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### Law, endowment and inequality in access to finance

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# Law, Endowment and Inequality in Access to Finance

## Abstract

Theoretical work suggests an ambiguous relationship between the strength of institutions and the distribution of access to finance. Using a sample of listed firms from 70 countries, this study constructs country-level measures of inequality in access to external finance and explores its relation to institutions. We show that inequality of access is positively related to financial development as well as inequality in the distribution of firm size, firm revenue, and residents' incomes. Countries with stronger investor protection for equity and debt have higher inequality in equity and debt financing respectively, presumably as a result of higher efficiency in fund allocation. Finally, we find that the historical determinants of institutions, including the civil law tradition and the disease environment encountered by colonizers, are negative related to inequality in access to external finance. The results support both law and endowment theories.

**Keywords:** capital concentration, endowment, external financing, financial development, investor protection, inequality, law

**JEL classification:** G2; K2; O16; P51; N20;

## Highlights:

- Inequality in access to external equity is positively related to the anti-director rights index
- Inequality in access to external debt is positively related to the credit rights index
- Civil law and mortality rates of colonizers are positively related to funding inequality
- Funding inequality is positively related to financial development
- Funding inequality is negatively related to inequality in firm size, revenue and residents' incomes

Revise and Resubmit to *Finance Research Letters*

## 1. Introduction

Given the importance of finance to economic growth (See King and Levine, 1993; Levine, 1997, 2005), the literature extensively explores the reason why some countries have better institutions as indicated by strong laws and private property rights that facilitate financial development. Law and finance theory argues that English common-law countries tend to have better investor protections and thus larger capital markets (La Porta et al., 1997, 1998). Endowment theory contends that hospitable endowments encountered by European colonizers favored the establishment of secure property rights, and thus more developed stock markets (Acemoglu et al., 2001; Beck et al., 2003). While certain measures of financial development, such as private credit divided by total credit or gross domestic product (GDP)<sup>1</sup>, consider the distribution of assets between private and state sectors, it is still not clear how institutions shape the distribution of access to external finance among individual firms. This study intends to shed light on this under-researched aspect of capital markets.

Claessens and Perotti (2007) provide a conceptual review of the emerging literature on the distribution of access to finance. They report that the distribution of external financing is skewed and varies greatly across countries and firms. They also discuss its consequences such as reduced entrepreneurial activities and individual welfare, and conjecture that a weaker institutional environment may lead to barriers to broader access to finance. This “inclusion hypothesis” states that improved institutions can ease the unequal distribution by reducing barriers to access, especially for poorer individuals and small businesses. At the same time, the law and finance theory (La Porta et al., 1997) also predicts that more developed institutions constrain the misuse of funds and ensure that only good projects enjoy access to finance. Schumpeter (1912) points out that well-functioning banks identify and finance the entrepreneurs with the best chances. In line with these predictions, Wurgler (2000) provides evidence that developed financial markets, which tend

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<sup>1</sup> King and Levine (1993) contend that larger private credit indicates that financial systems provide more services.

to have strong protection for minority investors, are associated with a better allocation of capital, as reflected in lower overinvestment in declining industries. This “efficiency hypothesis” implies a positive link between developed institutions and uneven distribution of funding across companies, due to better access to funds for high-NPV ventures, and less access for low-NPV ventures. Given these differing predictions of the distributional effects of stronger institutions, the question of their net effect on inequality of access to finance is timely and important.

Institutions are found to influence other aspects of inequality. Chong and Gradstein (2007) show that poor institutional quality is conducive to income inequality, and that the reverse holds as well. Piketty and Saez (2014) argue that institutions determine which of several powerful forces push the direction of income inequality over the long run. Kumar et al. (1999) document that the strength of institutions is negatively related to the dispersion in firm size within an industry. Cabral and Mata (2003) refer to financial constraints to explain the distribution of firm size. Since access to external finance is a possible channel that influences the effects discussed above, we also predict that inequality of access is associated with unequal distribution of firm size and individual income.

To perform our analysis, we construct sample of 633,119 firm-year observations from Worldscope covering 70 countries between 2004 and 2017. We follow the intuition of La Porta et al. (1997) in measuring firm-level access to equity (debt) finance by market capitalization (total liability) divided by total asset. A higher ratio suggests a stronger ability to raise capital. We then estimate the yearly country-level inequality of access to finance by a) the coefficient of variation, b) the Herfindahl-Hirschman Index, and c) the Gini coefficient of the market capitalization or total liability divided by total asset<sup>2</sup>. These are commonly used measures for inequality or concentration, and each has its pros and cons. For example, the Gini index and coefficient of variation are sensitive to firms with almost no funds, while the Herfindahl index is almost unaffected by them.

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<sup>2</sup> Estimation of the Gini index is based on Karagiannis and Kovacevic (2000).

We first show that inequality in external financing for firms is positively associated with financial development in the relevant country, and with inequality in the distribution of firm size and revenue, and the incomes of residents. We then provide evidence that better protection of the rights of equity and debt investors is associated with higher cross-firm inequality in access to finance, using the measures described above. This supports the “efficiency hypothesis”, that strong institutions enhance the efficiency of resource allocation (Wurgler, 2000). Specifically, the anti-director rights index (creditor rights index) is positively related to inequality in equity (debt) financing. In addition, the civil-law tradition and a higher mortality rate of colonizers, both indicators of weaker institutions, are associated with lower inequality of access to finance. We emphasise that our results are not necessarily inconsistent with the view of Claessens and Perotti (2007) and others, that stronger institutions promote access to finance among poorer individuals and micro-ventures. Our interpretation is that, among listed firms (which are the agents we study), stronger institutions imply provision of funding that is better aligned to wealth-creating opportunities. This is associated with wealth inequality at the individual level, possibly arising from the extreme wealth of certain entrepreneurs, shareholders and executives.

The study contributes to the literature in two ways. First, this is the first study to document cross-firm inequality in access to finance and explore its determinants, adding to the emerging literature on the distribution of access (Claessens and Perotti, 2007). Second, we apply the law (La Porta et al., 1997, 1998) and endowment theories (Acemoglu et al., 2001; Beck et al., 2003) to study inequality in access, which is an important dimension of financial development.

## **2. Data and Descriptive Statistics**

We employ several measures of the strength of institutions. We use two proxies of investor protection; *Anti-Director Rights Index* from Spamann (2010) reflects legal protection of equity investors, while *Creditor Rights Index* from Djankov et al. (2007) represents legal protection of debt investors. *Civil Law* is a dummy variable that equals 1 for countries with civil-law tradition and zero

otherwise, from La Porta et al. (2008). *Mortality* is the log of the annualized deaths per thousand European soldiers in European colonies in the early 19th century, from Beck et al. (2003). Finally, we use data from La Porta et al. (1999) which classify religion into four categories; *Catholic*, *Muslim*, *Protestant* and *Other Religions* are the percentage the population in a given country that belonged to the corresponding religion in 1980s. Control variables on economic development are from World Bank and Worldscope. Other variables relating to the institutional environment, such as Government Efficiency, Control of Corruption, Regulatory Quality and Rule of Law, are obtained from The Worldwide Governance Indicators (WGI) project of the World Bank. Definition of variables and data sources are provided in the Appendix.

We exclude country-year observations with less than 20 listed trading stocks. The final sample consists of 70 countries from 2004 and 2017. Figure 1 shows the degree of cross-firm inequality around the world as reflected by the sum of the coefficients of variation that we calculate for equity and debt financing. Online Appendix provides the full ranking list and evidence that financial development and inequality in access are positively correlated. Table 1 presents descriptive statistics. All variables are defined in the Appendix.

[Figure 1 insert here] & [Table 1 insert here]

### **3. Empirical Results**

#### **3.1. Capital Inequality and Beyond**

First of all, we show that inequality of access to finance is linked to financial development, and inequality of firms and residents at the country level. Existing theories have not yet assembled the links. Panel A of Table 2 indicates a positive association between inequality of access and equity- and debt-market development. Panels B and C report that both equity and debt inequality have significantly positive coefficients in regressions of inequality on employee-based firm size, and firm revenue. The results are also economically significant. In panel C column (1) for example, a one standard deviation increase in the equity inequality (8.441) is associated with an increase of

0.38 (=  $8.441 \times 0.045$ ) in the inequality of firm revenues, equivalent to 10.9% as a proportion of the sample mean. This result suggests that access to external equity is a possible determinant of firm size, and since firm size is related to the process of economic growth,<sup>3</sup> the result potentially adds to our understanding of the finance-growth relationship.

Panel D shows that the coefficients of both equity and debt inequality are significantly positive in the regressions with individual income inequality as the dependent variable. The results complement the studies on the financial determinants of income inequality (e.g. Clarke et al., 2006; Beck et al., 2007). Access to finance could influence resident income through the channels of income on capital, salary, and entrepreneurship. A larger dispersion in the funding opportunities may exaggerate the heterogeneity of firms in terms of return and average salary, and the heterogeneity of entrepreneurs in terms of their ability to raise capital, which in turn increases income inequality.

[Table 2 insert here]

### 3.2. Investor Protection and Inequality

In Table 3 and 4, we regress our inequality measures of equity and debt financing on measures of investor protection. The coefficient on *Anti-Director Rights Index* (Table 3) is significantly positive, and on *Civil Law* (Table 4) is significantly negative, after controlling for economic and other institutional conditions. This suggests that investor protection increases the uneven distribution of funding opportunities. The results seem contradictory to the “inclusion hypothesis” of Claessens and Perotti (2007) developed through the discussion of poorer individuals and small firms, which predicts that unequal access to finance will arise from weak enforcement of private contracting. However, the results are in line with the notions of Schumpeter (1912) and Wurgler (2000) i.e. the “efficiency hypothesis” that well-functioning

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<sup>3</sup> Rajan and Zingales (1998) indicate that two-thirds of industry growth comes from growth in the size of the existing establishments.

financial intermediaries channel funds to entrepreneurs identified as having the best investment opportunities, and that strong investor protection can constrain the misuse of funds and improve the allocation of capital.

The coefficients on *Catholic* and *Protestant* are significantly positive in column (4) in Tables 3 and 4. This is in line with Guiso et al. (2006) and Stulz and Williamson (2003) that Catholics and Protestants have a more negative attitude toward redistribution than those with no religion. Their attitude reflects a higher tolerance of inequality. When religion variables are included, the significance levels of investor protection diminish, which is in line with the argument in Stulz and Williamson (2003) that religion influences external financing through the channel of institutions.

[Table 3 & 4 insert here]

### **3.3. Law Vs Endowment Theories**

Columns (2) and (3) of Table 3 and 4 report the regression results for evaluating the law and endowment theories. We argue that both theories are applicable to the study of access to finance. The law and finance theory (La Porta et al., 1997, 1998) focuses on the legal tradition: common law stresses private property rights and private market outcomes whereas civil law gives more priority to the rights of the state and societal preference (Liang and Renneboog, 2017). Poor investor protection and intervention from a powerful state can lead to less efficient allocation of resources, undermining the ability of the best firms in secure funding. This suggests that civil law countries may exhibit lower inequality in external financing.

Endowment theory (Acemoglu et al., 2001; Beck et al., 2003) emphasizes that institutional development has been shaped by disease and geographic endowments encountered by European colonizers. In countries with a hostile initial environment, colonizers were less able to develop institutions that favor protection of private property rights and development of competitive financial markets. Feasibility of settlement therefore facilitates the efficient allocation of resources. This view combined with the efficiency hypothesis predicts that mortality rate of European



colonizers is negatively related to institutional development, and negatively related to inequality in external financing.

While the two theories suggest different influencing mechanisms, they are not mutually exclusive. In fact, the coefficients on *Civil Law* and *Mortality* are significantly negative in the regressions of equity and debt inequality, rendering support to the predictions drawn from both theories. The results are of economic significance too. In Table 3 for example, a one standard deviation change in *Mortality* is associated with a 23.5% ( $= 1.13 \times 1.026 / 4.934$ ) change in equity inequality, as a proportion of mean inequality.

When all the variables are incorporated in Column (5), the number of countries in the sample is reduced to 22 (25) in Table 3 (4), and only *Mortality* remains significant in Table 4, suggesting that the evidence for the endowment theory is more robust. When both investor protection and legal origin are incorporated in Columns (6-8), the coefficients on *Civil Law* remain significantly negative for alternative specifications of funding inequality.

#### **4. Discussion and Conclusion**

The literature on law and finance largely ignores the distributional effects of institutions on external financing. This study provides a first picture of cross-country differences in inequality in access to finance, and discusses their importance by showing links between access and other widely studied inequality indicators such as the distribution of firm size and revenue, and of residents' incomes. We find that investor protection is an important determinant of funding inequality, in that stronger institutions promote allocation of resources. Finally, we show that historical determinants of institutional development, suggested by the law and endowment theories, matter for inequality of access.

Following the conceptual review of Claessens and Perotti (2007), our exploratory study adds to work on the distribution of access to finance, which is still at an early stage. We encourage future studies to better understand the distributional aspects of capital markets, including their

determinants (e.g. the competition of financial intermediaries and information sharing) and effects (e.g. industry structure, the allocation of capital, and economic growth). By estimating the cross-country industry-level funding inequality, future studies can explore the possible moderating effects of financial dependence (i.e. an industry's technological demand for external financing). The results will inform public policy from a new perspective.

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Figure 1: Inequality in External Finance around the World

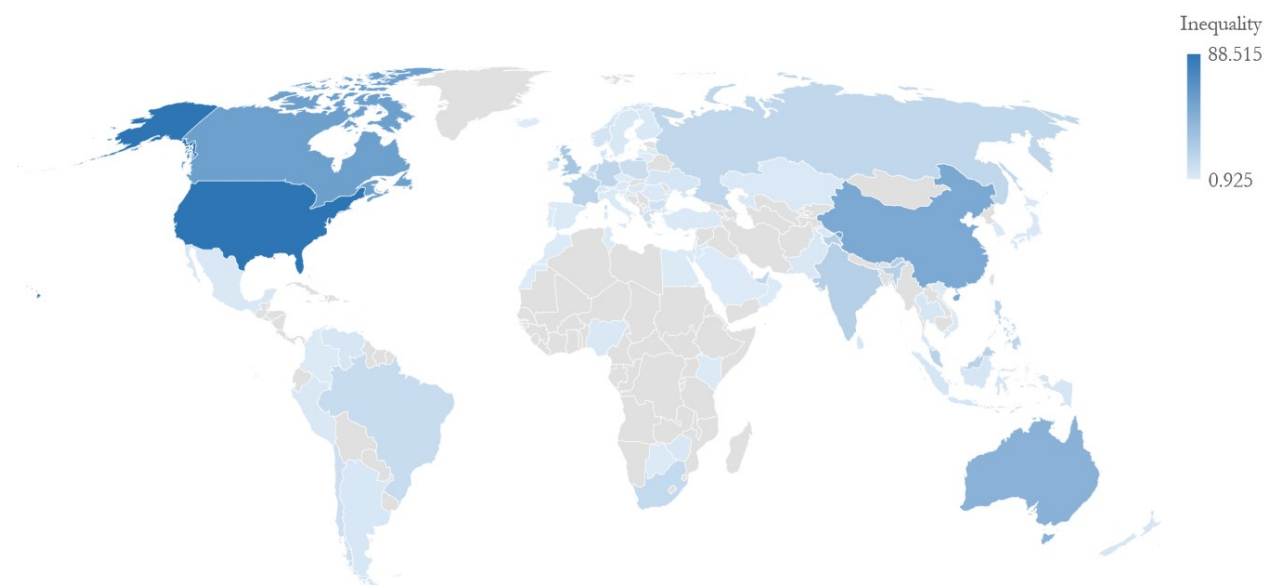


Table 1: Summary Statistics

	Obs.	Country	Mean	S.D.	Min	Max	p25	Median	p75
Stock Market	739	54	84.11	139.72	4.63	1274.13	29.26	49.12	88
Debt Market	834	62	79.59	57.08	11.05	450.39	42.26	66.85	97.89
Gini(Size)	923	70	0.70	0.15	0.00	0.95	0.63	0.73	0.81
CV(Revenue)	924	70	3.46	1.76	0.92	9.41	2.10	3.01	4.54
Gini(Income)	528	37	35.45	7.54	23.70	64.80	30.05	34.00	39.65
<b>External Finance Inequality</b>									
CV(Equity)	924	70	5.09	8.59	0.47	67.11	1.07	1.54	4.84
HHI(Equity)	924	70	0.15	0.25	0.00	1.00	0.02	0.04	0.14
Gini(Equity)	924	70	0.62	0.19	0.26	1.00	0.47	0.56	0.74
CV(Debt)	924	70	4.73	9.84	0.19	85.20	0.56	0.76	3.13
HHI(Debt)	924	70	0.11	0.23	0.00	1.00	0.01	0.02	0.05
Gini(Debt)	924	70	0.44	0.23	0.11	1.00	0.29	0.36	0.52
<b>Institutional Environments</b>									
Anti-Director Rights Index	616	45	3.08	1.33	0.00	5.00	2.00	3.00	4
Creditor Rights Index	892	67	1.94	1.10	0.00	4.00	1.00	2.00	3
Civil Law	924	70	0.69	0.46	0.00	1.00	0.00	1.00	1
Mortality	347	26	3.85	1.13	2.15	7.60	2.79	4.22	4.26
Catholic	911	69	34.47	38.41	0.00	97.30	0.60	12.10	81
Protestant	898	68	14.30	25.27	0.00	97.80	0.20	1.20	16.1
Other Religions	898	68	33.42	34.53	0.40	100.00	4.10	18.58	63.8
<b>Controls</b>									
Listed	924	70	685.00	1422.64	20.00	11068.00	93.50	214.50	597.5
GDP per Capita	924	70	28792.47	20103.60	1215.02	98076.53	12041.44	24271.82	41615.3
Government Effectiveness	924	70	8.41	1.96	3.00	13.00	7.00	8.00	10
Control of Corruption	924	70	11.41	2.96	4.00	17.00	9.00	11.00	14
Regulatory Quality	924	70	8.95	1.92	4.00	13.00	7.00	9.00	11
Rule of Law	924	70	13.07	2.87	7.00	19.00	11.00	13.00	16

**Table 2: External Finance Inequality and Income Inequality**

This table presents the relation between external finance inequality and the financial development indicators (Panel A), the inequality of firm size (Panel B), firm revenue (Panel C) and resident income (Panel D). All variables are defined in the Appendix. *Equity Inequality* is proxied by *CV(Equity)* in column (1), *HHI(Equity)* in column (2) and *Gini(Equity)* in column (3). *Debt Inequality* is proxied by *CV(Debt)* in column (4), *HHI(Debt)* in column (5) and *Gini(Debt)* in column (6). *Economic Control* represents a set of economic development control variables including GDP per capita adjusted for PPP and the number of total listed companies. *Institution Control* represents a set of institutional environment control variables including indicators on government efficiency, control of corruption, regulatory quality and rule of law from World Government Indicators. Year dummy variables are included in all regressions and *t*-statistics are in brackets. \*\*\*, \*\*, \* denote significance levels at 1%, 5% and 10% respectively.

<b>Panel A: Financial Development</b>						
	(1)	(2)	(3)	(4)	(5)	(6)
	Stock Market	Stock Market	Stock Market	Debt Market	Debt Market	Debt Market
Equity Inequality	3.084*** [3.118]	51.832*** [2.612]	110.069*** [4.010]			
Debt Inequality				0.712** [1.981]	21.760*** [2.768]	23.474*** [2.786]
Economic Control	Yes	Yes	Yes	Yes	Yes	Yes
Institution Control	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	61	61	61	61	61	61
Intercept	256.003*** [4.579]	260.427*** [4.536]	193.943*** [3.908]	205.746*** [12.530]	203.773*** [12.420]	199.055*** [12.254]
R-square	0.332	0.318	0.329	0.356	0.356	0.355
Observation	739	739	739	834	834	834
<b>Panel B: Firm size inequality</b>						
	Gini(Size)	Gini(Size)	Gini(Size)	Gini(Size)	Gini(Size)	Gini(Size)
Equity Inequality	0.002*** [5.771]	-0.024 [-1.205]	0.103*** [4.293]			
Debt Inequality				0.002*** [5.286]	0.076*** [6.310]	0.137*** [9.611]
Economic Control	Yes	Yes	Yes	Yes	Yes	Yes
Institution Control	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	61	61	61	61	61	61
Intercept	0.809*** [20.581]	0.788*** [19.676]	0.750*** [17.958]	0.792*** [19.939]	0.786*** [19.825]	0.755*** [19.388]
R-square	0.338	0.330	0.343	0.338	0.340	0.360
Observation	923	928	928	928	928	928
<b>Panel C: Firm revenues inequality</b>						
	CV(Revenue)	CV(Revenue)	CV(Revenue)	CV(Revenue)	CV(Revenue)	CV(Revenue)
Equity Inequality	0.045*** [4.969]	0.039 [0.218]	1.121*** [4.184]			
Debt Inequality				0.038*** [4.414]	0.596*** [2.797]	2.038*** [8.630]
Economic Control	Yes	Yes	Yes	Yes	Yes	Yes
Institution Control	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	70	70	70	70	70	70
Intercept	3.982*** [8.175]	3.844*** [7.889]	3.841*** [7.626]	3.789*** [7.573]	3.383*** [6.456]	3.290*** [6.859]
R-square	0.352	0.352	0.330	0.336	0.343	0.384
Observation	924	929	929	929	929	929
<b>Panel D: Resident income inequality</b>						
	Gini(Income)	Gini(Income)	Gini(Income)	Gini(Income)	Gini(Income)	Gini(Income)
Equity Inequality	0.109*** [3.082]	1.883* [1.893]	2.742** [2.077]			
Debt Inequality				0.090*** [3.571]	2.553*** [2.978]	3.758*** [3.653]
Economic Control	Yes	Yes	Yes	Yes	Yes	Yes
Institution Control	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	61	61	61	61	61	61
Intercept	25.049*** [10.641]	25.130*** [10.644]	23.898*** [9.987]	24.684*** [10.495]	24.289*** [10.284]	24.029*** [10.079]
R-square	0.646	0.644	0.644	0.646	0.646	0.649
Observation	528	528	528	528	528	528

**Table 3 External Finance Inequality – Equity**

This table presents the regression results of the determinants of the inequality in equity financing. The proxies for inequality of equity financing include *CV(Equity)* in column (1)-(6), *HHI(Equity)* in column (7) and *Gini(Equity)* in column (8). *Anti-Director Rights Index* measures the quality of legal protection on minority shareholders in a given country and ranges from 0-6. *Civil Law* is a dummy variable equals to one for countries with civil law system and zero otherwise. *Mortality* is the log of the annualized deaths per thousand European soldiers in European colonies in the early 19th century. *Catholic* is the percentage of the population of each country that belonged to the religion of “Roman Catholic”. *Protestant* is the percentage of the population of each country that belonged to the religion of “Protestant”. *Other Religions* is the percentage of the population of each country which does not belong to the religion of “Roman Catholic, Protestant and Muslim”. *Economic Control* includes GDP per capita adjusted for PPP and the number of total listed companies. *Institution Control* includes indicators on government efficiency, control of corruption, regulatory quality and rule of law from World Government Indicators. Year dummy variables are included in all regressions and *t*-statistics are given in parentheses. \*\*\*, \*\*, \* denote significance levels at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CV(Equity)	CV(Equity)	CV(Equity)	CV(Equity)	CV(Equity)	CV(Equity)	HHI(Equity)	Gini(Equity)
Anti-Director Rights Index	0.991*** [4.285]				0.983*** [2.685]	0.291 [1.193]	-0.005 [-0.358]	0.024*** [3.175]
Civil Law		-2.627*** [-4.719]			-0.325 [-0.290]	-4.891*** [-5.307]	-0.053* [-1.870]	-0.052** [-2.537]
Mortality			-1.026*** [-2.689]		-0.273 [-0.614]			
Catholic				0.021*** [4.436]	0.034** [2.004]	0.047*** [4.223]	0.003*** [6.786]	0.002*** [5.827]
Protestant				0.018*** [2.595]	0.052 [1.136]	0.039*** [2.843]	0.002*** [3.934]	0.001*** [3.285]
Other Religions				0.011 [1.612]	0.003 [0.114]	-0.018 [-1.342]	0.001*** [3.213]	0.001** [2.451]
Economic Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Institution Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	45	70	26	68	22	45	45	45
Intercept	-1.244 [-0.406]	-0.830 [-0.417]	13.676*** [2.779]	-3.992* [-1.798]	9.158 [1.190]	1.932 [0.563]	-0.259* [-1.851]	0.400*** [4.177]
R-square	0.507	0.504	0.645	0.490	0.652	0.544	0.099	0.254
Observation	616	924	347	898	303	616	616	616

**Table 4 External Finance Inequality – Debt**

This table presents the regression results of the determinants of the inequality in debt financing. The proxies of the inequality of debt financing include  $CV(Debt)$  in column (1)-(6),  $HHI(Debt)$  in column (7) and  $Gini(Debt)$  in column (8). *Creditor Rights Index* measures the quality of creditor right protection in a given country. *Civil Law* is a dummy variable equals to one for countries with civil law system and zero otherwise. *Catholic* is the percentage of the population of each country that belonged to the religion of “Roman Catholic”. *Protestant* is the percentage of the population of each country that belonged to the religion of “Protestant”. *Other Religions* is the percentage of the population of each country which does not belong to the religion of “Roman Catholic, Protestant and Muslim”. *Economic Control* includes GDP per capita adjusted for PPP and the number of total listed companies. *Institution Control* includes indicators on government efficiency, control of corruption, regulatory quality and rule of law from World Government Indicators. Year dummy variables are included in all regressions and *t*-statistics are given in parentheses. \*\*\*, \*\*, \* denote significance levels at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CV(Debt)	CV(Debt)	CV(Debt)	CV(Debt)	CV(Debt)	CV(Debt)	HHI(Debt)	Gini(Debt)
Creditor Rights Index	0.617*** [2.981]				0.345 [0.782]	0.374* [1.668]	-0.008 [-1.075]	0.002 [0.325]
Civil Law		-2.218*** [-3.803]			-1.431 [-1.270]	-2.734*** [-3.422]	-0.073*** [-3.231]	-0.108*** [-5.698]
Mortality			-1.179*** [-2.922]		-1.252*** [-2.955]			
Catholic				0.012*** [3.099]	0.005 [0.394]	0.028*** [4.794]	0.001*** [3.837]	0.001*** [4.400]
Protestant				0.012* [1.838]	-0.017 [-0.510]	0.016** [2.026]	0.000 [0.299]	0.001** [2.211]
Other Religions				0.009 [1.075]	-0.026 [-1.068]	0.002 [0.178]	0.001* [1.889]	0.001** [2.036]
Economic Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Institution Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	67	70	26	68	25	65	65	65
Intercept	-1.435 [-1.487]	1.409 [1.428]	4.389* [1.744]	-1.002 [-1.082]	24.798*** [2.942]	-2.034 [-0.739]	0.040 [0.428]	0.235*** [2.881]
R-square	0.517	0.524	0.664	0.514	0.681	0.529	0.084	0.287
Observation	910	942	352	916	343	871	871	871

## Appendix: Variable Description

Variable	Description
<b>Firm Level Variables</b>	
MarketCap	Market capitalization for each company in each year. Source: Worldscope, item8002.
Total Asset	Total asset for each company in each year. Source: Worldscope, item2999.
Total Debt	Total liabilities for each company in each year. Source: Worldscope, item3351.
Firm Income	Net sales or revenues in U.S. dollars for each company in each year. Source: Worldscope, item7240.
Employee	The number of employees for each company in each year. Source: Worldscope, item7011.
<b>External Finance Inequality Indicators</b>	
CV(Equity)	The standard deviation over the mean of market capitalization over total asset for each country in each year. $CV(Equity) = S.D. (MarketCap/Total Asset) / Mean(MarketCap/Total Asset)$
HHI(Equity)	The Herfindahl–Hirschman Index of market capitalization over total asset for each country in each year. $HHIEquity = \sum_i^N S_i^2$ , where $S_i$ is the weight of firm $i$ 's equity financing to total equity market in each country each year, measured by $MarketCap/Total Asset$ .
Gini(Equity)	The Gini ratio of market capitalization over total asset for each country in each year. $GiniEquity = \sum_{i=1}^N \sum_{j=1}^N  X_i - X_j  / 2 \sum_{i=1}^N \sum_{j=1}^N X_j$ , where $X_i$ is the firm $i$ 's ability of fund raising by equity in each year which is captured by $MarketCap/Total Asset$ .
CV(Debt)	The standard deviation over the mean of total debt over total asset for each country in each year. $CV(Debt) = S.D. (Total Debt/Total Asset) / Mean(Total Debt/Total Asset)$ .
HHI(Debt)	The Herfindahl–Hirschman Index of total debt over total asset for each country in each year. $HHIDebt = \sum_i^N S_i^2$ , where $S_i$ is the weight of firm $i$ 's debt financing to total debt market in each country each year, measured by $Total Debt/Total Asset$ .
Gini(Debt)	The Gini ratio of total debt over total asset for each country in each year. $GiniDebt = \sum_{i=1}^N \sum_{j=1}^N  X_i - X_j  / 2 \sum_{i=1}^N \sum_{j=1}^N X_j$ , where $X_i$ is the firm $i$ 's ability of fund raising by debt which is captured by $Total Debt/Total Asset$ .
<b>Other Inequality Indicators</b>	
Gini(Size)	The Gini ratio of firm size, measured by the number of employees. $Size = \sum_{i=1}^N \sum_{j=1}^N  X_i - X_j  / 2 \sum_{i=1}^N \sum_{j=1}^N X_j$ , where $X_i$ is the firm $i$ 's number of employees.
CV(Revenues)	The standard deviation over the mean of firm income for each country in each year. $Revenues = S.D. (Firm Income) / Mean(Firm Income)$
Gini(Income)	Gini index of income distribution of a nation's residents. Source: World Bank
<b>Country Level Institutional Environments</b>	
Stock Market	The market capitalization of listed domestic companies divide by GDP (%). Source: World Bank.
Debt Market	Liquid liabilities divide by GDP (%). Source: World Bank.
Anti-Director Rights Index	The quality of legal protection on minority shareholders in a given country and ranges from 0-6. It includes six key components: 1) proxy by mail allowed, (2) shares not blocked before shareholder meeting, (3) cumulative voting/proportional representation, (4) oppressed minority protection, (5) pre-emptive rights to new share issues, and (6) percentage of share capital to call an extraordinary shareholder meeting. Each component is a dummy variable and the index is formed by aggregating the value of all six components. Source: Spamann (2010).
Creditor Rights Index	An index measures the quality of creditor right protection in a given country. Source: Djankov, McLiesh and Shleifer (2007).
Civil Law	A dummy variable equals to one for countries with civil law system and zero otherwise, including French Legal Origin, German Legal Origin, and Scandinavian Legal Origin. Source: La Porta, Lopez-de-Silanes and Shleifer (2008).
Mortality	The log of the annualized deaths per thousand European soldiers in European colonies in the early 19th century. Source: Beck, Demirgüç-Kunt and Levine (2003).
Catholic	The percentage of the population of each country in 1980 that belonged to the religion of "Roman Catholic". Source: La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999).
Protestants	The percentage of the population of each country in 1980 that belonged to the religion of "Protestant". Source: La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999).
Other Religions	The percentage of the population of each country in 1980 which are not belonged to the religion of "Roman Catholic, Protestant and Muslim". Source: La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999).
Economic Control	Two economic development control variables: (1) <i>GDP per Capita</i> : GDP per Capita adjusted for PPP (Source: World Bank) and (2) <i>Lis</i> : the number of total listed companies. (Source: Worldscope)
Institution Control	Four institutional environment variables including indicators on: (1) Government Efficiency, (2) Control of Corruption, (3) Regulatory Quality and (4) Rule of Law. Source: World Government Indicators.



### Online Appendix 1: Stock Market Development and Inequity in Equity Financing

Country	Stock Market	Ranking	CV(Equity)	Ranking	HHI(Equity)	Ranking	Gini(Equity)	Ranking
Argentina	14.56	56	3.34	45	0.26	55	0.73	52
Australia	109.16	9	20.47	68	0.31	59	0.82	61
Austria	32.33	41	1.30	17	0.04	20	0.49	16
Belgium	69.62	19	4.29	50	0.33	62	0.66	46
Botswana	.	.	1.09	15	0.10	36	0.47	13
Brazil	52.73	23	5.24	52	0.27	57	0.76	55
Bulgaria	12.17	58	4.91	51	0.17	47	0.75	54
Canada	119.42	8	28.28	69	0.37	64	0.97	69
Chile	107.60	10	7.72	56	0.42	66	0.88	66
China	55.72	22	20.35	67	0.27	56	0.77	57
Colombia	44.00	28	1.04	12	0.05	25	0.46	12
Croatia	42.46	29	2.38	42	0.15	43	0.58	37
Czech Republic	21.75	50	0.79	3	0.08	32	0.39	3
Denmark	4.30	62	2.12	37	0.04	19	0.49	19
Egypt	33.27	40	1.43	22	0.02	13	0.49	18
Finland	6.67	60	0.90	5	0.02	11	0.42	7
France	79.51	16	8.17	58	0.22	53	0.67	47
Germany	45.72	25	8.82	62	0.17	48	0.72	51
Greece	35.89	35	2.35	41	0.08	31	0.58	34
Hong Kong	972.82	1	14.85	65	0.28	58	0.83	62
Hungary	20.78	52	1.59	28	0.12	40	0.54	26
Iceland	.	.	0.67	1	0.09	34	0.35	1
India	78.43	18	13.53	64	0.17	46	0.74	53
Indonesia	40.34	33	2.80	43	0.05	24	0.62	43
Ireland	46.85	24	1.92	34	0.09	35	0.58	38
Israel	78.52	17	8.24	59	0.18	49	0.80	59
Italy	25.99	46	1.48	26	0.02	9	0.52	23
Jamaica	8.02	59	1.76	31	0.22	52	0.60	40
Japan	84.83	12	1.96	35	0.00	1	0.53	24
Jordan	83.79	13	0.97	9	0.01	7	0.42	6
Kazakhstan	22.47	49	1.80	32	0.18	50	0.65	45
Kenya	18.48	54	1.33	18	0.06	28	0.55	29
Kuwait	25.46	47	0.97	10	0.01	6	0.41	4
Latvia	.	.	0.76	2	0.06	26	0.39	2

Online Appendix 1 – Continued

Country	Stock Market	Ranking	CV(Equity)	Ranking	HHI(Equity)	Ranking	Gini(Equity)	Ranking
Lithuania	.	.	0.92	6	0.06	29	0.43	8
Luxembourg	147.50	5	1.67	30	0.12	38	0.55	30
Malaysia	138.31	6	8.00	57	0.16	44	0.63	44
Malta	40.89	30	1.35	20	0.14	42	0.56	31
Mexico	34.66	37	1.48	25	0.07	30	0.49	17
Morocco	31.96	42	0.97	8	0.03	18	0.49	15
Netherlands	87.97	11	8.58	61	0.48	67	0.85	63
New Zealand	34.83	36	2.26	39	0.05	23	0.60	39
Nigeria	13.26	57	2.23	38	0.11	37	0.62	42
Norway	58.22	21	3.55	47	0.14	41	0.67	48
Oman	44.28	27	0.96	7	0.03	16	0.44	11
Pakistan	26.25	45	2.28	40	0.03	14	0.61	41
Peru	45.15	26	1.99	36	0.09	33	0.58	35
Philippines	67.46	20	8.34	60	0.35	63	0.96	68
Poland	33.58	39	6.02	53	0.17	45	0.67	49
Portugal	34.64	38	1.07	14	0.05	22	0.50	20
Romania	6.51	61	1.57	27	0.03	15	0.52	21
Russia	26.38	44	10.48	63	0.40	65	0.82	60
Saudi Arabia	40.61	32	0.89	4	0.02	8	0.42	5
Singapore	231.44	3	4.11	48	0.06	27	0.58	36
Slovenia	21.54	51	1.60	29	0.12	39	0.56	32
South Africa	248.43	2	7.59	55	0.32	60	0.70	50
Spain	80.06	15	1.40	21	0.02	10	0.54	25
Sri Lanka	24.31	48	1.43	23	0.02	12	0.52	22
Sweden	.	.	1.46	24	0.01	5	0.55	28
Switzerland	214.95	4	1.87	33	0.03	17	0.57	33
Thailand	80.21	14	1.04	11	0.01	2	0.44	10
Tunisia	18.09	55	1.17	16	0.05	21	0.54	27
Turkey	27.88	43	1.34	19	0.01	4	0.48	14
Ukraine	3.77	63	3.50	46	0.32	61	0.76	56
United Arab Emirates	37.22	34	7.42	54	0.67	69	0.87	64
United Kingdom	40.64	31	15.29	66	0.19	51	0.77	58
United States	128.45	7	40.69	70	0.25	54	1.00	70
Venezuela	.	.	4.20	49	0.86	70	0.87	65
Vietnam	19.72	53	1.04	13	0.01	3	0.43	9
Zimbabwe	.	.	3.23	44	0.61	68	0.90	67

Missing value in *Stock Market* is due to the data limit from World Bank while the inequality indicators (*CV(Equity)*, *HHI(Equity)*, *Gini(Equity)*) is from Worldscope.

## Online Appendix 2: Debt Market Development and Inequity in Debt Financing

Country	Debt Market	Ranking	CV(Debt)	Ranking	HHI(Debt)	Ranking	Gini(Debt)	Ranking
Argentina	22.34	67	0.85	29	0.02	24	0.32	22
Australia	87.75	21	22.46	67	0.34	64	0.90	68
Austria	78.83	22	0.90	30	0.03	27	0.30	16
Belgium	104.99	13	4.81	51	0.40	68	0.59	60
Botswana	33.94	59	0.59	13	0.06	36	0.32	20
Brazil	58.61	37	6.61	58	0.28	60	0.68	62
Bulgaria	62.95	32	2.79	48	0.05	31	0.56	56
Canada	42.91	49	28.18	68	0.37	66	0.98	69
Chile	36.51	56	1.76	40	0.02	22	0.42	42
China	149.09	5	29.48	69	0.33	63	0.78	65
Colombia	20.60	69	0.69	23	0.02	19	0.37	34
Croatia	62.45	35	0.72	24	0.02	14	0.32	23
Czech Republic	65.26	29	0.66	20	0.06	38	0.36	31
Denmark	58.41	38	2.48	47	0.07	45	0.57	57
Egypt	72.16	27	0.60	14	0.01	7	0.32	17
Finland	62.51	34	1.82	42	0.07	44	0.34	25
France	78.71	23	9.69	63	0.28	59	0.53	52
Germany	75.51	25	8.18	61	0.15	55	0.56	55
Greece	90.01	19	6.28	57	0.36	65	0.57	58
Hong Kong	283.67	1	19.59	66	0.38	67	0.80	67
Hungary	51.39	43	1.25	36	0.14	54	0.41	40
Iceland	68.16	28	0.25	1	0.05	34	0.14	1
India	64.28	31	7.49	59	0.07	47	0.46	46
Indonesia	31.09	64	1.83	43	0.02	18	0.38	35
Ireland	111.71	10	1.38	38	0.06	37	0.46	47
Israel	78.04	24	5.19	53	0.12	53	0.54	54
Italy	72.38	26	0.44	6	0.00	3	0.22	4
Jamaica	45.38	47	0.64	17	0.05	33	0.34	26
Japan	189.83	3	0.52	10	0.00	1	0.26	7
Jordan	113.73	8	0.77	25	0.01	9	0.42	43
Kazakhstan	29.83	65	0.82	27	0.03	28	0.33	24
Kenya	33.86	60	0.48	7	0.02	21	0.27	9
Kuwait	62.74	33	0.64	18	0.01	6	0.35	30
Latvia	42.89	50	0.95	32	0.07	43	0.40	38

Online Appendix 2 – Continued

Country	Debt Market	Ranking	CV(Debt)	Ranking	HHI(Debt)	Ranking	Gini(Debt)	Ranking
Lithuania	41.79	51	0.51	8	0.04	30	0.28	13
Luxembourg	201.51	2	0.84	28	0.04	29	0.42	41
Malaysia	113.08	9	11.01	64	0.22	58	0.62	61
Malta	131.89	6	0.44	5	0.05	35	0.24	6
Mexico	23.87	66	1.31	37	0.06	40	0.32	18
Morocco	91.46	16	0.41	4	0.02	15	0.23	5
Netherlands	101.42	14	5.82	55	0.28	61	0.57	59
New Zealand	43.41	48	2.30	46	0.07	42	0.48	51
Nigeria	16.73	70	0.65	19	0.01	12	0.27	10
Norway	48.97	45	2.25	45	0.08	49	0.36	32
Oman	34.88	57	0.60	15	0.02	13	0.32	21
Pakistan	37.62	54	0.79	26	0.01	5	0.30	14
Peru	33.18	61	1.15	35	0.02	23	0.35	27
Philippines	54.44	41	8.45	62	0.42	69	0.76	64
Poland	48.16	46	4.87	52	0.09	51	0.48	50
Portugal	89.22	20	0.36	3	0.02	20	0.18	2
Romania	32.09	62	0.92	31	0.01	11	0.44	45
Russia	38.79	52	5.32	54	0.11	52	0.48	49
Saudi Arabia	49.44	44	0.67	22	0.01	10	0.35	28
Singapore	109.94	11	4.38	50	0.07	46	0.43	44
Slovenia	54.68	40	0.56	11	0.03	26	0.30	15
South Africa	37.97	53	6.10	56	0.20	57	0.54	53
Spain	93.59	15	0.66	21	0.01	8	0.27	12
Sri Lanka	31.20	63	1.73	39	0.08	48	0.39	36
Sweden	53.41	42	1.78	41	0.02	16	0.37	33
Switzerland	150.79	4	1.88	44	0.07	41	0.40	39
Thailand	91.04	18	3.74	49	0.08	50	0.47	48
Tunisia	57.46	39	0.51	9	0.02	17	0.26	8
Turkey	37.53	55	1.02	33	0.01	4	0.39	37
Ukraine	34.06	58	1.08	34	0.03	25	0.35	29
United Arab Emirates	59.76	36	7.67	60	0.63	70	0.79	66
United Kingdom	128.74	7	13.42	65	0.15	56	0.70	63
United States	64.49	30	47.83	70	0.30	62	0.99	70
Venezuela	22.30	68	0.58	12	0.05	32	0.32	19
Vietnam	91.30	17	0.62	16	0.00	2	0.27	11
Zimbabwe	105.29	12	0.35	2	0.06	39	0.19	3

### Online Appendix 3: Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Stock Market Development	1.000							
(2) Debt Market Development	0.615*	1.000						
(3) CV(Equity)	0.209*	0.178*	1.000					
(4) HHI(Equity)	0.092	-0.002	0.575*	1.000				
(5) Gini(Equity)	0.187*	0.085	0.705*	0.776*	1.000			
(6) CV(Debt)	0.251*	0.236*	0.762*	0.295*	0.521*	1.000		
(7) HHI(Debt)	0.165*	0.171*	0.421*	0.439*	0.462*	0.686*	1.000	
(8) Gini(Debt)	0.267*	0.225*	0.643*	0.396*	0.598*	0.782*	0.798*	1.000

\* indicates significance at the .01 level