

Institutions, Investor Protection, and Corporate Choices in Developing Economies

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ABSTRACT

This paper examines the extent to which differences in legal tradition, judicial efficiency, and investor protection affect debt financing and risk taking across developing economies. We find that firms in common law countries have the highest preference for debt financing while corporations in countries of socialist legal tradition assume the greatest levels of risk. Further, judicial efficiency matters most across developing economies. When legal formalism is high, firms contract more debt, but they are less willing to undertake risky investments. The findings also support the “dark side” to strong creditor rights in bankruptcy, but this “dark side” is sector-dependent.

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Since the seminal work of La Porta, Lopez-de-Silanes, Shleifer and Vishny (LLSV, 1997, 1998, 2002) on the importance of institutions in explaining country differences in financial development, a growing body of literature (briefly reviewed below) shows that investor protection rules also affect firm growth. More specifically, a trend has recently emerged to examine a specific channel through which investor protection shapes firm prospects, which is managerial risk-taking. John, Litov, and Yeung (JLY, 2008) and Acharya, Amihud and Litov (AAL, 2008) examine the effect of shareholder and creditor protection, respectively, on firm risk-taking.

John, Litov, and Yeung (JLY, 2008) argue that better investor protection reduces the private benefits of control of managers who would otherwise sub-optimally reject positive Net Present Value (NPV) and value-enhancing risky projects. JLY also make the case for a possible negative relationship between investor protection and risk taking, due to excessive managerial conservatism stemming from managerial career concerns. Using firm data from 39 countries (most of which are developed), the authors find a positive relationship between shareholder protection, corporate risk-taking, and eventually firm growth.

Instead of focusing on shareholder protection, Acharya, Amihud and Litov (AAL, 2008) examine the implications of investor rights on firms' investment policy by considering another class of stakeholders, namely creditors. AAL question the value of strong creditor rights and affect a "dark side" to them because they can inhibit firms from undertaking risky investments. Using a sample of 38 countries that are similarly covered by JLY, AAL propose that strong creditor rights destroy firms' incentives to undertake value-enhancing but risky projects, inducing them instead to engage in value-reducing diversifying acquisitions.

This study is partly motivated by the opposing implications of protecting the rights of two different classes of firm investors, shareholders and creditors, as reported by JLY and AAL, respectively, on corporate risk-taking. While we acknowledge that investor protection laws affect corporate behavior, we also tie this new trend in the literature with implications from the earlier LLSV's view that a country's legal tradition also matters for corporate risk-taking and not only for financial development at the country level. No prior research has specifically investigated whether the risk-taking stance of a firm associates with the legal origin of the country where it operates. Giannetti (2003) assesses whether differences in legal origin and creditor protection rights affect corporate financing but not firm risk taking across eight European developed countries, but her sample does not exhibit great variation in legal origin.^{1,2}

However, while laws and institutions shape firm decisions, the effectiveness of judicial enforcement matters more than the laws on the books (Djankov, La Porta, Lopez-De-Silanes, and Shleifer, DLLS 2003; Djankov, McLiesh, and Shleifer, DMLS 2007). For instance, the legal power of creditors is likely to determine the viability of credit, but what is more relevant is the ease with which lenders can force repayment, grab collateral, or even gain control of the firm. Most studies recognize that laws and regulations protect investors only to the extent that they are actually enforced, but they do not explicit account for judicial efficiency using recently compiled databases.³ For instance, each of JLY, AAL, and Giannetti (2003) control for the level of

¹ Two of the eight countries considered by Giannetti (2003) have a common law tradition, and the remaining six are of civil legal origin.

² Qian and Strahan (2007) also assess the importance of laws and institutions, but they are mainly concerned how the latter affect loan contracting terms and not firm decisions, albeit considering a sample that is considerably larger than Giannetti (2003).

³ One exception is the forthcoming study by McLean, Zhang, and Zhao (2011) that uses recent measures of investor protection by La Porta, Lopez-de-Silanes, and Shleifer (2006) and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) to investigate the importance of the law on the allocations of equity and debt issuance. The indicators of judicial efficiency considered herein are from DLLS (2003) and DMLS (2007).

judiciary using LLSV's rule of law variable that covers a prior period falling between 1982 and 1995 and which is not really congruent with their study period.⁴

In this paper, we expand the spectrum of institutional arrangements previously examined in the literature and present a more comprehensive view on their importance in setting corporate risk taking. We explicitly consider four dimensions of a country's institutional development - legal tradition, judicial efficiency, shareholder protection, and creditor rights. Our perspective is that firm decisions are shaped not just by the degree of investor protection, but also by the country's legal tradition, and more importantly by the level of judicial efficiency in place. We also consider another major corporate decision that the firm must act upon, or debt financing. Just like JLY and AAL find opposing implications of different forms of investor protection on firm risk taking, evidence on the importance of laws and institutions for firm debt financing is similarly conflicting. For example, Giannetti (2003), Haselmann, Pistor and Vig (2006), and Qian and Strahan (2007) report that stronger creditor rights increase firms' reliance on debt financing, whereas Acharya and Subramanian (2007) and Vig (2007) find the opposite.

Further, our field work covers developing countries only and does not include any developed country. One of the many lessons of the recent financial crisis is that emerging markets have a key role to play in restoring global economic growth, and the G7 has been enlarged to the G20. Prior studies on the implication of laws on firm risk taking consider a mixed sample of developing and developed countries. AAL and JLY use firm-level data from 38 and 39 countries, 13 and 12 of which are from developing economies, respectively, and the remaining majority are 25 developed countries.⁵ Further, combining developed and developing

⁴ JLY's, AAL's, and Giannetti's (2003) study periods are 1992-2002, 1994-2004, and 1993 to 1997, respectively.

⁵ The largest number of developing countries previously considered in related literature is by Qian and Strahan (2007) and McLean, Zhang, and Zhao (2011) who each include 19 developing countries in a sample of 44 countries, but the authors investigate different hypotheses compared to JLY and AAL.

countries together could be problematic, because the quality of institutions and the efficiency of markets are likely to be more dissimilar than what can be captured with using country-level indicators, and even after controlling for the emerging nature of the economy using a dummy variable as in AAL. Also, JLY and AAL samples do not include firms from the fastest growing and most populous country, China, which has a determining role in ensuring global financial stability, or other growing developing economies like Russia. In this paper, we conduct our analyses using a much wider sample than JLY and AAL, considering 27 developing countries over the period 1997-2007.⁶

No prior study has investigated how different institutional arrangements simultaneously affect firm debt financing and risk taking decisions in the context of developing economies solely. We use debt ratios to investigate differences in firm financing choices and construct proxies for firm risk taking using corporate earnings volatility and the variation in firm level cash flow over assets as in JLY.⁷ We classify countries according to their legal tradition and use indicators for shareholders and creditor rights from LLSV (1997, 1998, and 2002). We also include DLLS's (2003) and DMLS's (2007) legal formalism indicators as measures of judicial enforcement and efficiency. These indicators are important because most developing countries have undergone extensive reforms of investor protection rules over the past decades, but it does not follow that law enforcement has followed suit. We then run firm-level regressions pooling data on all developing countries, and we also bring the data down to the sector level.

⁶ The number of countries included in our study is small compared to the coverage of DLLS (2003) and DMLS (2007), but the latter provide country-level data as opposed to our firm-level analysis. The relatively smaller coverage of developing countries is mostly a result of the lack of firm-level data availability, but our sample is at least still twice as large as JLY and AAL.

⁷ We do not look into equity and bond equity issuance as in McLean, Zhang, and Zhao (2011) because capital markets in most developing countries are likely to suffer from the lack of depth and breadth, and bond markets are generally not active.

We obtain three main results. First, firms in common law countries rely significantly more on debt financing compared to firms in other developing countries, while those operating in countries of *Socialist* origin assume greater corporate risk. Second, judicial efficiency matters a great deal in shaping corporate financing and investment decisions. Stricter law enforcement discourages firms from contracting more debt, resulting in a preference for equity financing and higher corporate risk taking. Third, we find some evidence to support JLY's findings in favor of stronger shareholder rights, while AAL's "dark side" to strong creditor rights appears to constrain firm debt financing and risk taking in developing countries. The results are robust to adding country-level and firm-levels controls previously used in the literature. However, our third finding becomes ambiguous when we take the analysis to a sector level. The positive relationship between shareholder protection and firm risk-taking becomes less clear-cut, and the "dark side" to creditor right is reversed for several sectors of economic activity.

The organization of the paper is as follows. Section I reviews the relevant literature to formulate four sets of hypotheses. Section II presents the empirical design, including a description of variables, data, and methodology. Section III discusses the main findings and section IV extends the analysis to account for exchange listing and sector of activity. Section V offers the conclusion.

I. Literature Review and Hypotheses Development

In this section, we review the related literature and formulate four sets of hypotheses that correspond to the importance of legal origin (*Hypotheses 1*), judicial efficiency (*Hypotheses 2*), creditor protection (*Hypotheses 3*), and shareholder protection (*Hypotheses 4*), respectively, in shaping firm debt financing (*a*-labeled hypotheses) and risk taking (*b*-labeled hypotheses)

decisions. For the sake of clarity, the following two subsections A and B summarize the related country-level and firm-level literature, respectively.

A. Laws and Firm Debt Financing and Risk Taking

La Porta, Lopez-de-Silanes, Shleifer and Vishny (LLSV, 1997) have established that differences in the effectiveness of financial systems can be traced to a country's legal origin. According to LLSV, a country's legal origin can help determine the degree of investor protection and consequently the level of financial development of the country. Legal origin refers to the historical origin of the country's laws on which the legal rules of investor protection are based. LLSV (1998, 2002) provide empirical evidence at the country level that the key determinant of capital market development is the degree of legal protection provided to investors. When the legal environment protects potential investors against expropriation by entrepreneurs, the willingness to invest is increased, thus expanding the scope of capital markets and the country witnesses prosperous financial development. Similarly, Levine (1999) reports that financial intermediaries are better developed in countries with better legal protection. In turn greater financial development reduces the cost of external financing and allows industrial firm to grow faster than in countries with less developed financial markets (Rajan and Zingales, 1998). In the extended 1998 and 2002 articles, LLSV distinguish between four categories of legal origin; British, French, German, and Scandinavian legal origin. The authors reveal that a country's legal origin is important in explaining the country's laws on creditor rights, shareholder rights, and private property rights. LLSV argue that common law countries give shareholders the strongest legal rights; French civil law countries extend the weakest protection; and German civil law and

Scandinavian countries generally fall in the middle.⁸ Their findings also confirm that a country with poor shareholder protection is penalized by stunt financial development. Further, Beck, Demirguc-Kunt and Levine (2003) find that credit from financial intermediaries to the private sector as a share of GDP is higher in countries of British legal origin.

To our knowledge, no prior study has assessed the importance of legal tradition in setting debt-financing and risk-taking decisions at the firm level in the context of developing countries separately. We hypothesize that, in common law developing countries with strong legal rights, better developed financial intermediaries increase the supply of financing available to firms, providing an incentive for entrepreneurs to invest and engage in risk-taking activities.

Hypothesis 1a: All else equal, firms in common law developing countries rely more on debt financing compared to firms in developing countries of other legal tradition.

Hypothesis 1b: All else equal, firms in common law developing countries assume more risk compared to firms in developing countries of other legal tradition.

Aside from the legal tradition of a country, the efficiency of its judicial systems is a major factor determining the availability of finance. Demirguc-Kunt and Maksimovic (1998) argue that differences in the efficiency of the legal financial system determine access to external financing and growth, and Demirguc-Kunt and Maksimovic (1999) propose that differences in legal institutions across developed and developing countries affect the financing choices of corporations. Beck and Levine (2002) show that the efficiency of legal institutions increases the availability of financing to industries. Building on the work of LLSV (2002), Demirguc-Kunt and Maksimovic (2002) also contend that access to external finance is primarily a function of the development of a country's legal system. DLLS (2003) construct two indices to measure the

⁸ It is beyond the scope of this paper to debate whether the categorization of countries according to their legal origin is useful, or whether other factors like politics or cultural and religious heritage are crucial determinants of investor protection laws and financial development.

effectiveness of courts as mechanisms of resolving two specific disputes, the eviction of a non-paying tenant and the collection of a bounced check. The authors find that procedural legal formalism is greater in civil law countries than common law countries and in developing countries than in developed countries.

Here again, we are not aware of research that explicitly relates the efficiency of the judicial to differences in debt-financing and risk-taking decisions at the firm level. We conjecture that, under high procedural legal formalism, lenders are reluctant to part with their funds because the inefficient judicial system in place does not guarantee the protection of their rights. The supply of funds available for corporate financing is thus lowered, forcing firms to forgo risky but value-enhancing capital projects.

Hypothesis 2a: All else equal, under high legal formalism, firms are discouraged from borrowing more.

Hypothesis 2b: All else equal, under high legal formalism, firms are discouraged from engaging in risk-enhancing activities.

B. Investor Protection and Firm Debt Financing and Risk Taking

Recently, a new body of evidence has emerged to examine the effect of investor protection on managerial decisions and equity prices.⁹ The literature review in this subsection focuses on studies that assess the importance of creditor and shareholder rights on the level of debt financing and risk taking only. Before reviewing firm-level related research, it is

⁹ Some of the recent work is by Lee, Lee, and Yeo (2009) who examine the impact of shareholder and bondholder rights on the design of convertible debt; Qi, Roth, and Wald (2009) who find that an improvement in either political and creditor rights, which act as substitutes, lowers the cost of debt for corporate bonds; Chiou, Lee, and Lee (2010) who investigate the relationship between the legal environment and stocks' risk and return and report that stronger legal protection of investor rights are associated with low risk and high return-risk stock performance; and King and Wen (2011) who report that strong bondholder or shareholder governance at investment-grade firms is associated with low capital expenditures and insignificant R&D expenses.

worthwhile mentioning two studies that find opposing implications of the importance of investor protection at the aggregate level. The macro-economic model by Castro, Clementi, and MacDonald (2004) shows that an improvement in investor protection leads to a better risk sharing mechanism and increases the demand for capital, which eventually raises the interest rate, lowers the income of entrepreneurs, and decreases current savings and next period's supply of capital. In small open economies with lower restrictions on capital flows, shareholder and creditor protection fosters risk sharing, but more importantly, such countries rely significantly less on debt financing. In contrast, DMLS (2007) report a different effect of investor protection on private credit that contradicts the predictions of the Castro, Clementi, and MacDonald (2004) model. Using a cross-section of countries as well as time series in changes in creditor rights, DMLS find that stronger creditor rights foster aggregate lending. The importance of creditor protection in determining private credit is statistically and economically significant, notwithstanding a weaker relationship in poorer countries.

B.1 Creditor protection and corporate decisions

Some studies report that stronger creditor rights increase corporate reliance on debt financing. Giannetti (2003) finds that it is easier to obtain loans in countries with good creditor protection, resulting in higher leverage levels for firms. Haselmann, Pistor and Vig (2006) find that a strengthening of creditor rights through the creation of a collateral registry in Central and East European countries improves firm lending. Qian and Strahan (2007) similarly propose that loan availability increases in a stronger creditor rights environment.

In contrast, other research provides firm-level evidence in support of a negative association between strong creditor rights and firm leverage. Acharya and Subramanian (2007)

show that firms borrow less and grow slower when creditor rights are strong, and Vig (2007) reports a negative association between creditor rights and firm borrowings in India.

Therefore, a strengthening of creditor rights can either increase or reduce firms' reliance on debt, and we evaluate which effect dominates.

Hypothesis 3a: All else equal, a better protection of creditor rights could encourage firms to incur either more or less debt financing.

With respect to the implications of strong creditor rights on firm risk-taking, Acharya, Amihud and Litov (AAL 2008) affect a “dark side” to creditor rights. While strong creditor rights in bankruptcy laws reduce opportunistic behavior by debtors, they might also inhibit entrepreneurial activities. AAL propose that strong creditor rights induce firms to engage in risk-reducing investments that are potentially inefficient and reduce firm value. The main reason is to avoid inefficient firm liquidation and to lower the likelihood of distress which would hurt both managers' private benefits of control and stakeholders. Using a sample of 38 mostly developed countries over the period 1994-2004, AAL argue that strong (as well as a strengthening of) creditor rights are associated with greater diversifying merger activity, which proves to destroy value. Also, firms operating in a country with strong creditor rights reduce operating or cash flow risk, and target firms in high-recovery industries are more likely to be acquired by firms in low-recovery industry.

A growing body of literature provides support to this negative or “dark side” to creditor rights as they relate to risk-taking. According to Adler, Capkun and Weiss (2007), a strengthening of creditor control in bankruptcy gives an incentive for managers to invest in value-reducing activities to delay a filing. Acharya and Subramanian (2007) further argue that firms experience a reduction in corporate innovation and intensity in patent creation when creditor rights are strong. Chava and Roberts (2008) and Nini, Smith and Sufi (2008) similarly find that

firm-specific creditor rights inhibit capital investment. We formalize a hypothesis about AAL's "dark side" to creditor rights as:

Hypothesis 3b: All else equal, strong creditor rights inhibit corporate risk taking.

B.2 Shareholder protection and corporate decisions

The relevance of shareholder rights in setting good corporate governance practices for the firm has also received a great deal of attention in the literature. Leuz, Nanda and Wysocki (2003) argue that firms in countries with dispersed ownership structures and stronger investor rights engage in less earnings management activities, and they support their claim using evidence from over 8,000 firms in 31 countries, only 8 of which are developing economies. The authors suggest that strong and well-enforced outsider rights limit insiders' acquisition of private control benefits, and consequently mitigate insiders' incentives to manage accounting earnings. Other studies propose that the existence of corporate governance mechanisms positively affects firm value. Black (2001) and Black, Love, and Rachinsky (2006) use firm-level corporate governance rankings of Russian companies and report that there is a strong and positive relationship between corporate governance and firm market value. Klapper and Love (2004) use cross-country firm-level indicators of corporate governance across 14 emerging markets to find that better corporate governance is highly correlated with improved operating performance and firm value, and that this relationship is stronger in weak legal environments. Francis, Hasan, and Song (2007) use the same data set on corporate governance as Klapper and Love (2004) and report that firm-level corporate governance matters for the supply of bank loans and in bank loan contracting terms.

When good corporate governance practices prevail, the risk of expropriation is diminished. Shareholders become more confident that managers will exercise due diligence in

meeting the firm's debt obligations, and the firm's propensity to borrow is likely increased. As a result, we test the following hypothesis:

Hypothesis 4a: All else equal, better shareholder protection encourages firms to assume more debt.

On the other hand, John, Litov and Yeung (JLY, 2008) argue that better investor protection in terms of adequate disclosure rules and more effective monitoring of managers encourages firms to take on riskier but value-enhancing investments because managers are less able to divert corporate resources. In parallel, in countries with low investor protection, dominant shareholders have significant private benefits and high inside exposure control, and they are likely to direct corporate investments towards more conservative venues. Further, in such countries, non-equity stakeholders influence firm decisions to be geared toward conservative investments. However, when investor protection is strong, there is also less need for shareholder dominance to monitor managers because the latter are less likely to conceal their private control benefits. In such an environment, career concerns could induce managers to implement conservative investments or to tunnel risky projects to lower layers of management (Hirshleifer and Thakor, 1992; Holmstrom and Costa, 1986). Using both firm-level and country-level data from 1999 till 2002 for 39 countries, JLY find that stronger shareholder protection is associated with higher firm-level risk taking, which in turn positively associates with firm-level growth. In line with JLY's finding, we assume that JLY's positive association between shareholder protection and corporate risk prevails for firms in developing countries.

Hypothesis 4b: All else equal, better shareholder protection fosters corporate risk taking.

II. Empirical Design

A. Description of Variables

We use both country-level and firm-level data to analyze how different institutional arrangements across developing countries affect firm leverage and corporate risk taking. Table I provides a concise reference of all variables. We describe below how we generate our key variables.

[Table I about here]

We retrieve financial data on publicly traded companies in 27 developing countries from the Thomson DataStream Advance 4.0 database over the period 1997-2007.¹⁰ We only consider companies with at least five firm-year observations for our main variables. We collect data on total assets, total debt, earnings before interest, taxes, depreciation and amortization (EBITDA), total equity, and net income.

We use the financial data to compute firm *Leverage* as the ratio of *Total Debt* to *Total Assets* (TA), $\frac{Total\ Debt_{i,c,t}}{TA_{i,c,t}}$, which depicts the reliance of firm i in country c on debt financing at time t . *Total Debt* represents all interest-bearing and capitalized lease obligations, or the sum of long and short term debt. Higher leverage increases credit risk exposure and the likelihood of bankruptcy.

We additionally construct two proxies for corporate risk-taking, *Risk1* and *Risk2*. *Risk1* represents *Corporate Earnings Volatility* calculated as $\sigma_{i,c} = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left(\frac{EBITDA_{i,c,t}}{TA_{i,c,t}} - \frac{1}{T} \sum_{t=1}^T \frac{EBITDA_{i,c,t}}{TA_{i,c,t}} \right)^2}$. For each firm i in country c at time t , we compute the ratio of earnings before interest and taxes (EBITDA) to contemporaneous total assets (TA) and then take the standard deviation of this measure as an indicator of the volatility of corporate earnings.

¹⁰ We exclude financial institutions from our sample.

Risk2 or *Within-Country Corporate Earnings Volatility* is generated following JLY as

follows: $\sigma_{i,c} = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left(E_{i,c,t} - \frac{1}{T} \sum_{t=1}^T E_{i,c,t} \right)^2}$ where T (or number of observation per firm) ≥ 5 , $E_{i,c,t} = \frac{EBITDA_{i,c,t}}{TA_{i,c,t}} - \frac{1}{N_{c,t}} \sum_{k=1}^{N_{c,t}} \frac{EBITDA_{k,c,t}}{TA_{k,c,t}}$, and $N_{c,t}$ is the total number of firms in country c at year t . For each firm with available EBITDA/TA for at least five years across 1997-2007, we compute $E_{i,c,t}$ as the deviation of the firm's EBITDA/TA in year t from the country average for the same year.¹¹ By subtracting $\frac{1}{T} \sum_{t=1}^T E_{i,c,t}$ from $E_{i,c,t}$, we remove time invariant firm-specific factor in the ratio of EBITDA/Asset. We then compute the standard deviation of this measure, so that each firm is affected a single *Risk2* indicator.¹²

The above risk measures give more weight to countries with more firm representation when we run pooled firm-level cross-country regressions. We account for potential within-country correlation in the residuals by clustering standard errors by country, and we also weigh individual observations with the inverse of the number firms from the corresponding country.¹³

We gather information on *Legal Origin* for the developing countries included in our sample from DLLS (2003) and group countries under three law categories, Common law origin, Civil law origin, and Socialist law origin.¹⁴

We further collect information on investor protection from LLSV (1998) to gauge the level of protection of both shareholders and creditors from managerial stealing. We retrieve from the LLSV database the *Anti-Director Rights (ADR)* index, which measures the country's

¹¹ Similar to JLY, we winsorize $E_{i,c,t}$ at 0.5% to account for possible data errors.

¹² We do not consider the volatility of stock returns as an additional risk measure because the greater likelihood of price manipulation and the lack of presence of institutional investors, among other factors, do not ensure efficient pricing of securities in stock markets of developing countries.

¹³ We acknowledge that corporate income smoothing can reduce our estimates of *Risk1* and *Risk2* (Ball, Kothari, and Robin, 2000; Leuz, Nanda, and Wysocki, 2003). However, the lack of detailed accounting data for developing countries does not allow us to control for income smoothing effects. We assume that all firms across developing countries engage in such activities, so that the net effect on our indicators of risk is identical across the sample.

¹⁴ In our sample, there are no countries with Scandinavian legal origin, and there is only one country of German legal tradition that we include under the civil law group of countries.

degree of protection of shareholder rights. A better protection of shareholders from insiders' or Board of Directors' expropriation of firm value associates with a higher *ADR* score. From the same database, we also extract the *Creditors' Right (CR)* index, which assesses restrictions on creditors, creditors' possession of their security, disposition of creditors' assets, and other factors influencing creditor rights. A better protection of creditor rights is attributed a higher score on the *CR* index.

A better protection of investors, however, can only be ensured with an adequate and efficient judicial enforcement of incumbent laws. From DLLS (2003), we include a variable to proxy for judicial efficiency, or *Legal Formalism*. *Legal Formalism* is an estimate of the number of days necessary to collect on a bounced check and to evict a tenant for nonpayment of rent before the courts in the country's largest city.¹⁵ Larger values on *Legal Formalism* reflect a less efficient judicial system in resolving disputes or more specifically in enforcing investor protection rights.

In addition to the above, we account for the level of financial development with the *Financial Freedom* indicator provided by the Heritage Foundation, with higher values suggesting a more open financial system. The intuition is that less government ownership, influence, and regulations as well fewer restrictions on foreign banks' operations are likely to increase the supply of loans available to all firms alike and encourage entrepreneurs to seek value enhancing risky projects.

Finally, we include controls at the firm level and at the country level in all regressions. Specifically, we control for firm size (natural logarithm of total assets) and initial firm growth, in addition to initial corporate earnings, initial book leverage, and market capitalization. Based on

¹⁵ From Djankov, McLiesh and Shleifer (2007), we also consider another proxy for judicial enforcement for robustness, or Contract Enforcement Days, or the number of days needed to resolve a payment dispute worth 50% of the country's GDP per capita through courts. Our main results are maintained.

large differences in the median firm size across countries, we scale all financial variables (except for firm size) by the lagged value of total assets and include the natural logarithm of the resulting ratios. We also control for each country's GDP per capita, as larger economies have bigger credit markets because of economies of scale in setting institutions (DLLS, 2007).

B. Data and Univariate Results

Our sample consists of 2,782 nonfinancial firms across 27 developing countries or a total of 14,274 firm-year observations for the fiscal years 1997 to 2007. Table II reports the number of firm-year observations and number of firms per country, as well as descriptive statistics for our main variables grouped at the country level.

[Table II about here]

There is significant variation in both the number of firms and firm-year observations across developing countries due to differences in country size and the availability of complete financial accounting data. The number of firms per country varies from one (Zambia) to 601 firms (China), suggesting that it is important to control for sample bias in our analysis, which we account for by implementing clustering and weighting procedures. We also consider a separate subsample that excludes China which dominates our data set, in addition to excluding countries with less than fifty firms.

In our sample, *Leverage* is as low as 4.17% and as high as 43.09% of firm assets, with an average and standard deviation of 22.28% and 8.67%, respectively. The cross-country average *Corporate Earnings Volatility* or *Risk1* is 6.95%, ranging from 1.8% to 13%. The mean *Risk2* indicator of *Within-Country Corporate Earnings Volatility* is 5.28%, going from 0 to 8.66%.

To examine whether our debt-financing and risk-taking measures exhibit significant variation by legal tradition, Table III provides descriptive statistics on our key variables by legal origin.

[Table III about here]

From Table III, firms in common law countries rely significantly more on debt financing, experience greater earnings volatility, but less within country variation in earnings compared to countries with a civil law and socialist tradition. At the other extreme, countries with a socialist legal origin are significantly less leveraged, despite a higher within country volatility of earnings. While providing some insights, these statistics present an overall murky picture, and do not consider the effect of institutional variables other than legal origin on corporate choices.

We also analyze the pairwise correlations among the main country-level variables presented in Table IV.

[Table IV about here]

We first observe that the correlation coefficients between our key dependent variables (leverage and risk-taking) and most of the remaining country-level exogenous variables are less than 10% in absolute terms, and that our two measures of corporate risk-taking, *Risk1* and *Risk2* strongly positively correlate (at 61%). High legal formalism or low judicial efficiency positively correlates with debt financing (7.8%), negatively correlates with our two measures of risk (-13.6 and -16.4% respectively for *Risk1* and *Risk2*). It is also highest in developing countries of civil legal origin countries (27.4%) and lowest in common law origin developing economies (1.9%), with developing countries of socialist tradition lying in between (7.4%). Similarly, a significant positive correlation prevails between common law developing countries and shareholder protection (62.7%) and creditor rights (43.8%). Shareholder protection is lowest in countries

with socialist legal tradition (7.4%), and slightly higher in civil law origin countries (15.5%), while creditor rights are weakest in civil law countries (-67.1%). Developing countries in which legal formalism is high, shareholder rights are low (-3.5%), and creditor protection is significantly reduced (-67.2%). Large firms have significantly lower risk measures (-15.6 and -21.4% respectively for *Risk1* and *Risk2*) and are more likely to prevail in civil law developing countries (22.8%) than in common law developing countries (-26.1%). Finally, emerging economies with a higher GDP per capita significantly positively correlate with our risk measures; they enjoy significantly less procedural formalism (-22.4%) and a significantly better protection of shareholder (26.4%) and creditor (24.8%) rights.

C. Methodology

Our objective is to analyze how differences in legal origin, judicial efficiency, and investor protection affect firm debt financing and risk taking in developing economies. We regress firm-level indicators of leverage and risk on proxies that capture legal origin, legal formalism, shareholder protection, creditor rights, and financial freedom, while controlling for firm-level and country-level differences in the sample. Our baseline model is of the general form:

$$CorpChoice_i = \beta_1 LegOr_c + \beta_2 LegForm_c + \beta_3 InvProt_c + \beta_4 OthInst_c + \beta_5 F_i + \beta_6 Z_c + \varepsilon_j \quad (1)$$

Where *CorpChoice_i* represents corporate choices for firm *i* in terms of debt financing and risk-taking. These include *Leverage*, *Risk1* or *Corporate Earnings Volatility*, and *Risk2* or *Within-Country Corporate Earnings Volatility*. *Leverage* is the ratio of *Total Debt* to *Total Assets*; *Risk1* is the standard deviation of the ratio of *EBITDA* to *TA*; and *Risk2* is the standard deviation of the difference between a firm's *EBITDA/TA* and the country average *EBITDA/TA*

for the corresponding year. Except for *Leverage* which is time varying for each firm, *Risk1* and *Risk2* represent an assessment of corporate risk-taking over the entire sample period, and they are time invariant for each firm. We estimate the panel regression for *Leverage* using firm random effects with robust standard errors clustered by country, since our key variables $LegOr_c$, $LegForm_c$ and $InvProt_c$ do not vary within countries. Additionally, when considering *Risk1* and *Risk2*, we weigh individual observations by the inverse of the number of firms in each country to control for sample bias.

$LegOr_c$ denotes the country's legal tradition; developing countries fall in one of three legal origins: *Common*, *Civil*, or *Socialist*. *Common* is excluded from Equation 1, and the coefficients of the other two legal origins are estimated with respect to this omitted variable. $Legform_c$ corresponds to legal formalism or the efficiency of the judicial system in country c , taken from DLLS (2003) and DMLS (2007). $InvProt_c$ stands for investor protection, and it includes both of LLSV's proxies for shareholder and creditor protection. We proxy for shareholder protection against insiders' expropriation of benefits with the *Anti-Directors' Rights* index (*ADR*) and assess creditor protection with the *Creditors Rights* index (*CR*).

$OthInst_c$ captures other institutional arrangements that are likely to affect firm financing and investing decisions, such as *Financial Freedom*, *Freedom from Corruption*, and *Government Size* in the economy, all taken from the Heritage Foundation. $F_{i,c}$ and Z_c denote firm-level and country-level controls respectively, including firm size and the macroeconomic environment or the level of economic development measured by GDP per capita; and $\varepsilon_{i,t}$ is a random error term.¹⁶

III. Discussion of Main Empirical Findings

¹⁶ We consider alternative firm and country level controls in the robustness section.

We present the multivariate estimation results for firm leverage and corporate risk-taking in Tables V, VI, and VII using *Leverage*, *Risk1*, and *Risk2* as dependent variables, respectively. We estimate Equation 1 for the full sample of firms in all developing countries (Panel A), and for a reduced subset which excludes China because it dominates the number of firms and observations in our data set (Panel B). We run several specifications by incorporating our key variables sequentially, starting with *Legal Origin* (Model 1), *Legal Formalism* (Model 2), *Investor Protection* in the form of *ADR* and *CR* (Model 3), and *Financial Freedom* (Model 4). All regressions control for firm size and GDP per capita.

A. Multivariate Results using Leverage

The dependent variable in Table V is firm leverage measured as the ratio of total debt to assets.

[Table V about here]

In Panel A, the coefficient on both *Civil* and *Socialist* is negative and significant, and its significance increases when we control for investor protection rules and the freedom to contract financially. Since the omitted category is *Common*, then firms in developing countries with socialist or civil legal origin finance a significant lower proportion of their assets through debt compared to firms in common law countries. Further, the estimated coefficient is larger in absolute terms for socialist than for civil origin countries, indicating that *Socialist* origin developing countries have the lowest leverage levels compared to firms in other developing economies. The significance and difference in size for the *Socialist* and *Civil* coefficients are maintained in Panel B when we exclude China from our sample. Our findings thus lending support to *Hypothesis 1a*. But they are opposite to those of Demirguc-Kunt and Maksimovic

(1999) who report that firms in countries with a tradition of common law use less debt relative to assets than firms in countries with a tradition of civil law. This discrepancy could be due to the fact that the sample used by Demirguc-Kunt and Maksimovic covers the period 1980-1991, while ours is more recent extending from 1997 to 2007. It could also be that the process of financial liberalization which was mainly triggered in the 1990s has modified countries' perspectives on debt financing, especially after several countries experienced economic cycles with low interest rate environments or after capital markets opened up globally increasing the array of investors and reducing the cost of borrowing. Our findings, however, are consistent with Bancel and Mittoo (2004) who report that debt policy varies with the quality of a country's legal system in the context of European economies.

In Model 2, we add *LegForm* to assess the importance of judicial efficiency in setting the financing choice available to the firm. The sign on *LegForm* is positive and highly significant both in Panels A and B, providing evidence against *Hypothesis 2a* across all developing countries. When legal formalism is high and the judicial is not efficient in enforcing contracts, firms have an incentive to increase their levels of debt as a proportion of assets. The positive coefficient on *LegForm* is maintained across all specifications, and when excluding China from the data set. This result is also not in line with the finding of Demirguc-Kunt and Maksimovic (1999) that a stricter enforcement of legal rules is associated with higher debt to assets, or with DMLS's (2007) proposition that the ratio of private credit to GDP is increased in a low legal formalism environment. However, the study by Demirguc-Kunt and Maksimovic is for an earlier period, and DMLS examine the importance of the judicial on macro credit and not firm-level debt ratios. We explain the positive association between *LegForm* and *Leverage* from a borrower's perspective because firms in developing countries might be encouraged to take on

more corporate debt when legal formalism is high. In case of an eventual default and in an environment in which law enforcement is loose, the debtor would expect delay in a possible legal ruling that forces repayment, assuming that corrective action is effectively ruled by the courts whose independence and impartiality might be questioned in developing countries. Despite an overall reduction in the supply of credit as predicted by DMLS, firms might still have a preference for debt financing at the micro level. Interestingly, this finding is corroborated by Ayyagari, Demirguc-Kunt and Maksimovic (2008) who find that judicial efficiency is ranked lowest among 10 obstacles to growth that firms reported in the World Business Environment Survey.

With respect to investor protection, the estimated parameter of *CR* in Panel A is negative and significant, indicating that firms in developing countries generally rely less on debt financing when creditor rights are strong, and possibly providing support to AAL's "dark side" to creditor rights. It could be that the presence of laws protecting creditors does not, by itself, provide a strong motivation for lenders to part with their funds, probably because of resilient inefficiencies in the judicial enforcement of legal contract in those countries. While the coefficient loses significance when excluding Chinese firms, it remains negative in Panel B, thus rewording *Hypothesis 3a* as follows: Firms in developing countries with better protection of creditor rights incur less debt financing. Our findings are opposite to those of Giannetti (2003) for European countries in which creditor protection is important for ensuring debt financing, to the evidence advanced by Haselmann, Pistor and Vig (2006) that better creditor rights in Central and East Europe boosted lending, and to DMLS's result that strong creditor rights increase the supply of private credit at the macro level. However, they are similar to those reported by Vig (2007) that Indian firms' propensity to borrow is reduced with a strengthening of creditor rights, and to

Acharya and Subramanian (2007) that firms employ lower financial leverage in countries with stronger creditor rights.

In Panel A, the coefficient on *ADR* is positive and highly significant, suggesting that a better protection of shareholder rights against insiders' expropriation of benefits encourages firms in developing countries to increase their leverage. This result, however, is reversed in Panel B when we exclude China from the estimation process, and where the coefficient of *ADR* turns negative and significant. It seems that better shareholder protection in countries other than China might encourage firms to rely more on equity financing, but the opposite holds for Chinese firms which have a preference for debt, even when shareholder rights are well protected. In China, the state maintained full ownership of the so-called Big Four banks for a long period of time, thus affecting the allocation of credit in the economy and giving a natural preference for debt financing, notwithstanding a piling up of nonperforming loans. We explain the opposite relationship for other countries with the following argument. In developing countries, most firms are family-owned businesses even if they are publicly listed, because the founders usually retain control of most aspects of the business. When shareholder rights are better protected, such firms are likely to rely more on equity than on debt financing, especially if capital markets are underdeveloped. Therefore, we do not find evidence to support *Hypothesis 4a* consistently across all developing countries.

The findings also suggest that the freedom to contract financially marginally reduces the proportion of assets financed by debt, but this result does not hold in Panel B. Further, large firms appear to rely more on debt financing compared to their peers across all developing countries. It could be that large firms have already built up a credit history and relationships with banks, or they have more assets that could serve as collateral in borrowing, or their visibility

is simply increased in the market, allowing them to have access to more debt financing relative to firms of smaller size in developing countries.

B. Multivariate Results using Risk1 and Risk2

Table VI presents the multivariate results using *Risk1* or the variability in corporate earnings, and Table VII uses *Risk2* or within-country volatility of corporate earnings.

[Table VI about here]

[Table VII about here]

Our first variables of interest related to legal origin indicate that firms in developing countries with a tradition of socialist law are significantly riskier compared to companies in countries with a tradition of common law, and this result is maintained across all models and when excluding China from the sample. The coefficient on *Civil*, however, does not exhibit a consistent sign across all models, and we cannot infer whether firms operating in countries with a tradition of civil law assume more or less risk compared to corporations in economies which operate under a tradition of common law. Since firm risk is difficult to assess, we examine whether our results are modified when using *Risk2* or within-country earnings volatility as a proxy for corporate risk-taking, similar to JLY (2008). In Table VII, the parameter estimate on *Socialist* is also positive and highly significant across all specifications, and we do not recognize a consistent pattern for firm risk-taking across developing countries of civil legal origin. In light of these results, we therefore reject *Hypothesis 1b*. In the previous section, the results of Table V suggested that firms in socialist developing countries finance a significant lower portion of their assets in the form of debt compared to firms in other countries, implying a relative greater reliance on equity. Since the latter is a riskier source of funding compared to debt, it is not

surprising that we also find in Tables VI and VII that firms in socialist developing countries assume significantly greater risk compared to firms in developing countries with a common legal tradition, consistent with the risk-return relationship. It is possible that higher corporate risk-taking in developing countries of socialist legal origin will eventually be translated into higher levels of returns and better growth rates, both at the firm and country levels.¹⁷

The results for *LegForm* across Tables VI and VII point to a significantly negative association between legal formalism and corporate risk that strongly holds across all model specifications. Stricter judicial enforcement of laws is conducive to higher levels of corporate risk-taking in all developing countries, as predicted by *Hypothesis 2b*. We explain this result conjunctly with the findings of Table V. A more efficient law enforcement (through lower values of *LegForm*) implied lower debt financing in the previous section, or alternatively a capital structure in favor of more equity. A preference for a riskier source of financing, in turn, is translated into greater volatility in firm earnings (*Risk1*) and within-country volatility (*Risk2*).

With respect to *CR*, we report a significant and negative relationship between *ADR* and each of *Risk1* and *Risk2* across all models. A better protection of creditor rights across developing countries significantly and negatively associates with corporate risk-taking, and this association is persistent in all four panels of Tables VI and VII. The findings thus lend strong support for *Hypothesis 3b* and to the “dark side” of creditor rights advanced by AAL (2008). The results are also consistent with Acharya and Subramanian (2007) who show that firm innovation and therefore risk-taking are reduced in countries with stronger creditor rights.

In Panel A of Table VI, the coefficient estimates for *ADR* across Models 3 and 4 is positive and significant, and this result is maintained in Panel B when excluding Chinese firms, notwithstanding a lower reported level of significance. Our finding is similar to JLY (2008) who

¹⁷ This issue is not addressed in the current paper, and it is left for future research to investigate it.

also report that shareholder rights are significant determinants of the volatility of corporate earnings. When shareholders are better protected against insiders, managers have a lower tendency to forgo risky but value-enhancing projects. Their private benefits are reduced, and they are likely to assume more corporate risk. In Table VII, the parameter estimate of *ADR* loses significance, but its positive sign is maintained across all specifications of Panels A and B. Thus, the findings lend some evidence for *Hypothesis 4b*.

With respect to financial freedom, it encourages firms in developing countries to increase corporate risk-taking using both measures of risk *Risk 1* and *Risk 2*, and this result holds when excluding Chinese firms. It could be that lower restrictions on financial contracting improves the risk-sharing mechanism in place, and encourages firms to assume more risk. Also, bigger sized firms assume significantly less risk compared to small firms in developing countries, consistent with the finding in Table V that large firms rely more on debt (and less on the riskier equity funding) in financing their operations. Large firms have a higher charter value relative to small firms. They stand to lose more in case of bankruptcy compared to their peers, possibly triggering a risk aversion attitude.

C. Robustness

We consider the possibility that other institutional arrangements are important for corporate financing and firm risk-taking in developing countries. Specifically, we include the ratio of stock market capitalization to GDP and the quality of bank supervision collected by Barth, Caprio, and Levine (2004). We find that some of these variables are statistically significant, and that they do not eliminate the statistical significance and sign of our main variables on legal origin, legal enforcement, and investors' rights.

We also interact our key variables on laws and institutions with each other and include them as additional exogenous variables in all regressions. Specifically, we try to determine whether judicial enforcement matters more for creditors or for shareholders. Our main results are maintained, but we also find that the interactive term is significant for shareholder protection and less so for creditor rights. Creditors have stronger cash flow rights relative to equity holders, which also give them control rights with the threat to liquidate. Thus, shareholders require judicial efficiency and enforcement for it to exercise some discipline on managers.¹⁸

We add other firm-level controls to equation (1), including *Initial Book Leverage*, *Initial Corporate Earnings*, and *Market Capitalization*. We consider other country-level controls from the Heritage Foundation, including *Freedom from Corruption* and *Government Size*. Further, we exclude from our original sample all countries with less than fifty firms. Our main results obtain.

Finally, we cross-check our findings by relating firm debt-financing and risk-taking decisions to a firm-level indicator of corporate governance. We use the Crédit Lyonnais Securities Asia (CLSA) emerging markets corporate governance database (Klapper and Love, 2004; Francis, Hasan, and Song, 2007) and match it with our sample of public firms to merge a firm-level corporate governance score *CG* with our original data set. Since only a subset of our firms is matched with the CLSA data, our sample is as a result considerably reduced to 115 firms or a total of 800 observations. We generate a cross product term between *CG* and *ADR* to examine the interaction between different levels of shareholder protection at the country and firm levels. We run our key regressions on debt financing and firm risk and present the results in Table VIII.

[Table VIII about here]

¹⁸ The author is grateful to Viral Acharya for this interpretation of the finding.

Our results are generally consistent with the previous findings. Firms operating in developing countries of socialist legal origin rely less on debt financing compared to firms in countries of common law origin, and they are likely to take on more risk. However, our subsample shows that firms in developing countries of civil legal origin countries have a preference for debt financing and are less risky enterprises compared to firm in common law countries. One result that is thoroughly maintained across all models of Table VIII relates to the economic importance of judicial efficiency. When legal formalism is high, firms rely more on debt but are less likely to assume greater investment risk. With respect to investor protection, the signs of the parameter estimates of *CR* and *ADR* are similar to those in the previous tests, except that stronger creditor rights are now associated with greater debt financing. Still, AAL's "dark side" to creditor rights becomes apparent with lower firm risk taking, whereas shareholder protection rights generally foster investment risk just as in JLY. At the firm level, a better system of corporate governance associates with a lower reliance on debt financing, although the relationship is not significant. However, improved corporate governance at the firm level significantly reduces risk-taking in developing countries, contrary to the evidence suggested using aggregate indicators of shareholder protection and to the findings of JLY for mostly developed countries. In developing countries, the ownership structure of publicly listed firms is likely to comprise dominant shareholders with significant inside benefits of control. As a result, these shareholders are keen on protecting their high stakes and their behavior reflects a risk averse nature, even in the presence of a good corporate governance system to ensure value maximization. The results also suggest that the interactive term between indicators of good governance at the country and firm levels is not significant. Our findings on the significance and sign of all other controls are maintained.

IV. Extended Analysis: Exchange listing and Sector of Activity

The results of prior estimations showed that firm size is a significant determinant of corporate debt-financing and risk-taking. Large firms rely significantly more on debt financing compared to small firms, and they seem significantly less willing to undertake risky investments. Further, the decision to rely more on debt financing and to increase risk taking may be dependent upon the exchange where the firm is listed. Stock markets in developed countries are more developed than in developing countries, and a firm may seek to increase its access to finance by listing itself on such an exchange. Table IX shows the distribution of companies across exchanges.

[Table IX about here]

In the sample under study, the total number of exchanges is 50, 17 of which are located in a developed country. Of the total 2,782 firms, 444 are listed on an exchange that is located in a developed country, representing 16% of total companies included in the sample. We create a dummy called *Developed Exchange* which is set to one when the firm is listed on an exchange in a developed country and 0 otherwise, and re-run our baseline regressions *Leverage*, *Risk1* and *Risk2* regressions. Table X shows the estimation results.

[Table X about here]

The results appearing in Table X indicate that previous findings on legal origin, judicial efficiency, and investor protection are maintained across all specifications. The variable *Developed Exchange* is positive and significant at the 5% level for the regressions on firm risk taking. This finding suggests that firms in developing countries that opt for an exchange listing

in a developed economy are more likely to engage in risky activities relative to firms that only list on a domestic exchange.

Alternatively, we investigate the possibility that our main findings also vary by sector of economic activity. In our data set, firms are classified according to 36 different sectors. Table XI lists descriptive statistics on our key variables on laws and institutions, in addition to firm size (in terms of book and market value) and growth, by sector of activity. The smallest firm sizes belong to the Forestry & Paper and Food & Drug Retailers industries whereas the largest corporates are in Oil & Gas and Electricity sectors. Firm growth also varies from as low as -3.37%, on average, for the Equity Investment Instruments industry and as high as 79.09% for Alternative Energy.

[Table XI about here]

Similarly, levels of debt financing are as low as 6.44% for Nonlife Insurance companies and they reach 29.38% for Forestry & Paper firms. The smallest values for our two risk-taking proxies, *Risk1* and *Risk2*, are for Life Insurance and Oil Equipment & Services companies, respectively, while the highest corresponding values are for firms in the Equity Investment Instruments sector. The great variability in our key indicators of laws and institutions presented in Table IX suggest that it is possible that our previous findings do not hold consistently across different sectors of economic activity.

We re-estimate our previous regressions by sector and present the results in tables XII, XIII, and XIV, respectively, using *Leverage*, *Risk1*, and *Risk2* as dependent variables. In each table, we only present the level of significance on our key variables for simplicity purposes, and we further shade in grey the coefficient estimates that are of opposite sign to those reported in tables V, VI, and VII.

[Table XII about here]

[Table XIII about here]

[Table XIV about here]

The purpose of this further investigation is not to provide additional discussion on the importance of institutional arrangements on firm debt financing and risk-taking decisions, but rather to suggest that our previous findings could be sector-dependent. First, the results appearing in tables XII to XIV indicate that the relevance of laws and institutions for firm debt financing and risk taking is not consistent across all sectors, and that they are not even significant for several sectors of activity. Second, of all exogenous variables, the sign on *Legal Formalism*, when significant, is the only one that is generally maintained in line with the previous findings across all regressions, thus reinforcing the idea that judicial efficiency matters most in setting corporate choices. Third, of all institutional arrangements, creditor rights *CR* is the variable that changes signs most when regressions are run by sector. This finding suggests that AAL's "dark side" to creditor rights is sector-dependent. It is not the case that better creditor rights always come with "a dark side" that lowers firm leverage or inhibits corporate risk-taking. Fourth, the parameter estimate on *ADR* flips in sign in Table XII for several sectors, thus also providing evidence against our previous finding and JLY's on the importance of shareholder protection for greater firm risk-taking. For some sectors, a better protection of shareholder rights actually deters managers from undertaking risky but value enhancing activities. These findings suggest that more sector-level research is necessary to fully examine the implications of investor protection on firm financing and investing choices.

V. Conclusion

Developing countries are expected to play a crucial role in restoring global financial stability and economic growth, and their presence on the international arena is now marked with the enlargement of the G7 to the G20. In this paper, we investigate to which extent differences in institutional arrangements across developing economies delimit firm debt-financing and risk-taking choices. Our motivation is that, in a world hit by the worst global recession ever since the Great Depression, a better understanding of firm debt-financing and corporate risk-taking appetite in economies such as Brazil, China, India, Russia, and others is likely to help restore growth in output at a global scale. We focus on a spectrum of institutional arrangements, including legal tradition, judicial enforcement, and investor protection, and find that laws and institutions are important determinant of corporate choices.

First, legal origin matters for firm debt financing and risk taking in developing economies. Firms operating in developing countries with a socialist legal tradition rely the least on debt financing, followed by firms in civil law countries, while those operating in a common law environment have the highest debt to assets ratios. Additionally, for firms in developing countries with a socialist legal origin, the higher preference for equity financing is translated into significantly higher levels of risk-taking.

Second, among all determinants of firm financing and corporate risk-taking choices in developing countries, judicial enforcement matters most. In countries with high legal formalism (worse enforcement of contracts), firms are encouraged to contract more debt financing, notwithstanding a possible lower supply of credit. They are, however, less willing to undertake risky investments. By financing a higher proportion of their operations with debt in a loose judicial environment, firms might expect that it is unlikely they would be held liable for their obligations in case of corporate default, but when it comes to risk-taking, they are rather more

careful and risk averse. The importance of legal enforcement is strongly maintained across all robustness tests, and especially when using firm-level indicators of corporate governance and when running the analysis by sector of economic activity.

Third, similar to JLY (2008), we find that a better protection of shareholders against managers' expropriation of private benefits generally encourages firms to borrow more and to undertake riskier investments. The analysis also supports the presence of AAL's (2008) "dark side" to creditor rights that are not always optimal. However, when we bring the analysis to a sector level, our third main finding becomes ambiguous and it is actually reversed for firms in different sectors of economic activity, thus no longer supporting the findings of JLY and AAL on the implications of better shareholder and creditor protection.

We believe that our study contributes to the law and finance literature and the corporate governance literature for developing countries in three important ways. First, we provide novel evidence about debt financing and risk-taking choices of firms operating in developing countries of different legal origin. Second, we find that, for developing countries, judicial efficiency matters most for corporate decisions, even when we conduct a sector-level investigation. Third, our study suggests that more sector level analysis is necessary to better assess the implication of investor protection on firm financing and investing choices. It is left for future research to examine further implications of the results on firm growth and eventually economic development.

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Table I
Variables Definition

Variable	Definition	Source
<i>Leverage</i>	<i>Leverage</i> or credit risk exposure calculated as the ratio of total debt to total assets. Total debt represents all interest-bearing and capitalized lease obligations. It is the sum of long and short term debt.	Author's calculations
<i>Risk 1</i>	<i>Corporate Earnings Volatility</i> calculated as the standard deviation of the ratio of EBITDA to total assets, $\sigma_i = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left(\frac{EITDA_{i,c,t}}{TA_{i,c,t}} - \frac{1}{T} \sum_{t=1}^T \frac{EITDA_{i,c,t}}{TA_{i,c,t}} \right)^2}$. This measure is similar to the one used in JLY (2008).	Author's calculations
<i>Risk 2</i>	<i>Within-Country Corporate Earnings Volatility</i> $\sigma_{i,c}$, calculated following JLY (2008) as the standard deviation of the difference between each firm's yearly EBITDA/Total Assets and the country average EBITDA/Total Assets for the corresponding year. $\sigma_{i,c} = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left(E_{i,c,t} - \frac{1}{T} \sum_{t=1}^T E_{i,c,t} \right)^2}$ where $T \geq 5$, $E_{i,c,t} = \frac{EBITDA_{i,c,t}}{TA_{i,c,t}} - \frac{1}{N_{c,t}} \sum_{k=1}^{N_{c,t}} \frac{EBITDA_{k,c,t}}{TA_{k,c,t}}$, and $N_{c,t}$ is the total number of firms in country c at year t . This measure is similar to the one used in JLY (2008).	Author's calculations
<i>Legal Origin</i>	Variable that identifies the legal origin of the Company Law or Commercial Code of each country: <i>Common</i> , <i>Civil</i> , or <i>Socialist</i> Law.	Djankov et al. (2003 and 2007).
Judicial Efficiency		
<i>Legal Formalism</i>	An estimate of the number of days necessary to collect on a bounced check and to evict a tenant for nonpayment of rent before the courts in the country's largest city. These estimates were prepared by law firms in each country surveyed by Djankov et al. (2003). Higher values indicate worse judicial enforcement.	Djankov et al. (2003)
<i>Contract Enforcement Days</i>	Natural logarithm of the number of days to resolve a payment dispute through courts. The data are based on the methodology in Djankov and others (2003) and describe the number of calendar days to enforce a contract of unpaid debt worth 50% of the country's GDP per capita. Higher values indicate greater procedural formalism and greater inefficiency in judicial enforcement.	Djankov et al. (2007)

Table I Continued

Investor Protection Variables		
<i>Creditor rights</i>	An index aggregating different creditor rights. The index is formed by La Porta et al. by adding “1” when: (1) the country imposes restrictions, such as (1998) creditors' consent or minimum dividends to file for reorganization; (2) secured creditors are able to gain possession of their security once reorganization petition has been approved (no automatic stay); (3) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm; and (4) the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from zero to four, with higher values indicating stronger creditors' rights.	La Porta et al. (1998)
<i>ADR</i>	Anti-director rights index measures the country's degree of protection of shareholder rights. In particular, the index measures the mechanisms available to shareholders to protect themselves against expropriation by the board of directors by conceding the following six shareholder rights: (1) mailing their proxy votes to the firm; (2) waiving requirements to deposit their shares prior to a general shareholder meeting; (3) allowing cumulative voting or proportional representation of minorities on the board of directors; (4) enabling minority shareholders against perceived oppression by directors; (5) having a minimum percentage of share capital that entitles a shareholder to call an extraordinary shareholder meeting of less than or equal to 10%; and (6) having preemptive rights that can only be waived by a shareholder vote. The index ranges from 0 – 6, where zero represents the weakest antidirector rights and 6 the strongest anti-director rights.	La Porta et al. (1998)
Other Institutional Factors		
<i>Financial Freedom</i>	An indicator of relative openness of banking and financial systems. The index ranges in value from 0 (very low) to 100 (very high). It reflects: Government ownership of financial institutions, restrictions on the ability of foreign banks to open branches and subsidiaries, government influence over the allocation of credit, government regulations.	Heritage Foundation
Firm-Level Control Variables		
<i>Firm Size</i>	Natural logarithm of total assets which represent the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.	Thomson DataStream Advance 4.0
<i>Firm growth</i>	Natural Logarithm of the ratio of total assets to lagged total assets multiplied by 100.	Thomson DataStream Advance 4.0
Country-Level Control Variables		
<i>Per Capita GDP</i>	Logarithm of per capita GDP.	International Financial Statistics
<i>GDP growth</i>	100 multiplied by natural logarithm of per capita GDP to lagged per capita GDP.	International Financial Statistics

Table II
Descriptive Statistics by Country

The first three columns show the number of observations and firms per country over the period 1997-2007. *Legal Origin* is from Djankov et al. (2003 and 2007), *Leverage* is the ratio of total debt to total assets, *Risk1* is corporate earnings volatility, and *Risk2* is within-country corporate earnings volatility. The last three columns are calculated based on data on listed firms retrieved from DataStream. Table 1 provides more details on the calculation of these variables.

Country Name	No of Obs.	No of Firms	<i>Legal Origin</i>	<i>Leverage</i>	<i>Risk 1</i>	<i>Risk 2</i>
ARGENTINA	107	17	Civil Law	0.2673	0.1177	0.0775
BRAZIL	1334	206	Civil Law	0.2602	0.0752	0.0693
CHILE	323	46	Civil Law	0.2475	0.0430	0.0416
CHINA	3307	601	Socialist Law	0.2191	0.0532	0.0531
COLOMBIA	12	2	Civil Law	0.0984	0.0180	n/a
EGYPT	39	11	Civil Law	0.2435	0.0730	0.0199
INDIA	1207	340	Common Law	0.2941	0.0555	0.0257
INDONESIA	709	121	Civil Law	0.3073	0.0812	0.0635
JORDAN	35	10	Civil Law	0.1520	0.0296	0.0291
KOREA	1308	313	Civil Law	0.2440	0.0934	0.0496
LITHUANIA	6	2	Civil Law	0.3492	n/a	n/a
MALAYSIA	1661	364	Common Law	0.2357	0.0578	0.0430
MEXICO	578	77	Civil Law	0.2206	0.0700	0.0631
MOROCCO	30	5	Civil Law	0.0993	0.0618	0.0820
NIGERIA	7	5	Common Law	0.1687	n/a	n/a
PAKISTAN	176	25	Common Law	0.4309	0.0809	0.0661
PAPUA NEW GUINEA	2	1	Common Law	0.0417	n/a	n/a
PERU	187	32	Civil Law	0.2092	0.0518	0.0397
PHILIPPINES	183	39	Civil Law	0.2282	0.1263	0.0736
RUSSIAN FEDERATION	303	61	Socialist Law	0.1979	0.0706	0.0504
SOUTH AFRICA	1314	240	Common Law	0.2053	0.1300	0.0829
SRI LANKA	8	3	Common Law	0.1393	0.0265	0.0000
THAILAND	1088	191	Common Law	0.3336	0.0625	0.0518
TURKEY	286	57	Civil Law	0.2647	0.1109	0.0866
VENEZUELA	58	10	Civil Law	0.1132	0.0399	0.0393
ZAMBIA	4	1	Common Law	0.3037	n/a	n/a
ZIMBABWE	2	2	Common Law	0.1398	n/a	n/a
<i>Total</i>	14274	2782	<i>Average</i>	0.2486	0.0725	0.0549
			<i>Minimum</i>	0.0417	0.0180	0.0000
			<i>Maximum</i>	0.4309	0.1300	0.0866
			<i>Std deviation</i>	0.0867	0.0312	0.0228

Table III
Descriptive Statistics by *Legal Origin*

Legal origin is from Djankov et al. (2003 and 2007), *Leverage* is calculated as the ratio of total debt to total assets, *Risk1* is corporate earnings volatility, and *Risk2* represents within-country corporate earnings volatility. All variables are calculated based on data for listed firms over the period 1997-2007. More details on the calculation of these variables are in Table I.

Legal Origin	<i>Leverage</i>	<i>Risk 2</i>	<i>Risk3</i>
<i>Common Law</i>			
Minimum	0.0000	0.0053	0.0000
Mean	0.2668 ^a	0.0785 ^a	0.0513 ^d
Maximum	0.9832	2.7596	0.4352
Std Dev.	0.1844	0.1387	0.0589
<i>Civil Law</i>			
Minimum	0.0000	0.0042	0.0000
Mean	0.2535 ^b	0.0761 ^b	0.0637 ^a
Maximum	0.9694	0.5736	0.3500
Std Dev.	0.1765	0.0683	0.0530
<i>Socialist Law</i>			
Minimum	0.0000	0.0040	0.0000
Mean	0.2244 ^c	0.0629	0.0520 ^b
Maximum	0.8572	2.6715	0.3388
Std Dev.	0.1519	0.1172	0.0556

^a Higher than the mean for the other two legal origin categories with significance at the 1% level

^b Higher than the mean for the other two legal origin categories with significance at the 5% level

^c Lower than the mean for the other two legal origin categories with significance at the 1% level

^d Lower than the mean for the other two legal origin categories with significance at the 5% level

Table IV
Pairwise Correlations of Main Variables

In this table we present correlations for the variables that are included in our study: firm *Leverage* for debt to assets, *Risk1* for corporate earnings volatility, *Risk3* for within-country earnings volatility (all three calculated from DataStream), legal origin (Common, Civil, Socialist) and legal formalism from Djankov et al. (2003 and 2007), financial freedom from the Heritage Foundation, *ADR* for anti-director rights and *CR* for creditor rights from LLSV (1998), firm size as the natural logarithm of total assets from DataStream, and *GDPPC* for GDP per capita from the IFS. More details on the calculation of the main variables are in Table I. Pairwise correlations are presented in percentage values. * indicates significance at the 5% level.

	<i>Leverage</i>	<i>Risk1</i>	<i>Risk2</i>	<i>Common</i>	<i>Civil</i>	<i>Socialist</i>	<i>Legal Formalism</i>	<i>Financial Freedom</i>	<i>ADR</i>	<i>CR</i>	<i>Firm Size</i>	<i>GDPPC</i>
<i>Leverage</i>	1.000											
<i>Risk1</i>	0.021*	1.000										
<i>Risk2</i>	0.049*	0.610*	1.000									
<i>Common</i>	0.083*	0.039*	-0.016	1.000								
<i>Civil</i>	0.017*	0.021*	0.055*	-0.482*	1.000							
<i>Socialist</i>	-0.043*	-0.002	0.021*	-0.116*	-0.090*	1.000						
<i>Legal Formalism</i>	0.078*	-0.136*	-0.164*	0.019*	0.274*	0.074*	1.000					
<i>Financial Freedom</i>	0.003	0.042*	0.068*	0.153*	0.416*	-0.026*	0.346*	1.000				
<i>ADR</i>	0.090*	0.084*	0.052*	0.627*	0.155*	0.044*	-0.035*	0.204*	1.000			
<i>CR</i>	-0.041	0.051*	0.023*	0.438*	-0.671*	-0.012	-0.672*	-0.425*	0.156*	1.000		
<i>Firm Size</i>	0.066*	-0.156*	-0.214*	-0.261*	0.228*	0.163*	0.101*	0.118*	-0.071*	-0.261*	1.000	
<i>GDPPC</i>	-0.079	0.064*	0.059*	-0.109*	0.104*	0.061*	-0.224*	-0.103*	0.264*	0.248*	0.063*	1.000

Table V
Institutional Arrangements and Firm Leverage

The dependent variable is Leverage or the ratio of total debt to total assets over the period 1997-2007. *Socialist* and *Civil* are dummy variables for countries with Socialist and Civil legal origins, respectively, with Common Law being the omitted category; *Legal Formalism* is a proxy for judicial efficiency; *CR* and *ADR* represent creditor rights and anti-director rights, respectively, for creditor and shareholder investor protection. *Financial freedom* is an indicator of relative openness of banking and financial systems; *Firm Size* is measured as the natural logarithm of firm assets; and $\ln(GDPPC)$ is the natural logarithm of GDP per capita. Panel A covers the entire sample of firms across countries in 27 developing countries, and Panel B excludes Chinese firms which dominate the number of firms in our sample. We report parameter estimates with standard errors in parentheses. All regressions are run with firm random effects with robust standard errors clustered by country to account for potential within-country correlation in the residuals. We also use weigh the individual observations with the inverse of the number firms from the corresponding country. *, **, *** indicate significance at the 10, 5, and 1%, respectively.

	Panel A: All Developing Countries				Panel B: Developing Countries Excluding China			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>Civil</i>	-0.0015 (0.0066)	-0.0061 (0.0070)	-0.0223 (0.0102)**	-0.0177 (0.0104)*	-0.0233 (0.0072)***	-0.0274 (0.0076)***	-0.0448 (0.0119)***	-0.046 (0.0122)***
<i>Socialist</i>	-0.0368 (0.0174)**	-0.0425 (0.0175)**	-0.0592 (0.0176)***	-0.0595 (0.0176)***	-0.0521 (0.0182)***	-0.0572 (0.0183)***	-0.0708 (0.0188)***	-0.0707 (0.0188)***
<i>Legal Formalism</i>		0.0121 (0.0048)**	0.0097 (0.0059)*	0.0116 (0.0059)*		0.0097 (0.0049)**	0.0102 (0.0061)*	0.0098 (0.0061)
<i>CR</i>			-0.0146 (0.0073)**	-0.0149 (0.0073)**			-0.0113 (0.0078)	-0.0111 (0.0078)
<i>ADR</i>			0.0157 (0.0018)***	0.0164 (0.0018)***			-0.0108 (0.0041)***	-0.0112 (0.0041)***
<i>Financial Freedom</i>				-0.0004 (0.0001)***				0.0001 (0.0002)
<i>Firm Size</i>	0.0076 (0.0014)***	0.0073 (0.0014)***	0.0087 (0.0015)***	0.0087 (0.0015)***	0.0085 (0.0016)***	0.0083 (0.0016)***	0.0084 (0.0017)***	0.0083 (0.0017)***
$\ln(GDPPC)$	-0.0167 (0.0025)***	-0.015 (0.0026)***	-0.0151 (0.0031)***	-0.0164 (0.0031)***	-0.0377 (0.0030)***	-0.0364 (0.0031)***	-0.035 (0.0036)***	-0.0348 (0.0036)***
Nb. of Obs.	14267	14265	13683	13683	10964	10962	10380	10380
Nb. of Firms	2780	2779	2701	2701	2180	2179	2101	2101

Table VI
Institutional Arrangements and Corporate Risk-Taking using *RiskI*

The dependent variable is *RiskI* or corporate earnings volatility σ_i to proxy for firm risk-taking, calculated as the standard deviation of the EBITDA/Assets over the period 1997-2007. We include only firms for which there are at least five annual observations on EBITDA/Assets. *Socialist* and *Civil* are dummy variables for countries with Socialist and Civil legal origins, respectively, with Common Law being the omitted category; *Legal Formalism* is a proxy for judicial efficiency; *CR* and *ADR* represent creditor rights and anti-director rights, respectively, for creditor and shareholder investor protection. *Financial freedom* is an indicator of relative openness of banking and financial systems; *Firm Size* is measured as the natural logarithm of firm assets; and $\ln(GDPPC)$ is the natural logarithm of GDP per capita. Panel A covers the entire sample of firms across countries in 27 developing countries, and Panel B excludes Chinese firms which dominate the number of firms in our sample. We report parameter estimates with robust standard errors clustered by country in parentheses to account for potential within-country correlation in the residuals, We also use weigh the individual observations with the inverse of the number firms from the corresponding country. *, **, *** indicate significance at the 10, 5, and 1%, respectively.

	Panel A: All Developing Countries				Panel B: Developing Countries Excluding China			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>Civil</i>	0.0048 (0.0086)	0.0079 (0.0078)	-0.0082 (0.0100)	-0.0127 (0.0105)	0.0033 (0.0096)	0.0053 (0.0086)	-0.0096 (0.0128)	-0.0136 (0.0131)
<i>Socialist</i>	0.0246 (0.0126)*	0.0278 (0.0122)**	0.0278 (0.0128)**	0.0278 (0.0128)**	0.0229 (0.0134)*	0.0249 (0.0127)**	0.0272 (0.0135)**	0.0275 (0.0136)**
<i>Legal Formalism</i>		-0.021 (0.0058)***	-0.0441 (0.0085)***	-0.0488 (0.0093)***		-0.0215 (0.0059)***	-0.0444 (0.0088)***	-0.0491 (0.0096)***
<i>CR</i>			-0.0218 (0.0070)***	-0.018 (0.0071)**			-0.0221 (0.0075)***	-0.0182 (0.0077)**
<i>ADR</i>			0.0057 (0.0021)***	0.0067 (0.0024)***			0.0052 (0.0031)*	0.0065 (0.0034)*
<i>Financial Freedom</i>				0.0007 (0.0004)*				0.0007 (0.0004)*
<i>Firm Size</i>	-0.0119 (0.0024)***	-0.0115 (0.0023)***	-0.013 (0.0024)***	-0.013 (0.0024)***	-0.0117 (0.0025)***	-0.0112 (0.0024)***	-0.013 (0.0025)***	-0.013 (0.0025)***
$\ln(GDPPC)$	0.0103 (0.0055)*	0.0072 (0.0052)	0.0103 (0.0064)	0.008 (0.0064)	0.0099 (0.0057)*	0.0063 (0.0053)	0.0102 (0.0064)	0.008 (0.0064)
Nb. of Firms	1435	1435	1375	1375	1065	1065	1005	1005

Table VII
Institutional Arrangements and Corporate Risk-Taking using *Risk2*

The dependent variable is *Risk2*, or within-country earnings volatility $\sigma_{i,c}$ to proxy for firm risk-taking, calculated following JLY (2008) as the standard deviation of the difference between each firm's yearly EBITDA/Total Assets and the country average EBITDA/Total Assets for the corresponding year over the period 1997-2007. We include only firms for which there are at least five annual observations on EBITDA/Assets. *Socialist* and *Civil* are dummy variables for countries with Socialist and Civil legal origins, respectively, with Common Law being the omitted category; *Legal Formalism* is a proxy for judicial efficiency; *CR* and *ADR* represent creditor rights and anti-director rights, respectively, for creditor and shareholder investor protection. *Financial freedom* is an indicator of relative openness of banking and financial systems; *Firm Size* is measured as the natural logarithm of firm assets; and $\ln(GDPPC)$ is the natural logarithm of GDP per capita. Panel A covers the entire sample of firms across countries in 27 developing countries, and Panel B excludes Chinese firms which dominate the number of firms in our sample. We report parameter estimates with robust standard errors clustered by country in parentheses to account for potential within-country correlation in the residuals. We also use weight the individual observations with the inverse of the number firms from the corresponding country. *, **, *** indicate significance at the 10, 5, and 1%, respectively.

	Panel A: All Developing Countries				Panel B: Developing Countries Excluding China			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>Civil</i>	0.0098 (0.0055)*	0.012 (0.0058)**	-0.0048 (0.0073)	-0.0087 (0.0076)	0.0092 (0.0058)	0.0111 (0.0061)*	-0.007 (0.0092)	-0.0103 (0.0095)
<i>Socialist</i>	0.0233 (0.0091)**	0.0266 (0.0092)***	0.0251 (0.0099)**	0.0249 (0.0095)***	0.0224 (0.0095)**	0.0253 (0.0096)***	0.0234 (0.0107)**	0.0235 (0.0104)**
<i>Legal Formalism</i>		-0.0117 (0.0036)***	-0.0297 (0.0063)***	-0.0336 (0.0065)***		-0.0118 (0.0036)***	-0.0299 (0.0065)***	-0.0337 (0.0068)***
<i>CR</i>			-0.0203 (0.0074)***	-0.0172 (0.0076)**			-0.0207 (0.0077)***	-0.0175 (0.0079)**
<i>ADR</i>			0.0006 (0.0024)	0.0015 (0.0025)			0.0000 (0.0037)	0.001 (0.0038)
<i>Financial Freedom</i>				0.0006 (0.0002)***				0.0006 (0.0002)***
<i>Firm Size</i>	-0.0064 (0.0018)***	-0.0064 (0.0018)***	-0.0071 (0.0019)***	-0.0071 (0.0019)***	-0.0062 (0.0019)***	-0.0061 (0.0019)***	-0.0068 (0.0020)***	-0.0068 (0.0020)***
$\ln(GDPPC)$	0.0022 (0.0038)	0.0011 (0.0037)	0.0072 (0.0036)**	0.0053 (0.0033)	0.0019 (0.0040)	0.0008 (0.0040)	0.007 (0.0036)*	0.0052 (0.0033)
Nb. of Firms	1433	1433	1373	1373	1063	1063	1003	1003

Table VIII

Institutional Arrangements, Leverage, and Risk-Taking using Firm-Level Corporate Governance Indicators

The dependent variables are *Leverage*, *Risk1*, and *Risk2*, respectively, in Panels A, B, and C. *Leverage* is the ratio of total debt to total assets, *Risk1* is corporate earnings volatility, and *Risk2* is within-country earnings volatility to proxy for firm risk-taking following JLY (2008) over the period 1997-2007. We include only firms for which there are at least five annual observations on EBITDA/Assets. *Socialist* and *Civil* are dummy variables for countries with Socialist and Civil legal origins, respectively, with Common Law being the omitted category; *Legal Formalism* is a proxy for judicial efficiency; *CR* and *ADR* represent creditor rights and anti-director rights, respectively, for creditor and shareholder investor protection. *CG* denotes the firm-level corporate governance score from the CLSA emerging markets corporate governance database, and *GC*ADR* is the cross product of the firm and country level shareholder protection variables. *Financial freedom* is an indicator of relative openness of banking and financial systems; *Firm Size* is measured as the natural logarithm of firm assets; and *ln(GDPPC)* is the natural logarithm of GDP per capita. We report parameter estimates with robust standard errors clustered by country in parentheses to account for potential within-country correlation in the residuals. Panel A regressions are run with firm random effects, and Panel B and C regressions are weighted by the inverse of the number firms from the corresponding country. *, **, *** indicate significance at the 10, 5, and 1%, respectively.

	Panel A: <i>Leverage</i>			Panel B: <i>Risk1</i>			Panel C: <i>Risk2</i>		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
<i>Civil</i>	0.0057 (0.0307)	0.091 (0.0461)**	0.09 (0.0463)*	0.0184 (0.0128)	-0.0259 (0.0140)*	-0.0249 (0.0131)*	0.0071 (0.0091)	-0.0359 (0.0119)***	-0.0347 (0.0121)***
<i>Socialist</i>	-0.2011 (0.0830)**	-0.1679 (0.0882)*	-0.1693 (0.0889)*	0.0303 (0.0165)*	-0.0289 (0.0225)	-0.0245 (0.0215)	0.0371 (0.0195)*	0.0414 (0.0186)**	0.0369 (0.0199)*
<i>Legal Formalism</i>	0.0236 (0.0211)	0.0771 (0.0273)***	0.0782 (0.0281)***	-0.0148 (0.0061)**	-0.0358 (0.0071)***	-0.0334 (0.0076)***	-0.0163 (0.0058)***	-0.0348 (0.0082)***	-0.0329 (0.0092)***
<i>CR</i>		0.0983 (0.0324)***	0.0985 (0.0325)***		-0.0367 (0.0096)***	-0.0348 (0.0088)***		-0.0297 (0.0109)***	-0.0278 (0.0111)**
<i>ADR</i>		-0.0034 (0.0102)	-0.0156 (0.0439)		0.0093 (0.0019)***	-0.0031 (0.0111)		0.0077 (0.0028)***	-0.0007 (0.0201)
<i>CG</i>	-0.0012 (0.0009)	-0.0006 (0.0010)	-0.0016 (0.0038)	-0.0001 (0.0003)	-0.001 (0.0004)**	-0.002 (0.0008)**	-0.0001 (0.0003)	-0.0012 (0.0004)***	-0.0018 (0.0016)
<i>CG*ADR</i>			0.0002 (0.0008)			0.0002 (0.0002)			0.0002 (0.0004)
<i>Financial Freedom</i>	0.0005 (0.0004)	0.0002 (0.0005)	0.0002 (0.0005)	0.0004 (0.0002)*	0.0011 (0.0003)***	0.001 (0.0003)***	0.0005 (0.0003)	0.0016 (0.0003)***	0.0015 (0.0004)***
<i>Firm Size</i>	0.0097 (0.0050)*	0.013 (0.0053)**	0.0129 (0.0054)**	-0.0042 (0.0018)**	-0.0076 (0.0016)***	-0.0077 (0.0016)***	-0.0028 (0.0021)	-0.006 (0.0023)**	-0.006 (0.0023)**
<i>ln(GDPPC)</i>	-0.0361 (0.0102)***	-0.0501 (0.0118)***	-0.0503 (0.0118)***	0.0016 (0.0035)	0.0142 (0.0032)***	0.0133 (0.0033)***	0.0041 (0.0052)	0.0183 (0.0065)***	0.0172 (0.0061)***

Table IX
Firm Distribution by Exchange

The table lists the frequency distribution of firms in developing countries across the exchanges where they are listed.

Exchange	Frequency	Percent
Amman	10	0.36
Bangkok	127	4.57
Berlin	146	5.25
Bogota	2	0.07
Bombay	248	8.91
Buenos Aires	10	0.36
Cairo	11	0.4
Caracas	8	0.29
Casablanca	4	0.14
Colombo	3	0.11
Frankfurt	113	4.06
Hong Kong	27	0.97
Indonesia	70	2.52
Istanbul	53	1.91
Johannesburg	108	3.88
KOSDAQ	211	7.58
Karachi	25	0.9
Korea Stock Exchange	94	3.38
Kuala Lumpur	183	6.58
Kuala Lumpur 2nd. Board	117	4.21
Kuala Lumpur MESDAQ	57	2.05
Lima	27	0.97
Lithuania	2	0.07
London	6	0.22
Luxembourg	1	0.04
Madrid SIBE	15	0.54
Mexico	32	1.15
Munich	6	0.22
NASDAQ	2	0.07
Namibian	2	0.07
National India	87	3.13
New York	10	0.36
Nigeria	5	0.18
Non NASDAQ OTC	60	2.16
Paris-SBF	1	0.04
Philippine Stock Exchange	31	1.11
Russian Trading System	39	1.4
SEAQ International	7	0.25
Santiago	35	1.26
Sao Paulo	168	6.04
Shanghai	288	10.35
Shenzhen	244	8.77
Singapore	4	0.14
Singapore Catalist	1	0.04
Stuttgart	15	0.54
TSX Ventures	1	0.04
Thailand	33	1.19
Tokyo Stock Exchange	2	0.07
XETRA	29	1.04
Zimbabwe	2	0.07
Total	2,782	100

Table X
Institutional Arrangements, Leverage, and Risk Taking

The dependent variables are *Leverage*, *Risk1*, and *Risk2*. *Leverage* is the ratio of total debt to total assets, *Risk1* is corporate earnings volatility, and *Risk2* is within-country earnings volatility to proxy for firm risk-taking following JLY (2008) over the period 1997-2007. We include only firms for which there are at least five annual observations on EBITDA/Assets. *Socialist* and *Civil* are dummy variables for countries with Socialist and Civil legal origins, respectively, with Common Law being the omitted category; *Legal Formalism* is a proxy for judicial efficiency; *CR* and *ADR* represent creditor rights and anti-director rights, respectively, for creditor and shareholder investor protection. *Financial freedom* is an indicator of relative openness of banking and financial systems; *Developed Exchange* is a dummy variable to designate that the firm is listed on an exchange in a developed country. *Firm Size* is measured as the natural logarithm of firm assets; and $\ln(GDPPC)$ is the natural logarithm of GDP per capita. We report parameter estimates with robust standard errors clustered by country in parentheses to account for potential within-country correlation in the residuals. *Leverage* regressions are run with firm random effects, and *Risk1* and *Risk2* regressions are weighted by the inverse of the number firms from the corresponding country. *, **, *** indicate significance at the 10, 5, and 1%, respectively.

	<i>Leverage</i>	<i>Risk1</i>	<i>Risk2</i>
<i>Civil</i>	-0.0164 (0.0105)	-0.0140 (0.0106)	-0.0095 (0.0078)
<i>Socialist</i>	-0.0570 (0.0177)***	0.0266 (0.0131)**	0.0244 (0.0094)***
<i>Legal Formalism</i>	0.0100 (0.0059)*	-0.0460 (0.0099)***	-0.0316 (0.0067)***
<i>CR</i>	-0.0142 (0.0070)**	-0.0197 (0.0072)***	0.0008 (0.0025)
<i>ADR</i>	0.0166 (0.0018)***	0.0058 (0.0022)***	-0.0182 (0.0074)***
<i>Financial Freedom</i>	-0.0003 (0.0001)**	0.0006 (0.0002)*	0.0005 (0.0002)**
<i>Developed Exchange</i>	-0.0104 (0.0090)	0.0211 (0.0107)**	0.0169 (0.0078)**
<i>Firm Size</i>	0.0092 (0.0016)***	-0.0146 (0.0025)***	-0.0084 (0.0017)***
$\ln(GDPPC)$	-0.0171 (0.0032)***	0.0094 (0.0066)***	0.0063 (0.0034)***
Nb. of Firms	2701	1375	1373

Table XI
Descriptive Statistics by Sector

The table shows average figures per sector. *Firm Size* and *Market Capitalization* are in thousand USD, and *Firm Growth*, *Risk1* and *Risk2* are in percent. Data are for listed firms retrieved from DataStream over 1997-2007. Table 1 provides more details on the calculation of these variables.

<i>Sector</i>	<i>Firm Size</i>	<i>Market Cap</i>	<i>Firm Growth</i>	<i>Leverage</i>	<i>Risk 1</i>	<i>Risk 2</i>
Alternative Energy	1,138,408	703,260	79.09	22.45	7.27	7.20
Automobiles & Parts	278,474	223,233	18.97	25.41	7.24	4.37
Beverages	1,417,997	2,233,445	10.85	20.25	5.62	5.18
Chemicals	367,742	367,950	17.51	23.29	5.52	3.34
Construction & Materials	559,969	515,483	19.78	23.33	7.92	4.32
Electricity	3,084,829	1,988,802	12.27	26.44	5.75	4.56
Electronic & Electrical Equipment	126,765	214,468	19.91	20.80	7.13	4.05
Equity Investment Instruments	93,664	60,686	-3.37	23.55	52.59	10.88
Food & Drug Retailers	39,400	50,300	19.78	21.22	3.02	3.16
Food Producers	293,295	323,505	18.66	27.19	5.61	3.83
Forestry & Paper	41,000	28,400	11.71	29.38	4.47	3.71
Gas, Water & Multi-utilities	1,428,172	784,383	14.38	24.14	4.76	3.61
General Industrials	616,410	412,628	12.00	20.93	6.32	4.76
General Retailers	860,626	878,877	25.87	21.10	6.83	4.74
Health Care Equipment & Services	159,882	224,845	25.33	19.10	4.70	3.13
Household Goods & Home Construction	196,473	297,377	17.67	22.03	6.32	5.06
Industrial Engineering	269,794	303,914	22.16	18.79	6.37	3.06
Industrial Metals & Mining	1,373,659	1,408,368	23.33	25.70	7.31	4.33
Industrial Transportation	95,900	56,800	18.76	25.44	5.85	4.62
Leisure Goods	208,873	176,667	9.21	18.16	17.94	7.31
Life Insurance	203,639	335,142	5.52	8.88	1.58	1.94
Media	436,452	670,756	17.87	18.68	11.49	4.42
Mining	756,379	2,150,513	26.31	18.62	14.57	5.75
Mobile Telecommunications	3,900,746	6,535,270	12.67	28.83	9.30	7.31
Nonlife Insurance	877,799	491,390	15.94	6.44	2.74	0.90
Oil & Gas Producers	16,800,000	13,400,000	11.82	23.21	5.45	5.58
Oil Equipment & Services	1,207,192	786,512	24.96	25.73	5.54	0.48
Personal Goods	645,000	152,989	18.28	27.49	7.84	4.16
Pharmaceuticals & Biotechnologies	138,165	314,012	17.02	20.57	6.74	4.36
Real Estate Investment & Services	335,107	438,337	31.99	23.63	6.19	3.20
Real Estate Investment Trusts	249,016	185,665	24.48	18.31	9.53	1.14
Software & Computer Services	140,138	193,667	18.89	15.06	23.21	3.91
Support Services	168,042	193,374	15.59	19.15	7.46	5.13
Technology Hardware & Equipment	251,328	392,144	20.10	19.08	7.34	3.01
Tobacco	1,599,033	2,507,202	49.49	12.98	4.02	3.33
Travel & Leisure	665,165	593,298	20.72	24.32	5.54	3.82
<i>Average</i>	<i>1,139,570</i>	<i>1,127,602</i>	<i>20.15</i>	<i>21.38</i>	<i>8.53</i>	<i>4.27</i>

Table XII
Institutional Arrangements and Firm Leverage, Analysis by Sector

The table shows the significance of estimation results when the dependent variable is *Leverage* or the ratio of total debt to total assets over the period 1997-2007. Regressions are similar to those in Table V, except that they are run by sector. *, **, and *** indicate significant results at the 10, 5, and 1%, respectively. Shaded cells indicate that coefficient estimates are of opposite sign to those in Table V.

<i>Sector</i>	<i>Civil</i>	<i>Socialist</i>	<i>Legal Formalism</i>	<i>CR</i>	<i>ADR</i>
Alternative Energy					
Automobiles & Parts	***	*		***	***
Beverages					
Chemicals		***			***
Construction & Materials					*
Electricity		***			
Electronic & Electrical Equipment					
Equity Investment Instruments					
Food & Drug Retailers		*	***	***	***
Food Producers					***
Forestry & Paper			*		
Gas, Water & Multi-utilities					
General Industrials					***
General Retailers	*		***		
Health Care Equipment & Services					
Household Goods & Home Construction					
Industrial Engineering	***				
Industrial Metals & Mining		**	***	***	***
Industrial Transportation	*	**			***
Leisure Goods			***		***
Life Insurance					***
Media					*
Mining					
Mobile Telecommunications					
Nonlife Insurance					
Oil & Gas Producers		***			
Oil Equipment & Services		***			
Personal Goods				***	***
Pharmaceuticals & Biotechnologies					***
Real Estate Investment & Services	***				***
Real Estate Investment Trusts	*		***	***	***
Software & Computer Services					
Support Services				*	
Technology Hardware & Equipment					**
Tobacco				**	
Travel & Leisure					

Table XIII

Institutional Arrangements and Corporate Risk-Taking using *RiskI*, Analysis by Sector

The table shows the significance of estimation results when the dependent variable is *RiskI* or corporate earnings volatility σ_t to proxy for firm risk-taking, calculated as the standard deviation of the EBITDA/Assets over the period 1997-2007. Regressions are similar to those in Table VI, except that they are run by sector. *, **, and *** indicate significant results at the 10, 5, and 1%, respectively. Shaded cells indicate that coefficient estimates are of opposite sign to those in Table VI.

<i>Sector</i>	<i>Civil</i>	<i>Socialist</i>	<i>Legal Formalism</i>	<i>CR</i>	<i>ADR</i>
Alternative Energy					
Automobiles & Parts				**	
Beverages					
Chemicals					
Construction & Materials					
Electricity	***	*	***	***	
Electronic & Electrical Equipment			***		
Equity Investment Instruments					
Food & Drug Retailers	*				***
Food Producers		*	***		
Forestry & Paper					
Gas, Water & Multi-utilities					
General Industrials	***		***	***	*
General Retailers					
Health Care Equipment & Services					
Household Goods & Home Construction	***			***	
Industrial Engineering	***			***	
Industrial Metals & Mining			**		
Industrial Transportation	***			**	
Leisure Goods				*	**
Life Insurance	**				
Media					
Mining	*	*		**	**
Mobile Telecommunications					
Nonlife Insurance					
Oil & Gas Producers					
Oil Equipment & Services					
Personal Goods					
Pharmaceuticals & Biotechnologies			**		
Real Estate Investment & Services					
Real Estate Investment Trusts					
Software & Computer Services					
Support Services	**		***		
Technology Hardware & Equipment					
Tobacco					
Travel & Leisure					***

Table XIV

Institutional Arrangements and Corporate Risk-Taking using *Risk2*, Analysis by Sector

The table shows the significance of estimation results when the dependent variable is *Risk2* or within-country earnings volatility $\sigma_{i,c}$ to proxy for firm risk-taking, calculated following JLY (2008) over the period 1997-2007. Regressions are similar to those in Table VII, except that they are run by sector. *, **, and *** indicate significant results at the 10, 5, and 1%, respectively. Shaded cells indicate that coefficient estimates are of opposite sign to those in Table VII.

<i>Sector</i>	<i>Civil</i>	<i>Socialist</i>	<i>Legal Formalism</i>	<i>CR</i>	<i>ADR</i>
Alternative Energy					
Automobiles & Parts	**	***		*	***
Beverages					
Chemicals		*	*	***	
Construction & Materials					
Electricity	***	*	***	***	
Electronic & Electrical Equipment			***		
Equity Investment Instruments					
Food & Drug Retailers		***			
Food Producers					*
Forestry & Paper			**	***	
Gas, Water & Multi-utilities	**		**		
General Industrials			***	***	
General Retailers					
Health Care Equipment & Services			*	*	
Household Goods & Home Construction	**				*
Industrial Engineering					
Industrial Metals & Mining			***		*
Industrial Transportation	***	***		*	*
Leisure Goods				*	*
Life Insurance					
Media					
Mining	***	***	***	***	
Mobile Telecommunications					
Nonlife Insurance					
Oil & Gas Producers	***	**			***
Oil Equipment & Services					
Personal Goods				**	
Pharmaceuticals & Biotechnologies			***		***
Real Estate Investment & Services	**	*		**	
Real Estate Investment Trusts					
Software & Computer Services					
Support Services			***		
Technology Hardware & Equipment					
Tobacco					
Travel & Leisure	*	**	**	**	***

