in order to proxy the political institutional quality. The Polity variable was designed to record the regime's institutionalised authority characteristics. The database records a democracy score and an autocracy score (ranging from 0 to 10), and subtracting the autocracy score from the democracy score of a country creates the polity2 variable. Higher scores of polity2 therefore indicate a higher degree of democracy. In the present study we use DURABLE from the Polity index, which is a measure of the durability of the regime's authority pattern for a given year. It shows the number of years that have passed since the last major change in the authority characteristics. This change can be either towards democracy or autocracy.

Finally, following Basu (2008), we use the Workers' Rights Index from CIRI Human Rights Dataset,[4] as a proxy for social institutional quality. This index indicates the extent to which workers' rights at work are internationally recognised, including a prohibition on the use of any form of forced or compulsory labour; a minimum age for the employment of children; and acceptable conditions of work with respect to minimum wages, hours of work, and occupational safety and health.

### 3.1.3.  Trade openness

Trade openness is measured as the volume of exports and imports to GDP:

TO = (IMP + EXP) / GDP

where IMP (EXP) denotes the sum of imports (exports) of goods and services.

### 3.1.4. Financial openness

Financial openness is measured using the data on foreign assets and liabilities from international investment positions published by central banks. We use the ratio of accumulating holdings of assets and liabilities of portfolio equity and financial derivatives to GDP:

FO = (PORT$_A$ + PORT$_L$ + FD$_A$ + FD$_L$) / GDP, where PORT$_A$ (PORT$_L$)

denotes the stock of portfolio equity assets (liabilities) and FD$_A$ (FD$_L$) the stock of financial derivatives assets (liabilities).

### 3.1.5. Macroeconomic variables

(a) Inflation, aimed at capturing the consistency of monetary policy; and (b) Human Development Index (HDI), which is a composite index that measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate and the combined gross enrolment ratio for primary, secondary and tertiary schools; and a decent standard of living, as measured by GDP per capita. It is obvious that HDI represents a broader concept than the GDP per capita variable that has been common practice in the literature as a standard measure of a country's development.

### 3.2. Methodology

To assess the role of institutions and human development in financial development for 52 developing economies during 1985–2008, the following model is estimated:

$$y_{it} = \alpha y_{i,t-1} + \mathbf{x}'_{it} 2\beta + \varepsilon_{it}$$
$$\varepsilon_{it} = \mu_i + v_{it} \qquad (1)$$
$$\mathrm{E}[\mu_i] = \mathrm{E}[v_{it}] = \mathrm{E}[\mu_i v_{it}] = 0$$

where $y_{it}$ is banking sector development, $x_{it}$ is a vector of variables including institutions (ECONOMIC, REGIME, WORKERS), trade openness (TO), financial openness (FO), inflation (INFL) and human development indicator (HDI);[5] the disturbance term has two orthogonal components: the fixed effects, $\mu_i$ and idiosyncratic shocks, $v_{it}$; the subscripts $i$ and $t$ represent country and time period. According to the financial development literature, we expect the sign of the coefficient of institutions, openness and human development index to be positive and the sign of the coefficient of inflation to be negative.

In order to remove the fixed effect, Anderson and Hsiao (1981) difference the equation and use $y_{i,t-2}$ as an instrument for $\Delta y_{i,t-1}$ (to avoid the correlation with the error term). Going a step further, Arellano and Bond (1991) propose the Differenced GMM estimator for dynamic panel data models, which uses all lagged values of $y$ and $x$ as instruments for $\Delta y_{i,t-1}$ and $\Delta x_{i,t-1}$ in the first-difference equation of Anderson and Hsiao (1981). The result is an instrument matrix $Z$ that is of the form:

$$Z_i = \begin{bmatrix} [y_{i1}, x'_{i1}, x'_{i2}] & 0 & \cdots & & 0 \\ 0 & \ddots & \cdots & & 0 \\ \vdots & \vdots & \ddots & & \vdots \\ 0 & 0 & \cdots & [y_{i1}, \ldots, y_{i,T-2}, x'_{i1}, \ldots, x'_{i,T-1}] \end{bmatrix} \tag{2}$$

This matrix corresponds to the family of $(T-2)(T-1)/2$ moment conditions:

$$\mathrm{E}[y_{i,t-1}\Delta\varepsilon_{it}] = 0 \text{ for each } t \geq 3, l \geq 2 \tag{3}$$

The Arellano-Bover/Blundell-Bond estimator augments Arellano-Bond by making an additional assumption, that first differences of instrument variables are uncorrelated with the fixed effects. This allows the introduction of more instruments, and can dramatically improve efficiency. It builds a system of two equations – the original equation as well as the transformed one – and is known as System GMM. In other words, a 'system GMM' estimator enables the lagged first-differences of the series ($y_{it}$, $x_{it}$) dated $t$–1 to be used as instruments for the untransformed equations in levels. The typical instrument set looks like:

$$Z_i^L = \begin{bmatrix} [\Delta y_{i2}, \Delta x'_{i2}, \Delta x'_{i3}] & 0 & \cdots & & 0 \\ 0 & \ddots & \cdots & & 0 \\ \vdots & \vdots & \ddots & & 0 \\ 0 & 0 & \cdots & [\Delta y_{i2}, \ldots, \Delta y_{i,T-2}, \Delta x'_{i2}, \ldots, \Delta x'_{i,T}] \end{bmatrix} \tag{4}$$

This corresponds to the moment conditions:

$$\mathrm{E}[\Delta y_{i,t-1}\varepsilon_{it}] = 0 \text{ for each } t \geq 3 \tag{5}$$

Based on the combination of first-difference equations with suitably lagged levels as instruments, and levels equations with suitably lagged first-differences as instruments, the system GMM estimator generally produces more efficient and precise estimates compared with first-differenced GMM by improving precision and reducing the finite sample bias (Baltagi, 2008). Three points are worth mentioning about system GMM (Roodman, 2006, 2007): (i) the GMM estimator requires that there is first-order serial correlation but that there is no second-order serial correlation in the residuals. Since the null hypotheses are that there is no first-order/second-order serial correlation, it means that one needs to reject the null hypothesis in the AR(1) test but not to reject it in the AR(2) test to get appropriate diagnostics; (ii) the system GMM can generate an enormous number of potentially 'weak' instruments that can cause biased estimates. Therefore, we have to check that the number of instruments should not exceed the number of observations.[6] Second, we have to check the Hansen statistic, which tests the null hypothesis of correct model specification and valid overidentifying restrictions, i.e. validity of instruments. The *p*-value of this statistic should have a higher value than the conventional 0.050 or 0.100 levels, in order to accept the null hypothesis that the model has the correct specification and valid instrumentation; and (iii) the 'steady state' assumption requires a kind of steady-state in the sense that deviations from long-term values are not systematically related to the fixed effects. More simply, the estimated coefficient on the lagged dependent variable in the model should indicate convergence by having a value less than unity, otherwise system GMM is invalid.

As we can see from the tables that follow, all rules are satisfied and the specification tests – the Arellano-Bond test for autocorrelation and the Hansen test of valid

overidentifying restrictions – that are reported in the last rows of each column, support the validity of the model specification and instrumentation.

## 4.   Results

Table 1 reports the regression results from the two-step system-GMM for the period 1985–2008 for low- and lower-middle-income countries. The dependent variable is Banking Sector Development and the explanatory variables are: Economic, Political and Social Institutions, Financial Openness, Trade Openness, Inflation and Human Development Index. In models 1–3 we estimate the three different dimensions of economic institutions (quality of government, quality of the legal system, and intervention of government) and in models 4–6 we estimate the combinations of the three dimensions of economic institutions. In model 7 we estimate overall economic institutions. In Table 2, we present the regression results for all developing countries.[7]

### 4.1.   Low and lower-middle income countries

When low and lower-middle income countries are examined, economic institutions in all dimensions (and combinations) are statistically significant, with the dimension of legal structure to be displayed as the most important, at a rate close to 0.0395 (model 2). As shown in models 4 and 5, the combinations of legal structure with government intervention and government quality have large and statistically significant coefficients (0.0449 and 0.0479, respectively), emphasising the primacy of good government structures in low levels of economic development, especially if government policy and rationale is based on a stable legal structure (integrity of the legal system, judicial independence, protection of property rights, legal enforcement of contracts, etc). In other words, the legal dimension of economic institutions is of fundamental importance for banking sector development, and much more when it is accompanied by a less government intervention via privatisation or/and liberalisation of the public sector and by a government commitment against bureaucracy and corruption.

Regarding the political institutions, regime durability is highly significant in all specifications of the regressions for low and lower-middle income countries, with a coefficient ranging from 0.0003 (model 3) to 0.0004 (model 4). This result is consistent with the political economy and the economic logic, since more developing and democratic societies lessen the power exercised by the elite, and consequently leads to more active financial markets. As for the social institutions, there is a particularly important result from this analysis: although insignificant in all cases, labour rights (minimum wage, job security) exhibit a positive coefficient (in all specifications for low and lower-middle income countries), a compatible result with the theory of effective wages. Wages and labour rights appear to have marginally positive economic benefits, since job security motivates employees to plan long-term economic action, i.e. to save, invest and borrow to a greater extent than in an unstable working environment.

Moreover, openness (in goods and capital market) also have statistically significant coefficients in all models (trade openness exhibits an average coefficient of 0.0045 and financial openness an average coefficient of 0.0861) since, as supported by the literature, openness fosters the formation of active financial markets by increasing the efficiency of technology (through knowledge spillovers), by diversification of risk, and by expanding financially intensive sectors. Finally, note that HDI exhibits statistically significant coefficients in all specifications, a result absolutely consistent with the financial

Table 1.   Institutions and Financial Development (low & lower-middle 39 countries). Dependent variable: Banking Sector Development (BSD). Explanatory variables: Economic Institutions (GOV, LEGAL, POL), Political Institutions (REGIME), Social Institutions (WORKERS' RIGHTS), Financial Openness (FO), Trade Openness (TO), Inflation (INFL), Human Development Index (HDI). Period: 1985–2008.

$$FD_{lt} = \alpha FD_{it-1} + \beta_1 INS_{lt} + \beta_2 FO_{lt} + \beta_3 TO_{lt} + \beta_4 INFL_{lt} + \beta_5 HDI_{lt} + \varepsilon_{it}$$

| Variables | Basic Model | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
| BSD_-1 | 0.8195*** | 0.7648*** | 0.7977*** | 0.7635*** | 0.7560*** | 0.7880*** | 0.7492*** |
| | (0.0768) | (0.1095) | (0.0991) | (0.0883) | (0.1148) | (0.0875) | (0.0985) |
| POL | 0.0169** | | | | | | |
| | (0.0009) | | | | | | |
| LEGAL | | 0.0395** | | | | | |
| | | (0.0018) | | | | | |
| GOV | | | 0.0275* | | | | |
| | | | (0.0145) | | | | |
| POL & LEGAL | | | | 0.0449*** | | | |
| | | | | (0.0129) | | | |
| LEGAL & GOV | | | | | 0.0479** | | |
| | | | | | (0.0220) | | |
| POL & GOV | | | | | | 0.0347** | |
| | | | | | | (0.0137) | |
| ECON | | | | | | | 0.0538*** |
| | | | | | | | (0.0176) |
| REGIME | 0.0003** | 0.0003* | 0.0003* | 0.0004** | 0.0003* | 0.0004** | 0.0004** |
| | (0.0001) | (0.0002) | (0.0002) | (0.0002) | (0.0002) | (0.0002) | (0.0002) |
| WORKERS' RIGHTS | 0.0010 | 0.0010 | 0.0008 | 0.0006 | 0.0006 | 0.0005 | 0.0003 |
| | (0.0016) | (0.0015) | (0.0015) | (0.0015) | (0.0015) | (0.0016) | (0.0015) |
| FO | 0.0741** | 0.0842** | 0.0792** | 0.0917*** | 0.0905** | 0.0860** | 0.0972*** |
| | (0.0301) | (0.0350) | (0.0360) | (0.0334) | (0.0388) | (0.0350) | (0.0369) |
| TO | 0.0049 | 0.0047* | 0.0043* | 0.0036 | 0.0036 | 0.0036 | 0.0029 |
| | (0.0031) | (0.0029) | (0.0026) | (0.0029) | (0.0026) | (0.0027) | (0.0026) |
| INFL | -0.0004*** | -0.0004*** | -0.0004*** | -0.0004*** | -0.0004*** | -0.0004*** | -0.0004*** |
| | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) | (0.0001) |
| HDI | 0.0639** | 0.0830** | 0.0719** | 0.0715** | 0.0798** | 0.0663** | 0.0729** |
| | (0.0335) | (0.0383) | (0.0341) | (0.0324) | (0.0372) | (0.0318) | (0.0326) |
| *Arellano-Bond test for serial correlation* | | | | | | | |
| AR(1) | 0.044 | 0.065 | 0.052 | 0.049 | 0.063 | 0.045 | 0.052 |
| AR(2) | 0.647 | 0.666 | 0.646 | 0.667 | 0.662 | 0.652 | 0.667 |
| *Tests of overid. restrictions* | | | | | | | |
| Sargan test | 0.393 | 0.302 | 0.355 | 0.281 | 0.294 | 0.332 | 0.266 |
| Hansen test | 0.749 | 0.626 | 0.716 | 0.654 | 0.623 | 0.709 | 0.631 |

Notes: Regressions use the two-step system-GMM estimator. Robust standard errors are reported in brackets.
Instruments used are Economic Institutions (GOV, LEGAL, POL), Political Institutions (REGIME), Social Institutions (WORKERS' RIGHTS), Financial Openness (FO), Trade Openness (TO), Inflation (INFL), Human Development Indicator (HDI): for the difference equations, all in lagged levels and, for the level equation, in first difference.
***, **, and *denote significance at the 1, 5, and 10% level, respectively.
Arellano test for serial correlation and Sargan/Hansen over-identifying restrictions test report $p$-value.

Table 2. Institutions and Banking Sector Development (all 52 countries). Dependent variable: Banking Sector Development (BSD). Explanatory variables: Economic Institutions (GOV, LEGAL, POL), Political Institutions (REGIME), Social Institutions (WORKERS' RIGHTS), Financial Openness (FO), Trade Openness (TO), Inflation (INFL), Human Development Index (HDI). Period: 1985–2008.

**Basic Model**

$$FD_{it} = \alpha FD_{it-1} + \beta_1 INS_{it} + \beta_2 FO_{it} + \beta_3 TO_{it} + \beta_4 INFL_{it} + \beta_5 HDI_{it} + \varepsilon_{it}$$

| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| $BSD_{-1}$ | 0.8702*** (0.0514) | 0.8430*** (0.0581) | 0.8520*** (0.0558) | 0.8285*** (0.0611) | 0.8260*** (0.0619) | 0.8407*** (0.0596) | 0.8128*** (0.0652) |
| POL | 0.0195** (0.0009) | | | | | | |
| LEGAL | | 0.0362** (0.0014) | | | | | |
| GOV | | | 0.0319*** (0.0119) | | | | |
| POL &LEGAL | | | | 0.0490*** (0.0160) | | | |
| LEGAL &GOV | | | | | 0.0497*** (0.0172) | | |
| POL &GOV | | | | | | 0.0414*** (0.0155) | |
| ECON | | | | | | | 0.0610*** (0.0197) |
| REGIME | 0.0001 (0.0001) | 0.0001 (0.0001) | 0.0001 (0.0001) | 0.0002 (0.0001) | 0.0001 (0.0001) | 0.0001 (0.0001) | 0.0001 (0.0001) |
| WORKERS'RIGHTS | -0.0002 (0.0012) | -0.0003 (0.0013) | -0.0004 (0.0013) | -0.0008 (0.0012) | -0.0007 (0.0013) | -0.0008 (0.0013) | -0.0011 (0.0013) |
| FO | 0.0587*** (0.0218) | 0.0556*** (0.0199) | 0.0589*** (0.0212) | 0.0701*** (0.0241) | 0.0633*** (0.0218) | 0.0691*** (0.0249) | 0.0749*** (0.0253) |
| TO | 0.0052** (0.0026) | 0.0064** (0.0029) | 0.0049** (0.0025) | 0.0042 (0.0028) | 0.0049* (0.0027) | 0.0036 (0.0025) | 0.0033 (0.0027) |
| INFL | -0.0004*** (0.0001) | -0.0004*** (0.0001) | -0.0004*** (0.0001) | -0.0004*** (0.0001) | -0.0004*** (0.0001) | -0.0004*** (0.0001) | -0.0004*** (0.0001) |
| HDI | 0.0388** (0.0187) | 0.0456** (0.0192) | 0.0427** (0.0180) | 0.0384** (0.0188) | 0.0438* (0.0185) | 0.0375** (0.0180) | 0.0383** (0.0182) |
| *Arellano-Bond test for serial correlation* | | | | | | | |
| AR(1) | 0.012 | 0.016 | 0.014 | 0.013 | 0.016 | 0.012 | 0.013 |
| AR(2) | 0.998 | 0.999 | 0.987 | 0.973 | 0.998 | 0.989 | 0.974 |
| *Tests of overid. restrictions* | | | | | | | |
| Sargan test | 0.837 | 0.912 | 0.929 | 0.914 | 0.934 | 0.917 | 0.936 |
| Hansen test | 0.818 | 0.889 | 0.907 | 0.887 | 0.931 | 0.893 | 0.928 |

Notes: Regressions use the two-step system-GMM estimator. Robust standard errors are reported in brackets.
Instruments used are Economic Institutions (GOV, LEGAL, POL), Political Institutions (REGIME), Social Institutions (WORKERS' RIGHTS), Financial Openness (FO), Trade Openness (TO), Inflation (INFL), Human Development Indicator (HDI): for the difference equations, all in lagged levels and, for the level equation, in first difference.
***, **, and *denote significance at the 1%, 5%, and 10% level, respectively.
Arellano test for serial correlation and Sargan/Hansen over-identifying restrictions test report *p*-value.

development – economic growth relationship. The values of human development are very high (up to 0.0830, model 2), demonstrating the paramount importance of economic development for the development of financial markets for lower-middle countries. In sum, as shown in model 7, financial openness is considered as the main determinant of the banking sector development (0.0972), followed by HDI (0.0729), economic institutions (0.0538) and inflation (–0.0004).

## 4.2.  *All developing countries*

In all countries' analysis, the results are (more or less) the same: economic institutions are statistically significant, with the dimension of legal structure (0.0362, model 2) and its combination with the other two dimensions exhibiting the largest values (0.0490 and 0.0497, models 4 and 5). This apparently shows that a government rationale is a precondition for developing countries: first, bureaucracy and corruption distort the economic and financial environment by forcing the withdrawal or withholding of an investment and encourage the development of the black market; second, the degree of liberalism of the state and the extent of privatisation that take place in the economy greatly affects the efficiency of government and business; both are gaining importance and magnitude when they are accompanied by the quality of the legal system.

Note that due to the fact that more developing countries are entering the sample, financial openness and a country's human development, although significant, are losing some of their impact (from 0.0972 to 0.0749 and from 0.0729 to 0.0383, respectively), while the significance of inflation remains the same (–0.0004) regardless of the model's specification. Finally, the impact of the lagged value of the dependent variable seems to be increasing as countries are developing (from 0.7492 for low and lower-middle countries to 0.8128 for all countries), emphasising the dynamic view of financial development.

## 5.   Conclusions

Since the late 1980s, institutions have been implemented in unparalleled scale across the developing world while financial development became one of the main components of economic growth. In this paper, we go beyond the identification of the effects of an overall institutional index and try to provide a more comprehensive assessment of the finance-institutions link for 52 economies from 1985 to 2008, by asking which dimension of institutions (economic, political, social) matter vis-à-vis financial development and whether the effects of economic institutions differ when different aspects are used (quality of government, intervention of government, integrity of the judiciary).

Our main finding from the regression analysis is a robust empirical relationship from institutions (economic and political) to financial development, a result consistent with most empirical studies. We argue that economic institutions are of fundamental importance for banking sector development especially for developing countries, while political institutions are statistically significant in low and lower-middle income countries. Especially for economic institutions, the dimension of the legal system seems to be the main determinant for the development of the banking sector, and much more when it is accompanied by less government intervention via privatisation or/and liberalisation of the public sector and by a government commitment against bureaucracy and corruption. As for human development, there is a consistent effect on the financial development in

all samples of countries, demonstrating the paramount importance of economic development for the development of financial markets.

Regarding the openness and finance link, we find that openness in both the good and financial markets has a strong association with bank-based finance and that capital inflows have a great and positive effect on financial development regardless of the stage of economic development. Finally, the inflation-finance correlation emerges independently of the inclusion or exclusion of countries with different stages of economic development.

In terms of policy implications, our results suggest that the government of these developing economies should impose less restrictive regulatory policies on financial market activities in order to promote the development of their financial systems. Moreover, there may be good news for policy makers in countries that are relatively closed, since opening up their capital accounts may provide an effective stimulus to financial development. Overall, improving economic and institutional development, as well as financial openness, will encourage the development of financial markets.

We highlight two extensions of our study. First, one could further extend the analysis to investigate the effects of other structural reforms on financial development, such as the extent to which bank assets are controlled by private owners, the restrictions on foreign bank entry, the presence and extent of subsidised credit schemes and the degree of independence of the bank supervisory agency. Second, the direction of causality between financial sector development and the explanatory variables is an important issue of further research.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Notes

1. The 'politics and finance' view is linked to the theory of institutions, and more specifically with the 'settler mortality' hypothesis. Countries in which extractive institutions were set up by colonial powers to avoid large-scale permanent settlement have often continued to privilege small elites. These post-colonial elites have continued to restrict suffrage in the political system and have limited access to economic resources to those within their own group. In such systems there are no incentives to put into place a legal system that protects individuals' rights against the state, to protect property rights and create regulatory and supervisory institutions – i.e. to create the institutional conditions for successful financial development.
2. We generated two versions of this index: one is constructed by calculating the arithmetic average of the normalised values of these three variables (Campos & Kinoshita, 2008), and the second is constructed by using the method of principal component analysis. Since the two indexes are almost identical, we run the regressions with the arithmetic average of the normalised values. One main advantage of such a transformation is that it allows our reform series to be measured over the same scale. Another advantage is that the reference point is the maximum in-sample value that changes over time (that is, it is not bound from above and does not refer to some idealised perfectly functioning market economy).
3. http://www.systemicpeace.org/polity/polity4.htm
4. http://ciri.binghamton.edu
5. More information about the variables used in the regression analysis and the relative databases can be found at the Data Appendix.
6. Our empirical approach uses System GMM based on the xtabond2 command developed by David Roodman for use with STATA, which offers unique features including observation weights, automatic Hansen testing, and the ability to 'collapse' instruments to limit instrument proliferation.

7.   The countries of the sample are: Algeria, Argentina, Bangladesh, Bolivia, Brazil, Cameroon, Chile, China, Colombia, Costa Rica, Cote d'Ivoire, Dominican Republic, Ecuador, Egypt, El Salvador, Gabon, Ghana, Guatemala, Jamaica, Haiti, Honduras, India, Indonesia, Iran, Jordan, Kenya, Madagascar, Malawi, Malaysia, Morocco, Niger, Nigeria, Pakistan, Papua, New Guinea, Panama, Paraguay, Peru, Philippines, Poland, Senegal, South Africa, Sri Lanka, Syrian Arab Republic, Thailand, Togo, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Zambia, Zimbabwe.

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## Appendix. Data Appendix

| Variable | Definition | Database |
|---|---|---|
| BSD Banking Sector development | Aggregate measure based on Ratio of liquid liabilities to GDP (LL), Credit issued to the private sector to GDP (PC) and Ratio of the commercial bank assets to the sum of commercial bank assets and central bank assets (DBA) | World Bank World Development Indicators database: http://data.worldbank.org/indicator |
| ECONOMIC Economic Institutions | The Economic Institutional Quality is a composite index of GOV, LEGAL and POL as described below. | Economic Freedom of the World: 2009 Annual Report: www.freetheworld.com/download.html |
| GOV Economic Institutions (government-related) | Government Quality Index (bureaucracy, corruption, legislative capacity and accountability of the government) in order to approach the Acemoglu et al. (2001) hypothesis (higher values indicate higher quality of government) | International Country Risk Guide Database (ICRG): www.prsgroup.com/CountryData.aspx |
| LEGAL Economic Institutions (legal-related) | Legal Structure and Security of Property Rights Index (independence of the judiciary, impartiality of the courts, protection of property rights and legal application of contracts) in order to proxy the La Porta et al. (1997; 1998) hypothesis (the index ranges from 0–10 where 0 corresponds to 'less economic freedom' and 10 to 'more economic freedom') | Economic Freedom of the World: 2009 Annual Report: www.freetheworld.com/download.html |
| POL Economic Institutions (politics-related) | Size of Government Enterprises and Investment Index (size of government enterprises, subsidies, transfers and expenditures) in order to proxy the Girma and Shortland hypothesis (countries with more government enterprises and government investment received lower ratings) | Economic Freedom of the World: 2009 Annual Report: www.freetheworld.com/download.html |
| REGIME Political Institutions | The Political Institutional Quality is proxied by the Regime Durability (the number of years since the most recent regime change) | Polity4 Index: www.systemicpeace.org/polity/polity4.htm |
| WORKERS' RIGHTS Social Institutions | The Social Institutional Quality is proxied by Workers" Rights Index (measures the extent to which workers' rights at work are internationally recognised, including a prohibition on the use of any form of forced or compulsory labour; a minimum age for the employment of children; and acceptable conditions of work with respect to minimum wages, hours of | Cingranelli & Richards – Human Rights Data-set: http://ciri.binghamton.edu |

**Appendix**. (*Continued*)

| Variable | Definition | Database |
|---|---|---|
| | work, and occupational safety and health) | |
| FO<br>Financial openness | Ratio of accumulating holdings of assets and liabilities of portfolio equity, financial derivatives, foreign direct investment and debt to GDP | External Wealth of Nations Mark II database as described in Lane and Milesi-Ferretti (2007) |
| TO<br>Trade openness | Ratio of exports and imports to GDP | World Bank World Development Indicators database: http://data.worldbank.org/indicator |
| INFL<br>Inflation | Inflation | World Bank World Development Indicators database: http://data.worldbank.org/indicator |
| HDI<br>Human Development Index | Composite index in three basic dimensions of human development: a long and healthy life, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate and the combined gross enrolment ratio for primary, secondary and tertiary schools; and a decent standard of living, as measured by GDP per capita | World Bank World Development Indicators database: http://data.worldbank.org/indicator |

## Summary Statistics Appendix

Low- and lower-middle income countries

| Variable | Observations | Mean | Std. deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| FD | 897 | 0.333 | 0.108 | 0.034 | 0.677 |
| ECON | 897 | 0.209 | 0.097 | 0.027 | 0.473 |
| LEGAL | 897 | 0.433 | 0.113 | 0.160 | 0.742 |
| GOV | 897 | 0.460 | 0.130 | 0.091 | 0.769 |
| POL | 897 | 0.634 | 0.143 | 0.195 | 0.993 |
| REGIME | 897 | 14.807 | 14.923 | 0 | 59 |
| WORKERS | 897 | 0.802 | 0.675 | 0 | 2 |
| FO | 897 | 1.093 | 0.536 | 0.171 | 3.785 |
| TO | 897 | 0.937 | 0.442 | 0.145 | 3.902 |
| INFL | 897 | 0.702 | 9.448 | −0.114 | 244.110 |
| HDI | 897 | 0.575 | 0.135 | 0.219 | 0.817 |
| *All developing countries* | | | | | |
| FD | 1,196 | 0.346 | 0.108 | 0.034 | 0.677 |
| ECON | 1,196 | 0.236 | 0.110 | 0.027 | 0.586 |
| LEGAL | 1,196 | 0.460 | 0.119 | 0.143 | 0.742 |
| GOV | 1,196 | 0.489 | 0.140 | 0.091 | 0.864 |
| POL | 1,196 | 0.637 | 0.138 | 0.195 | 0.993 |
| REGIME | 1,196 | 16.612 | 17.102 | 0 | 88 |
| WORKERS | 1,196 | 0.883 | 0.687 | 0 | 2 |
| FO | 1,196 | 1.188 | 0.771 | 0.171 | 10.330 |
| TO | 1,196 | 0.909 | 0.431 | 0.144 | 3.902 |
| INFL | 1,196 | 0.724 | 8.356 | −0.117 | 244.110 |
| HDI | 1,196 | 0.629 | 0.148 | 0.219 | 0.893 |