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PII: S1544-6123(17)30427-0
DOI: 10.1016/j.frl.2017.09.022
Reference: FRL 782

To appear in: *Finance Research Letters*

Received date: 17 July 2017
Revised date: 21 September 2017
Accepted date: 30 September 2017

Please cite this article as: Simon Döring , Wolfgang Drobetz , Malte Janzen , Iwan Meier , Global Cash Flow Sensitivities, *Finance Research Letters* (2017), doi: 10.1016/j.frl.2017.09.022

Highlights

- Financial structure, investor rights, and legal environment affect the relation between cash flow and firms' investment and financing behavior.
- Firms from countries with a strong institutional framework have higher financing-cash flow sensitivi-ties.
- Investment-cash flow sensitivities are higher for firms in countries with a weaker institutional frame-work.

Global Cash Flow Sensitivities

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First version: July 2017

This draft: October 2017

Abstract

We examine the role of a country's institutional framework for investment and financing activities. A country's financial structure, investor rights, and legal environment are important determinants of the relation between cash flow and firms' investment and financing behavior. Firms from countries with a strong institutional framework exhibit higher financing-cash flow sensitivities. These firms are more likely to substitute a cash flow shortfall with issuing equity. Conversely, investment-cash flow sensitivities are higher for firms in countries with a weaker institutional framework.

Keywords: Cash flow sensitivity, financial development, law and finance
JEL Classification Codes: G20, G31, G38

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I. Introduction

A large strand of literature suggests that the efficient allocation of capital is of major importance for economic growth, and that the best way to achieve an efficient capital allocation is through financial and legal development. Formal financial markets and associated institutions improve the capital allocation process and contribute to economic growth. For example, Levine and Zervos (1998) find that both the size of the banking sector and the extent of stock market activity are related to future economic growth. Wurgler (2000) shows that financial markets improve the real economy by better allocating investment. Relative to countries with small financial markets, financially developed countries boost investment more in their growing industries, and cut it more in declining industries. Love (2003) notes that financial development affects economic growth by reducing financial constraints. Similarly, Ayyagari et al. (2008, 2011) document that constrained access to finance hinders innovation, and obstacles to raise external finance restrain firm growth. Beck et al. (2005) and Beck et al. (2006) conclude that the financial and institutional development weakens the constraining effects of financial and legal obstacles on capital allocation efficiency.

We provide a deeper understanding of the effect a country's economic, financial, and legal development has on firms' access to finance. Access to finance is examined by comparing how different institutional frameworks affect the sensitivities of firms' investment and financing decisions to cash flow, with particular emphasis on financing-cash flow sensitivities. This approach is in contrast to the prior literature on cash flow-sensitivities, which has mainly focused on the relation between investment and cash flow. Fazzari et al. (1988) were the first to report that investment spending of U.S. firms is positively related to their cash flow, which has usually been interpreted as an indication of constrained access to capital. Their results have been challenged methodologically (Erickson and Whited, 2000, 2012; Chen and Chen, 2012). We argue that another main critique is that single-equation models, by focusing exclusively on the investment-cash flow sensitivity but neglecting the financing-cash flow sensitivities, only provide an indirect test of financial constraints.

Recently, scholars have started to study the direct effect cash flow has on firms' financing choices, incorporating additional sources and uses of funds. Gatchev et al. (2010) show that

firms mainly use debt to offset a shortfall in cash flow, but they cannot find a significant investment-cash flow sensitivity. McLean et al. (2012), Chang et al. (2014), and Lewellen and Lewellen (2016) report significant investment- and financing-cash flow sensitivities.

To the best of our knowledge, our work is the first to examine the effect a country's institutional framework has on both the investment-cash flow and the financing-cash flow sensitivities. Using Lewellen and Lewellen's (2016) cash flow sensitivity equations framework, we incorporate all sources and uses of funds to obtain a comprehensive view on the implications of a one dollar shortfall in cash flow. Prior studies examined the impact of country-level characteristics on the relation between investment and cash flow, but are incomplete in that they ignored the link between financing and cash flow. Islam and Mozumdar (2007), Francis et al. (2013), Larkin et al. (2017), and Moshirian et al. (2017) all find a stronger link between investment and cash flow in less developed countries with poor firm- or country-level governance. However, these studies do not analyze firms' financing-cash flow sensitivities.

II. Hypotheses development

Previous research has identified institutional development as an important determinant of economic growth. King and Levine (1993) and Wurgler (2000), for instance, show that financial development promotes efficient resource allocation and economic growth. Beyond financial development, the model by Egli et al. (2006) illustrates that countries with weak accounting practices, creditor rights, and legal enforcement tend to grow more slowly. Moreover, this relation between institutional development and economic growth has been linked to finance. For example, Carlin and Mayer (2003) find that the impact of the structure of the financial system on industry growth is stronger in industries that rely more on external equity.

Building on these findings, we examine the role access to external finance has in translating institutional development into economic growth. We hypothesize that a country's institutional framework affects firms' financing conditions, which in turn becomes visible in their investment- and financing-cash flow sensitivities. A strong institutional framework facilitates access to external finance when a firm suffers from a shortfall in cash flow. Conversely, firms will face more difficulties in substituting cash flow with external financing in countries with a

weak institutional framework. Moreover, restricted access to external sources of finance likely affects firms' investment behavior as well. To analyze the effect of a country's institutions on investment and financing behavior, we compare firms' investment- and financing-cash flow-sensitivities across different institutional frameworks. In doing so, we measure the quality of a country's institutional framework along three dimensions: (1) economic development, (2) financial system, and (3) legal system.

While there is still an ongoing debate how financial constraints can be properly measured, we argue that differences in access to external finance should become apparent in financing-cash flow sensitivities. Already Gatchev et al. (2010) emphasize that the presence of financial constraints becomes evident not in firms' investment-cash flow sensitivities, but rather in the sensitivity of financing variables towards variations in cash flow. Therefore, we do not rely solely on the investment-cash flow sensitivity, which measures financial constraints only indirectly, but focus on the direct effect cash flow has on firms' financing choices. We note that popular indices that have been used to measure financial constraints such as the KZ-index (Kaplan and Zingales, 1997; Lamont et al., 2001), the WW-index (Whited and Wu, 2006), and the size-age-index (Hadlock and Pierce, 2010) are not unequivocal markers of a firm's ability to raise external funds, but capture other unobservable differences across firms, as has been forcefully demonstrated by Farre-Mensa and Ljungqvist (2016).

To shed light on the mechanisms through which the institutional framework affects firms' investment- and financing-cash flow-sensitivities, we split our sample into several subgroups. First, we compare firms from advanced and developing economies. We build on previous findings that capital markets in advanced economies are deeper and provide firms access to a broader variety of financing instruments compared to developing economies' financial markets (Bekaert and Harvey, 2003). Lower economic development should thus be associated with lower financing-cash flow sensitivities and a higher investment-cash flow sensitivity.

Second, we categorize countries according to various financial system criteria. Allen and Gale (2000) argue that the promotion of either bank or market financing through the financial system shapes firms' opportunities to access different sources of finance. In particular, firms' equity issue-cash flow sensitivity should be higher in market-based systems, whereas the debt

issue-cash flow sensitivity should be higher in bank-based systems. Furthermore, following Langfield and Pagano (2016), who find that prioritizing bank financing to market financing tends to be associated with lower economic growth, we expect a higher investment-cash flow sensitivity in bank-based systems compared to market-based systems.

We further consider Levine's (2002) 'financial services view' that stresses the importance of the overall financial development for economic growth. More specifically, Love (2003) emphasizes that financial market development is an important factor for firms' access to finance. Therefore, we expect lower financing-cash flow sensitivities and a higher investment-cash flow sensitivity in less efficient financial markets.

La Porta et al. (1997) find that investor rights have a positive effect on capital market development. Wurgler (2000) documents that the allocation of capital is more efficient when minority shareholder protection is high. McLean et al. (2012) show that investment is less sensitive to cash flow in countries with strong investor protection, because in these countries low cash flow firms issue more equity and debt to overcome financing shortfalls. We thus expect the equity issue-cash flow sensitivity to be lower in countries with weak shareholder rights, and the debt issue-cash flow sensitivity to be lower in countries with weak creditor rights. Conversely, constrained access to debt in countries with weak creditor rights will lead firms to rely more on equity issues. We further conjecture that both weak shareholder rights and weak creditor rights entail a higher investment-cash flow sensitivity.

Third, we focus on the legal framework. La Porta et al. (1997, 1998) argue that financial markets in common law countries are more investor friendly and more developed than in civil law countries. Francis et al. (2013) report a higher investment-cash flow sensitivity in emerging countries with weak legality. Therefore, we expect lower financing-cash flow sensitivities and a higher investment-cash flow sensitivity in civil law countries and countries with weak legality compared to common law countries and countries with strong legality, respectively.

Following Castanias (1983), who shows that firms from industries with a high probability of default tend to have lower leverage ratios, we expect that high bankruptcy costs are associated with lower financing-cash flow sensitivities and a higher investment-cash flow sensitivity. Finally, Rajan and Zingales (1998) report that the growth of industries that are dependent

on external finance is strongly related to the quality of accounting standards. Hail and Leuz (2006) find that firms from countries with stronger disclosure requirements and securities regulation as well as stricter law enforcement have lower costs of capital. Hay et al. (1996) show that high accounting standards facilitate efficient contracting as they help information to be verified more easily. Poor accounting standards should thus be associated with weaker financing-cash flow sensitivities and a higher investment-cash flow sensitivity.

We apply all characteristics discussed above to measure the quality of a country's institutional framework and formulate two testable hypotheses. Our first hypothesis refers to financing-cash flow sensitivities:

Hypothesis 1: Firms from countries with a weak institutional framework exhibit lower financing-cash flow sensitivities than firms from countries with a strong institutional framework.

If a poor institutional framework implies constrained access to capital markets, firms are more dependent on internal cash flow to implement their investment. In case of a drop in cash flow, firms from countries with a weak institutional framework will more likely cut their investment spending. The second hypothesis thus refers to the investment-cash flow sensitivity:

Hypothesis 2: Firms from countries with a weak institutional framework exhibit a higher investment-cash flow sensitivity than firms from countries with a strong institutional framework.

III. Data and methodology

A. Data

Accounting data and stock returns for firms from 103 countries over the 1996-2015 period are from Compustat.[1] We omit observations with missing data for net assets or stock returns, financial firms, and the smallest half of firms in terms of average net assets in each country.[2]

[1] Data for the institutional framework variables are taken from the following sources. Economic development: IMF World Economic Outlook and the CIA World Factbook; financial system and financial market efficiency:

Following Lewellen and Lewellen (2016), we define cash flow as income before extraordinary items plus depreciation plus other operating cash flow, and investment as total changes in fixed assets adjusted for non-cash components. Extending Lewellen and Lewellen's (2016) approach, we distinguish between short-term and long-term debt to investigate whether the effect of cash flow shocks is uniform along the maturity of debt. We scale flow variables by average net assets during the financial year, and level variables by net assets at the end of the financial year. Net assets are defined as total assets minus non-debt current liabilities. To account for its highly right skewed distribution, the market-to-book ratio is winsorized at the 1st percentile and trimmed at the 95th percentile annually.[3] All other variables are winsorized annually at their 1st and 99th percentiles. Table I reports descriptive statistics.

[Insert Table I here]

B. Methodology

To investigate the link between investment, financing, and cash flow, we build on the cash flow-sensitivity equations from the third model in Lewellen and Lewellen (2016), which incorporate all uses and sources of funds. All investment and financing variables are regressed on cash flow, a proxy for Tobin's (1969) *q*, and additional control variables. The following model enables us to directly measure how cash flow of firm i at time t affects the different sources and uses of funds:

$$Channel_{k,i,t} = \gamma_0 + \gamma_1 CF_{i,t} + \gamma_2 M/B_{i,t-1} + \sum_j \beta_j x_{j,i,t} + u_{i,t}, \quad (1)$$

where $Channel_{k,i,t}$ denotes channel *k* through which a firm can spend cash flow: investment, the change in short-term debt, the change in long-term debt, equity issues, dividend

Levine (2002); investor rights, legal tradition, legality factors, and accounting standard: La Porta et al. (1998); bankruptcy costs: Djankov et al. (2008).

[2] Excluding the smallest half of firms is similar to the approach used by Lewellen and Lewellen (2016), who lose approximately half of the firms by excluding firms smaller than the NYSE 10th percentile.

[3] Despite the skewness of the market-to-book ratio, we repeat all our tests winsorizing market-to-book annually at the 1st and 99th percentiles and obtain qualitatively unchanged results.

payments, the change in net working capital, and the change in cash holdings. These dependent variables are separately regressed on cash flow ($CF_{i,t}$), the lagged market-to-book ratio of net assets ($M/B_{i,t-1}$, as a proxy for Tobin's q), and a set of control variables ($x_{j,i,t}$). The control variables include lagged cash flow (to control for the effect of prior-year cash flow on investment), prior-year cash holdings, and prior-year short-term and long-term debt (to control for the impact of the financial situation on investment). Current stock returns and two lags of stock returns are also included as control variables for investment opportunities. We estimate Fama-MacBeth regressions with Newey-West corrected standard errors (with two lags).[4] The coefficient of interest in equation (1) is the cash flow sensitivity, denoted as γ_1, which measures the reaction of the respective investment or financing variable to a decrease in cash flow.

Our main goal is to test how the cash flow-coefficients differ across institutional frameworks. We thus additionally incorporate interaction terms with the institutional variables:

$$Channel_{k,i,c,t} = \mu_0 + \mu_1 D_c + \mu_2 CF_{i,c,t} + \mu_3 CF_{i,c,t} D_c + \mu_4 M/B_{i,c,t-1} + \mu_5 M/B_{i,c,t-1} D_c + \sum_j \theta_j x_{j,i,c,t} + \sum_j \psi_j x_{j,i,c,t} D_c + u_{i,t}, \quad (2)$$

where D_c is a dummy variable that captures the institutional framework in country c. The coefficients of interest in equation (2) are μ_2 and μ_3. The latter coefficient measures differences between country groups. In addition, to infer the sensitivities towards changes in investment opportunities, we report γ_2 for equation (1) as well as μ_4 and μ_5 for equation (2).

For the institutional framework variables that are already binary (such as economic development), D_c takes a value of one for firms in countries with a strong institutional framework (e.g., advanced economies), and zero for firms in a weak institutional framework (e.g., developing economies). For all other institutional variables, groups are built depending on whether

[4] In line with Lewellen and Lewellen (2016), we do not use fixed effects. Because countries do not change their institutional framework in our sample, the time-invariant institutional framework is perfectly correlated with potential time-invariant unobserved effects, making the inclusion of country or firm fixed effects impossible (see Gormley and Matsa, 2013). We also note that Lewellen and Lewellen (2016) oppose to include fixed effects in their model based on U.S. data in order not to impose additional survivorship requirements (an issue which would be even more problematic in our international data with many firms being in our sample for only a short time period) and to prevent biases in the estimates (Stambaugh, 1999; Hjalmarsson, 2008).

the respective variable's index value is below or above the median value of all sample countries. For example, firms in countries with a high financial market efficiency index value score are assigned a value of one for the variable D_c, while firms in countries with a low financial market efficiency index score are assigned a value of zero.

IV. Empirical results

A. Economic development

Table II shows the cash flow and market-to-book coefficients for our full sample and for three country subsamples related to economic development. While the estimates in column 1 for the full sample and column 2 for the U.S. are from the regression in equation (1), the estimates in columns 3 and 4 are from pooled regressions in equation (2) that exclude the U.S. This latter specification allows us to examine the differences in cash flow sensitivities between countries with different levels of economic development.

In the full sample, a one dollar decrease in cash flow leads to an increase in short- and long-term debt of \$0.06 and \$0.11, respectively, additional equity issues of \$0.19, and a reduction in investments of \$0.20. In contrast, for the most developed financial market, the U.S. market, we find an investment-cash flow sensitivity that is statistically insignificant.

[Insert Table II here]

As shown in columns 3 and 4, firms in advanced economies issue significantly more equity in response to a one dollar cash flow shortfall (\$0.19 = \$0.04 + \$0.15) than firms in developing economies, where the estimate of \$0.04 is insignificant, i.e., only firms from advanced economies can raise equity to compensate for cash flow shortfalls. Moreover, the decrease of investment in response to a one dollar decrease in cash flow is significantly weaker in advanced economies (\$0.22 = \$0.30 − \$0.08 compared to \$0.30 in developing economies). Taken together, Table II supports both of our hypotheses.

B. Financial system

Table III categorizes countries according to characteristics of their financial system. We exclude U.S. firms because they would otherwise dominate the results. Firms in countries with a market-based financial system issue additional \$0.27 (\$0.30 − \$0.03) of equity in response to a one dollar decrease in cash flow. In contrast, the equity issues estimate of \$0.03 for firms in bank-based systems is insignificant. These results support our first hypothesis and are confirmed by the corresponding estimates for the financial market efficiency and shareholder rights variables. As expected, the effect is opposite for the creditor rights variable.

We also note a significantly stronger increase in long-term debt financing in response to a one dollar cash flow shortfall in bank-based systems (\$0.11) compared to market-based systems (\$0.08 = \$0.11 – \$0.03). Likewise, we observe a high long-term debt-cash flow sensitivity for firms in countries with strong creditor rights (\$0.14 = \$0.06 + \$0.08). The financial market efficiency and shareholder rights variables indicate that firms operating in institutional frameworks that constrain equity financing use long-term debt to partly compensate for the limited access to equity.

Finally, we find support for our second hypothesis. Investment reacts more strongly to a one dollar cash flow shortfall for firms in bank-based systems (\$0.32) than for firms in market-based systems (\$0.20 = \$0.32 – \$0.12). The same result is obtained for the shareholder rights variable, albeit not for the financial market efficiency and creditor rights variables.

[Insert Table III here]

C. Legal framework

Table IV shows differences in cash flow sensitivities across legal frameworks. As for legal tradition, we find significantly higher equity issues in reaction to a one dollar decrease in cash flow for firms operating in institutional frameworks with deeper capital markets (\$0.26 = \$0.32 – \$0.06 in common law countries compared to insignificant \$0.06 in civil law countries). To partly offset the constrained access to equity, firms in civil law countries use more short term-debt (\$0.07) than firms in common law countries (\$0.04 = \$0.07 – \$0.03) when

cash flow falls by one dollar. Again supporting our first hypothesis, the results are similar for the other legal framework variables. However, for long-term debt financing we do not find consistent results.

In line with our second hypothesis, firms from civil law countries cut investments more strongly in response to a one dollar cash flow shortfall ($0.34) compared to firms from common law countries ($0.17 = $0.34 – $0.17). The results for the legality and accounting standard measures are similar.

[Insert Table IV here]

V. Conclusion

We examine how the quality of a country's institutional framework affects firms' investment and financing behavior. Financing-cash flow sensitivities are generally higher for firms from countries with a strong institutional framework, while their investment-cash flow sensitivity tends to be lower compared to firms from countries with a weaker institutional framework.

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Tables

Table I
Descriptive statistics

This table reports time-series averages of the annual cross-sectional mean, median (Med.), standard deviation (Std.), 1st percentile (Min.), 99th percentile (Max.), and sample size (N) for the listed variables. Flow variables (except stock returns) are scaled by average net assets during the financial year, while level variables are scaled by net assets at the end of the financial year. All variables except M/B are winsorized annually at their 1st and 99th percentiles. M/B is winsorized at the 1st percentile and trimmed at the 95th percentile annually. Accounting and return data are obtained from the Compustat Global and Compustat North America databases. The sample consists of nonfinancial firms from 103 countries, including the U.S., that have data for net assets and stock returns for the period 1996 to 2015. For each country, firms with below-median average net assets, measured by the 2006 USD value, are excluded from the sample. The panel comprises 215,423 observations for 23,044 firms.

Variable	Description	Mean	Med.	Std.	Min.	Max.	N
Capx	Total investment in fixed assets	0.127	0.093	0.211	– 0.491	1.015	9,542
dStDebt	Change in StDebt	0.008	0.001	0.092	– 0.343	0.373	9,546
dLtDebt	Change in LtDebt	0.021	0.002	0.135	– 0.416	0.588	9,537
Issues	Share issuance	0.040	0.008	0.176	– 0.466	0.943	9,544
Div	Dividends	0.022	0.009	0.036	0.000	0.215	9,546
dCash	Change in cash holdings	0.011	0.003	0.101	– 0.315	0.449	9,545
dNWC	Change in NWC	0.008	0.005	0.124	– 0.440	0.456	9,540
CF	Prof + Depr + OthCF	0.104	0.103	0.129	– 0.408	0.492	9,467
M/B	Market-to-book asset ratio	1.502	1.244	0.840	0.409	4.384	10,134
Cash	Cash holdings	0.181	0.111	0.202	0.000	0.976	10,767
StDebt	Short-term nonoperating liabilities	0.125	0.073	0.146	0.000	0.718	10,769
LtDebt	Long-term nonoperating liabilities	0.281	0.241	0.232	0.000	1.089	10,762
Return	Annual stock return	0.147	0.014	0.696	– 0.827	3.907	10,771
Prof	Income before extraordinary items	0.032	0.046	0.145	– 0.674	0.387	9,467
Depr	Depreciation	0.056	0.048	0.041	0.000	0.236	9,546
OthCF	Other operating cash flows	0.015	0.008	0.068	– 0.211	0.349	9,546
FA	Fixed assets	0.681	0.702	0.249	0.071	1.207	10,763
NWC	Non-cash net working capital	0.137	0.113	0.219	– 0.532	0.749	10,761
dNA	Change in net assets	0.075	0.053	0.265	– 0.766	1.089	9,546
Sales	Revenues	1.387	1.076	1.244	0.001	7.189	9,544

Table II

Investment-cash flow sensitivity: cross-country differences

This table compares Fama-MacBeth coefficients of cash flow, CF_t, and lagged market-to-book ratio, M/B_{t-1}, from the regression specification in equation (1) for the full sample and the U.S. as well as equation (2) with interaction terms for economic development. The other explanatory variables from equation (1) and (2) are included in the regression estimations, but the coefficient estimates are not shown for the sake of brevity. Developing economies in column (3) serve as the baseline, and column (4) shows the difference in coefficients between advanced economies (excluding the U.S.) and developing economies. Significance levels are based on Newey-West corrected standard errors with two lags to account for possible autocorrelation and heteroscedasticity. Variable definitions and data adjustments are as in Table I. Accounting and stock return data is from Compustat Global and Compustat North America, the classification into developing and advanced economies follows the IMF's World Economic Outlook and the CIA World Factbook. The panel comprises 155,900 observations for 19,555 individual firms between 1998 and 2015. N reports the number of observations in the full sample, for U.S. firms as well as for developing and advanced economies with a value of zero and one for the dummy variable D_c, respectively. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

Dependent variable	Explanatory variable	Full sample	United States	Developing economies (baseline)	Advanced economies excl. U.S. (interaction)
		(1)	(2)	(3)	(4)
Capx	CF_t	0.20 ***	0.11	0.30 ***	– 0.08 *
	M/B_{t-1}	0.03 ***	0.03 ***	0.02 ***	0.03 ***
dStDebt	CF_t	– 0.06 ***	– 0.06 ***	– 0.08 ***	0.03
	M/B_{t-1}	0.00	0.00 ***	0.01 ***	– 0.01 ***
dLtDebt	CF_t	– 0.11 ***	– 0.18 ***	– 0.10 ***	0.02
	M/B_{t-1}	0.02 ***	0.02 ***	0.01 ***	0.01 ***
Issues	CF_t	– 0.19 ***	– 0.23 ***	– 0.04	– 0.15 ***
	M/B_{t-1}	0.04 ***	0.03 ***	0.02 ***	0.02 ***
Div	CF_t	0.05 ***	0.02 ***	0.07 ***	– 0.02 ***
	M/B_{t-1}	0.01 ***	0.00 ***	0.01 ***	0.00
dNWC	CF_t	0.10 ***	0.17 ***	0.05 **	0.01
	M/B_{t-1}	0.00 ***	0.01 ***	0.00 ***	– 0.00
dCash	CF_t	0.14 ***	0.10 ***	0.16 ***	0.01
	M/B_{t-1}	0.01 ***	0.01 ***	0.01 ***	0.00 **
N		155,900	37,774	$D_C = 0$: 36,426	$D_C = 1$: 81,700

Table III

Financial system

This table compares Fama-MacBeth coefficients of cash flow, CF_t, and lagged market-to-book ratio, M/B_{t-1}, from the regression specification in equation (2) with interaction terms for the financial system, financial market efficiency, shareholder rights, and creditor rights. The other explanatory variables from equation (2) are included in the regression estimations, but not shown for the sake of brevity. Significance levels are based on Newey-West corrected standard errors with two lags to account for possible autocorrelation and heteroscedasticity. Variable definitions and data adjustments are as in Table I. Accounting and stock return data is from Compustat Global, the financial system and financial market efficiency classification from Levine (2002), and the shareholder rights and creditor rights index from La Porta et al. (1998). The panel comprises 101,268 observations from 12,427 individual firms between 1998 and 2015, for which at least one of the four country variables is available. Firms from the U.S. are excluded from the sample. For each financial system measure, the column labeled "interaction" shows the differences in the coefficients between a weak and a strong institutional framework, as defined by the respective measure. N reports the number of observations, with a value of zero (baseline) or one (interaction) for the dummy variable D_C. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

		Financial system		Financial market efficiency		Shareholder rights		Creditor rights	
Dependent variable	Explanatory variable	bank-based (baseline)	market-based (interaction)	low (baseline)	high (interaction)	weak (baseline)	strong (interaction)	weak (baseline)	strong (interaction)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capx	CF_t	0.32 ***	– 0.12 *	0.20 ***	0.01	0.33 ***	– 0.11 **	0.21 ***	0.00
	M/B_{t-1}	0.02 ***	0.03 ***	0.04 ***	0.00	0.02 ***	0.02 ***	0.05 ***	– 0.02 ***
dStDebt	CF_t	– 0.06 ***	0.01	– 0.15 ***	0.10 **	– 0.10 ***	0.06 ***	– 0.05 ***	0.00
	M/B_{t-1}	0.00	0.00	0.01 ***	– 0.01 ***	0.00	0.00	0,00 *	0,00
dLtDebt	CF_t	– 0.11 ***	0.03 **	– 0.07 **	– 0.02	– 0.06 **	– 0.02	– 0.06 **	– 0.08 ***
	M/B_{t-1}	0.01 ***	0.01 **	0.02 ***	0.00	0.02 ***	0.00	0.02 ***	0.00
Issues	CF_t	0.03	– 0.30 ***	0.02	– 0.23 ***	0.08	– 0.32 ***	– 0.29 ***	0.20 ***
	M/B_{t-1}	0.02 ***	0.04 ***	0.02 ***	0.02 ***	0.01 *	0.04 ***	0.05 ***	– 0.03 ***
Div	CF_t	0.04 ***	0.02 ***	0.09 ***	– 0.04 ***	0.04 ***	0.01	0.06 ***	0.00
	M/B_{t-1}	0.01 ***	0.00 *	0.01 ***	– 0.00 **	0.01 ***	0.00	0.01 ***	0.00 ***
dNWC	CF_t	0.03	0.05 **	– 0.04	0.11 ***	0.07 **	– 0.02	0.07 ***	0.01
	M/B_{t-1}	0.00 *	0.00	0.01 *	– 0.00	– 0.00	0.00	0.01 **	– 0.01 **
dCash	CF_t	0.17 ***	– 0.02 *	0.19 ***	– 0.04	0.15 ***	0.00	0.14 ***	0.01
	M/B_{t-1}	0.01 ***	0.00 *	0.00	0.01 **	0.01 ***	0.00 **	0.01 ***	– 0.01 ***
N	$D_C = 0$	50,266		8,886		19,238		24,845	
	$D_C = 1$		39,324		82,301		63,960		41,651

Table IV
Legal framework

This table compares Fama-MacBeth coefficients of cash flow, CF_t, and lagged market-to-book ratio, M/B_{t-1}, from the regression specification of equation (2) with interaction terms for legal tradition, legality, bankruptcy costs, and accounting standard. The other explanatory variables from equation (2) are included in the regression estimations, but not shown for the sake of brevity. Significance levels are based on Newey-West corrected standard errors with two lags to account for possible autocorrelation and heteroscedasticity. Variable definitions and data adjustments are as in Table I. Accounting and stock return data is from Compustat Global, the legal tradition classification and the accounting standard rating from La Porta et al. (1998), and bankruptcy costs data from Djankov et al. (2008). We follow Berkowitz et al. (2003) and use principle component analysis to calculate a legality index, based on the following variables from La Porta et al. (1998): countries' judicial efficiency, rule of law, corruption, risk of expropriation, and risk of contract repudiation. The panel comprises 112,319 observations for 14,143 individual firms between 1998 and 2015, for which at least one of the four country variables is available. Firms from the U.S. are excluded from the sample. For each legal framework measure, the column labeled "interaction" shows the differences in the coefficients between a weak and a strong institutional framework, as defined by the respective measure. N reports the number of observations, with a value of zero (baseline) and one (interaction) for the dummy variable D_C. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

		Legal tradition		Legality		Bankruptcy costs		Accounting standard rating	
Dependent variable	Explanatory variable	civil law (baseline)	common law (interaction)	low (baseline)	high (interaction)	high (baseline)	low (interaction)	low (baseline)	high (interaction)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capx	CF_t	0.34 ***	– 0.17 ***	0.29 ***	– 0.08 **	0.29 ***	– 0.07	0.29 ***	– 0.08 **
	M/B_{t-1}	0.02 ***	0.03 ***	0.02 ***	0.03 ***	0.02 ***	0.02 ***	0.02 ***	0.03 ***
dStDebt	CF_t	– 0.07 ***	0.03 *	– 0.07 ***	0.03 **	– 0.10 ***	0.06 *	– 0.10 ***	0.06 **
	M/B_{t-1}	0.00 **	– 0.00 **	0.00	0.00	0.01 ***	– 0.01 ***	0.00	0.00
dLtDebt	CF_t	– 0.06 ***	– 0.04 ***	– 0.12 ***	0.04 **	– 0.09 ***	0.01	– 0.08 **	0.00
	M/B_{t-1}	0.01 ***	0.00 **	0.01 **	0.01 **	0.01 ***	0.01 ***	0.01 ***	0.01 ***
Issues	CF_t	0.06	– 0.32 ***	0.02	– 0.25 ***	– 0.05	– 0.14 ***	0.10	– 0.33 ***
	M/B_{t-1}	0.02 ***	0.03 ***	0.02 **	0.03 ***	0.02 ***	0.03 ***	0.01	0.04 ***
Div	CF_t	0.04 ***	0.02 ***	0.06 ***	– 0.01	0.07 ***	– 0.02 **	0.04 ***	0.01
	M/B_{t-1}	0.01 ***	0.00	0.01 ***	– 0.00	0.01 ***	0.00 *	0.01 ***	0.00 **
dNWC	CF_t	0.02	0.07 *	0.06 *	– 0.01	0.06 *	– 0.01	0.13 ***	– 0.08 ***
	M/B_{t-1}	0.00 ***	– 0.00	– 0.00	0.00	0.01 **	0.00	0.00	0.00
dCash	CF_t	0.19 ***	– 0.05 **	0.15 ***	0.01	0.17 ***	– 0.01	0.10 ***	0.07 ***
	M/B_{t-1}	0.01 ***	0.00 **	0.01 ***	0.00	0.00 **	0.01 ***	0.01 **	0.00 *
N	$D_C = 0$	54,606		22,919		26,103		22,943	
	$D_C = 1$		46,326		65,604		76,971		69,718