Has Investment-Cash Flow Sensitivity Disappeared Across Countries?

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ABSTRACT

This paper examines whether the phenomenon of disappearing investment-cash flow sensitivity is unique to the U.S. market. We find that in aggregate, investment-cash flow sensitivity has also declined around the world, yet there exists a substantial cross-country variation. Specifically, investment-cash flow sensitivity has remained high in countries with low GDP per capita, less credit available, high intensity of capital controls, less financially developed markets, and high cost of capital, but has disappeared in financially developed countries. These results suggest that once a country advances to a certain degree of financial and economic development, it becomes more efficient in allocating resources within the country, and financial constraints at the individual firm level become less binding. We also find that access to external equity finance is a possible channel through which financial development affects the sensitivity of investment to internal cash flow.

Keywords: Investments, Cash flow, Financing constraints; Financial development, Equity Finance

JEL Classification: G31, G32

1. Introduction

Numerous studies have examined the investment-cash flow sensitivity, but offered mixed results and conflicting interpretations of this widely documented phenomenon. Furthermore, recent research has discovered puzzling evidence that the investment-cash flow sensitivity has declined over the past fifty years and vanished in the last decade. Since the existing studies mainly focus on the U.S.,[1] it is not clear whether the disappearance of the investment-cash flow sensitivity over time is a U.S.-specific phenomenon, or an international one. This paper answers this question by examining whether investment-cash flow sensitivity has disappeared around the world.

We start by examining investment-cash flow sensitivity on a sample of 475,387 firm-year observations from 44 countries across the globe for the period of 1981-2014. We divide the whole sample period into three subperiods of almost equal length, and first perform a pooled analysis by estimating investment-cash flow sensitivity across all countries in the sample. Our findings provide strong evidence of a positive investment-cash flow sensitivity worldwide; the time trend of investment sensitivity to cash flow is generally similar to that found in the U.S. Specifically, sensitivity is high and statistically significant during the first subperiod (1981-1992) of our sample, declines substantially during the second subperiod (1993-2003), and disappears in recent years (2004-2014). Our results remain robust even after we exclude the U.S., account for research and development (R&D), as well as selling, general, and administrative (SG&A) expenses as part of the investment policy, and also perform separate analyses across different industry sectors.

We then ask whether the pattern is universal by repeating the analysis for each individual country, but find that there is substantial variation. On the one hand, nations such as the U.K, Ireland, and Austria have experienced a decline similar to that of the U.S.: the sensitivity is statistically and economically significant in the 1980s, has declined in the 1990s, and has become non-existent in the last decade. On the other hand, in countries such as China, Indonesia, and Venezuela, investment-cash flow sensitivity has remained high, and in some cases, has even increased

[1] See Allayannis and Mozumdar (2004), Agca and Mozumdar (2008), Brown and Petersen (2009), and Chen and Chen (2012) for evidence of a declining investment-cash flow sensitivity over time.

over time.

We next turn to examining the explanations of cross-country variation in the decline in investment-cash flow sensitivity and start with regulatory characteristics of countries that could either exacerbate or mitigate the impact of financial constraints. Legal environment of financial markets has evolved substantially over time, and even more so in common law countries. As a result, firms that operate in countries where investor protection laws have remained weak could be more sensitive to the existence of financial constraints due to high degrees of information asymmetries and contracting imperfections (McLean, Zhang, and Zhao, 2012). To proxy for legal protection, we employ a country's legal origin, disclosure requirements and liability standards, investor protection index, anti-self-dealing index (all these variables are from La Porta Lopez-de-Silanes, and Shleifer (2006) and Djankov et al. (2008)), and access index that measures the ease of firms to issue securities (Schwab et al., 1999).[2] Our empirical analysis shows that investment-cash flow sensitivity declines across all the groups, whether we look at countries with civil and common law systems, or countries with strong and weak investor protection. Thus, measures of the quality of financial legal system are unable to explain why investment-cash flow sensitivity has disappeared in some countries, but has remained stable in the others.

Since measures of a country's regulatory and legal environment are unable to explain the decline in investment-cash flow sensitivity over time, we next ask whether it is possible that the severity of financial constraints within a country could be explained by changes to its financial and economic environment. Overall, countries with larger availability of economic and financial resources, as well as more efficient reallocation of those resources within the economy, could generate positive externalities and minimize the importance of financial constraints at the individual firm level. Prior studies, such as Fazzari, Hubbard, and Petersen (1988) and Hoshi, Kashyap, and Scharfstein (1991), argue that financial constraints stem from capital market imperfections that give rise to differences between the costs of internal and external financing. If this is the case, then recent trends of worldwide globalization and financial development could have relaxed the severity of financial

[2]The definition and construction of these variables are presented in Appendix Table A.1.

constraints at the firm level and led to the disappearance of investment-cash flow sensitivity in developed countries, but not the developing ones. Conceivably, country-level characteristics still play a role in investment-cash flow sensitivity over time, but may not necessary be captured by a country's regulatory and legal environment.

To test this hypothesis, we sort countries into terciles based on their level of gross domestic product (GDP) per capita (in constant dollars of 2005) in the following way. For each subperiod, we first calculate each country's average GDP per capita. Next, we rank these country-subperiod averages from the largest to the smallest and find thresholds that split the resulting distribution into three groups of equal size. We then apply the obtained time-invariant thresholds within each sub-period and end up with nine GDP-subperiod bins. While this sorting approach results in an unequal number of countries in each bin, it has several benefits. First, it accounts for the overall trend of world-wide GDP growth. As a result, once a country reaches a certain threshold of financial and economic development, it moves to a higher tercile independently of how many other countries have moved to a higher tercile. Since GDP per capita has increased in a majority of countries throughout our sample period, there are more countries that fall into the bottom tercile of economic development in the first subperiod than countries that have low level of development in the most recent period. We then repeat the estimation of investment-cash flow sensitivity based on the cross-section of firms in each of the resulting nine bins. We find that the investment-cash flow sensitivity is stable across all subperiods in countries in the lowest GDP tercile, but experiences a steep decline in the middle and top terciles. Our results suggest that the level of a country's overall economic development is an important determinant of the investment-cash flow sensitivity pattern across countries

Since GDP could be viewed as a crude measure of economic, and especially financial, development, we repeat our analysis using alternative proxies. Specifically, we use the amount of available private credit, the size of a country's stock market (i.e., the stock market capitalization), the degree of financial openness, and the aggregate cost of equity financing.[3] Private credit captures financial

[3]The definition and construction of these measures of financial development are presented in Appendix table A.1.

instruments such as loans and trade credit, and a country's total stock market capitalization scaled by GDP measures the degree of stock market development. Financial openness reflects the intensity of capital controls, or the extent and nature of restrictions on external accounts. Finally, the aggregate cost of equity financing captures the efficiency of resource allocation in a country and its availability. We perform the analysis by allocating all country-periods into nine bins, using time-invariant thresholds of each measure of financial development, as described earlier. Based on these alternative measures of a country's financial and economic development, our findings are consistent with those obtained using the GDP measure. The investment-cash flow sensitivity remains high in countries with low levels of development, but vanishes for financially developed countries.

Next, we explore the channel through which financial development potentially affects the extent of investment-cash flow sensitivity across countries and over time. To gauge the mechanism at work, we examine whether individual firms' access to external financing changes as the country's financial markets become more developed. If financial development facilitates removal of financial barriers within a country, we should observe that more firms turn to external capital to finance their investment opportunities. The reliance on external capital will, in turn, reduce the sensitivity of investment to internally generated resources and generate the pattern of decaying sensitivity of investment to cash flow in developed countries. To test our conjecture, we perform the following two tests.

In our first test, we estimate the sensitivity of equity and debt issuances to firm-level cash flow. If firms raise more external capital when they have not generated sufficient internal funds, the sensitivity of external issuances to cash flow should be negative. Alternatively, in the presence of financial constraints, only established, or otherwise privileged , firms may enjoy access to external capital market, and therefore, their sensitivity of equity/debt issuances to internal cash flow would be insignificant, or even positive. To capture the role of financial development in establishing a viable equity financing channel, we estimate equity issues as a function of cash flow across groups of countries with various levels of financial development. The groups are constructed in the same manner as in our tests of investment-cash flow sensitivity as a function of financial development.

We find that for financially developed countries the sign of the cash flow coefficient switches from positive in the first subperiod to negative in the last two subperiods, supporting the notion that external capital has become more available to firms in need. In contrast, we find no statistically significant relationship between cash flow and external capital in less developed countries, suggesting that firms operating in economies with limited resources cannot access external capital when they need to do so.

As our second test examines the role of financial development in explaining the declining sensitivity in some countries, while not others, we re-estimate the main investment-cash flow sensitivity specification after augmenting it with variables of external financing (i.e., equity and debt issues). We find that the economic significance of the equity channel has declined (increased) in less (more) developed countries through time, further supporting the idea that financially developed countries can substitute internal sources of capital with external ones.

Finally, we explore alternative explanations of our main results. Specifically, we exploit our large cross-section of firms in both developed and developing countries to examine whether firm- rather than country-level measures of financial constraints could explain the variation in investment-cash flow sensitivity over time. We conduct several tests to capture different ways of defining firm-level financial constraints (such as Kaplan and Zingales (1997), Whited and Wu (2006), and Hadlock and Pierce (2010) indices; the amount of equity and debt raised; and the level of total payouts). We split our sample into terciles based on the level of each measure of financial constraints, and find that investment-cash flow sensitivity declines over time, and essentially disappears in the last decade across all subsamples, including the most financially constrained firms. Specifically, firms with little access to external financing experience a declining pattern in investment-cash flow sensitivity that is similar to firms with high external financing. Low payout firms have actually lower investment-cash flow sensitivity than high payout ones. Thus, our findings do not support the notion that firm-level variation in factors related to the measures of financial constraints explain our country-level findings.

Overall, our research expands prior empirical U.S.-based studies on the time trend of investment-

cash flow sensitivity to an international context.[4] Allayannis and Mozumdar (2004) find that sensitivity in the U.S. has fallen from the period of 1977-1986 to the period of 1987-1996, but offer no explanation for their finding. Agca and Mozumdar (2008) also document a big decline in sensitivity using rolling ten-year windows for a sample period of 1970-2001, and attribute their result to reduced capital market imperfections. Similarly, Ascioglu, Hegde, and McDermott (2008) show a decline in the investment sensitivity to cash flow for firms with high information asymmetry for the period 2000-2003. Brown and Petersen (2009) attribute the drop to R&D and increased availability of public equity as a source of funds (i.e., fewer financial constraints). Chen and Chen (2012) explore many possible explanations for the decline, but conclude that the decline is still a puzzle. Our results show that sensitivity also diminishes in less developed countries and in countries that adopt civil law origin, countries with lower liability standards, weaker investor protection index, weaker governance, but not in countries with low levels of financial and economic development, which leads to difficulty in accessing equity capital. Our evidence therefore suggests that the trend of disappearing cash-flow sensitivity cannot be explained by country-fixed characteristics, but rather by time-varying measures of financial development.

More broadly, our findings on the relationship between external capital and investment suggest that even for financially developed countries, the relaxation of financial constraints has been gradual over time. For example, Bekaert et al. (2016), show that developed countries have been in the process of liberalizing their capital markets throughout the 1980s and 1990s. Their finding is consistent with the declining investment-cash flow sensitivity exhibited in these countries, including the U.S. As financial constraints at the firm level become less binding in financially developed countries, firms are able to gain access to external capital and hence, no longer have to rely on internally generated funds. For comparison, emerging markets have started to experience a wave of liberalizations much later. This observation underscores the gradual process of globalization and

[4] After developing this paper, we became aware of a contemporaneous paper by Moshirian et al. (2015) that examines the determinants of cross-country and time-series variations in investment-cash flow sensitivity. Their paper closely follows McLean, Zhao, and Zhang (2012) to show that the sensitivity declines over time and that financial development drives the result. However, based on a longer sample period of 1981 to 2014 and employing a different methodology, our study differs from theirs in that we show explicitly that equity issuance is the channel through which financial development affects investment-cash flow sensitivity.

highlights the importance of implicit and explicit financial barriers faced by firms, especially in emerging markets.

The paper is organized as follows. The next section describes the empirical methodology and data. In Section 3, we establish the international evidence of investment-cash flow sensitivity and also its variation over time. Section 4 explores various plausible explanations at the country level for the disappearing investment-cash flow sensitivity, whereas Section 5 examines alternative explanations at the firm level. The final section concludes.

2. Empirical Framework and Data

In this section, we describe the empirical methodology that is employed to estimate investment-cash flow sensitivity and the data used to construct our sample.

2.1. Empirical Specification

Following the existing literature,[5] we employ the following empirical model to estimate the investment-cash flow sensitivity.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t}, \tag{1}$$

where $I_{i,t}$ is firm i's fixed investment, measured as capital expenditure scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; β_1 is the investment-q sensitivity; β_2 is the investment-cash flow sensitivity; α_i, $\alpha_{c,i}$, $\alpha_{ind,i}$, and α_t denote firm, country-year, and industry-year fixed effects, repectively.

Equation (1) postulates that a firm's investment depends not only on its investment opportunities, as proxied by Tobin's q, but also on its internally generated cash flow. Fazzari, Hubbard, and Petersen (1988) argue that when a firm relies on internal funds to finance its investment, it is financially constrained; otherwise, the firm would have access to external financing by way of equity and debt issuances.

[5] See, for example, Fazzari, Hubbard, and Petersen (1988), and Baker, Stein, and Wurgler (2003).

Recent U.S. studies show that the investment-cash flow sensitivity has been declining and disappeared in recent years. To facilitate comparison of our results with those of prior studies, we follow the latter by employing (1) as our baseline model on a sample of international firms. Specifically, we first conduct pooled regressions of equation (1) on a sample of firms from 44 countries for the entire period (1981-2014), as well as three subperiods (1981-1992, 1993-2003, and 2004-2014). Using subperiod analyses allows us to examine for any evidence of a declining investment-cash flow sensitivity in both U.S. and non-U.S. countries over time.

2.2. Sample and Descriptive statistics

Our sample is obtained from Worldscope for the period from 1981 to 2014. Worldscope contains annual firm-level data, including financial statement variables and the market value of equity. Following Baker, Stein, and Wurgler (2003) and McLean, Zhang, and Zhao (2012), we exclude financial firms and firms with negative book values of equity. We further winsorize all financial variables at the 1st and 99th percentiles in each year. Our final sample consists of 44 countries from 1981 to 2014, with 475,387 firm-year observations.

Our three main variables are investment measured as capital expenditure scaled by the lagged total assets, Tobin's q measured as total assets plus the market value of equity minus the book value of equity divided by total assets, and cash flow measured as net income plus depreciation and amortization scaled by the lagged total assets. Our sample includes only firms with non-missing main variables.

Table 1 provides descriptive statistics of the variables employed in estimating equation (1) by country and by subperiod. The last row of the table shows the aggregate mean values of each variable for all countries in our sample. For each country, we report the number of observations and mean values of the three variables: investment, Tobin's q, and cash flow by subperiod. Similar statistics for the full sample period, as well as those for subperiods of five-year windows, are shown in the online appendix, Table OA.1.

The subperiod statistics show substantial cross-country variation in the number of firm-year

observations and main variables. The total number of observations increases from 46,740 in the first subperiod to 275,874 in the last subperiod, as Worldscope's coverage of many developing countries increases substantially from the second to third subperiod. For example, the numbers of firm-year observations in China, India, and Israel increase by at least fourfold across the two subperiods.

On average, there is a gradual fall in a firm's investment and cash flow, but a rise in its Tobin's q across the entire sample period. For example, the average aggregate investment of firms relative to total assets declines from 9.1% during the first subperiod (1981-1992) to 6.7% in the last subperiod (2004-2014), and the decline is more pronounced in emerging than in developed countries. Brazil experiences the largest decline across the first and third subperiods of -32.6% (from 0.394 to 0.068), followed by Argentina and the Philippines. Investments in other developing countries, such as Chile, Turkey, and Venezuela, has dropped as well. In contrast, on average, Tobin's q increases from 1.456 in the first subperiod to 1.734 in the third subperiod, indicating increasing growth opportunities across the sample period. These observations are consistent with the evidence reported in Fu, Huang, and Wang (2012) who find that capital expenditures of firms, especially from developed markets, have declined substantially from 1980 to 2012. Their results suggest that more developed economies outsource their capital-expenditure-intensive manufacturing activities to developing markets, and that economic globalization promotes the development of production technology in developed markets.

Similar to investment, cash flow on average also declines considerably from 10.1% in the first subperiod to 1.5% in the third subperiod. Except for Chile, Denmark, Peru, and Venezuela, all the remaining 40 countries experience a decrease in cash flow; among these countries, Australia, Brazil, Sweden, the U.K., and the U.S. have an average negative cash flow in the third subperiod.

Table OA.1 shows similar patterns when we divide the entire sample period into seven subperiods. On average, investment declines from 8.9% in 1981-1985 to 5.9% in 2011-2014 and cash flow falls between 10.6% to 3.1%, correspondingly. However, q increases between 1.281 and 1.550 for the two subperiods.

In light of the declining investment and cash flow across time, it is important that our subsequent analysis evaluates the economic significance of the cash flow impact on investment.

3. Investment-cash flow sensitivity: an international puzzle

In this section, we first confirm the existence of investment-cash flow sensitivity around the world. Next, we examine whether the sensitivity has disappeared over time. We address both issues using a large sample of firms from a broad spectrum of countries. Analyzing a large international sample provides more robust evidence on whether the disappearing sensitivity is specific to the U.S., or is prevalent across both developed and developing countries.

Table 2 reports the estimates of β_1's and β_2's from firm-level panel regressions of equation (1). Throughout this study, all $t-$statistics (shown in parentheses) associated with the regression coefficients are adjusted for standard errors clustered at the country level. For robustness, we employ different investment definitions for the dependent variable. In the top panel, the dependent variable is defined as a firm's investment relative to the firm's beginning-of-period total assets, whereas in the bottom panel, it is computed as the ratio of the sum of the firm's investment and R&D spending to the firm's beginning-of-period total assets.[6] The latter definition incorporates the intangible investment of the firm; its importance has increased significantly over the last decades (see, for example, Peters and Taylor (2016)).

Results show strong international evidence of investment-q and investment-cash flow effects. On average, investment is positively and strongly associated with q and with cash flow across the entire sample period and in each of the three subperiods. The q effect on investment is fairly stable and statistically significant. For example, the coefficient of q is 0.011 (t =8.11) for the whole sample period, and ranges between 0.008 (t =21.75) and 0.018 (t =12.22). Of particular interest is the monotonically declining cash flow effect on investment. Specifically, the investment sensitivity to cash flow, as captured by β_2, drops from 0.246 (t =5.53) to 0.001 (t =0.10), with an overall effect of 0.024 (t =1.80). Figure 1 shows the declining sensitivity for all countries and for all countries

[6]The results remain qualitatively similar when we replace R&D with SG&A expenses.

excluding the U.S. and compares these graphs with that of the U.S. only. In terms of economic significance, a one-standard deviation increase in a firm's cash flow leads to a 7.8% increase in mean investment in the full sample period. A closer analysis indicates that across subperiods, a one-standard deviation increase in a firm's cash flow induces a 24.4% increase in mean investment in the first subperiod but only a 0.40% increase in mean investment in the third subperiod. Looking at economic significance is particularly important as both the dependent and independent variables have declined over time.

Arguably, our evidence of a declining investment-cash flow sensitivity could be driven by a single country or a group of countries. Prior studies have documented that the investment-cash flow sensitivity of U.S. firms has been decreasing over time (Allayannis and Mozumdar, 2004; Agca and Mozumdar, 2008; Ascioglu, Hegde, and McDermott, 2008; Brown and Petersen, 2009) and has disappeared in the past decade (Chen and Chen, 2012). Given the robust evidence of the disappearing investment-cash flow sensitivity in the U.S., as well as the relatively high proportion of U.S. firms in the international sample, it is possible that our international evidence could be driven by the presence of U.S. firms. To rule out this possibility, we exclude the U.S. from our analysis and find that the results remain materially unchanged. For example, the sensitivity, while larger in magnitude, declines significantly from the first to the second subperiod and disappears in the last subperiod. The lower panel shows the results based on the alternative expanded investment definition. The inclusion of R&D spending in our definition of investment does not qualitatively affect our key finding. The investment-cash flow sensitivities, along with their $t-$statistics, are larger than their counterparts reported in the upper panel of the table, but they exhibit the same disappearing phenomenon during the last subperiod.

For further robustness, Table 3 reports results by country and type of markets (developed vs. emerging), as well as results by 11-year subperiod, whereas Table OA.2 shows similar results by 5-year subperiod and during the 2007-2009 global credit crisis. During this crisis period, firms across the world faced insurmountable barriers to raise external funds to finance their investments (Demirguc-Kunt, Martinez-Peria, and Tressel, 2015; Campello, Graham, and Harvey, 2010;

Almeida et al., 2009). If the sensitivity reflects severity of financial frictions faced by firms, then the β_2 coefficient in equation (1) should be positive and large during the global crisis period. The findings suggest that a large majority of the countries experience a fall in investment-cash flow sensitivity over time and that the sensitivity is statistically insignificant during the crisis period. Overall, the results further reinforce our key evidence that in aggregate, investment-cash flow sensitivity across the globe has declined, especially in developed markets, and that the sensitivity varies substantially across countries.

4. Why Has Investment-Cash Flow Sensitivity Disappeared?

In the previous section, we have established that the investment-cash flow sensitivity of firms from a broad sample of developed and developing countries has fallen over the entire sample period. We now turn to exploring the plausible reasons for the decline. Extant research has attempted to explain why the investment-cash flow sensitivity of U.S. firms has declined over time. For example, Brown and Petersen (2009) argue that for the period of 1970-2006, R&D and the ease of accessing external equity finance explain the declining sensitivity. Chen and Chen (2012) show that sensitivity has declined, even when they replace firm investment with R&D and also,during the 2007-2008 credit crisis period. They test several different explanations of investment-cash flow sensitivity, but are unable to find a reason.

In this section, we ask whether investment-cash flow sensitivity is a manifestation of financial constraints at the country rather than firm level. Countries with fewer financial constraints could have greater access to sources of external finance; as such, firm investment becomes less dependent on internal capital. Prior research shows that financial constraints tend to be lower in countries with strong investor protection, as well as in financially developed countries.[7] We test these two possible explanations for the declining investment-cash flow sensitivity.

[7]See, for example, Rajan and Zingales (1998), Wurgler (2000), La Porta et al. (2000), Love (2003), McLean, Zhao, and Zhang (2012), among others.

4.1. Investor protection and investment-cash flow sensitivity

Prior studies have shown that investor protection promotes efficient allocation of financial capital and improves firms' access to external finance.[8] For example, Love (2003) shows that a country's regulatory environment, such as the efficiency of the legal system, expropriation risk, corruption, or legal origin, is associated with a reduction in financial constraints. McLean, Zhang, and Zhao (2012) find that in countries with stronger investor protection laws, investment is less sensitive to cash flow. Therefore, it is possible that the disappearing investment-cash flow sensitivity may be evident only in firms operating in countries with strong investor protection, where the existing legal system has led to a more efficient allocation of a growing pool of financial resources to firms that are in need of external capital.

To test this hypothesis, we employ a set of seven popular measures of a country's level of investor protection. Below we outline each measure, while full details are provided in Appendix Table A.1.

(i) A legal origin indicator (*Common*): it takes the value of one if a country is of common law origin and zero if otherwise (La Porta et al., 1998).

(ii) A protection index (*Protection*): the first principal component of the various disclosure and liability indexes, combined with an antidirector rights index (La Porta et al., 2002).

(iii) A disclosure index (*Disclosure*): the mean score of six sub-indexes (prospectus delivering, insider compensations, large shareholder ownership, insider ownership, contracts outside the normal course of business, and related parties' transactions). All of these subindexes are dummy variables, and for each subindex, a value of one is assigned to the index if it signifies high quality disclosure, and zero otherwise (La Porta, Lopez-de-Silanes, and Shleifer, 2006).

(iv) A liability standard index, (*Liability*): the average of three provisions that measure the ease with which investors who suffer losses could prosecute the firm for misleading financial statements in its prospectus (La Porta, Lopez-de-Silanes, and Shleifer, 2006).

[8] See, for example, Demirguc-Kunt and Makismovic (1998), Levine and Zervos (1998), Rajan and Zingales (1998), Wurgler (2000), Love (2003), Khurana, Martin, and Periera (2006), and Becker and Sivadasan (2010), McLean, Zhang, and Zhao (2012), among others.

(v) An anti-self-dealing index (*Anti-Self*): a country's disclosure quality, approval, and litigation governing self-dealing transactions (Djankov et al., 2008).

(vi) A transparency index (*Transparency*): the intensity and timeliness of financial disclosure by firms and coverage by analysts and media (Bushman, Piotroski, and Smith, 2004).[9]

(vii) An access index (*Access*): a firms' ability to access external financing (Schwab et al., 1999).

Countries with common law and with high *Protection*, *Disclosure*, *Liability*, *Anti-Self*, *Transparency*, and *Access* index values are inclined to be associated with strong investor protection laws. If investor protection explains the vanishing investment-cash flow sensitivity, we should expect investment-cash flow sensitivity to disappear in countries with strong investor protection.

Appendix Table A.2 reports the cross-correlation coefficients between the seven investor protection measures and estimates of the investment-cash flow sensitivity. The results show that the protection index is highly and positively correlated with a country's legal origin, anti-self-dealing index, liability standards, and disclosure with statistically significant correlation coefficients of greater than 0.5. Their strong correlation suggests that these proxies substantially measure similar aspects of a country's degree of investor protection. Hence, following the existing literature,[10] our subsequent empirical analysis incorporates each measure one at a time.

To test whether investor protection explains the phenomenon of the disappearing investment-cash flow sensitivity, we sort countries into terciles based on their level of investor protection, with the bottom tercile consisting of firms from countries with the weakest investor protection and the top tercile consisting of those from countries with the strongest investor protection. For the legal origin of the country, we divide the countries into two groups: common law and civil law. Within each group of countries formed based on their levels of investor protection, we conduct firm-level panel regressions of model (1) for the full sample period and for three subperiods. Table 4 presents

[9] While *Transparency* is not directly associated with legal factors, it measures the information environment of a country. Countries with strong investor protection tend to have a more transparent information environment. Lau, Ng, and Zhang (2012) find that countries with greater transparency are associated with a lower level of information asymmetries. With lower information asymmetries, external financing costs associated with information acquisition should be lower.

[10] See, McLean, Zhang, and Zhao (2012).

the regression results for each measure of investor protection.

A number of interesting results emerge from the table. First, when we compare the coefficients of cash flow for the full sample period across the two extreme terciles, we find that the cash flow coefficient is lower for countries with stronger investor protection. Furthermore, none of the cash flow coefficient for the top investor-protection tercile is statistically significant; the value of the coefficient is small and is between 0.002 (t-statistic = 0.13) in *High Liability* countries and 0.020 (t-statistic = 1.40) in *High Disclosure* countries. The subperiod analysis suggests that the insignificant cash flow coefficient found in the full sample results is mainly driven by the negative and insignificant coefficient in the third subperiod (i.e., 2004-2014), as those of the first two subperiods are positive and statistically significant. On the other hand, the cash flow coefficient for the bottom tercile is relatively large and statistically significant; the value ranges from 0.064 (t-statistic = 6.31) in *Weak Protection* countries to 0.105 (t-statistic = 8.04) in *Low Disclosure* countries. These findings suggest that investor protection matters for investment-cash flow sensitivity of a country, and possibly indicate that firms in countries with strong investor protection are likely to have better access to external finance and hence, their investments are less sensitive to cash flow.

The overall results show that the sensitivity vanishes over the last decade in common law countries and in countries with strong protection, high *Disclosure*, *Liability*, and *Transparency*, as well as strong *Anti-Self* countries. For example, the investment-cash flow sensitivity falls monotonically from 0.236 ($t-$statistic=4.47) in the first subperiod to -0.012 ($t-$statistic=-0.86) in the last subperiod for common law countries, and correspondingly, from 0.278 ($t-$statistic=4.18) to 0.068 ($t-$statistic=4.02) for civil law countries. The evidence seems to suggest that investor protection explains the declining or disappearing investment-cash flow sensitivity. But the investment-cash flow sensitivity also declines monotonically over time across all the subsamples of countries with different legal origins, as well as strong and weak investor protection systems. Hence, it is unlikely that these time-invariant measures of investor protection that dictate the regulatory and legal environment of a country are the primary driver of the the declining investment-cash flow sensitivity over time.

4.2. Financial development and investment-cash flow sensitivity

In this section, we examine whether time-varying measures financial development could explain the declining trend in investment-cash flow across the globe. Existing research shows that a well-functioning financial system is a key to economic expansion as it improves firms' access to outside capital and reduces the cost of raising outside capital relative to the cost of internally generated cash flow (Rajan and Zingales, 1998; Levine, 2005). Easy access to external finance allows firms with limited internal cash flow to pursue profitable investment opportunities that require large investments. Love (2003) shows that a country's financial development not only affects a firm's investment through its ability to obtain external finance,[11] but also mitigates financial constraints by reducing information asymmetries and contracting imperfections.

The above discussion suggests that firms from countries with fewer financial constraints should be able to raise external funds to exploit their growth opportunities. With greater access to external finance, a firm's investment becomes less dependent on sufficient internal capital. Therefore, as financially developed countries have reduced market impediments to sources of external capital, investment-cash flow sensitivity of firms could decrease and then vanish in recent years. In contrast, firms from less financially developed countries could face greater financial barriers up to today and hence, still have limited access to external finance. These firms would rely more on internally generated cash flows, and therefore, their investment-cash flow sensitivity should remain significant.

To test these predictions, we construct several measures of financial development. Drawn from the vast investment literature, our study employs five proxies for financial development: (i) the GDP per capita (GDPC); (ii) financial openness (Openness); (iii) the amount of available domestic credit to GDP (Credit); (iv) stock market capitalization scaled by GDP (Market Cap),[12] and (v) the aggregate cost of equity financing (ICOC).[13] These five measures suggest that financially developed

[11] Love (2003) employs an overall index of financial development, which is an average of five standardized indexes from Demirguc-Kunt and Levine (1996). The five indices are market capitalization scaled by GDP, total value traded over GDP, total value traded over market capitalization, the ratio of liquid liabilities to GDP, and the credit going to the private sector over GDP. Their financial development index combines the five preceding characteristics of financial markets into a single measure.

[12] King and Levine (1993), La Porta et al. (1997), and Rajan and Zingales (1998) employ the size of a country's equity and credit markets relative to its GDP as a proxy for the general level of financial development.

[13] We follow Hail and Leuz (2006) and Lau, Ng, and Zhang (2010) by employing the average of four different implied

countries tend to have higher GDPC, more Openness, larger Credit, larger Market Cap, and lower ICOC, compared to their less financially developed counterparts. Details of these five proxies for financial development are contained in Appendix Table A.1, whereas their cross-correlations are shown in Appendix Table A.2. As expected, the investment-cash flow sensitivity is negatively correlated with GDPC, Market Cap, Credit, and Openness and is positively correlated with ICOC; all are statistically significant at conventional levels. The correlations between the five measures are strongly and statistically significant, and their coefficients range from -0.142 (Market Cap and ICOC) to 0.653 (GDPC and Openness).

Consistent with the analysis in Table 4, we again sort countries into terciles based on each subperiod measure of financial development. There is one key difference between the measures of investor protection and those of financial development. The proxies for investor protection, as discussed earlier, are all time-invariant, but those for financial development vary across time. To sort countries into each tercile based on their measures of financial development, we first compute each country's average measure of financial development for each subperiod. Based on the resulting distribution of country-subperiod measures of financial development, we determine two time-invariant break points that allow us to allocate countries into their respective tercile bins. The bottom tercile contains the least financially developed countries, whereas the top tercile consists of the most financially developed countries. Within each tercile, countries are grouped into their respective three subperiods. This approach allows us to capture the time variation in the degree of financial development of each country and its rising trend, if any. In this way, once a country attains a certain threshold of financial and economic development, it moves to a higher tercile regardless of the number of other countries have moved to a higher tercile as well. Given that the majority of countries have experienced a tremendous financial and economic growth in the past two decades, there are more countries that fall into the top tercile of economic development in the most recent subperiod than countries that have high level of development in the first period. Our unreported

cost of equity (ICOC) as a proxy for each firm's yearly cost of capital. For each country and for each year, we then employ the value-weighted estimates of firms' ICOCs as a proxy for the country's cost of equity financing. See Hail and Leuz and Lau, Ng, and Zhang on the specifications and assumptions of the four models we use to estimate the ex ante cost of equity capital as implied by each model.

sorting results suggest that across the three subperiods, the U.S. remains in the top tercile, while the Philippines belongs to the bottom tercile. However, other countries experience substantial movements across the terciles. For example, countries such as Hong Kong and Singapore are in the middle tercile in the first two subperiods but move to the top tercile in the last subperiod. On the other hand, Argentina and Turkey are in the bottom tercile in the first two subperiods, but move to the middle tercile in the third subperiod.

Within each subperiod-tercile, we estimate β_2 in equation (1) using firm-level panel regressions. Table 5 presents the regression results, with the last row of each panel showing the economic significance of the cash-flow coefficient. The table yields several interesting findings. First, the time-series patterns of investment-cash flow sensitivity distinctly differ across the terciles. For the less financially developed tercile, the sensitivity declines from the first to second subperiod, and then remains fairly stable between the second and third subperiod. Their cash-flow coefficients are all positive and statistically significant, showing no sign of vanishing sensitivity. This finding is consistent across all measures of financial development. In contrast, for the financially developed tercile, the sensitivity falls sharply from the first to second subperiod and then disappears in the last subperiod. For example, the top GDP per capita tercile, the cash-flow coefficient falls from 0.180 ($t-$stat=31.73) in the first subperiod (1981-1992) to -0.018 ($t-$stat=1.58) in the last subperiod (2004-2014), compared to 0.173 ($t-$stat=2.33) and 0.150 ($t-$stat=4.92) for the bottom GDP per capita tercile of countries.

In terms of economic significance, a one-standard deviation increase in a firm's cash flow in the first subperiod, on average, leads to a 17.5% increase in mean investment in low $GDPC$ countries and a 19.0% increase in mean investment in their high $GDPC$ peers. However, their economic significance differs vastly in the last subperiod. A one-standard deviation increase in a firm's cash flow leads to a 23.8% increase in mean investment in low $GDPC$ countries but only a 0.081% decrease in mean investment in their high $GDPC$ counterparts. This time-series pattern is robust across countries formed on different measures of financial development.

Consistent with prior studies,[14] the coefficient of q is positive and mostly statistically significant across all terciles and over time. It is important to emphasize that studies such as Erickson and Whited (2000, 2012) have argued that q may be measured with error. To correct for this possible measurement error, we use Erickson, Jiang, and Whited's (2014) higher-order cumulant estimator. In our unreported results, we estimate the generalized method of moments (GMM) coefficient on cash flow in each year for both the full sample and the sample without the U.S. Although it is volatile in early years, the overall pattern still shows a clear decline over time. In some early years, the GMM coefficient on cash flow is even higher than the OLS coefficient. From 1996 onwards, the GMM coefficient on cash flow has been close to zero. The untabulated results remain qualitatively similar based on either the third- or fourth-order cumulant estimator. Furthermore, when we run the yearly cross-sectional regression of investment on cash flow only, we find the coefficient on cash flow exhibits very similar pattern as that shown in Figure 1, where the regression model controls for Tobin's q. Thus, similar to the U.S evidence reported in Chen and Chen (2012), we argue that the decline in investment-cash flow sensitivity across countries is not attributed to the measurement error in q. Our further analyses below will provide reinforcing evidence that the cash flow reflects financial constraints at the country level.

Finally, we repeat the above analysis by removing U.S. firms from the sample, and the results reported in Table OA.4 remain materially unchanged. The evidence further corroborates our main findings are not driven by the presence of U.S. firms in the sample.

In summary, the results suggest that a country's financial development plays a critical role in the disappearing investment-cash flow sensitivity over the recent 10 years.

5. The channel

In this section, we test a possible channel through which financial development could reduce firms' reliance on internally generated funds.[15] Theory postulates that financial development improves

[14] See, for example, McLean, Zhao, and Zhang (2012).

[15] We have also tested whether flows of foreign funds offer another possible channel, but unreported results show no evidence to support this channel.

efficient allocation of investment and hence, spurs economic growth. For example, Love (2003) shows that constrained firms are better off in more financially advanced countries rather than in less financially developed ones, where the cost of capital is substantially higher due to a limited pool of resources available. Hence, with financial market imperfection and unequal access to external finance, firms from less advanced countries have greater investment financing constraints. Our evidence, thus far, is consistent with the argument that financially developed countries facilitate greater access to external resources of capital than do less developed peers, and as a result, their investment is insensitive to internally generated capital. To explore this idea, we explicitly examine whether firms rely more on equity and debt capital than on internal fund in financing their investments.

5.1. Access to external finance

Financial development facilitates the removal of financial barriers across the globe and provides opportunities for firms to raise external finance.[16] If firms from financially developed countries have better access to external sources to finance their investment opportunities, then much of the firms' investment would be financed externally. As a result, the effect of internal cash flow on investment should decline, and hence, the relation between external funding and internally generated cash flow would be negative (or negligible) and insignificant.

To examine this channel, we start with univariate analyses and compute the yearly change in equity and debt of every firm within terciles formed based on each financial development proxy over the full sample period and three subperiods. Table 6 reports the average of the annual change in firms' equity and debt issuances. There are a number of distinct time-series patterns. For the full sample period, firms in the bottom tercile typically issue less equity but more debt compared to their peers from the top tercile. Across the subperiods, the change in equity issuances mainly decline (increase) in the bottom (top) tercile. For example, changes in equity issuances of firms from low GDP per capita countries fall from 0.294 in the first subperiod to 0.041 in the third

[16]Hubbard (1998) provides an excellent review of theoretical and empirical studies that have shown a strong relationship between firms' financial status and investment.

subperiod, whereas issuances of firms from high GDP per capita countries rise from 0.032 in the first subperiod to 0.141 in the third subperiod. In contrast, the change in debt issuances generally drop over time across the terciles and across the different measures of financial development. These findings suggest that firms in financially developed countries are increasingly relying on external finance, especially equity issuances, over the sample period. Taken together, these statistics provide preliminary explanation of why firms from developed markets are no longer dependent on internally generated cash flow.

We next examine the relation between external finance and internal cash flow in a multivariate setting. To test our hypothesis, for each financial development-formed tercile, we run the following firm-level regression within a subperiod.

$$\frac{\text{Equity}_{i,t}[\text{Debt}_{i,t}]}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \gamma_1 q_{i,t-1} + \gamma_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t}, \tag{2}$$

where $\text{Equity}_{i,t}$ ($\text{Debt}_{i,t}$) is firm i's annual change in equity (debt), while the remaining variables are as defined earlier. Equity is defined as the change in book equity, plus the change in deferred taxes, minus the change in retained earnings, and Debt is defined as the annual percentage change in total debt. All regressions include unreported firm, country-year, and industry-year fixed effects, respectively. Robust $t-$statistics reported in parentheses are computed based on standard errors clustered at the country level.

Table 7 reports the results of estimating equation (2), with the annual change of equity as the dependent variable. The findings clearly indicate that the cash flow coefficients and their levels of statistical significance vary substantially across the subperiods and across terciles. One interesting observation is that, on average, the effect of cash flow on the change in equity issuances is mostly negative for financially developed countries, but is positive for the least financially developed ones. For the entire sample period, the former's cash flow coefficient varies from -0.720 in countries with more financial openness to -0.788 in countries with low cost of equity capital, but the latter's is between 0.276 in countries with weak stock market development and 0.435 in countries with low amount of domestic credit available. That is, low cash flow firms from more financially developed countries are more likely to issue equity, but those from less financially developed countries are

less likely to do so. Consistent with our prediction, evidence indicates that financially developed markets facilitate firms with greater access to external equity finance.

Furthermore, the subperiod results reveal an intriguing finding. For financially developed countries, the sign of the cash flow coefficient switches from positive in the first subperiod (1981-1992) to negative in the second (1993-2003) and third subperiods (2004-2014). Thus, firms from financially developed countries seem to have greater access to sources of external finance in the last two subperiods, which is in accord with the firms' decreasing reliance on cash flow over time. The magnitude of the cash flow coefficient in the third subperiod is almost twice as large as that in the second subperiod, indicating the strong negative association between the equity issuance and cash flow. This finding is robust across all the different measures of financial development. For example, for the top $GDPC$ tercile, the cash flow coefficient is -0.484 (t-statistic= -7.929) in the second period and is -0.898 (t-statistic=11.63) in the third subperiod. In contrast, for less financially developed countries, the cash flow effect is positive and mainly statistically insignificant, indicating that firms with low cash flow have limited or no access to external finance. This finding explains the strong positive relation between investment and cash flow for these firms. With limited access to external finance, these firms have to depend on internal cash flow to finance their investment.

Table 8 reports the results of equation (2), with the annual change of debt as the dependent variable. The results, while weaker, are broadly consistent with those of Table 7. Firms from financially developed countries are substituting debt for cash flow, especially in the last subperiod, and this finding is robust across different measures of financial development. The substitution between debt and cash flow perhaps, to a large extent, is due to the gradual reduction of barriers to external finance. However, firms from less financially developed countries, especially those with low cash flow, show little access to debt finance. The combined results of Tables 7 and 8 indicate that with limited access to external equity and debt issuances, low cash flow firms from less financially developed countries tend to rely heavily on internal resources to finance their investments.

In summary, this section shows that only firms from financially developed countries, including the U.S., experience the disappearing investment-cash flow sensitivity, and that this phenomenon

is not evident in firms from less financially developed countries. While firms from countries with strong investor protection tend, on average, to have a lower investment-cash flow sensitivity, investor protection is not the reason for the disappearing sensitivity. Our evidence suggests that firms from financially developed countries are able to gain access to external finance, especially in the last two decades, which explains why firms rely less on cash flow to finance their investment opportunities. These findings, however, are not observed in firms from less financially developed countries, suggesting that implicit barriers or financial frictions still hinder their access to external finance, even though these countries have become more integrated with the world markets over the past couple of decades.[17]

Our results also explain why the disappearing sensitivity phenomenon is evident in financially developed countries, even those that are consistently ranked as the most developed ones. We show that during this period, firms from financially developed countries have more access to external financial resources than do their counterparts from under-developed countries, but the resources are not in abundance such that these firms could no longer depend on internal funds. In contrast, faced with limited access to external finance, firms from less developed countries continue to rely heavily on internal cash flows as a source of funds for their investments throughout the whole sample period. The implication is that during the earlier period, firms from financially developed countries, such as the U.S. and Sweden, still depend quite heavily on internal funds to finance their investments.

5.2. Economic impacts of internal/external finance on investment

We now turn to evaluating the economic trade-offs between internal and external capital in financing a firm's investment. Our earlier analysis indicates that investment is less sensitive to internally generated funds and that the association between internal funds and external resources is mainly negative in financially developed countries during the last two subperiods but is strictly positive in less developed countries. If firms in financially developed countries can access external capital more easily, we should find that adding equity and debt to the regression of investment-cash flow

[17] See, for example, Bekaert, Harvey, Lundblad, and Siegel (2011) and Carrieri, Chaieb, and Errunza (2013).

relation will have a positive and significant impact on investment. Moreover, if external capital becomes more important over time and substituting for internal financing, we expect to find that its economic magnitude in explaining investment is larger than that of internal funds. To assess the impact of both internal and external finances on investment, we conduct the following firm-level panel regression for each subperiod.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \alpha_t + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \beta_3 \frac{\text{Equity}_{i,t}}{A_{i,t-1}} + \beta_4 \frac{\text{Debt}_{i,t}}{A_{i,t-1}} + \epsilon_{i,t}. \quad (3)$$

The results are shown in Table 9. To conserve space, we present the full results based on GDPC-sorted countries and only the economic significance of both internal cash flow and debt/equity issuances for the remaining sorted countries by financial development measure.

The table reveals that the economic significance of the various sources of finance has changed over time, and that the pattern is different between financially advanced countries and their less financially advanced counterparts. Debt has the most significant impact on the investment of firms from less financially developed countries, while internal cash flow has the least. Our findings are consistent with Fan, Titman, and Twite (2012) who find that firms in countries that are corrupt or less developed are prone to use less equity but more debt, while firms operating within countries with sound legal systems that provide better investor protection are inclined to use more equity.

In fact, the economic effects of cash flow and Equity on investment are only half the size of the economic impact on Debt. For the full sample period, a one-standard deviation increase in a firm's Debt, on average, leads to a 49.2%–57.9% increase in its mean investment. In comparison, a one-standard deviation increase in a firm's cash flow (Equity), on average, leads to a 18.6%–22.0% (21.8%–25.4%) increase in its mean investment. On the other hand, equity finance has the most influential effect on the investment of firms from financially developed countries, followed by debt, with internal funds having the least effect. For the entire sample period, a one-standard deviation increase in a firm's equity (debt), on average, results in a 31.2%–34.9% (27.3%-31.2%) increase in the firm's mean investment. However, a one-standard deviation increase in a firm's cash flow, on average, generates only a 15.4%–18.0% rise in the firm's mean investment. The relatively smaller cash flow effect on investment, compared to those of equity and debt, is consistent with the

diminishing investment sensitivity to cash flow.

Overall, we find that the disappearing investment-cash flow sensitivity occurs only in firms from financially developed countries. As countries become more financially developed, barriers to external financing are gradually removed, thereby allowing firms to have better access to external finance.

6. Alternative Explanations

6.1. Firm-level financial constraints

Thus far, we have shown that better access to external finance is the channel through which financial development influences the sensitivity of investment to internal cash flow. However, many existing studies have attempted to explain the disappearing investment-cash flow phenomenon by examining the severity of financial constraints at the firm level. The underlying argument is that investment is not affected by internal cash flow because firms are no longer financially constrained. In this section, we evaluate whether the decline in investment-cash flow sensitivity reflects the diminishing financial constraints at the firm level.

Our study draws from the extensive literature and employs the following five popular measures of financial constraints. The first proxy measures a firm's ability to raise debt and equity finance. Financial constraints may arise due to limited external financing or due to credit rationing. Fazzari, Hubbard, and Petersen (1988) posit that in an environment with low costs of debt and equity, firms could still be financially constrained if they are unable to raise debt or equity financing. The greater the firm's ability to raise debt and equity finance, the less sensitive its investment should be to cash flow.

The second proxy measures a firm's ability to pay dividends. Corporate payouts are often used as a proxy for financial constraints. Our analysis uses a corporate's total payout, which is the sum of dividends and share repurchases scaled by the lagged total assets. High payout firms are less likely to be financially constrained. We expect the investment-cash flow sensitivity to be lower

among high payout firms if sensitivity is a valid measure of financial constraints.

The remaining three proxies are financial constraint indexes constructed by Kaplan and Zingales (1997, KZ), Whited and Wu (2006, WW), and Hadlock and Pierce (2010, HP); such indexes are commonly used to identify financially constrained firms. Following the existing literature, we construct the three indexes by applying their estimated coefficients to our sample. The KZ index is a linear combination of five accounting variables, such as cash flow, market value, debt, dividends, and cash holdings, each scaled by total assets. The WW index is a linear combination of cash flow, a dividend payer dummy, leverage, firm size, industry sales growth, and firm sales growth. The HP index is a linear combination of size, size-squared, and age. The higher the index value, the more severe is a firm's financial constraint.

To carry out our tests, we apply the approach employed in the earlier sections by splitting the sample into three groups based on the average value of each firm-level financial constraint measure over each subperiod. We allocate the firms into terciles based on the financial constraint threshold. For each sample period and each tercile, we estimate model (1), and report the results in Table 10.

There are several notable findings. First, investment-cash flow sensitivity declines rapidly from the first to second subperiods across the three terciles formed on equity and debt financing, and disappears in the third subperiod for the tercile with the largest debt and equity financing. Firms with high external financing exhibit the disappearing investment-cash flow sensitivity, suggesting that cash flow becomes unimportant in the last ten years when firms have access to external financing. For example, the coefficient on cash flow, CF, declines from 0.274 (t = 4.27) during the first subperiod to -0.011 (t = -0.79) during the last subperiod. However, firms with low external financing also display a similar declining pattern, except that their declining cash flow effects remain statistically significant across the subperiods. Such evidence suggests that sensitivity cannot reflect the severity of financial constraints faced by firms.

Second, low payout firms have a lower investment-cash flow sensitivity (-0.017) than high payout firms (0.064) during the full sample period. In fact, the cash flow coefficient in the low payout sample is consistently lower than its counterpart in the high payout sample. Furthermore, the low

payout firms experience the disappearing sensitivity in the last subperiod, whereas the high payout sample firms do not. These findings contradict the notion that low payout firms are more financially constrained than high payout firms and that the investment of the former should exhibit greater sensitivity to internally generated cash flow than that of their high payout peers. Our findings remain robust after excluding countries with mandatory payout policies (such as Brazil and Chile) from the analysis. Consistent with the results from equity-debt sort terciles, we find evidence of the declining investment-cash flow sensitivity in all three subsamples.

Finally, the last three panels of Table 10 show that the sensitivity of investment to cash flow decreases monotonically across time, implying that corporate investment is less sensitive to cash flow in the third than in the first subperiod. This phenomenon is persistent across subsamples of firms formed based on the commonly employed financial constraint indexes.

6.2. Cross-industry evidence

We explore the possibility that the disappearing investment-cash flow sensitivity may be driven by a certain type of industries whose investments are less dependent on internally generated cash flow. Due to recent market globalization, some countries have become hubs to certain industries (for example, support services in India, or electronic manufacturing in China). As a result, the differences in investment-cash flow sensitivity across countries could be essentially driven by countries' specialization in certain industries. To address this concern, we estimate the investment-cash flow sensitivity within each industry. Based on their SIC codes, we sort firms into manufacturing (SIC codes between 2000 and 3999) vs. non-manufacturing firms (SIC codes outside 2000-4000). Manufacturing firms are further sorted into industry groups, namely durable goods, nondurable goods, and high-tech sectors. Firms in the durable sector have SIC codes between 2400 and 2599 or between 3200 and 3899, while firms belonging to the non-durable sector have SIC codes between 2000 and 2399 or between 2600 and 3199. Firms in the high-tech sector have three-digit SIC codes 283, 357, 366, 367, 382, or 384. Results are summarized in Table 11.

We find that investment-cash flow sensitivity exhibits similar patterns across different industries.

For example, for manufacturing firms, sensitivity declines from 0.225 ($t-$statistic=4.43) in the first subperiod to 0.038 ($t-$statistic=2.17) the third subperiod, and the sensitivity for the overall sample period is 0.053 ($t-$statistic=3.18). The sensitivity of their non-manufacturing peers falls from 0.267 ($t-$statistic=6.56) to -0.014 ($t-$statistic=-0.96). Our results remain robust when we further split the manufacturing sector into durables, non-durables, and high tech groups.

7. Conclusion

This study investigates whether and how investment sensitivities to cash flow vary over time and across countries with different levels of financial development and varying degrees of investor protection. More importantly, our study attempts to examine whether the disappearing investment-cash flow sensitivity found in the U.S. is persistent across countries worldwide. Our empirical analysis exploits a large sample of 475,387 firm-year observations from 44 countries for the period of 1981-2014 and offers several significant insights on investment-cash flow sensitivities.

The findings indicate that the investment-cash flow sensitivity has declined worldwide and has disappeared in the vast majority of countries and across different sectors. While the popularly employed time-fixed legal and institutional proxies for investor protection (i.e., legal origin, disclosure, liability standards, protection, anti-self-dealing, transparency, and access to external finance) have a negative impact on the sensitivity of investment to cash flow, they are unable to explain the puzzling evidence of the disappearing investment-cash flow sensitivity in recent years. Instead, we find that time-varying proxies for financial development can explain the investment-cash flow sensitivity across countries and over time. Specifically, firms operating in less financially developed countries (i.e., low GDP per capita, low domestic credit available, low financial openness, less developed stock market, and high cost of equity financing) still rely on internally generated cash flow, and their investment-sensitivity to cash flow has remained fairly stable over time.

Our evidence suggests that firms from financially developed countries with fewer financial constraints (such as countries with high GDP per capita, more abundant private credit available, more financial transparency, more advanced stock market development, and low cost of equity financing)

enjoy the benefits of greater access to external finance. As these firms depend less on internal cash flow, their investment has become insensitive to the internal cash flow in recent years. To provide further evidence of this explanation, we examine the sensitivity of external capital issues to cash flow. We find that the coefficient has switched from positive to negative in countries with high levels of financial development, but has remained insignificant in under-developed countries.

Finally, we examine the sensitivity of investment to all sources of capital (both internal and external ones). We find that equity financing has become a more economically important source of financing for firms from developed countries, whereas it has lost its significance in financing investments of firms from less developed countries. Taken together, the results support the notion that firms operating in countries with limited and inefficient allocation of resources have to rely on internally generated capital, while firms in more developed countries can access external capital market if they need it.

Figure 1
Investment-Cash Flow Sensitivity Across All Countries and the U.S. by Year

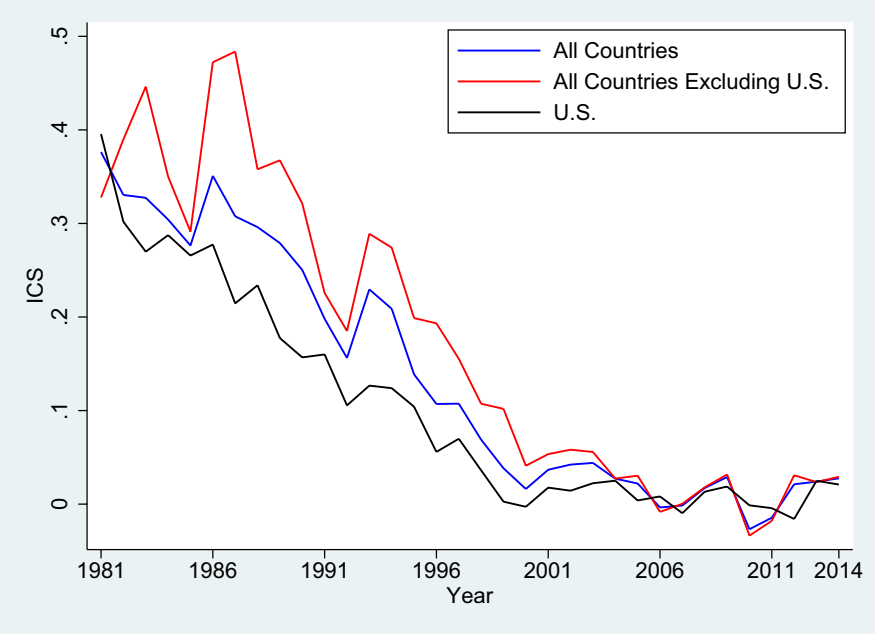

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Table 1

Means of Key Variables Across Periods by Country

This table presents the number of firm-year observations (N), average values of scaled investment ($\frac{I_{i,t}}{A_{i,t-1}}$), Tobin's $q_{i,t-1}$ (q), and cash flow ($\frac{CF_{i,t}}{A_{i,t-1}}$) in three subperiods by country, where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization, scaled by its beginning-of-period total assets, $A_{i,t-1}$. The sample period is between 1981 and 2014.

	N			$\frac{I_{i,t}}{A_{i,t-1}}$			$q_{i,t-1}$			$\frac{CF_{i,t}}{A_{i,t-1}}$		
Country	1981-1992	1993-2003	2004-2014	1981-1992	1993-2003	2004-2014	1981-1992	1993-2003	2004-2014	1981-1992	1993-2003	2004 2014
Argentina	25	352	675	0.367	0.068	0.066	1.923	1.190	1.594	0.231	0.054	0.089
Australia	1046	4281	13983	0.102	0.078	0.120	1.272	1.830	2.139	0.095	-0.039	-0.174
Austria	294	715	636	0.075	0.072	0.070	1.529	1.380	1.448	0.087	0.076	0.078
Belgium	395	830	869	0.078	0.082	0.058	1.124	1.587	1.528	0.099	0.095	0.082
Brazil	163	1545	2260	0.394	0.133	0.068	0.894	1.112	1.492	0.156	0.103	0.089
Canada	2498	6147	17953	0.102	0.112	0.144	1.350	1.904	2.345	0.083	0.011	-0.183
Chile	80	926	1467	0.147	0.075	0.062	1.418	1.317	1.621	0.202	0.100	0.092
China		2517	20939		0.071	0.074		2.059	2.162		0.055	0.071
Colombia	33	172	262	0.110	0.049	0.063	2.733	0.826	1.215	0.164	0.066	0.095
Denmark	467	1307	1154	0.097	0.076	0.058	1.221	1.585	1.739	0.089	0.088	0.047
Finland	341	1032	1194	0.113	0.089	0.053	1.161	1.659	1.589	0.058	0.104	0.087
France	2284	5340	5415	0.078	0.064	0.048	1.234	1.623	1.491	0.092	0.079	0.068
Germany	1900	5174	5518	0.107	0.077	0.050	1.476	1.699	1.573	0.102	0.063	0.060
Greece	8	338	2328	0.113	0.087	0.052	2.181	2.284	1.125	0.170	0.105	0.032
Hong Kong	511	3500	8474	0.100	0.054	0.051	1.542	1.383	1.540	0.144	0.025	0.023
India	26	2851	15899	0.133	0.096	0.097	1.666	1.701	1.433	0.121	0.103	0.088
Indonesia	60	1387	2919	0.169	0.083	0.074	1.800	1.313	1.507	0.150	0.071	0.091
Ireland	318	587	553	0.074	0.076	0.049	1.275	2.080	1.984	0.076	0.039	0.006
Israel		511	3298		0.056	0.037		1.696	1.557		0.032	0.014
Italy	841	1559	2047	0.078	0.062	0.045	1.206	1.394	1.317	0.082	0.064	0.050
Japan	2516	18013	36368	0.067	0.041	0.037	1.697	1.247	1.189	0.065	0.041	0.053
Luxembourg	10	124	264	0.132	0.073	0.063	1.386	1.645	1.620	0.126	0.080	0.096
Malaysia	525	3705	8686	0.064	0.064	0.048	1.669	1.498	1.139	0.091	0.062	0.061
Mexico	179	845	932	0.098	0.069	0.062	1.192	1.285	1.485	0.139	0.080	0.094
Netherlands	854	1621	1294	0.088	0.076	0.052	1.163	1.814	1.646	0.109	0.108	0.078
New Zealand	137	584	1065	0.073	0.072	0.066	1.071	1.592	1.839	0.093	0.085	0.022
Norway	357	1187	1553	0.136	0.116	0.094	1.334	1.704	1.733	0.057	0.062	0.023
Pakistan	17	717	1735	0.145	0.068	0.079	1.554	1.183	1.327	0.126	0.102	0.109
Peru		344	831		0.065	0.071		1.134	1.440		0.096	0.136
Philippines	24	779	1359	0.172	0.079	0.059	2.043	1.292	1.766	0.148	0.042	0.072
Poland		406	2651		0.099	0.070		1.272	1.586		0.090	0.070
Portugal	56	535	447	0.109	0.068	0.046	1.608	1.149	1.187	0.124	0.077	0.062
Singapore	383	2218	5486	0.065	0.069	0.058	1.409	1.374	1.298	0.076	0.060	0.063
South Africa	869	2194	2417	0.093	0.079	0.075	1.415	1.657	1.608	0.144	0.100	0.101
South Korea	200	3623	14677	0.119	0.064	0.062	1.400	0.982	1.201	0.078	0.044	0.038
Spain	478	1181	1130	0.078	0.061	0.054	1.161	1.367	1.567	0.077	0.090	0.070
Sweden	586	1963	3426	0.082	0.068	0.042	1.286	1.942	2.140	0.068	0.034	-0.003
Switzerland	594	1617	1855	0.098	0.059	0.044	1.270	1.558	1.735	0.098	0.083	0.068
Taiwan	13	3397	14995	0.066	0.062	0.053	2.538	1.483	1.408	0.122	0.074	0.076
Thailand	58	2071	4380	0.143	0.074	0.066	1.828	1.219	1.367	0.144	0.088	0.098
Turkey	15	728	2368	0.229	0.143	0.062	2.403	2.167	1.395	0.291	0.189	0.077
United Kingdom	6745	12671	12488	0.101	0.073	0.053	1.497	1.956	1.955	0.115	0.051	-0.015
United States	20826	51063	47506	0.087	0.075	0.062	1.514	2.307	2.334	0.104	0.006	-0.029
Venezuela	7	116	118	0.138	0.053	0.066	1.194	0.771	0.861	0.082	0.083	0.129
All	46740	152773	275874	0.091	0.072	0.067	1.456	1.812	1.734	0.101	0.039	0.015

Table 2
Investment-Cash Flow Sensitivities Around the World

This table reports coefficients estimated from regressing investment on Tobin's q and cash flow, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,i}$, and $\alpha_{ind,i}$, denoting firm, country-year, and industry-year fixed effects, respectively. The above regression is conducted separately for the full sample and for the sample excluding U.S. firms. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively. Economic significance is one standard deviation of cash flow multiplied by the coefficient on cash flow scaled by the average investment.

	Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	All Countries				**All Countries Excluding U.S.**			
	Investment Only							
q	0.011***	0.018***	0.008***	0.013***	0.012***	0.018***	0.008***	0.015***
	(8.11)	(12.22)	(21.75)	(7.49)	(7.56)	(5.18)	(8.59)	(7.81)
CF	0.024*	0.246***	0.045***	0.001	0.026	0.319***	0.075***	0.003
	(1.80)	(5.53)	(2.99)	(0.10)	(1.31)	(7.31)	(5.84)	(0.15)
N	471766	45752	148765	272516	353894	25209	98851	226296
$\bar{R}^2$	0.46	0.55	0.49	0.47	0.44	0.53	0.48	0.46
Economic Significance	0.078	0.244	0.133	0.004	0.075	0.291	0.173	0.010
	Investment including R&D							
q	0.014***	0.018***	0.011***	0.016***	0.015***	0.017***	0.010***	0.017***
	(11.73)	(11.31)	(16.84)	(9.38)	(7.42)	(4.89)	(7.68)	(7.80)
CF	0.039**	0.295***	0.077***	0.007	0.036	0.356***	0.099***	0.007
	(2.29)	(7.95)	(6.62)	(0.37)	(1.48)	(8.35)	(7.03)	(0.30)
N	471766	45752	148765	272516	353894	25209	98851	226296
$\bar{R}^2$	0.51	0.60	0.57	0.52	0.47	0.55	0.52	0.49
Economic Significance	0.094	0.273	0.166	0.019	0.086	0.313	0.196	0.019

Table 3

Investment-Cash Flow Sensitivities by Country

This table reports coefficients on cash flow estimated from regressing investment on Tobin's q and cash flow by country, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_t + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity; α_i and α_t are firm and year fixed effects. Robust $t-$statistics are computed based on standard errors clustered at the firm level. DEV denotes developed market, whereas EMG represents emerging market. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	Full Period	Subperiods		
Country	1981-2014	1981-1992	1993-2003	2004-2014
Argentina	0.112***	0.112***	0.124**	0.102**
Australia	-0.030***	0.266***	0.027*	-0.041***
Austria	0.154***	0.353***	0.190***	0.111
Belgium	0.140***	0.325***	0.111	0.088**
Brazil	0.131***	0.052	0.185***	0.124***
Canada	-0.020***	0.213***	0.079***	-0.040***
Chile	0.126***	0.126***	0.175	0.103***
China	0.183***	0.183***	0.110***	0.188***
Colombia	0.248***	0.248***	0.127	0.271**
Denmark	0.059*	0.286*	0.050	0.046
Finland	0.129***	0.543**	0.183***	0.090*
France	0.122***	0.384***	0.119***	0.099***
Germany	0.087***	0.436***	0.102***	0.050***
Greece	0.138*	0.138*	0.462	0.123
Hong Kong	0.050***	0.387***	0.054***	0.034***
India	0.273***	0.273***	0.363***	0.253***
Indonesia	0.151***	0.151***	0.155***	0.153***
Ireland	0.079*	0.456***	0.046	0.026
Israel	0.005	0.005	0.030	0.006
Italy	0.099	0.554***	0.196**	-0.014
Japan	0.062***	0.409***	0.045***	0.050***
Luxembourg	0.171***	0.171***	0.281	0.110**
Malaysia	0.135***	0.575***	0.147***	0.114***
Mexico	0.152***	0.158	0.096**	0.142*
Netherlands	0.057*	0.438***	0.134***	-0.034
New Zealand	0.044	0.813**	0.055	0.032
Norway	0.053**	0.006	0.049	0.049*
Pakistan	0.186***	0.186***	0.250***	0.151***
Peru	0.098**	0.098**	0.076	0.091
Philippines	0.025	0.025	0.183**	-0.042
Poland	0.099***	0.099***	0.206**	0.094***
Portugal	0.054	0.054	0.091	0.103**
Singapore	0.099***	0.017	0.155***	0.085***
South Africa	0.079***	0.283***	0.085***	0.075***
South Korea	0.050***	0.610***	0.076***	0.037***
Spain	0.178***	0.177**	0.250***	0.120**
Sweden	0.023**	0.228*	0.054***	0.007
Switzerland	0.062**	0.481***	0.056	0.019
Taiwan	0.131***	0.131***	0.213***	0.109***
Thailand	0.079***	0.079***	0.064	0.086**
Turkey	0.119***	0.119***	0.219***	0.073**
United Kingdom	0.039***	0.402***	0.037***	0.001
United States	0.022***	0.188***	0.020***	-0.003
Venezuela	0.211***	0.211***	0.172***	0.293***
DEV	0.010	0.251***	0.034***	-0.017
EMG	0.113***	0.186**	0.142***	0.101***

Table 4

Investor Protection and Investment-Cash Flow Sensitivities

This table reports coefficients estimated from regressing investment on Tobin's q and cash flow, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,t}$, and $\alpha_{ind,t}$, denoting firm, country-year, and industry-year fixed effects, respectively. We divide countries into terciles based on the various proxies for investor protection, namely anti-self-dealing (Anti-Self), liability, protection, disclosure, financial transparency, and access. The above regression is conducted separately for terciles. For the legal origin, we run the regression for two groups: common and civil law countries. All definitions are in Appendix Table A.1. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Civil Law				**Common Law**			
q	0.008***	0.012***	0.007***	0.009***	0.011***	0.020***	0.009***	0.014***
	(7.66)	(2.91)	(6.22)	(6.87)	(6.18)	(16.29)	(17.52)	(6.15)
CF	0.087***	0.278***	0.106***	0.068***	0.011	0.236***	0.032***	-0.012
	(6.47)	(4.18)	(8.33)	(4.02)	(0.86)	(4.74)	(3.12)	(-0.86)
N	203290	12276	57754	130904	268320	33379	90981	141579
$\bar{R}^2$	0.43	0.57	0.50	0.40	0.46	0.54	0.49	0.48

Table 4 - Continued
Investor Protection and Investment-Cash Flow Sensitivities

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Weak Protection				**Middle**				**Strong Protection**			
q	0.008***	0.015***	0.008***	0.010***	0.006***	0.009	0.004***	0.008***	0.011***	0.020***	0.009***	0.014***
	(8.12)	(4.01)	(9.06)	(5.98)	(5.26)	(1.54)	(4.05)	(3.83)	(6.03)	(16.28)	(14.84)	(6.05)
CF	0.064***	0.391***	0.092***	0.039***	0.083***	0.229**	0.103***	0.061***	0.011	0.233***	0.033**	-0.013
	(6.31)	(11.57)	(7.87)	(5.43)	(5.46)	(2.73)	(5.00)	(4.08)	(0.82)	(4.73)	(3.01)	(-0.94)
N	66707	5315	20619	40222	117356	7195	36642	72586	260615	32994	89314	135996
$\bar{R}^2$	0.36	0.48	0.40	0.36	0.49	0.62	0.56	0.43	0.46	0.54	0.49	0.48
	Low Disclosure				**Middle**				**High Disclosure**			
q	0.006***	0.015***	0.006***	0.008***	0.011***	0.010*	0.006***	0.013***	0.011***	0.020***	0.009***	0.013***
	(4.96)	(3.59)	(3.29)	(11.87)	(4.29)	(2.11)	(6.47)	(4.46)	(5.87)	(15.56)	(13.64)	(5.14)
CF	0.105***	0.230**	0.135***	0.072***	0.009	0.307***	0.059***	-0.009	0.020	0.231***	0.033**	-0.004
	(8.04)	(2.70)	(6.79)	(3.76)	(0.34)	(5.57)	(4.16)	(-0.37)	(1.40)	(4.51)	(2.79)	(-0.22)
N	43074	4330	15738	22577	159755	9271	45570	103740	241803	31888	85242	122478
$\bar{R}^2$	0.48	0.63	0.53	0.39	0.44	0.45	0.45	0.47	0.47	0.55	0.50	0.48
	Low Liability				**Middle**				**High Liability**			
q	0.007***	0.009	0.008***	0.008***	0.011***	0.016***	0.007***	0.013***	0.011**	0.021***	0.008***	0.013**
	(7.12)	(1.49)	(5.82)	(5.74)	(6.54)	(5.38)	(7.05)	(5.72)	(4.61)	(10.29)	(12.08)	(3.69)
CF	0.080***	0.252***	0.103***	0.053***	0.033	0.379***	0.062***	0.013	0.002	0.184***	0.024*	-0.027*
	(5.19)	(3.13)	(6.72)	(3.52)	(1.27)	(14.06)	(4.07)	(0.50)	(0.13)	(29.28)	(2.83)	(-1.68)
N	62543	6580	22998	32405	232269	15203	65375	149948	149942	23819	58196	66446
$\bar{R}^2$	0.46	0.59	0.50	0.40	0.41	0.49	0.43	0.43	0.51	0.57	0.54	0.54

Table 4 - Continued
Investor Protection and Investment-Cash Flow Sensitivities

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Weak Anti-Self Dealing				**Middle**				**Strong Anti-Self Dealing**			
q	0.008***	0.012*	0.007***	0.010***	0.008***	0.013**	0.006***	0.010***	0.011***	0.020***	0.009***	0.014***
	(6.12)	(2.09)	(5.14)	(4.46)	(4.29)	(2.21)	(3.78)	(3.69)	(6.44)	(16.24)	(16.39)	(6.52)
CF	0.077***	0.274***	0.111***	0.043**	0.099***	0.292**	0.114***	0.085**	0.011	0.236***	0.032***	-0.012
	(4.86)	(3.47)	(7.44)	(2.67)	(3.53)	(2.57)	(3.74)	(2.78)	(0.84)	(4.73)	(3.24)	(-0.93)
N	58839	7137	21706	29470	137740	5010	36547	95278	274818	33372	90429	147710
$\bar{R}^2$	0.49	0.60	0.54	0.43	0.40	0.49	0.44	0.40	0.47	0.54	0.50	0.49
	Low Transparency				**Middle**				**High Transparency**			
q	0.011***	-0.001	0.006**	0.014***	0.014***	0.014**	0.008***	0.017***	0.010***	0.019***	0.008***	0.012***
	(7.50)	(-0.14)	(2.27)	(16.55)	(9.59)	(2.61)	(4.77)	(18.33)	(7.17)	(12.14)	(19.89)	(4.97)
CF	0.099**	0.318***	0.122***	0.087*	0.000	0.157***	0.073**	-0.017	0.016	0.249***	0.032***	-0.014
	(2.80)	(12.61)	(4.09)	(2.10)	(0.00)	(3.18)	(2.79)	(-0.78)	(1.25)	(4.63)	(3.09)	(-0.96)
N	63454	1328	14625	47057	64529	3737	18572	41688	293903	40321	108731	142297
$\bar{R}^2$	0.34	0.48	0.38	0.34	0.47	0.53	0.50	0.47	0.50	0.55	0.52	0.53
	Low Access				**Middle**				**High Access**			
q	0.006***	0.008**	0.005**	0.007***	0.010***	0.009	0.007***	0.012***	0.011***	0.020***	0.009***	0.014***
	(4.25)	(2.35)	(2.72)	(3.64)	(9.64)	(1.29)	(4.32)	(8.55)	(6.23)	(16.48)	(17.72)	(5.64)
CF	0.085***	0.172*	0.117***	0.062***	0.090***	0.348***	0.112***	0.073***	0.004	0.239***	0.031***	-0.024**
	(5.70)	(2.00)	(4.82)	(3.91)	(4.20)	(6.08)	(4.94)	(3.25)	(0.33)	(4.83)	(3.24)	(-2.40)
N	87894	3915	28970	54337	120447	5216	29164	85095	236338	36366	88450	109380
$\bar{R}^2$	0.51	0.73	0.59	0.43	0.36	0.41	0.38	0.37	0.48	0.54	0.51	0.51

Table 5

Financial Development and Investment-Cash Flow Sensitivities

This table reports coefficients estimated from regressing investment on Tobin's q and cash flow, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,i}$, and $\alpha_{ind,i}$, denoting firm, country-year, and industry-year fixed effects, respectively. We divide sample into terciles based on the various proxies for financial development, namely a country's GDP per capita, financial openness, the amount of available domestic credit scaled by GDP, the size of its stock market capitalization scaled by GDP, and aggregate cost of equity financing. For each proxy of financial development and for each country-period, we rank country-period averages into high, middle, and low terciles. The above regression is conducted separately for terciles. All definitions are in Appendix Table A.1. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Low GDP per Capita				**Middle**				**High GDP per Capita**			
q	0.009***	0.008	0.007**	0.011***	0.012***	0.017***	0.008***	0.013***	0.010***	0.020***	0.008***	0.013***
	(7.87)	(1.49)	(2.80)	(7.46)	(7.19)	(4.67)	(9.14)	(6.03)	(7.18)	(29.21)	(20.31)	(6.05)
CF	0.150***	0.173**	0.153***	0.150***	0.077***	0.354***	0.059***	0.044***	0.003	0.180***	0.031***	-0.018
	(5.72)	(2.33)	(6.18)	(4.92)	(4.11)	(9.29)	(3.41)	(4.40)	(0.25)	(31.73)	(3.17)	(-1.58)
N	83775	1528	19503	61345	71275	21539	18599	30800	297307	22451	107328	165446
$\bar{R}^2$	0.40	0.69	0.48	0.36	0.41	0.52	0.40	0.34	0.50	0.55	0.52	0.52
Economic Significance	0.237	0.175	0.249	0.238	0.171	0.321	0.169	0.127	0.011	0.190	0.100	-0.081
	Less Financial Openness				**Middle**				**More Financial Openness**			
q	0.010***	0.009*	0.005**	0.012***	0.013***	0.015***	0.006***	0.017***	0.010***	0.020***	0.009***	0.012***
	(9.00)	(1.69)	(2.32)	(6.79)	(6.46)	(3.26)	(6.00)	(20.74)	(7.01)	(12.69)	(15.42)	(5.30)
CF	0.145***	0.165**	0.136***	0.147***	0.005	0.383***	0.076***	-0.019	0.012	0.196***	0.029**	-0.009
	(4.97)	(2.45)	(4.50)	(4.48)	(0.19)	(15.04)	(3.98)	(-0.92)	(1.10)	(10.35)	(3.11)	(-0.64)
N	79268	3426	16455	58190	101207	14956	46981	38778	270690	26534	81891	160359
$\bar{R}^2$	0.41	0.59	0.51	0.36	0.43	0.51	0.43	0.45	0.50	0.55	0.52	0.52
Economic Significance	0.227	0.162	0.222	0.234	0.014	0.352	0.178	-0.067	0.046	0.203	0.097	-0.041

Table 5 - Continued
Financial Development and Investment-Cash Flow Sensitivities

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Less Domestic Credit				**Middle**				**More Domestic Credit**			
q	0.009***	0.007	0.003	0.014***	0.008***	0.017**	0.007***	0.011***	0.011***	0.019***	0.009***	0.013***
	(4.39)	(1.30)	(1.50)	(8.14)	(8.24)	(2.53)	(7.57)	(6.75)	(7.04)	(19.88)	(15.93)	(6.73)
CF	0.162***	0.185***	0.198***	0.150**	0.064***	0.302***	0.061***	0.039***	0.011	0.236**	0.034**	-0.010
	(4.27)	(4.12)	(7.59)	(3.02)	(5.39)	(5.85)	(4.02)	(5.07)	(0.85)	(3.87)	(2.95)	(-0.77)
N	44933	2644	10243	31718	65023	12187	27328	25191	341574	30667	107845	200666
$\bar{R}^2$	0.41	0.58	0.53	0.35	0.39	0.48	0.40	0.35	0.49	0.56	0.51	0.50
Economic Significance	0.237	0.187	0.299	0.225	0.147	0.252	0.146	0.118	0.040	0.246	0.111	-0.042
	Small Market Capitalization				**Middle**				**Large Market Capitalization**			
q	0.010***	0.012**	0.007***	0.016***	0.008***	0.020***	0.005***	0.009***	0.011***	0.012**	0.009***	0.014***
	(4.13)	(1.98)	(2.45)	(6.93)	(6.29)	(14.27)	(4.25)	(6.05)	(5.82)	(2.40)	(15.81)	(6.05)
CF	0.119***	0.346***	0.121***	0.078***	0.114***	0.231***	0.097***	0.097***	0.002	0.346***	0.032***	-0.016
	(7.75)	(7.88)	(5.52)	(5.71)	(4.58)	(4.56)	(4.74)	(3.23)	(0.20)	(5.90)	(3.18)	(-1.35)
N	33905	8525	14910	10329	179976	33764	38369	107251	236436	2653	92147	139845
$\bar{R}^2$	0.47	0.49	0.54	0.36	0.45	0.56	0.43	0.42	0.48	0.33	0.50	0.50
Economic Significance	0.194	0.268	0.207	0.176	0.205	0.238	0.172	0.206	0.008	0.347	0.107	-0.070
	High Cost of Equity Financing				**Middle**				**Low Cost of Equity Financing**			
q	0.009***	0.022***	0.004**	0.014***	0.011***	0.018***	0.009***	0.011***	0.010***	0.011*	0.008***	0.013***
	(5.31)	(6.54)	(2.21)	(12.68)	(8.96)	(10.31)	(3.69)	(11.84)	(6.47)	(2.38)	(20.20)	(5.94)
CF	0.171***	0.325***	0.142***	0.162**	0.078***	0.200***	0.072***	0.062***	0.001	0.431***	0.033***	-0.019
	(4.57)	(5.94)	(5.23)	(3.19)	(4.14)	(8.29)	(5.05)	(3.06)	(0.09)	(13.45)	(3.14)	(-1.73)
N	58781	13665	16603	28288	106250	25737	12809	67469	285446	5597	116013	161730
$\bar{R}^2$	0.42	0.49	0.51	0.36	0.39	0.55	0.37	0.35	0.50	0.54	0.51	0.52
Economic Significance	0.244	0.305	0.238	0.246	0.164	0.209	0.152	0.155	0.004	0.321	0.107	-0.086

Table 6

Means of Firm-Level Equity and Debt Issuances Across Periods by Financial Development Measure

This table presents average values of the change in equity and debt over the full sample period and the three subperiods for subsamples split based on various measures of financial development, namely a country's GDP per capita, financial openness, the amount of available domestic credit scaled by GDP, the size of its stock market capitalization scaled by GDP, and aggregate cost of equity financing. $\text{Equity}_{i,t}$ is firm i's annual change in equity; $\text{Debt}_{i,t}$ is firm i's annual change in debt. Both are scaled by the beginning-of-period total assets, $A_{i,t-1}$. The sample period is between 1981 and 2014.

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Low GDP per Capita				**Middle**				**High GDP per Capita**			
$\text{Equity}_{i,t}$	0.064	0.294	0.112	0.041	0.051	0.044	0.071	0.043	0.114	0.032	0.091	0.141
$\text{Debt}_{i,t}$	0.050	0.116	0.059	0.044	0.037	0.045	0.033	0.033	0.030	0.035	0.034	0.027
	Less Financial Openness				**Middle**				**More Financial Openness**			
$\text{Equity}_{i,t}$	0.064	0.179	0.113	0.041	0.087	0.043	0.045	0.157	0.107	0.033	0.114	0.116
$\text{Debt}_{i,t}$	0.049	0.095	0.055	0.044	0.031	0.044	0.024	0.035	0.032	0.034	0.041	0.026
	Less Domestic Credit				**Middle**				**More Domestic Credit**			
$\text{Equity}_{i,t}$	0.087	0.208	0.171	0.048	0.050	0.041	0.061	0.042	0.105	0.036	0.091	0.122
$\text{Debt}_{i,t}$	0.060	0.103	0.076	0.050	0.035	0.041	0.034	0.033	0.031	0.037	0.034	0.029
	Small Market Capitalization				**Middle**				**Large Market Capitalization**			
$\text{Equity}_{i,t}$	0.099	0.094	0.140	0.032	0.034	0.038	0.025	0.039	0.119	0.043	0.114	0.124
$\text{Debt}_{i,t}$	0.061	0.067	0.072	0.035	0.031	0.037	0.019	0.038	0.033	0.040	0.041	0.030
	High Cost of Equity Financing				**Middle**				**Low Cost of Equity Financing**			
$\text{Equity}_{i,t}$	0.068	0.054	0.115	0.046	0.047	0.033	0.059	0.049	0.117	0.027	0.091	0.139
$\text{Debt}_{i,t}$	0.052	0.045	0.060	0.051	0.038	0.037	0.036	0.039	0.029	0.037	0.034	0.025

Table 7
Equity Issuance-Cash Flow Sensitivities and Financial Development

This table reports coefficients estimated from regressing a firm's annual change in equity financing on Tobin's q and cash flow, as follows.

$$\frac{\text{Equity}_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \gamma_1 q_{i,t-1} + \gamma_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $\text{Equity}_{i,t}$ is firm i's annual change in equity or debt, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; γ_1 is investment-q sensitivity; γ_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,t}$, and $\alpha_{ind,t}$, denoting firm, country-year, and industry-year fixed effects, respectively. The above regression is conducted separately for subsamples split based on various measures of financial development, namely a country's GDP per capita, financial openness, the amount of available domestic credit scaled by GDP, the size of its stock market capitalization scaled by GDP, and aggregate cost of equity financing. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Low GDP per Capita				**Middle**				**High GDP per Capita**			
q	0.037***	0.016	0.034***	0.044***	0.073***	0.034***	0.082***	0.072***	0.083***	0.029***	0.076***	0.097***
	(5.19)	(0.89)	(3.77)	(5.26)	(11.04)	(5.73)	(12.87)	(6.36)	(13.12)	(40.78)	(21.97)	(12.89)
CF	0.375*	0.265	0.358	0.430*	-0.212**	0.695***	-0.103	-0.386***	-0.762***	0.677***	-0.484***	-0.898***
	(2.00)	(0.80)	(1.73)	(1.99)	(-2.20)	(8.46)	(-0.64)	(-4.28)	(-9.58)	(50.31)	(-7.29)	(-11.63)
N	82752	1526	19131	60701	70408	21385	18234	30447	290236	22214	104594	161469
$\bar{R}^2$	0.68	0.95	0.87	0.14	0.21	0.22	0.24	0.20	0.45	0.25	0.38	0.48
	Less Financial Openness				**Middle**				**More Financial Openness**			
q	0.042***	0.015	0.036***	0.047***	0.085***	0.037***	0.060***	0.104***	0.083***	0.029***	0.079***	0.094***
	(5.76)	(1.65)	(3.37)	(5.32)	(6.21)	(4.79)	(5.85)	(9.33)	(13.69)	(17.85)	(20.49)	(11.68)
CF	0.360*	0.310	0.301	0.407	-0.686***	0.799***	-0.101	-0.838***	-0.720***	0.643***	-0.493***	-0.865***
	(1.79)	(1.49)	(1.41)	(1.80)	(-4.19)	(16.71)	(-0.69)	(-6.83)	(-8.21)	(13.94)	(-7.27)	(-7.99)
N	78290	3413	16104	57595	100032	14837	46427	38266	263884	26277	79321	156493
$\bar{R}^2$	0.70	0.93	0.90	0.15	0.35	0.19	0.24	0.42	0.44	0.25	0.38	0.48

Table 7 - Continued
Equity Issuance-Cash Flow Sensitivities and Financial Development

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Less Domestic Credit				**Middle**				**More Domestic Credit**			
q	0.031***	0.035**	0.025***	0.044***	0.067***	0.032***	0.070***	0.071***	0.084***	0.029***	0.077***	0.095***
	(3.75)	(2.27)	(5.49)	(4.29)	(9.39)	(5.40)	(7.96)	(7.49)	(12.89)	(8.92)	(21.54)	(12.76)
CF	0.435	0.318	0.371**	0.511	-0.252***	0.581***	-0.147	-0.414***	-0.722***	0.719***	-0.460***	-0.853***
	(1.64)	(1.35)	(2.38)	(1.50)	(-3.44)	(5.08)	(-1.01)	(-8.20)	(-8.29)	(19.17)	(-5.49)	(-9.24)
N	44319	2630	10040	31319	64255	12126	26897	24918	334007	30348	105003	196366
$\bar{R}^2$	0.76	0.92	0.93	0.16	0.22	0.18	0.26	0.19	0.43	0.24	0.36	0.47
	Small Market Capitalization				**Middle**				**Large Market Capitalization**			
q	0.027***	0.031***	0.023***	0.044**	0.054***	0.033***	0.060***	0.055***	0.085***	0.003	0.078***	0.097***
	(7.25)	(5.37)	(6.52)	(2.83)	(7.99)	(8.89)	(4.62)	(5.93)	(13.13)	(0.32)	(23.46)	(13.00)
CF	0.276**	0.406**	0.457**	0.027	0.107	0.683***	0.084	-0.005	-0.739***	0.936***	-0.474***	-0.841***
	(2.68)	(2.22)	(2.99)	(0.14)	(0.99)	(19.73)	(0.91)	(-0.03)	(-9.19)	(8.64)	(-6.59)	(-8.60)
N	25782	7770	10512	7349	128520	32003	42007	54199	287329	5066	89417	191014
$\bar{R}^2$	0.90	0.89	0.94	0.16	0.15	0.25	0.19	0.14	0.43	0.19	0.36	0.46
	High Cost of Equity Financing				**Middle**				**Low Cost of Equity Financing**			
q	0.036***	0.036***	0.035***	0.053**	0.064***	0.029***	0.064***	0.066***	0.083***	0.025	0.077***	0.097***
	(3.28)	(5.38)	(3.52)	(3.04)	(7.12)	(37.64)	(4.29)	(5.92)	(12.96)	(1.95)	(23.11)	(12.36)
CF	0.431	0.673***	0.239	0.557	-0.143	0.702***	0.184**	-0.271*	-0.778***	0.686*	-0.472***	-0.915***
	(1.60)	(6.96)	(1.34)	(1.45)	(-1.01)	(24.72)	(2.92)	(-1.86)	(-10.66)	(2.20)	(-6.70)	(-12.31)
N	57899	13541	16245	27890	105082	25474	12615	66761	278555	5592	113088	157863
$\bar{R}^2$	0.72	0.23	0.89	0.20	0.14	0.24	0.15	0.15	0.46	0.16	0.37	0.50

Table 8

Debt-Cash Flow Sensitivities and Financial Development

This table reports coefficients estimated from regressing a firm's annual change in debt financing on Tobin's q and cash flow, as follows.

$$\frac{\text{Debt}_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \gamma_1 q_{i,t-1} + \gamma_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $\text{Debt}_{i,t}$ is firm i's annual change in debt, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; γ_1 is investment-q sensitivity; γ_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,t}$, and $\alpha_{ind,t}$, denoting firm, country-year, and industry-year fixed effects, respectively. The above regression is conducted separately for subsamples split based on various measures of financial development, namely a country's GDP per capita, financial openness, the amount of available domestic credit scaled by GDP, the size of its stock market capitalization scaled by GDP, and aggregate cost of equity financing. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Low GDP per Capita				**Middle**				**High GDP per Capita**			
q	0.012***	0.004	0.011**	0.015***	0.015***	0.022***	0.013***	0.016***	0.010***	0.029***	0.010***	0.012***
	(9.84)	(0.56)	(2.52)	(15.46)	(7.16)	(6.50)	(4.46)	(7.35)	(14.70)	(31.07)	(18.39)	(6.72)
CF	0.096**	0.058	0.051	0.130***	0.038	0.380***	0.033	-0.004	-0.017	0.168***	0.001	-0.026**
	(2.84)	(0.53)	(1.39)	(4.20)	(1.39)	(6.68)	(1.50)	(-0.24)	(-1.41)	(8.42)	(0.05)	(-2.31)
N	83732	1528	19497	61308	71206	21531	18591	30748	296911	22439	107278	165107
$\bar{R}^2$	0.28	0.83	0.43	0.12	0.08	0.14	0.09	0.06	0.10	0.08	0.09	0.09
	Less Financial Openness				**Middle**				**More Financial Openness**			
q	0.013***	0.016	0.008*	0.015***	0.011***	0.018***	0.008***	0.011***	0.011***	0.028***	0.011***	0.012***
	(11.12)	(1.41)	(1.84)	(16.21)	(9.09)	(5.40)	(5.44)	(5.80)	(11.78)	(18.38)	(12.57)	(6.00)
CF	0.096**	0.136	0.042	0.123***	0.007	0.434***	0.061**	-0.013	-0.018	0.167***	-0.005	-0.027*
	(2.65)	(0.84)	(1.34)	(3.54)	(0.35)	(10.33)	(2.13)	(-1.53)	(-1.25)	(14.55)	(-0.21)	(-1.96)
N	79230	3425	16449	58158	101131	14940	46965	38733	270297	26531	81849	160008
$\bar{R}^2$	0.28	0.64	0.46	0.12	0.09	0.15	0.14	0.05	0.09	0.07	0.09	0.10

Table 8 – Continued
Debt-Cash Flow Sensitivities and Financial Development

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Less Domestic Credit				**Middle**				**More Domestic Credit**			
q	0.009***	0.006	0.004	0.014***	0.011***	0.021**	0.009***	0.018***	0.011***	0.026***	0.011***	0.012***
	(8.09)	(0.59)	(1.24)	(13.35)	(7.59)	(2.79)	(5.72)	(7.61)	(12.21)	(11.24)	(12.45)	(7.33)
CF	0.040	0.083	0.005	0.076**	0.042	0.325***	0.076**	-0.005	-0.010	0.227**	-0.002	-0.017
	(1.14)	(0.79)	(0.12)	(2.70)	(1.62)	(3.57)	(2.34)	(-0.39)	(-0.63)	(3.11)	(-0.07)	(-1.14)
N	44860	2634	10239	31659	64969	12180	27313	25159	341193	30664	107800	200329
$\bar{R}^2$	0.36	0.67	0.53	0.13	0.08	0.09	0.10	0.06	0.10	0.10	0.10	0.09
	Small Market Capitalization				**Middle**				**Large Market Capitalization**			
q	0.007**	0.025***	0.006	0.008*	0.013***	0.027***	0.009***	0.015***	0.011***	0.010	0.011***	0.012***
	(2.12)	(4.19)	(1.31)	(2.12)	(8.13)	(13.89)	(4.02)	(18.60)	(10.98)	(1.33)	(13.98)	(6.99)
CF	0.060	0.281*	0.058	0.019	0.096***	0.219***	0.056**	0.092**	-0.017	0.344***	-0.000	-0.022*
	(1.10)	(2.00)	(1.08)	(0.31)	(3.99)	(3.66)	(2.25)	(2.57)	(-1.19)	(5.03)	(-0.00)	(-1.80)
N	26052	7800	10666	7435	129997	32348	42584	54752	294001	5062	92097	194918
$\bar{R}^2$	0.46	0.49	0.54	0.06	0.11	0.09	0.17	0.09	0.09	0.11	0.08	0.10
	High Cost of Equity Financing				**Middle**				**Low Cost of Equity Financing**			
q	0.011***	0.024***	0.008*	0.015***	0.017***	0.027***	0.012**	0.018***	0.010***	0.011	0.010***	0.011***
	(6.13)	(5.09)	(1.94)	(12.25)	(10.96)	(14.88)	(2.98)	(13.05)	(14.55)	(1.87)	(16.73)	(6.67)
CF	0.069**	0.325***	0.027	0.066*	0.038	0.201***	0.078**	0.016	-0.017	0.473*	0.003	-0.023*
	(2.15)	(4.27)	(0.92)	(2.13)	(1.04)	(4.22)	(2.37)	(0.41)	(-1.06)	(2.63)	(0.10)	(-1.80)
N	58724	13652	16597	28249	106169	25730	12807	67397	285080	5597	115957	161413
$\bar{R}^2$	0.28	0.12	0.46	0.14	0.07	0.08	0.10	0.07	0.10	0.15	0.09	0.10

Table 9

Economic Significance of Cash Flow, Equity Issuances, and Debt Issuances

This table reports coefficients estimated from regressing investment on Tobin's q, cash flow, change in equity, and change in debt, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \beta_3 \frac{\text{Equity}_{i,t}}{A_{i,t-1}} + \beta_4 \frac{\text{Debt}_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; $\text{Equity}_{i,t}$ is firm i's annual change in equity, scaled by its beginning-of-period total assets; $\text{Debt}_{i,t}$ is firm i's annual change in debt, scaled by its beginning-of-period total assets; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,t}$, and $\alpha_{ind,t}$, denoting firm, country-year, and industry-year fixed effects, respectively. We divide sample into terciles based on the various proxies for financial development, namely a country's GDP per capita, financial openness, the amount of available domestic credit scaled by GDP, the size of its stock market capitalization scaled by GDP, and aggregate cost of equity financing. For each proxy of financial development, we take average for each country-period, and then rank these country-period averages into high, middle, and low terciles. The above regression is conducted separately for terciles. Both coefficients and their economic significance are reported for GDP subsamples. For the other measures, only the economic significance is reported. All definitions are in Appendix Table A.1. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively. Economic significance is one standard deviation of the variable of interest multiplied by the coefficient on that particular variable.

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Low GDP per Capita				**Middle**				**High GDP per Capita**			
q	0.004***	0.006	0.003	0.005***	0.006***	0.011***	0.004***	0.008***	0.005***	0.015***	0.004***	0.006***
	(5.72)	(1.51)	(1.66)	(7.18)	(4.75)	(3.65)	(4.54)	(3.81)	(11.54)	(76.32)	(15.30)	(6.48)
CF	0.123***	0.144***	0.148***	0.109***	0.085***	0.245***	0.057***	0.064***	0.040***	0.131***	0.054***	0.028***
	(7.22)	(5.47)	(5.36)	(5.99)	(6.37)	(10.65)	(6.13)	(7.08)	(5.29)	(14.30)	(10.95)	(5.00)
Equity	0.046***	0.062***	0.039***	0.047***	0.039***	0.069***	0.033***	0.032***	0.053***	0.037***	0.040***	0.056***
	(10.19)	(4.12)	(6.95)	(9.32)	(7.97)	(9.72)	(9.07)	(8.27)	(5.35)	(6.50)	(22.44)	(4.97)
Debt	0.244***	0.238***	0.214***	0.257***	0.177***	0.176***	0.167***	0.173***	0.128***	0.144***	0.120***	0.128***
	(6.80)	(14.60)	(10.54)	(5.95)	(36.29)	(14.49)	(18.37)	(21.92)	(12.03)	(9.32)	(10.87)	(10.21)
N	82714	1526	19125	60669	70343	21377	18226	30399	289902	22202	104550	161187
$\bar{R}^2$	0.53	0.74	0.58	0.51	0.51	0.59	0.50	0.45	0.58	0.62	0.59	0.59
Economic Significance												
q	0.071	0.045	0.052	0.091	0.094	0.086	0.086	0.153	0.142	0.146	0.127	0.170
CF	0.194	0.145	0.241	0.173	0.188	0.221	0.164	0.184	0.154	0.138	0.174	0.127
Equity	0.233	0.414	0.295	0.150	0.138	0.125	0.151	0.145	0.336	0.075	0.212	0.421
Debt	0.513	0.545	0.523	0.487	0.361	0.258	0.392	0.425	0.274	0.231	0.275	0.271

Table 9 - Continued
Economic Significance of Cash Flow, Equity Issuances, and Debt Issuances

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Less Financial Openness				**Middle**				**More Financial Openness**			
Economic Significance												
q	0.089	0.035	0.034	0.111	0.114	0.065	0.071	0.169	0.144	0.141	0.160	0.179
CF	0.186	0.118	0.220	0.173	0.113	0.235	0.172	0.095	0.180	0.155	0.175	0.151
Equity	0.226	0.314	0.318	0.143	0.292	0.133	0.161	0.365	0.312	0.077	0.215	0.396
Debt	0.512	0.457	0.500	0.492	0.351	0.275	0.413	0.316	0.273	0.221	0.259	0.284
	Less Domestic Credit				**Middle**				**More Domestic Credit**			
Economic Significance												
q	0.078	0.026	0.017	0.128	0.071	0.077	0.044	0.107	0.163	0.134	0.159	0.163
CF	0.218	0.159	0.317	0.178	0.162	0.172	0.131	0.176	0.168	0.174	0.179	0.135
Equity	0.254	0.299	0.305	0.152	0.136	0.113	0.157	0.134	0.319	0.100	0.209	0.390
Debt	0.579	0.525	0.554	0.551	0.392	0.275	0.383	0.465	0.285	0.225	0.282	0.288
	Small Market Capitalization				**Middle**				**Large Market Capitalization**			
Economic Significance												
q	0.015	0.033	-0.017	0.150	0.090	0.119	0.069	0.125	0.139	0.148	0.155	0.185
CF	0.220	0.156	0.297	0.133	0.158	0.167	0.119	0.176	0.161	0.181	0.183	0.138
Equity	0.218	0.271	0.264	0.077	0.144	0.103	0.126	0.180	0.328	0.106	0.212	0.380
Debt	0.498	0.389	0.521	0.528	0.341	0.240	0.386	0.380	0.312	0.223	0.277	0.335
	High Cost of Equity Financing				**Middle**				**Low Cost of Equity Financing**			
Economic Significance												
q	0.070	0.107	0.017	0.088	0.110	0.124	0.082	0.128	0.146	0.061	0.126	0.170
CF	0.212	0.203	0.247	0.200	0.170	0.155	0.101	0.183	0.154	0.227	0.182	0.131
Equity	0.225	0.141	0.310	0.134	0.136	0.076	0.137	0.159	0.349	0.108	0.207	0.431
Debt	0.492	0.276	0.490	0.562	0.361	0.235	0.455	0.393	0.279	0.222	0.285	0.276

Table 10

Firm-Level Financial Constraints and Investment-Cash Flow Sensitivities

This table reports coefficients estimated from regressing investment on Tobin's q and cash flow, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,t}$, and $\alpha_{ind,t}$, denoting firm, country-year, and industry-year fixed effects,vrespectively. We split the sample based on the following firm-level characteristics: external financing including the annual change in equity and debt, payout including annual dividend and shares repurchase, and three indices of financial constraints in the literature (Kaplan-Zingales, Whited-Wu, and Hadlock-Pierce). When ranking based on payout, we drop Chile and Brazil as dividends are mandatory in the two countries. For each measure, we calculate its average for each firm-period, and then divide the sample into high, middle, and low terciles. For the three indices, firms in the top (bottom) tercile are financially constrained (unconstrained). The above regression is conducted separately for terciles. All definitions are in Appendix Table A.1. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Low Firm Equity + Debt Issues				**Middle**				**High Firm Equity + Debt Issues**			
q	0.005***	0.012***	0.005***	0.005***	0.008***	0.016***	0.007***	0.009***	0.011***	0.021***	0.008***	0.014***
	(7.41)	(4.16)	(7.36)	(7.34)	(11.52)	(13.39)	(13.24)	(7.18)	(6.44)	(9.11)	(17.77)	(7.19)
CF	0.047***	0.139***	0.040***	0.038***	0.086***	0.240***	0.081***	0.068***	0.003	0.274***	0.031*	-0.011
	(10.58)	(9.66)	(6.48)	(6.30)	(10.71)	(8.66)	(7.61)	(6.37)	(0.21)	(4.27)	(1.81)	(-0.79)
N	157135	10935	49132	96423	175717	24006	55279	95931	135290	10531	44172	79945
$\bar{R}^2$	0.47	0.52	0.51	0.45	0.43	0.52	0.44	0.42	0.44	0.52	0.48	0.43
	Low Payouts				**Middle**				**High Payouts**			
q	0.010***	0.023***	0.007***	0.013***	0.012***	0.023***	0.009***	0.013***	0.009***	0.013***	0.008***	0.011***
	(5.85)	(14.51)	(11.53)	(6.93)	(8.22)	(5.88)	(12.56)	(6.61)	(12.30)	(6.96)	(8.03)	(9.49)
CF	-0.017*	0.136***	0.011	-0.028***	0.099***	0.262***	0.093***	0.088***	0.064***	0.296***	0.057**	0.044***
	(-1.76)	(5.22)	(1.52)	(-2.80)	(5.23)	(7.94)	(5.13)	(3.84)	(3.71)	(4.21)	(2.08)	(3.21)
N	109506	3666	33642	70984	178205	15415	57368	104718	175119	26143	55186	93078
$\bar{R}^2$	0.46	0.55	0.50	0.46	0.46	0.52	0.47	0.45	0.46	0.53	0.46	0.48

Table 10 - Continued
Firm-Level Financial Constraints and Investment-Cash Flow Sensitivities

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Low KZ Index				**Middle**				**High KZ Index**			
q	0.008***	0.012***	0.006***	0.009***	0.021***	0.023***	0.013***	0.025***	0.013***	0.031***	0.010***	0.016***
	(8.29)	(8.10)	(17.64)	(6.21)	(6.77)	(10.49)	(13.08)	(7.27)	(8.93)	(11.26)	(10.74)	(9.86)
CF	0.003	0.193***	0.022**	-0.009	0.052*	0.273***	0.106***	0.017	0.026*	0.250***	0.042**	0.006
	(0.22)	(3.33)	(2.09)	(-0.66)	(1.70)	(5.29)	(6.87)	(0.59)	(1.85)	(10.00)	(2.52)	(0.40)
N	153197	9063	39710	103544	166996	21108	52619	92491	147620	15231	55933	75524
$\bar{R}^2$	0.44	0.54	0.47	0.43	0.50	0.56	0.53	0.51	0.44	0.55	0.49	0.43
	Low WW Index				**Middle**				**High WW Index**			
q	0.013***	0.019***	0.011***	0.015***	0.010***	0.017***	0.008***	0.011***	0.009***	0.018**	0.007***	0.012***
	(11.55)	(8.57)	(7.38)	(8.99)	(11.97)	(7.65)	(10.68)	(7.97)	(6.42)	(2.34)	(27.19)	(6.88)
CF	0.108***	0.316***	0.151***	0.054**	0.098***	0.211***	0.095***	0.081***	-0.003	0.162***	0.004	-0.010
	(4.71)	(5.72)	(5.27)	(2.16)	(7.28)	(5.29)	(6.48)	(4.29)	(-0.37)	(5.19)	(0.49)	(-0.89)
N	173625	28606	58110	85949	149624	14097	50300	84282	137646	2637	39202	94915
$\bar{R}^2$	0.51	0.60	0.55	0.49	0.44	0.50	0.47	0.41	0.46	0.48	0.47	0.48
	Low HP Index				**Middle**				**High HP Index**			
q	0.009***	0.017***	0.007***	0.011***	0.011***	0.016***	0.008***	0.014***	0.011***	0.019***	0.008***	0.016***
	(5.98)	(6.94)	(12.49)	(6.86)	(8.26)	(5.97)	(11.21)	(6.33)	(6.93)	(7.33)	(12.62)	(4.48)
CF	-0.013	0.199***	0.001	-0.024**	0.058***	0.261***	0.076***	0.036**	0.139***	0.270***	0.147***	0.110***
	(-1.40)	(3.53)	(0.10)	(-2.31)	(4.21)	(3.97)	(3.82)	(2.23)	(6.77)	(4.31)	(7.15)	(3.56)
N	121602	4357	35191	80845	143309	9491	46303	86425	161560	10131	53430	96691
$\bar{R}^2$	0.40	0.44	0.37	0.42	0.48	0.52	0.48	0.48	0.54	0.58	0.58	0.54

Table 11
Investment-Cash Flow Sensitivities by Industry

This table reports coefficients estimated from regressing investment on Tobin's q and cash flow, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,t}$, and $\alpha_{ind,t}$, denoting firm, country-year, and industry-year fixed effects, respectively. The above regression is conducted separately for manufacturing and non-Manufacturing firms. Manufacturing firms are further divided into durables, non-durables, and high-tech firms. Industries are based on SIC codes. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Manufacturing				**Non-Manufacturing**			
	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
q	0.009***	0.018***	0.008***	0.011***	0.011***	0.019***	0.008***	0.014***
	(11.57)	(16.19)	(20.35)	(7.59)	(7.36)	(7.66)	(17.54)	(7.44)
CF	0.053***	0.225***	0.054**	0.038**	0.009	0.267***	0.039***	-0.014
	(3.18)	(4.43)	(2.59)	(2.17)	(0.63)	(6.56)	(3.23)	(-0.96)
N	232355	24343	74333	131526	239385	21389	74428	140990
$\bar{R}^2$	0.38	0.50	0.44	0.37	0.48	0.56	0.52	0.50
	Durables				**Non-Durables**			
q	0.012***	0.016***	0.012***	0.014***	0.012***	0.016***	0.011***	0.013***
	(8.70)	(13.32)	(13.22)	(5.36)	(7.07)	(10.96)	(19.89)	(9.33)
CF	0.079***	0.223***	0.088***	0.058***	0.094***	0.282***	0.102***	0.073**
	(4.78)	(5.66)	(3.73)	(3.16)	(4.30)	(4.89)	(5.84)	(2.44)
N	87922	10089	28267	48780	79236	8954	26029	43539
$\bar{R}^2$	0.40	0.50	0.47	0.38	0.38	0.51	0.43	0.36
	High-Tech							
q	0.007***	0.020***	0.007***	0.008***				
	(9.93)	(21.22)	(37.67)	(4.52)				
CF	0.021**	0.175***	0.018**	0.012				
	(2.53)	(5.22)	(2.24)	(1.07)				
N	60743	4739	18401	36991				
$\bar{R}^2$	0.39	0.47	0.44	0.39				

Appendix Table A.1
Variable Definition and Data Source

Variable	Definition	Data source
Firm-level variables		
I	Capital expenditure scaled by the lagged total assets	Worldscope
q	Total assets plus the market value of equity minus the book value of equity divided by total assets.	Worldscope
CF	Net income before extraordinary items/preferred dividends plus depreciation and amortization scaled by the lagged total assets	Worldscope
R&D	Research and development expenses scaled by the lagged total assets	Worldscope
Equity	The change in the sum of the book value of equity and the deferred taxes, minus the change in retained earnings, scaled by the lagged total assets	Worldscope
Debt	The change in the total debt scaled by the lagged total assets	Worldscope
Payout	The sum of dividend and share repurchase scaled by the lagged total assets. The share repurchase is the share repurchase plus the change in the preferred shares	Worldscope
Cash	Cash and short-term investments scaled by the lagged total assets	Worldscope
Country-level investor protection variables		
Common	Dummy equals one for a common law country	La Porta et al. (2006)
Protection	Principal component of disclosure, liability standards, and anti-director rights	La Porta et al. (2006)
Disclosure	The arithmetic mean of prospect, compensation, shareholders, inside ownership, contracts irregular, and transactions	La Porta et al. (2006)
Liability	The arithmetic mean of three liability standards: liability standard for the issuer and its directors, liability standard for the distributor, and liability standard for the accountant	La Porta et al. (2006)
Anti-Self	A measure of the protection of minority shareholders against self-dealing transactions that potentially benefit the controlling shareholders	Djankov et al. (2008)
Access	A measure of the access to stock markets for new and medium-sized firms	Schwab et al. (1999)
Country-level financial development variables		
GDPC	Log of gross domestic product (GDP) per capita measured in US dollars	World Development Indicators
Market Cap	Stock market capitalization deflated by GDP	World Development Indicators
Credit	Amount of deposit money in banks and other financial institutions deflated by GDP as a proxy for credit available	Financial Development and Structure Dataset (Beck, et al. (2013))
Openness	Chinn-Ito index that measures a country's degree of capital account openness	Chinn and Ito (2006)
ICOC	The average of four different implied cost of equity estimates as a proxy for a firm's cost of capital. The four models are (i) Gebhardt, Lee, and Swaminathan's (2001) residual income valuation model; (ii) Claus and Thomas's (2001) residual income valuation model; (iii) Ohlson and Juettner-Nauroth's (2005) abnormal earnings growth valuation model; and finally (iv) Easton's (2004) MPEG ratio (price-to-earnings ratios divided by growth rate) model, a special case of (iii).	IBES

Appendix Table A.2
Correlation Matrix

The table reports the correlation matrix of our main variables, namely GDP per capita, stock market capitalization, deposit money in banks and other financial institutions, financial openness, common/civil law, anti-self dealing (Anti-Self), liability standard, protection index, disclosure, financial transparency, access to stock markets, and aggregate implied cost of equity capital. All these variables are defined in Appendix Table A.1. ICF sensitivity is estimated using firms within a country for each year. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	ICF	Common	Anti-Self	Liability	Protection	Disclosure	Transparency	Access	GDPC	Market Cap	Credit	Openness	ICOC
ICF	1.000												
Common	-0.069*	1.000											
Anti-Self	-0.076*	0.766***	1.000										
Liability	-0.090**	0.365***	0.324***	1.000									
Protection	-0.089**	0.625***	0.544***	0.773***	1.000								
Disclosure	-0.078*	0.698***	0.668***	0.498***	0.643***	1.000							
Transparency	0.004	-0.025	0.050	0.216***	0.091***	0.319***	1.000						
Access	0.004	0.323***	0.021	0.084**	0.181***	0.114***	-0.125***	1.000					
GDPC	-0.140***	-0.073**	-0.058*	0.025	-0.171***	0.009	0.669***	-0.165***	1.000				
Market Cap	-0.152***	0.316***	0.354***	0.248***	0.334***	0.382***	0.171***	0.017	0.196***	1.000			
Credit	-0.242***	0.200***	0.262***	0.271***	0.169***	0.372***	0.514***	-0.009	0.566***	0.409***	1.000		
Openness	-0.100**	0.068*	0.125***	0.206***	0.049	0.120***	0.599***	-0.061*	0.653***	0.219***	0.536***	1.000	
ICOC	0.194***	-0.018	-0.093**	-0.123***	-0.007	-0.225***	-0.382***	0.118***	-0.389***	-0.142***	-0.389***	-0.431***	1.000

Table OA.1

Means of Key Variables Across Periods by Country

This table presents the number of firm-year observations, average values of investment, Tobin's q, and cash flow across the full sample period and various subperiods by country. The main variables are denoted by N, $\frac{I_{i,t}}{A_{i,t-1}}$, q, and $\frac{CF_{i,t}}{A_{i,t-1}}$, respectively. $I_{i,t}$ is firm i's fixed investment, which is scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is a proxy for investment opportunities, and $CF_{i,t}$ is firm i's internal cash flow. The sample period is between 1981 and 2014.

	Full Period	Subperiods						Full Period	Subperiods						
Country	1981-2014	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2014	1981-2014	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2014
	Firm-Year Observations								Value of Investment, $\frac{I_{i,t}}{A_{i,t-1}}$							
Argentina	980		2	60	166	256	288	208	0.067		0.213	0.116	0.078	0.038	0.068	0.076
Australia	16767	167	343	585	1111	3905	5869	4787	0.092	0.084	0.106	0.070	0.078	0.076	0.105	0.092
Austria	1593	37	148	240	324	320	319	205	0.069	0.063	0.074	0.067	0.075	0.067	0.069	0.061
Belgium	2128	72	146	319	393	438	471	289	0.065	0.072	0.084	0.068	0.082	0.063	0.053	0.047
Brazil	3425		5	111	595	956	977	781	0.073		0.391	0.143	0.081	0.066	0.076	0.058
Canada	24315	603	1160	1574	2200	4128	8336	6314	0.113	0.099	0.102	0.100	0.110	0.093	0.131	0.108
Chile	2290		23	181	385	586	626	489	0.069		0.185	0.115	0.078	0.056	0.067	0.057
China	19146			46	521	3963	6962	7654	0.075			0.101	0.060	0.079	0.076	0.074
Colombia	386		9	42	52	86	88	109	0.057		0.145	0.074	0.052	0.045	0.054	0.055
Denmark	2794	65	193	476	623	532	522	383	0.067	0.087	0.108	0.074	0.080	0.059	0.059	0.036
Finland	2474	50	143	316	441	571	549	404	0.072	0.099	0.151	0.073	0.104	0.066	0.051	0.044
France	12558	394	1048	1861	2244	2726	2687	1598	0.058	0.068	0.080	0.060	0.070	0.052	0.050	0.042
Germany	12186	406	849	1600	2223	2813	2660	1635	0.067	0.088	0.106	0.093	0.081	0.053	0.051	0.045
Hong Kong	2159	51	123	176	370	461	528	450	0.059	0.103	0.097	0.080	0.053	0.051	0.054	0.052
India	17709		3	413	1324	1829	7177	6963	0.091		0.071	0.121	0.098	0.075	0.109	0.075
Indonesia	3837			257	502	928	1103	1047	0.076			0.120	0.088	0.061	0.071	0.080
Ireland	1554	77	137	228	273	291	327	221	0.059	0.057	0.078	0.066	0.077	0.055	0.048	0.039
Israel	3574			30	166	525	1738	1115	0.038			0.125	0.073	0.037	0.037	0.034
Italy	4178	67	434	603	598	867	979	630	0.053	0.099	0.078	0.060	0.063	0.050	0.047	0.031
Japan	54108	699	1541	1935	5407	15277	16698	12551	0.039	0.070	0.065	0.056	0.047	0.036	0.039	0.033
Korea	18328	7	126	557	1417	3306	6810	6105	0.062	0.119	0.125	0.095	0.069	0.056	0.066	0.054
Luxembourg	351		4	28	44	62	104	109	0.068		0.092	0.088	0.067	0.054	0.065	0.072
Malaysia	11858	107	215	609	1332	2944	3779	2872	0.052	0.048	0.052	0.093	0.063	0.049	0.050	0.043
Mexico	1911	19	55	229	395	451	437	325	0.066	0.096	0.070	0.102	0.073	0.048	0.063	0.059
Netherlands	3669	194	366	650	743	717	620	379	0.068	0.075	0.090	0.077	0.088	0.054	0.051	0.044
New Zealand	1652	10	46	119	227	377	497	376	0.064	0.070	0.072	0.060	0.072	0.067	0.065	0.056
Norway	2702	36	165	328	506	539	692	436	0.091	0.139	0.127	0.107	0.117	0.065	0.095	0.058
Pakistan	2395		4	123	334	397	831	706	0.072		0.037	0.110	0.062	0.075	0.081	0.057
Peru	1059			38	128	246	385	262	0.066			0.094	0.072	0.054	0.065	0.071
Philippines	1969		6	101	337	477	577	471	0.067		0.173	0.133	0.104	0.048	0.053	0.060
Portugal	900		18	85	219	237	205	136	0.060		0.126	0.074	0.080	0.051	0.054	0.031
Singapore	7276	87	142	363	807	1672	2298	1907	0.061	0.063	0.051	0.093	0.081	0.056	0.060	0.053
South Africa	5186	200	398	581	960	1164	1053	830	0.076	0.108	0.084	0.075	0.080	0.069	0.080	0.062
Spain	2566	30	191	445	523	512	490	375	0.059	0.096	0.082	0.055	0.064	0.058	0.064	0.037
Sweden	5615	112	251	489	806	1198	1590	1169	0.050	0.066	0.086	0.076	0.077	0.042	0.040	0.033
Switzerland	4013	69	308	516	720	886	900	614	0.056	0.077	0.101	0.066	0.063	0.047	0.046	0.043
Taiwan	17451			167	1041	4168	6471	5603	0.054			0.077	0.079	0.058	0.055	0.045
Thailand	6060		8	421	838	1326	1856	1611	0.066		0.099	0.116	0.063	0.068	0.058	0.062
Turkey	2833		4	46	188	659	1052	884	0.071		0.187	0.171	0.152	0.076	0.058	0.059
UK	29845	991	3290	5241	5520	5485	5777	3541	0.067	0.087	0.109	0.073	0.078	0.054	0.049	0.045
US	114685	6966	9916	12997	24556	24000	21768	14482	0.067	0.092	0.081	0.077	0.077	0.052	0.058	0.056
Venezuela	212		2	20	48	63	60	19	0.066		0.309	0.099	0.064	0.035	0.081	0.061
ALL	430697	11516	21823	35206	61607	92344	117156	91045	0.066	0.089	0.088	0.078	0.076	0.056	0.067	0.059

Table OA.1 – Continued
Means of Key Variables Across Periods by Country

Country	Full Period	Subperiods						Full Period	Subperiods						
	1981-2014	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2014	1981-2014	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2014
	Value of q								Value of Cash Flow, $\frac{CF_{i,t}}{A_{i,t-1}}$							
Argentina	1.129		0.729	1.406	1.273	0.919	1.107	1.228	0.080		0.143	0.116	0.073	0.049	0.101	0.084
Australia	1.808	1.027	1.345	1.368	1.706	1.743	2.105	1.636	-0.090	0.094	0.107	0.084	0.049	-0.070	-0.126	-0.136
Austria	1.377	1.097	1.549	1.457	1.331	1.288	1.487	1.250	0.079	0.075	0.099	0.078	0.088	0.068	0.073	0.080
Belgium	1.429	0.947	1.245	1.194	1.743	1.421	1.480	1.401	0.088	0.086	0.122	0.084	0.108	0.093	0.075	0.059
Brazil	1.275		0.936	1.000	0.965	1.049	1.517	1.525	0.087		0.100	0.105	0.064	0.090	0.106	0.074
Canada	1.881	1.203	1.367	1.379	1.781	1.919	2.115	1.866	-0.061	0.089	0.097	0.087	0.058	-0.013	-0.115	-0.145
Chile	1.336		1.234	1.816	1.304	1.184	1.371	1.326	0.099		0.239	0.155	0.099	0.095	0.100	0.074
China	2.198			1.584	1.282	1.949	2.267	2.331	0.072			0.096	0.060	0.059	0.077	0.074
Colombia	1.120		1.009	1.340	0.832	0.848	1.288	1.261	0.086		0.133	0.114	0.060	0.095	0.087	0.075
Denmark	1.511	1.072	1.184	1.231	1.582	1.436	1.865	1.604	0.071	0.093	0.101	0.087	0.093	0.069	0.029	0.056
Finland	1.543	1.043	1.303	1.134	1.747	1.637	1.662	1.491	0.092	0.058	0.069	0.080	0.129	0.101	0.085	0.068
France	1.457	1.015	1.324	1.213	1.634	1.607	1.534	1.305	0.078	0.073	0.103	0.083	0.092	0.075	0.069	0.059
Germany	1.578	1.184	1.488	1.509	1.821	1.512	1.597	1.541	0.070	0.094	0.109	0.092	0.084	0.044	0.063	0.062
Hong Kong	1.313	1.479	1.658	1.529	1.307	1.304	1.283	1.162	0.075	0.154	0.148	0.117	0.055	0.062	0.068	0.065
India	1.418		1.115	1.891	1.656	1.416	1.470	1.292	0.092		0.133	0.117	0.102	0.117	0.101	0.073
Indonesia	1.428			1.662	1.322	1.196	1.380	1.678	0.091			0.137	0.075	0.078	0.092	0.099
Ireland	1.773	0.985	1.425	1.457	1.947	2.088	1.961	1.679	0.055	0.088	0.106	0.079	0.078	0.026	0.023	0.047
Israel	1.511			1.854	1.742	1.589	1.430	1.555	0.031			0.113	0.091	0.022	0.039	0.012
Italy	1.325	1.010	1.293	1.115	1.405	1.482	1.369	1.223	0.063	0.087	0.091	0.059	0.085	0.056	0.052	0.048
Japan	1.211	1.372	1.771	1.553	1.272	1.178	1.265	1.025	0.051	0.068	0.055	0.045	0.044	0.046	0.048	0.062
Korea	1.154	2.193	1.431	1.101	1.014	0.974	1.239	1.189	0.044	0.073	0.071	0.048	0.050	0.062	0.034	0.044
Luxembourg	1.432		0.880	1.335	1.479	1.268	1.532	1.455	0.080		0.093	0.102	0.095	0.063	0.095	0.063
Malaysia	1.252	1.794	1.552	2.047	1.601	1.193	1.117	1.116	0.067	0.090	0.083	0.108	0.063	0.060	0.066	0.064
Mexico	1.349	0.909	0.991	1.512	1.318	1.064	1.467	1.598	0.089	0.116	0.146	0.085	0.100	0.074	0.090	0.088
Netherlands	1.585	0.951	1.248	1.306	2.087	1.597	1.698	1.522	0.098	0.087	0.119	0.117	0.132	0.071	0.076	0.073
New Zealand	1.637	0.973	1.126	1.337	1.439	1.714	1.840	1.586	0.057	0.149	0.093	0.095	0.108	0.082	0.017	0.036
Norway	1.597	1.206	1.321	1.305	1.798	1.678	1.694	1.464	0.054	0.067	0.067	0.087	0.080	0.050	0.032	0.030
Pakistan	1.264		0.958	1.879	1.114	1.196	1.375	1.137	0.108		0.139	0.119	0.092	0.132	0.105	0.105
Peru	1.303			1.883	1.201	0.980	1.397	1.434	0.124			0.162	0.094	0.112	0.148	0.110
Philippines	1.524		1.510	2.039	1.403	1.152	1.516	1.886	0.074		0.153	0.117	0.063	0.043	0.087	0.087
Portugal	1.202		1.920	1.045	1.238	1.195	1.267	1.063	0.076		0.180	0.074	0.097	0.069	0.068	0.054
Singapore	1.309	1.378	1.393	1.583	1.492	1.295	1.312	1.179	0.069	0.064	0.084	0.082	0.073	0.066	0.079	0.053
South Africa	1.534	1.321	1.469	1.588	1.703	1.328	1.698	1.464	0.110	0.147	0.151	0.122	0.103	0.100	0.116	0.089
Spain	1.436	0.782	1.286	1.139	1.500	1.488	1.752	1.344	0.084	0.044	0.097	0.072	0.105	0.091	0.076	0.063
Sweden	1.913	1.222	1.388	1.203	2.142	1.918	2.170	1.878	0.031	0.061	0.082	0.085	0.080	0.016	0.008	0.008
Switzerland	1.571	1.159	1.383	1.156	1.631	1.587	1.798	1.633	0.083	0.091	0.102	0.086	0.100	0.074	0.078	0.071
Taiwan	1.408			2.191	1.796	1.282	1.397	1.418	0.076			0.106	0.080	0.078	0.083	0.066
Thailand	1.321		1.733	1.799	1.180	1.233	1.177	1.507	0.101		0.148	0.107	0.081	0.111	0.100	0.100
Turkey	1.494		2.276	2.223	2.480	1.451	1.314	1.487	0.090		0.263	0.251	0.172	0.114	0.070	0.070
UK	1.740	1.168	1.602	1.481	1.958	1.838	1.873	1.704	0.057	0.110	0.134	0.097	0.084	0.020	0.001	0.017
US	1.905	1.339	1.489	1.667	2.166	1.976	2.033	1.923	0.046	0.111	0.105	0.097	0.047	0.017	0.015	0.024
Venezuela	0.837		0.958	1.121	0.867	0.735	0.843	0.767	0.107		0.089	0.104	0.094	0.085	0.143	0.106
ALL	1.617	1.281	1.488	1.524	1.824	1.581	1.675	1.550	0.049	0.103	0.106	0.092	0.065	0.040	0.031	0.031

Table OA.2

Investment-Cash Flow Sensitivities by Period

This table reports coefficients estimated from regressing investment on Tobin's q and cash flow, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_t + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's fixed investment, which is scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is a proxy for investment opportunities, $CF_{i,t}$ is firm i's internal cash flow; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity. All regressions include unreported α_t and α_i denote year and firm fixed effects. Panel A reports the results based on the full sample, whereas Panel B reports those of all countries with U.S. excluded. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1% and 5% levels is denoted by *** and **, respectively.

	Full Period	Subperiods							Global Crisis Period
	1981-2014	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2014	2007-2009
	Panel A: All Countries								
q	0.011***	0.023***	0.017***	0.015***	0.009***	0.008***	0.012***	0.013***	0.010***
	(6.86)	(15.63)	(5.31)	(9.36)	(20.04)	(6.55)	(3.79)	(4.18)	(2.93)
CF	0.051***	0.350***	0.247***	0.174***	0.059***	0.036***	0.013	0.017	0.013
	(3.81)	(25.52)	(4.12)	(5.14)	(3.60)	(4.00)	(0.66)	(1.14)	(0.62)
N	430697	11516	21823	35206	61607	92344	117156	91045	71564
$\bar{R}^2$	0.44	0.63	0.61	0.56	0.54	0.57	0.52	0.54	0.56
	Panel B: All Countries Except the U.S.								
q	0.013***	0.021***	0.012***	0.014***	0.009***	0.009***	0.013***	0.015***	0.011**
	(6.29)	(4.51)	(3.01)	(5.23)	(8.29)	(6.55)	(3.54)	(4.12)	(2.58)
CF	0.052**	0.346***	0.346***	0.222***	0.091***	0.042***	0.011	0.018	0.013
	(2.67)	(6.57)	(8.89)	(8.20)	(3.79)	(3.10)	(0.46)	(1.00)	(0.50)
N	316012	4550	11907	22209	37051	68344	95388	76563	58415
$\bar{R}^2$	0.42	0.64	0.59	0.52	0.51	0.55	0.51	0.52	0.55

Table OA.3

Proxies for Investor Protection and Financial Development

This table presents mean values of time-invariant and varying measures of investor protection and financial development by country. The proxies for investor protection include a legal origin indicator (equals one if it is a common law country and 0 if otherwise), protection index, financial disclosure, liability standards, financial transparency, anti-self dealing index (Ant-Self), and an access index. The proxies for financial development are GDP per capita (GDPC), financial openness (Openness), private credit (Credit), stock market capitalization (Market Cap), and implied cost of equity capital (ICOC). The definition of these variables is reported in Appendix Table A.1. The sample period is between 1981 and 2014.

Country	Common	Protection	Disclosure	Liability	Anti-Self	Transparency	Access	GDPC	Openness	Credit	Market Cap	ICOC
Argentina	0	0.48	0.50	0.22	0.34	0.22	3.23	8.60	-0.31	0.20	0.11	0.15
Australia	1	0.78	0.75	0.66	0.76	0.35	6.00	10.27	1.51	0.73	0.78	0.10
Austria	0	0.10	0.25	0.11	0.21	-0.11	4.89	10.40	1.89	0.95	0.18	0.11
Belgium	0	0.07	0.42	0.44	0.54	0.50	5.70	10.36	1.71	0.61	0.47	0.11
Brazil	0	0.44	0.25	0.33	0.27	0.10	4.05	8.41	-0.99	0.36	0.35	0.18
Canada	1	0.96	0.92	1.00	0.64	1.17	6.39	10.34	2.39	1.06	1.07	0.10
Chile	0	0.61	0.58	0.33	0.63	-0.09	4.80	8.71	-0.27	0.63	0.94	0.11
China	0				0.76			7.16	-1.33	0.97	0.35	0.12
Colombia	0	0.35	0.42	0.11	0.57	-1.21	2.78	8.05	-1.11	0.30	0.27	0.15
Denmark	0	0.36	0.58	0.55	0.46	0.47	5.87	10.64	1.72	0.72	0.41	0.09
Finland	0	0.47	0.50	0.66	0.46	0.56	6.37	10.37	1.89	0.69	0.68	0.10
France	0	0.47	0.75	0.22	0.38	1.26	5.75	10.33	1.43	0.88	0.48	0.10
Germany	0	0.00	0.42	0.00	0.28	1.62	5.93	10.36	2.39	1.07	0.32	0.09
Greece	0	0.32	0.33	0.50	0.22	-0.87	5.28	9.81	0.57	0.55	0.36	0.13
Hong Kong	1	0.85	0.92	0.66	0.96	0.66	5.50	9.98	2.39	1.51	4.28	0.11
India	1	0.77	0.92	0.66	0.58	-0.64	5.30	6.39	-1.19	0.29	0.48	0.13
Indonesia	0	0.51	0.50	0.66	0.65		4.53	6.99	1.58	0.29	0.27	0.13
Ireland	1	0.48	0.67	0.44	0.79	-0.18	5.29	10.45	1.39	0.95	0.54	0.11
Israel	1	0.59	0.67	0.66	0.73	0.09	5.35	9.82	0.53	0.64	0.50	0.11
Italy	0	0.20	0.67	0.22	0.42	1.16	4.41	10.24	1.36	0.71	0.30	0.10
Japan	0	0.42	0.75	0.66	0.50	0.68	4.92	10.37	2.31	1.69	0.74	0.07
Luxembourg	0				0.28			11.04		1.23	1.18	0.12
Malaysia	1	0.73	0.92	0.66	0.95	0.23	5.11	8.40	0.86	0.99	1.34	0.09
Mexico	0	0.10	0.58	0.11	0.17	0.39	3.90	8.90	0.45	0.18	0.22	0.12
Netherlands	0	0.54	0.50	0.89	0.20	1.34	6.43	10.48	2.39	1.16	0.71	0.10
New Zealand	1	0.47	0.67	0.44	0.95	-0.03	5.82	10.08	2.02	0.79	0.39	0.10
Norway	0	0.44	0.58	0.39	0.42	0.28	5.57	10.92	1.27	0.70	0.37	0.11
Pakistan	1	0.63	0.58	0.39	0.41	-1.39	21.91	6.42	-1.21	0.23	0.19	0.16
Peru	0	0.66	0.33	0.66	0.45	-0.64	3.84	7.88	1.09	0.17	0.30	0.14
Philippines	0	0.81	0.83	1.00	0.22	-0.12	4.62	7.03	-0.48	0.33	0.51	0.10
Poland	0				0.29			8.92	-0.81	0.33	0.21	0.12
Portugal	0	0.57	0.42	0.66	0.44	-0.26	4.50	9.67	1.10	0.97	0.30	0.10
Singapore	1	0.77	1.00	0.66	1.00	0.46	5.50	10.03	2.30	0.96	1.63	0.09
South Africa	1	0.60	0.83	0.66	0.81	-0.41	5.94	8.58	-1.32	1.03	1.62	0.14
South Korea	0	0.36	0.75	0.66	0.47	-0.49	5.02	9.51	-0.25	0.69	0.45	0.12
Spain	0	0.55	0.50	0.66	0.37	0.88	5.09	9.98	1.31	1.07	0.75	0.11
Sweden	0	0.39	0.58	0.28	0.33	0.80	6.15	10.50	1.82	0.93	0.69	0.10
Switzerland	0	0.30	0.67	0.44	0.27	0.81	6.07	10.84	2.39	1.40	1.46	0.09
Taiwan	0	0.55	0.75	0.66	0.56		5.54					
Thailand	1	0.37	0.92	0.22	0.81	-0.36	4.24	7.72	-0.32	0.96	0.59	0.11
Turkey	0	0.34	0.50	0.22	0.43	-0.79	5.03	8.69	-0.80	0.20	0.24	0.14
United Kingdom	1	0.78	0.83	0.66	0.95	0.75	6.26	10.39	2.34	1.32	1.01	0.11
United States	1	1.00	1.00	1.00	0.65	1.59	6.74	10.52	2.39	1.41	0.94	0.10
Venezuela	0	0.22	0.17	0.22	0.09	-1.38	3.51	8.64	-0.19	0.26	0.08	0.22

Table OA.4

Financial Development and Investment-Cash Flow Sensitivities (Excluding the U.S.)

This table reports coefficients estimated from regressing investment on Tobin's q and cash flow, as follows.

$$\frac{I_{i,t}}{A_{i,t-1}} = \alpha_i + \alpha_{c,t} + \alpha_{ind,t} + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{A_{i,t-1}} + \epsilon_{i,t},$$

where $I_{i,t}$ is firm i's capital expenditure, scaled by its beginning-of-period total assets, $A_{i,t-1}$; $q_{i,t-1}$ is Tobin's q, measured as total assets minus the book value of equity plus the market value of equity divided by total assets; $CF_{i,t}$ is firm i's net income plus depreciation and amortization; β_1 is investment-q sensitivity; β_2 is investment-cash flow sensitivity. All regressions include unreported α_i, $\alpha_{c,i}$, and $\alpha_{ind,i}$, denoting firm, country-year, and industry-year fixed effects, respectively. We divide sample into terciles based on the various proxies for financial development, namely a country's GDP per capita, financial openness, the amount of available domestic credit scaled by GDP, the size of its stock market capitalization scaled by GDP, and aggregate cost of equity financing. For each proxy of financial development, we take average for each country-period, and then rank these country-period averages into high, middle, and low terciles. The above regression is conducted separately for terciles. All definitions are in Appendix Table A.1. Robust $t-$statistics are computed based on standard errors clustered at the country level and reported in parentheses; N is the number of firm-year observations, and $\bar{R}^2$ is the adjusted R-squared value. Statistical significance at the 1%, 5%, and 10% levels is denoted by ***, **, and *, respectively.

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Low GDP per Capita				**Middle**				**High GDP per Capita**			
q	0.009***	0.008	0.007**	0.011***	0.012***	0.017***	0.008***	0.013***	0.012***	0.051*	0.008***	0.014***
	(7.87)	(1.49)	(2.80)	(7.46)	(7.19)	(4.67)	(9.14)	(6.03)	(5.54)	(2.68)	(6.76)	(6.09)
CF	0.150***	0.173**	0.153***	0.150***	0.077***	0.354***	0.059***	0.044***	-0.007	0.167	0.056***	-0.022*
	(5.72)	(2.33)	(6.18)	(4.92)	(4.11)	(9.29)	(3.41)	(4.40)	(-0.52)	(1.17)	(5.23)	(-1.80)
N	83775	1528	19503	61345	71275	21539	18599	30800	179375	1855	57414	119226
$\bar{R}^2$	0.40	0.69	0.48	0.36	0.41	0.52	0.40	0.34	0.50	0.35	0.52	0.51
Economic Significance	0.237	0.174	0.249	0.238	0.170	0.319	0.170	0.127	-0.027	0.176	0.181	-0.099
	Less Financial Openness				**Middle**				**More Financial Openness**			
q	0.010***	0.009	0.005**	0.012***	0.013***	0.015***	0.006***	0.017***	0.012***	0.026**	0.010***	0.013***
	(9.00)	(1.69)	(2.32)	(6.79)	(6.46)	(3.26)	(6.00)	(20.74)	(4.94)	(3.76)	(8.71)	(4.34)
CF	0.145***	0.165**	0.136***	0.147***	0.005	0.383***	0.076***	-0.019	0.007	0.271**	0.053***	-0.011
	(4.97)	(2.45)	(4.50)	(4.48)	(0.19)	(15.04)	(3.98)	(-0.92)	(0.37)	(3.66)	(4.50)	(-0.57)
N	79268	3426	16455	58190	101207	14956	46981	38778	152761	5933	31975	114147
$\bar{R}^2$	0.41	0.59	0.51	0.36	0.43	0.51	0.43	0.45	0.49	0.49	0.52	0.50
Economic Significance	0.229	0.162	0.222	0.233	0.014	0.353	0.179	-0.067	0.027	0.280	0.179	-0.050

Table OA.4 - Continued
Financial Development and Investment-Cash Flow Sensitivities (Excluding the U.S.)

	Full Period	Subperiods			Full Period	Subperiods			Full Period	Subperiods		
Variable	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014	1981-2014	1981-1992	1993-2003	2004-2014
	Less Domestic Credit				**Middle**				**More Domestic Credit**			
q	0.009***	0.007	0.003	0.014***	0.008***	0.017**	0.007***	0.011***	0.013***	0.018***	0.010***	0.014***
	(4.39)	(1.30)	(1.50)	(8.14)	(8.24)	(2.53)	(7.57)	(6.75)	(6.75)	(5.06)	(7.25)	(6.92)
CF	0.162***	0.185***	0.198***	0.150**	0.064***	0.302***	0.061***	0.039***	0.006	0.412***	0.061***	-0.012
	(4.27)	(4.12)	(7.59)	(3.02)	(5.39)	(5.85)	(4.02)	(5.07)	(0.33)	(43.66)	(4.84)	(-0.74)
N	44933	2644	10243	31718	65023	12187	27328	25191	223662	10087	57934	154446
$\bar{R}^2$	0.41	0.58	0.53	0.35	0.39	0.48	0.40	0.35	0.48	0.55	0.51	0.49
Economic Significance	0.238	0.187	0.299	0.227	0.146	0.253	0.146	0.118	0.022	0.426	0.199	-0.051
	Small Market Capitalization				**Middle**				**Large Market Capitalization**			
q	0.004***	0.012*	0.002*	0.010***	0.009***	0.021***	0.007***	0.012***	0.013***	0.020*	0.010***	0.015***
	(3.77)	(2.08)	(1.92)	(7.97)	(7.92)	(17.95)	(4.80)	(8.10)	(7.11)	(2.29)	(9.40)	(6.78)
CF	0.159***	0.262***	0.187***	0.064**	0.100***	0.367***	0.076***	0.094***	0.005	0.253***	0.056***	-0.010
	(7.77)	(3.39)	(7.49)	(2.58)	(4.97)	(10.27)	(7.16)	(3.34)	(0.32)	(4.37)	(5.14)	(-0.56)
N	27035	7350	12030	7455	101295	10345	41236	49498	204657	6985	42229	154352
$\bar{R}^2$	0.50	0.57	0.53	0.32	0.41	0.51	0.44	0.38	0.46	0.50	0.48	0.48
Economic Significance	0.223	0.221	0.279	0.125	0.170	0.375	0.142	0.192	0.019	0.238	0.186	-0.042
	High Cost of Equity Financing				**Middle**				**Low Cost of Equity Financing**			
q	0.009***	0.022***	0.004**	0.014***	0.010***	0.008	0.009***	0.011***	0.012***	0.011*	0.009***	0.015***
	(5.31)	(6.54)	(2.21)	(12.68)	(11.68)	(0.81)	(3.69)	(11.84)	(5.98)	(2.38)	(7.74)	(6.40)
CF	0.171***	0.325***	0.142***	0.162**	0.070***	0.354***	0.072***	0.062***	-0.005	0.431***	0.058***	-0.024**
	(4.57)	(5.94)	(5.23)	(3.19)	(4.12)	(4.85)	(5.05)	(3.06)	(-0.36)	(13.45)	(5.06)	(-2.15)
N	58781	13665	16603	28288	85674	5161	12809	67469	188473	5597	66098	115508
$\bar{R}^2$	0.42	0.49	0.51	0.36	0.35	0.44	0.37	0.35	0.49	0.54	0.50	0.52
Economic Significance	0.244	0.305	0.238	0.246	0.147	0.370	0.152	0.155	-0.020	0.321	0.189	-0.109