The Equity-Financing Channel, the Catering Channel, and Corporate Investment: International Evidence*

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Abstract

We examine how stock market mispricing affects corporate investment in an international setting. We find that investment is more sensitive to stock prices for equity-dependent firms than for non-equity-dependent firms in our international sample. Investment is also more sensitive to stock prices for firms located in countries with more developed capital markets (i.e., lower costs of raising capital), higher share turnover (i.e., shorter shareholder horizons), and higher R&D intensity (i.e., more opaque assets). More importantly, the positive relation between equity dependence and the sensitivity of investment to stock prices is more pronounced for firms located in these same countries. These findings are consistent with the equity-financing hypothesis and the catering hypothesis on corporate investment proposed by Baker, Stein, and Wurgler (2003) and Polk and Sapienza (2009), respectively.

JEL classifications: G32; G34

Keywords: Equity-financing channel; Catering channel; Corporate investment

The existing literature has documented ample evidence of a positive relation between corporate investment and stock prices. The traditional explanation for this observed positive association is the "*q*-theory of investment" (Tobin (1969)). In an efficient market, stock prices (measured by Tobin's *Q*) reflect the market's information about a firm's investment opportunities or its marginal rate of return on capital. However, studies in behavioral finance have offered alternative explanations. For example, Keynes (1936) points out that stock market mispricing has an effect on the cost of equity, while Bernanke and Gertler (1995) and others argue that mispricing can also affect the cost of debt through its effect on perceived collateral values. Since the non-fundamental component of stock prices causes the effective cost of external equity to deviate from the cost of other forms of capital, this divergence affects a firm's equity financing and, consequently, corporate investment.

Based on Stein (1996), Baker, Stein, and Wurgler (2003) derive and test a simple model that suggests that corporate investment is more sensitive to stock prices for equity-dependent firms than for non-equity-dependent firms. The intuition is that managers of equity-dependent firms have incentives to issue equity in more attractive terms to finance investment when their stock prices are overvalued; but they would rather forgo their investment opportunities when their stock prices are undervalued. Using a modified *KZ* index first constructed by Kaplan and Zingales (1997) as a measure of equity dependence, Baker, Stein, and Wurgler (2003) find support for the equity-financing channel argument for U.S. firms.

Also based on Stein (1996), Polk and Sapienza (2009) develop and test a catering theory of investment, through which stock market mispricing affects corporate investment decisions. Using discretionary accruals as a proxy for mispricing, their empirical results from U.S. firms are consistent with the predictions of the catering theory--overvalued firms invest more while undervalued firms invest less. In addition, this catering effect is more pronounced for firms with shorter shareholder horizons (proxied by higher share turnover) and longer expected durations of mispricing (proxied by higher R&D intensity).

Despite these findings, very little is known about the relation between the roles of the equity-financing channel and the catering channel in corporate investment outside the United States, and in particular in emerging markets. Our first objective is therefore to examine whether the results documented by Baker, Stein, and Wurgler (2003) on the role of the equity-financing channel in corporate investment can be extended to our international sample. The equity-financing hypothesis predicts that the degree of equity dependence is positively related to the effect of stock prices on corporate investment. In this study, we focus on the effect of the equity-financing channel on corporate investment at the firm level.

Our second objective is to test whether the catering theory of Polk and Sapienza (2009) can also be extended to the international markets. More specifically, we extend the theory to allow for the cross-country difference in the cost of raising external equity capital. This extended catering theory suggests that corporate investment is more sensitive to stock prices for firms located in countries with a lower cost of raising external equity capital. The original catering theory of Polk and Sapienza (2009) also predicts that corporate investment is more sensitive to stock prices for firms whose shareholders have shorter horizons and whose assets are more difficult to value. In this study, we focus on the effects of the catering channel on corporate investment at the country level.

Our third and final objective considers the joint effects of the equity-financing and catering channels on the relation between corporate investment and stock prices. Specifically, we expect the positive relation between firm-level equity dependence and the sensitivity of investment to stock prices to be stronger for firms located in countries with lower financing costs and more short-term investors, as well as for firms whose assets are more difficult to evaluate.

To test our hypotheses, we use the financial flexibility index as an inverse measure of firm-level equity dependence. Our first main result confirms the role of the equity-financing channel in corporate investment decisions in the broader cross-country sample. More specifically, the sensitivity of investment to stock prices monotonically increases with the degree of equity dependence. We recognize that there may be alternative explanations for our result and potential measurement problems concerning several of our explanatory variables in the regressions. We attempt to address these concerns by performing a series of robustness tests. Our result survives these robustness tests.

To test the catering theory, we use the extent of capital market development to measure the cost of raising external capital. Capital market development is measured at the country level by: (1) the ease of access to equity markets, (2) whether the market is developed or emerging, and (3) the level of legal protection afforded to investors. In addition, we use country-level share turnover and R&D intensity to measure average shareholder horizon and the opaqueness of average firm assets, respectively. Consistent with the predictions of the extended catering theory, we find that corporate investment is more sensitive to stock prices for firms located in countries with more developed capital markets, higher share turnover, and higher R&D intensity. More importantly, the role of the equity-financing channel in the sensitivity of investment to stock prices is more pronounced for firms located in these same countries. These results suggest that both the equity-financing and catering channels affect the effect of stock market mispricing on corporate investment decisions.

The studies that are closest to ours are the ones by Baker, Stein, and Wurgler (2003) and Polk and Sapienza (2009). Baker, Stein, and Wurgler (2003) and Polk and Sapienza (2009) emphasize solely the roles of equity dependence and the catering channel, respectively, at the firm level. By contrast, our international sample allows us to focus on the roles of firm-level equity dependence and country-level institutions or characteristics as well as their joint effects. To the best of our knowledge, no previous empirical study has attempted to examine these issues jointly.

The findings from our study also complement the literature on the effect of stock prices on corporate investment. Earlier studies by Morck, Shleifer, and Vishny (1990) and Blanchard, Rhee, and Summers (1993) find little evidence that the stock market affects corporate investment. However, the evidence from recent studies by Baker, Stein, and Wurgler (2003), Chen, Goldstein, and Jiang (2007), Polk and Sapienza (2009), and Ovtchinnikov and McConnell (2009) suggests otherwise. The evidence from our international sample further confirms that financial markets are not just a sideshow; they also affect corporate investment decisions.[1]

The remainder of this paper is organized as follows. Section 1 develops our hypotheses. Section 2 describes the sources of our data. Section 3 presents the test results about the role of the equity-financing channel in corporate investment. Section 4 presents the test results about the role of the catering channel. Section 5 reports the results about joint effects of the two channels. Section 6 discusses the q-theory with investment frictions as an alternative explanation for some of our results. Section 7 concludes the paper.

1. Hypothesis Development

[1] See also Chirinko and Schaller (2001) and Gilchrist, Himmelberg, and Hubberman (2005). Another line of research examines the relation between capital investment and subsequent stock returns. See, for example, Titman, Wei, and Xie (2004), and Li and Lu (2010).

1.1 The role of the equity-financing channel in corporate investment

Baker, Stein, and Wurgler (2003) extend the model of Stein (1996) and derive the implications of stock market mispricing for the role of the equity-financing channel in corporate investment. They define a firm as equity dependent if its stock price is undervalued and its available capital is so low that it has to issue undervalued equity to achieve the first-best level of investment. They argue that stock market irrationality is unlikely to affect the investment decisions of non-equity-dependent firms (those with sufficient liquidity and no debt), since they do not rely on external financing. By contrast, equity-dependent firms will not want to issue equity in the external market when their stocks are undervalued, even if they need to raise funds for investment. The opposite is true in the case of overvaluation--equity-dependent firms are willing to issue equity to finance their investment when their stocks are overvalued. Therefore, equity-dependent firms have their investments that are more sensitive to the variation in the non-fundamental component of stock prices than non-equity-dependent firms.

Our first hypothesis on the role of the equity-financing channel in corporate investment follows that of Baker, Stein, and Wurgler (2003). Specifically, we hypothesize that:

H1: *Under the equity-financing channel, investment is more sensitive to stock prices for equity-dependent firms than for non-equity dependent firms in our international sample*.

1.2 The role of the catering channel in corporate investment

Polk and Sapienza (2009) extend the model of Stein (1996) and derive the testable implications of stock market mispricing for the role of the catering channel in corporate investment. We further extend their model to an international setting by allowing for the cross-country difference in the cost of raising capital. Following Polk and Sapienza (2009) closely with the same notations, we assume that K is the capital at time 0 used by a firm to produce output and K_0 is the initial capital right before time 0. The new investment, $(K – K_0)$, has a unit cost of c, if there is no market frictions. With market frictions, the cost of capital is $c(1 + f)$, where $f > 0$, and can be interpreted as a measure of how difficult and costly it is for a firm to raise external capital. Therefore, f should be lower for firms located in more developed capital markets or in countries with easier access to equity markets or stronger legal protection.

Due to investor irrationality or sentiment (Baker and Wurgler (2006)), a firm's stock price may be overvalued or undervalued from time to time. Hence we assume that the true value of the firm is $V(K)$, while its market value is $V^{mkt}(K) = (1+\alpha_t)V(K)$, where α_t measures the degree of mispricing. The level of initial mispricing is α, which decays over time at a rate of p. That is, $\alpha_t = \alpha e^{-pt}$. A higher p value indicates a shorter duration, and therefore, faster disappearance of mispricing. A representative shareholder will have a liquidity need at some point in time. The arrival of this liquidity shock follows a Poison process with a mean arrival rate of $q \in (0, \infty)$. A larger q indicates that the shareholder horizon is shorter. The representative shareholder's level of income (Y_t) is the weighted average of the firm value before and after the true value of the firm is revealed. That is,

$$Y_0 = \int_{t=0}^{\infty} (1+\alpha e^{-pt}) q e^{-qt} V(K) dt - (K - K_0) c(1+f) .$$

The first-order condition is

$$V'(K) = \frac{c}{\gamma}, \tag{1}$$

where $\gamma \equiv \left(\frac{1}{1+f}\right)\left(1+\frac{\alpha q}{q+p}\right)$.[2]

[2] Following Polk and Sapienza (2009), we assume that $(q + p + \alpha q) > 0$.

Assume that the optimal investment level is K^*, which is the case where there is no mispricing (i.e., $\alpha = 0$) and no market frictions (i.e., f = 0). In this case, $V'(K^*) = c$. The implication of equation (1) is that if managers cater to this short-term representative investor, they will overinvest when their stocks are overvalued (i.e., $\alpha > 0$) and underinvest when they are undervalued (i.e., $\alpha < 0$). Polk and Sapienza (2009) also argue that the catering effect is stronger for firms with more short-term investors (i.e., larger q) and for firms whose assets are more difficult to evaluate (i.e., smaller p or longer durations of mispricing). In addition, our extended model suggests that the catering effect should also be more pronounced for firms located in countries with a lower cost of raising equity capital (i.e., smaller f). If we further assume that $V(K) = K^{\beta}$, where $\beta < 1$ (i.e., decreasing returns to scale), the above arguments can be presented mathematically as follows:

$$\frac{dK}{d\alpha} = \frac{\beta q K^{\beta}}{c(1-\beta)(p+q)(1+f)} > 0, \tag{2}$$

$$\frac{d^2K}{d\alpha df} = \frac{\beta q K^{\beta}}{c(1-\beta)(\beta-1)(p+q)(1+f)^2} < 0, \tag{3}$$

$$\frac{d^2K}{d\alpha dq} = \frac{\beta p K^{\beta}}{c(1-\beta)(1+f)(p+q)^2}\left(1+\frac{\beta}{(1-\beta)}\times\frac{\alpha q}{(p+q+\alpha q)}\right) > 0, \text{ if } \alpha > 0, \quad \text{or in the case of } \alpha < 0, |\alpha| < (1-\beta)(1+\frac{p}{q}), \tag{4}$$

$$\frac{d^2K}{d\alpha dp} = -\frac{\beta q K^{\beta}}{c(1-\beta)(1+f)(p+q)^2}\left(1+\frac{\beta}{(1-\beta)}\times\frac{\alpha q}{(p+q+\alpha q)}\right) < 0, \text{ if } \alpha > 0, \quad \text{or in the case of } \alpha < 0, |\alpha| < (1-\beta)(1+\frac{p}{q}). \tag{5}$$

There is no ambiguity in the signs in equations (2) and (3). Although the signs in equations (4) and (5) are somewhat ambiguous, the results that $d^2K/d\alpha dq > 0$ and $d^2K/d\alpha dp < 0$ hold true if $\alpha > 0$. But even if $\alpha < 0$, the two results hold as long as $|\alpha| < (1-\beta)(1+\frac{p}{q})$.

The catering theory suggests that investment is positively associated with the extent of stock market mispricing (equation (2)). We follow Baker, Stein, and Wurgler (2003) and use Tobin's Q as our empirical proxy for α, the non-fundamental component of the stock price. In addition, equation (3) suggests that the positive sensitivity of investment to stock prices is more pronounced for firms located in countries with smaller market frictions (i.e., smaller *f*) than for firms located in countries with larger market frictions. If we average over the overvaluation and undervaluation regions, equations (4) to (5) suggest that, in most cases, firms located in countries with shorter shareholder horizons (i.e., larger *q*) or longer durations of mispricing (i.e., smaller *p*) make investments that are more sensitive to stock prices than firms located in countries with longer shareholder horizons or faster disappearance of mispricing. As mentioned at the outset, we focus on the country-level proxies for *f*, *q*, and *p* to test the cross-country implications of the catering channel. In particular, we measure market frictions by the extent of capital market development. Following Polk and Sapienza (2009), we measure shareholder horizons inversely by share turnover and durations of mispricing by R&D intensity. The above discussion leads to our second hypothesis:

H2: *Under the catering channel, investment is more sensitive to stock prices for firms located in countries with more developed capital markets, higher share turnover, or higher R&D intensity than for firms located in countries with less developed capital markets, lower share turnover, or lower R&D intensity*.

1.3 The joint effects of the equity-financing channel and the catering channel on corporate investment

We next examine how the joint effects of the equity-financing channel and the catering channel affect corporate investment decisions. From the above discussion, we can easily form our third hypothesis.

H3: *Under both the equity-financing channel and the catering channel, the effect of the equity-financing channel on the sensitivity of corporate investment to stock prices is more pronounced for firms located in countries with more developed capital markets, higher share turnover, or higher R&D intensity than for firms located in countries with less developed capital markets, lower share turnover, or lower R&D intensity.*

2. Data and Summary Statistics

We collect two sets of data. The first set consists of firm-level financial data available from Worldscope and Datastream, both of which are provided by Thomson Financial. After eliminating countries with less than 100 firm-year observations, we manage to retrieve firm-level data for 44 countries. For each firm, we collect financial variables that include capital expenditures (including property, plant, and equipment; research and development; and acquisitions), cash flow, cash balances, cash dividends, total debt, total assets, and the book value of equity from Worldscope; and the market value of equity and stock returns from Datastream.

We exclude firms with missing firm-year observations, firms operating in the financial industry (i.e., firms with SIC codes between 6000 and 6999), and firms with a book value of total assets of less than US$10 million.[3] Overall, our filtering process yields an unbalanced panel of 239,307 firm-year observations from 44 countries. The sample period is from 1982 to 2008. Table 1 presents the sample distribution in terms of the country-level institutional variables. The second column of Table 1 reports the total number of firm-year observations for each country in the final sample. Japan, the United Kingdom, and the United States dominate the sample, each with more than 20,000 firm-year observations.

[Insert Table 1 here]

2.1 Country-level variables

Our second dataset includes data on three country-level institutional variables and two country characteristics. To test equation (3), we need to proxy for the cross-country difference in the cost of raising external equity capital. Recent studies have found that the cost of equity capital tends to be lower in countries with more developed financial markets and better corporate governance (Hail and Leuz (2006); Chen, Chen, and Wei (2009)).[4] Therefore, our first variable is the access-to-equity market index (*ACCESS*) obtained from La Porta, Lopez-de-Silanes, and Shleifer (2006). This variable measures the extent of access to the equity market. A higher score on this index indicates that a firm can more easily access the equity market, and so the cost associated with raising external equity is lower. Our second country-level variable represents whether a country belongs to the developed market or not. We follow International Monetary Fund (IMF) to classify the countries in our sample into 23 developed markets and 21 emerging markets. We construct a dummy variable, *DEV*, which is equal to 1 for firms in the developed markets and 0 for firms in the emerging markets.

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[3] We use the exchange rates from Datastream to convert the book value of total assets from local currencies to US dollars.

[4] In addition, several recent studies have documented that country-level institutions are important determinants of corporate investment decisions (Wurgler (2000); McLean, Zhang, and Zhao (2011)). In the context of our study, these institutional variables will influence managers' abilities to exploit the mispricing to raise external equity to finance investment needs (McLean, Pontiff, and Watanabe (2010)).

Our last variable measures the legal protection of investors or corporate governance. Several indexes have been proposed to measure investor protection in the literature. In this study, we use the anti-self-dealing (*ANTISELF*) index borrowed from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) to measure investor protection. These authors argue that as this newly constructed index emphasizes private enforcement, it is more grounded in theory and works better empirically than the index of anti-director rights constructed by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) or their own revised anti-director rights index. The *ANTISELF* index measures the existence of securities laws and effectiveness of the enforcement of those laws. A higher *ANTISELF* index indicates better legal protection of investors, and so it is associated with a lower cost of raising external capital.

We employ the country-level share turnover (*TURNOVER*) index to proxy for average shareholder horizons. This index is obtained from the World Bank Development Indicators and is calculated as the annual average of the total value of stocks traded as a fraction the total value of shares outstanding (%) for the period from 1996 to 2005. A higher *TURNOVER* index indicates a shorter shareholder horizon. Finally, we create a country-level R&D intensity (*RD*) index to proxy for the average opacity of a firm's assets. This index is calculated by taking the average of the firm-level research and development expenditures (R&D) divided by total sales for all firms with a positive value of R&D expenditures.[5] A higher *RD* index indicates that the average assets of a firm are more opaque and more difficult to value.

The third to the sixth columns of Table 1 present the scores of *ACCESS*, *ANTISELF*, *TURNOVR*, and *RD* in each country. *ACCESS* ranges from 2.78 (Columbia) to 6.74 (United States); *ANTISELF* ranges from 0.09 (Venezuela) to 1.00 (Singapore); *TURNOVER* ranges from 7.07% (Columbia) to 286.2% (Pakistan); and *RD* ranges from 0 (Columbia, Egypt, and

[5] We follow the previous studies to assign a value of 0 if the value of R&D expenditures is missing.

Venezuela) to 4.7% (United States). Panels A and B of Table 1 also report the means and standard deviations of the four country-level variables for the developed and emerging markets, respectively. We observe that developed countries have easier access to capital markets, stronger legal protection, and higher R&D intensity. The overall means (standard deviations) of *ACCESS*, *ANTISELF*, *TURNOVER*, and *RD* are 5.18 (0.91), 0.51 (0.24), 77.24% (69.81%), and 1.1% (1.6%), respectively.

2.2 Firm-level measures of financial variables

We use three measures of corporate investment. The first measure is capital investment (*CAPX*) calculated as capital expenditures in year *t* divided by total assets at the end of year *t*-1. The second measure, *CAPRD*, is defined as the sum of capital expenditures and research and development expenditures in year *t* divided by total assets at the end of year *t*-1. The third measure, *CAPXRDA*, is defined as the sum of capital expenditures, research and development expenditures, and acquisitions in year *t* divided by total assets at the end of year *t*-1.

Cash flow (*CF*) is calculated as income before extraordinary items plus depreciation and amortization in year *t* divided by total assets at the end of year *t*-1. Similar to Baker, Stein, and Wurgler (2003), we use Tobin's *Q* (*Q*) as our main measure of the non-fundamental component of the stock price. *Q* is calculated as the market value of equity (i.e., the stock price multiplied by the number of shares outstanding) plus total assets minus the book value of equity divided by total assets at the end of year *t*-1. In our robustness tests, we also use returns (*RET*) as an alternative measure. *RET* is calculated as the change in stock price from the end of year *t*-2 to the end of year *t*-1.[6] We winsorize all financial variables at the 1st and 99th percentile levels to minimize the outlier problem.

2.3 Firm-level measures of equity dependence

Our main measure of equity dependence is the financial flexibility (*FF*) index. Following Doidge, Karolyi, Lins, Miller, and Stulz (2009), we first compute the 75th percentile of cash balance (*CASH*) and dividend payout ratios (*DIV*), as well as the 25th percentile of CAPX for each country. A firm is considered financially flexible if it has high values of *CASH* and *DIV* and a low value of *CAPX*. More specifically, it will be assigned a value of 1 if its *CASH* value or *DIV* value is greater than the 75th percentile or its *CAPX* value is below the 25th percentile. In this respect, the *FF* score ranges from 0 to 3. Firms with lower *FF* scores are considered less financially flexible and therefore more equity dependent. In our robustness tests, we also use the adjusted *KZ* index originally constructed by Kaplan and Zingales (1997) based on a sample of 49 low-dividend manufacturing firms in the United States as an alternative measure of equity dependence.

Panel A of Table 2 presents the summary statistics of the financial variables. The mean (median) value of *CAPX* across the 44 sample countries is 7.4% (4.6%). This is slightly lower than the mean (median) of 8.2% (6.0%) reported by Baker, Stein, and Wurgler (2003) for the sample of U.S. firms. In addition, the mean (median) values of *CAPXRD* and *CAPXRDA* are 9.5% (6.1%) and 11.5% (6.9%), respectively. The mean (median) value of *CF* is 11.5% (12%), while the mean (median) value of the logarithm of *Q* is 0.3 (0.2). The mean (median) value of the *FF* index is 1.2 (1.0).

[6] In our untabulated tests, we repeat all the empirical analyses using *RET* as an alternative measure of stock prices and obtain results that are similar to those when Tobin's *Q* is used.

[Insert Table 2 here]

Additionally, we present the correlations among the firm-level variables and among the country-level institutional variables in Panels B and C of Table 2, respectively.[7] All three measures of corporate investment (*CAPX*, *CAPXRD*, and *CAPXRDA*) are positively correlated with *Q* and *CF*. These preliminary findings are consistent with the evidence reported in the literature in the United States (e.g., Baker, Stein, and Wurgler (2003)). The correlations among the country-level variables are all in the expected signs (i.e., positive) for most of the variables, except for the correlation between *TURNOVER* and *ANTISELF*, with the magnitudes ranging from -0.03 to 0.61.

3. The Role of the Equity-financing Channel in Corporate Investment: Regression Results

In this section, we first investigate if the empirical evidence found in U.S. firms for the role of the equity-financing channel in corporate investment (Baker, Stein, and Wurgler (2003)) can be extended to our international sample. Following Fazzari, Hubbard, and Petersen (1988) and Baker, Stein, and Wurgler (2003), we first estimate the following baseline investment equation:

$$CAPX_{it} = a_o + bQ_{it-1} + cCF_{it} + u_{it}, \qquad (6),$$

where $CAPX_{it}$ is the corporate investment of firm *i* in year *t*, Q_{it-1} is firm *i*'s Tobin's *Q* in year *t*-1, and CF_{it} is its cash flow in year *t*. All these variables are scaled by total assets. The regression coefficient *b* measures the sensitivity of corporate investment to the stock price (as proxied by *Q*) and the regression coefficient *c* measures the sensitivity of investment to cash flow. We use the panel regression model with country fixed effects to estimate equation (6) for the pooled

[7] The country median values of financial variables are used to compute the correlation coefficients.

sample.[8] u_{it} is the error term which is assumed to be independent of the explanatory variables. To mitigate the problems of within-firm serial correlation and heteroskedasticity, we conduct our tests by estimating White's (1980) heteroskedasticity-corrected standard errors, clustered by country.

In our unreported results, the estimated coefficients of *b* and *c* are 0.957 (*t*-statistic = 17.01) and 0.125 (*t*-statistic = 29.99), respectively. Both coefficients are statistically significant at the 1% level. The finding for our international sample corroborates the prevailing results that both *Q* and *CF* are positively and significantly correlated with *CAPX*. Replacing *CAPX* in equation (6) with *CAPXRD* or *CAPXRDA* yields similar results.

3.1 The effect of the equity-financing channel on corporate investment: Baseline results

Our next task is to test the role of the equity-financing channel in corporate investment in the international setting. As elaborated earlier, we use the financial flexibility index (*FF*) as our inverse measure of equity dependence to test H1. It is noted that the degree of equity dependence decreases with the *FF* score. We first assign firms to quartile portfolios according to their *FF* scores, where *FF*1 represents the portfolio of firms with the *FF* score of 0, and *FF*4 represents the portfolio of firms with the *FF* score of 3. Firms in the *FF*1 quartile are the most equity dependent, while firms in the *FF*4 quartile are the least equity dependent. Following Baker, Stein, and Wurgler (2003), the assignment of firms is based on the firm's median *FF* scores over the whole sample period.

We then estimate the baseline investment equation (6) separately for each *FF* quartile portfolio using the country fixed effects model with year and industry dummies. We follow

[8] We also estimate all our regressions using firm fixed effects and country random effects models and obtain similar results. The results are available upon request.

Fama and French (1997) in defining the industry classification of our firms. H1 predicts that the sensitivity of corporate investment to stock prices should decrease (increase) with the degree of financial flexibility (equity dependence). That is, b should decrease with FF quartiles.

Panel A of Table 3 presents the estimation results of equation (6) for portfolios formed using FF and with *CAPX* as the dependent variable. We observe that the coefficient on Q (i.e., b) decreases from 5.194 in the bottom FF quartile to 0.075 in the top FF quartile. We also compute the p-value of the F-statistic which essentially tests the hypothesis that the difference in the b coefficient between the top and bottom quartile portfolios is zero. We find that the p-value is smaller than 0.01. Our evidence indicates that corporate investment is significantly more sensitive to stock prices for less financially flexible (or equity-dependent) firms than for more financially flexible (or non-equity-dependent) firms in our international sample.

[Insert Table 3 here]

Similarly, Panels B and C of Table 3 present the regression results when the dependent variable is replaced by *CAPXRD* and *CAPXRDA*, respectively. All the results are consistent with the findings reported in Panel A of Table 3. That is, the sensitivity of investment to stock prices in general declines with the degree of financial flexibility. More specifically, when *CAPXRD* is the measure of corporate investment, the regression coefficient on Q is 7.076 for the $FF1$ quartile and 2.018 for the $FF4$ quartile. The difference in the b coefficient between the $FF1$ quartile and the $FF4$ quartile is significantly positive at the 1% level. When *CAPXRDA* is the measure of corporate investment, the results are even stronger. The regression coefficient on Q is 9.642 for the $FF1$ quartile but only 2.993 for the $FF4$ quartile. The difference in the b coefficient between the two extreme quartiles is also statistically significant at the 1% level.

As an alternative specification to test H1, we estimate the following regression for the pooled sample:

$$CAPX_{it} = a_o + bQ_{it-1} + b_1(Q_{it-1} \times FF_{it}) + cCF_{it} + dFF_{it} + +u_{it}, \tag{7}$$

where *FF* is the financial flexibility index. The other variables are defined previously. We include the interaction term between *Q* and *FF* as an additional explanatory variable. The coefficient of interest in this case is b_1 and we expect the interaction coefficient to be negative (i.e., $b_1 < 0$). That is, corporate investment is less sensitive to the stock price for financially flexible firms than for financially inflexible firms. Panel D of Table 3 reports the estimation results of equation (7). We find that the coefficient of the interaction term, b_1, is negative and highly significant for all three measures of corporate investment at the 1% level. More specifically, b_1 is -2.148, -1.922, and -3.018, when the dependent variable is *CAPX*, *CAPXRD*, and *CAPXRDA*, respectively.

In summary, the empirical results in Table 3 are consistent with H1 and extend the findings of Baker, Stein, and Wurgler (2003) to our international sample. We conclude that the equity-financing channel at the firm level explains for the positive relation between corporate investment and stock prices among firms in our international sample.[9]

3.2 Inclusion of alternative measures of investment opportunities

Our regression specifications might suffer from potential problems related to Tobin's *Q* which we use in this study as a proxy for the non-fundamental component of stock prices. In particular, one alternative explanation for our finding is that corporate investment is simply responding to investment opportunities. Past studies have also used Tobin's *Q* as a measure of

[9] The dependent variable that we use in the subsequent analysis is *CAPX*. We continue to obtain robust results for the other two alternative measures of *CAPX*. These results are available upon request.

growth opportunities. To test the robustness of our results, we include two alternative measures of growth opportunities (*TAG* or *SG*) separately in the estimation of equation (6) as an additional control variable. *TAG* is total assets growth and is calculated as the change in total assets from the end of year *t*-1 to the end of year *t*, divided by total assets at the end of year *t*-1. *SG* is sales growth and is calculated as the change in total sales from year *t*-1 to year *t*, divided by total sales in year *t*-1.

The results are presented in Panels A and B of Table 4. Our finding of a monotonic decline in the magnitude of the regression coefficient on *Q* from the least financially flexible firms (*FF*1) to the most financially flexible firms (*FF*4) persists, regardless of which additional measure of growth opportunities is included in the regression. More specifically, the regression coefficient on *Q* decreases monotonically from 3.653 (3.980) in the *FF*1 group to 0.075 (0.0071) in the *FF*4 group when *TAG* (SG) is included in the regression to proxy for investment opportunities. The difference in the coefficient between the two extreme groups is significant at the 1% level in both cases. We further include *TAG* (or *SG*) and the interaction term between *TAG* (or *SG*) and *FF* in the estimation of equation (7) for the pooled sample. The result from Panel C of Table 4 shows that the coefficient on $Q \times FF$ continues to be negative with a value of -1.528 (-1.567), when *TAG* (*SG*) and its interaction with *FF* are also included in the regression. Both coefficients are highly significant at the 1% level. Therefore, our results are not sensitive to the inclusion of other measures of growth opportunities.

[Insert Table 4 here]

3.3 Results from country-by-country analysis

We next examine whether the role of the equity-financing channel in corporate investment as documented in Table 3 is stronger in some countries than in others. Moreover, we acknowledge that the measurements of *CAPX*, *Q*, and *CF* are affected by differences in accounting methods and reporting incentives across countries. In order to mitigate this concern, we estimate equation (7) for each of the countries in our international sample. Table 5 presents the results for the country-by-country analysis. For the sake of brevity, we only present the regression coefficient and standard error of $Q \times FF$. The regressions yield negative interaction coefficients in 35 out of the 44 countries in our international sample. In addition, among those negative coefficients, 15 are significant at the 10% level or better. Therefore, the results in Table 5 illustrate that the equity-financing channel affects corporate investment in most countries in our sample, albeit to different degrees in different countries.

[Insert Table 5 here]

3.4 Robustness checks

In this section, we perform a series of robustness checks to examine if our results are sensitive to alternative specifications and sub-samples. First, we re-estimate equation (7) using the Fama and Macbeth (1973) methodology. The result is reported in Column (1) of Table 6. The coefficient on $Q \times FF$ remains negative and highly significant with a value of -2.016. The estimated coefficient is very close to that estimated using the industry- and year-fixed effect ordinary least squares (OLS) method reported in Panel D of Table 3. However, the standard error is reduced substantially from 0.495 to 0.127. There is a great variation in the number of firm-year observations among the 44 countries in our sample. To mitigate the concern that our results might be driven by a large number of observations from the larger countries, we re-estimate equation (7) using the weighted least squares (WLS) methodology, where the weight is the inverse of the number of firms in each country in each year. The result is presented in Column (2) of Table 6. The coefficient on $Q \times FF$ is slightly reduced to -1.796, which is still highly significant; the standard error of 0.482 remains very close to the 0.495 reported in Panel D of Table 3.

[Insert Table 6 here]

We then exclude Japan, the United Kingdom, and the United States from our sample to check if our results would still hold because these three countries dominate our sample observations. The result is presented in Column (3) of Table 6. We also test our results for the sample of manufacturing firms only (SIC codes 2000 to 3999). The finding is reported in Column (4) of Table 6. The results in both Columns (3) and (4) are similar to the results from the overall sample--the coefficient on $Q \times FF$ is negative and highly significant in both cases.[10]

We next replace the dependent variable by total assets growth (*TAG*) or the change in investment (i.e., $\Delta CAPX$, calculated as the change in capital investment from time *t*-1 to *t*, divided by total assets at the end of year *t*-1). The results are reported in Columns (5) and (6) of Table 6. We also replace Tobin's *Q* by annual stock returns in the previous year (i.e., *RET*, calculated as the change in stock prices from the end of year *t*-2 to the end of year *t*-1). The result is presented in Column (7) of Table 6. We then replace the *FF* index with the *KZ* index (i.e., the adjusted Kaplan-Zingales (1997) index) as our measure of equity dependence.[11] The result is shown in Column (8) of Table 6. Since the *KZ* index is a direct measure of equity dependence, we expect the interaction coefficient on $Q \times KZ$ to be positive. We also include the interaction term between *CF* and *FF* $(CF \times FF)$ in the regression. The result is reported in Column (9) of

[10] In addition, our results (unreported) remain robust even after excluding the periods of financial crises (1987, 1998 to 2000, and 2008) and in the different sub-periods (pre-1990, 1990 to 2000, and post-2000).

[11] Baker, Stein, and Wurgler (2003) use the *KZ*-index as their main measure of equity dependence and find similar results for U.S. firms. The *KZ* score is estimated for each firm-year observation using an equation that comprises five components. The estimated coefficients of cash flow (*CF*), dividend payout ratios (*DIV*), and cash balance (*CASH*) are negatively associated with the *KZ* index, while leverage (*LEV*) and Tobin's *Q* are positively associated with the *KZ* index. Therefore, firms with a higher *KZ* score are considered more equity dependent or more reliant on external equity financing for their investment projects.

Table 6. Finally, we include contemporaneous *Q* (denoted as Q_t) and lagged investment (denoted as *LCAPX*) in our regression specification. The reason for including *LCAPX* is because a firm's actual investment occurs with a lag (Lamont (2000)). The result is presented in Column (10) of Table 6. The results in Columns (5)-(10), except Column (8), show that the regression coefficients on the interaction term $(Q \times FF)$ are all negative and highly significant, while the interaction coefficient on $(Q \times KZ)$ reported in Column (8) is positive and highly significant.[12]

In summary, our sensitivity tests show that our main finding of a positive effect of equity dependence or a negative effect of financial flexibility on the sensitivity of investment to stock prices in our international sample survives all robustness checks. This suggests that the role of the equity-financing channel in corporate investment decisions is robust.

4. The Role of the Catering Channel in Corporate Investment: Regression Results

In this section, we formally examine whether the catering channel also plays an important role in corporate investment. In particular, H2 posits that the sensitivity of investment to stock prices should be higher for firms located in countries where the costs associated with raising external equity capital for investment needs are lower, or for firms whose shareholders have shorter investment horizons, or for firms whose assets are more difficult to value. To test this hypothesis, we first partition our whole sample into two sub-samples according to the median value of *ACCESS*, *ANTISELF*, *TURNOVER*, or *RD*, or whether the dummy variable *DEV* is 0 or 1. We then estimate equation (6) for each of the two sub-samples. The prediction from the first part of H2 is that the sensitivity of corporate investment to stock prices is higher in countries

[12] We also use firm size, which is computed as the natural logarithm of total assets, as another alternative measure of equity dependence. The smaller the firm is, the more equity dependent it should be. Our results remain unchanged.

where the cost of raising external equity is lower and is lower in countries where the financing cost is higher.

Panel A of Table 7 present the estimation results of equation (6) for the two sub-samples based on the above three country-level institutional variables (*ACCESS*, *ANTISELF*, and *DEV*). Consistent with the prediction of H2, we find that sensitivities of investment to stock prices (as measured by the coefficient of *b* in equation (6)) are higher for the sub-sample of firms located in countries with a high score on *ACCESS* and *ANTISELF*, and for firms in developed markets than for firms in the other sub-samples. For example, when *ACCESS* is used as a measure of external-financing costs, the estimated coefficient of *b* increases from 1.456 in the low sub-sample to 4.291 in the high sub-sample. Both coefficients are statistically significant at the 1% level. We also conduct the *F*-test which essentially tests the hypothesis that the difference in the coefficient of *b* between the high and low sub-samples is zero. As expected, the *F*-statistic is positive and highly significant at the 1% level or better. When *ANTISELF* is used as a measure of external-financing costs, the regression coefficient of *Q* (i.e., *b*) increases from 1.525 in the low sub-sample to 4.072 in the high sub-sample. The difference in the regression coefficient of *Q* is highly significant at the 1% level or better. Investment is also significantly more sensitive to stock prices for firms in developed markets (with $b = 4.056$) than for firms in emerging markets ($b = 1.602$).

[Insert Table 7 here]

The second part of H2 predicts that corporate investment is also more sensitive to stock prices for firms located in countries where shareholders have shorter horizons and for firms whose average assets are more opaque. We find the results to be consistent with the predictions of the catering theory (Panel A of Table 7) when we use *TURNOVER* as an inverse measure of average shareholder horizons and *RD* as a direct measure of asset opacity. For example, when *TURNOVER* is the partitioning variable, the sensitivity of investment to stock prices is 3.947 for the high *TURNOVER* sub-sample firms and 2.693 for the low *TURNOVER* sub-sample firms. When *RD* is the partitioning variable, the sensitivity of investment to stock prices is 3.933 for the high *RD* sub-sample firms and 1.843 for the low *RD* sub-sample firms. The difference in the regression coefficient of *Q* between the high and low sub-samples is significant at the 1% level or better in both cases.

As an alternative specification to test H2, we estimate the following regression for the pooled sample using the random effects model:

$$CAPX_{it} = a_o + bQ_{it-1} + b_1 COUNTRY_i + b_2 (Q_{it-1} \times COUNTRY_i) + cCF_{it} + u_t, \quad (8)$$

where *COUNTRY* is a dummy variable that equals 1 for countries with a high score on *ACCESS*, *ANTISELF*, *TURNOVER*, or *RD*, and for developed countries, and 0 otherwise. The coefficient of interest in this case is the coefficient on the interaction term between *Q* and *COUNTRY*, b_2. H2 predicts that the coefficient of b_2 should be positive. We estimate equation (8) by including the interaction of each of the five country-level variables with Tobin's *Q* as an additional regressor. Panel B of Table 7 presents the estimation results for the pooled sample. Consistent with the findings in Panel A of Table 7, we find that the coefficients of the interaction term (i.e., b_2) are all positive and significant at the 10% level or better. More specifically, b_2 is significant at the 1% level for *Q* interacted with *ACCESS* or *DEV*, at the 5% level for *Q* interacted with *ANTISELF* or *TURNOVER*, and at the 10% level for *Q* interacted with *RD*. The results again appear to support H2.[13]

[13] In our unreported results, we find that the coefficient of the interaction term between our country-level variables and *CF* is negative and significant at the 1% level for all five country-level variables.

Our findings in this section highlight the important roles that the various country-level variables which proxy for the costs of raising external capital, average shareholder horizons, and opacity of assets, play in the relation between corporate investment and stock prices. In general, our results suggest that the non-fundamental component of stock prices is a better predictor of investment for firms in countries where the costs of raising external equity are lower, or where average shareholder horizons are shorter, or for firms whose assets are more difficult to evaluate. The results support the catering theory of investment proposed by Polk and Sapienza (2009).

5. The Joint Roles of the Equity-Financing and Catering Channels in Corporate Investment

In this section, we explore the joint effects of the equity-financing and catering channels on corporate investment behavior in our international sample. Specifically, we test whether the ability of managers to engage in market timing is attenuated or intensified in countries with a lower external equity-financing cost.

We continue to use the partitioned samples based on each of the country-level variables used in the previous section and re-estimate equation (7) for each of them. The investment regressions are estimated using the country fixed effects model, with year and industry dummies and White's heteroskedasticity-corrected clustered standard errors. The results are reported in Panel A of Table 8. When *ACCESS* is used as the country-level partitioning variable, we find that the coefficient on the interaction term between *Q* and *FF* is more negative in the high *ACCESS* sub-sample (-2.070) than in the low *ACCESS* sub-sample (-1.329). This is consistent with our hypothesis that the role of the equity-financing channel is more pronounced in countries with easier access to equity markets. Moreover, the *F*-statistic that tests the difference in the coefficient on $Q \times FF$ between the two sub-samples is highly significant with a *p*-value of less than 0.01.

[Insert Table 8 here]

We also find that the effect of the equity-financing channel is significantly stronger (with a *p*-value of less than 0.01) for firms in developed markets (coefficient of *Q*×*FF* = -2.242) than for firms in emerging markets (coefficient of *Q*×*FF* = -1.533). The same pattern is also found for firms split by *ANTISELF*, *TURNOVER*, or *RD*. The coefficient of *Q*×*FF* is -2.243 for firms from the high *ANTISELF* sub-sample and -1.570 for firms from the low *ANTISELF* sub-sample. Meanwhile, the coefficient of *Q*×*FF* is -2.236 (-2.215) for firms from the high *TURNOVER* (*RD*) *s*ub-sample and -1.534 (-1.532) for firms from the low *TURNOVER* (*RD*) sub-sample. The differences in the estimated coefficients of *Q*×*FF* between the two sub-samples are highly significant at the 1% level or better with the correct signs in all three cases.

As an alternative specification to test H3, we estimate the following regression for the pooled sample using the random effects model:

$$\begin{aligned} CAPX_{it} &= a_o + bQ_{it-1} + b_1(Q_{it-1} \times FF_{it}) + b_2(Q_{it-1} \times COUNTRY_i) \\ &\quad + b_3(Q_{it-1} \times FF_{it} \times COUNTRY_i) + cCF_{it} + dFF_{it} + eCOUNTRY_i + u_{it}, \end{aligned} \tag{9}$$

where all variables are defined previously. We include three interaction terms, *Q*×*FF*, *Q*×*COUNTRY*, and *Q*×*FF*×*COUNTRY*, as additional explanatory variables. The coefficient of interest in this case is b_3 and we expect this coefficient to be negative. That is, corporate investment is more sensitive to stock prices for non-financially flexible (i.e., equity-dependent) firms than for financially flexible (i.e., non-equity-dependent) firms and the effect of this equity-financing channel should be stronger in countries where the external financing costs are lower, or where shareholders have shorter horizons, or for firms whose assets are more difficult to value.

Panel B of Table 8 presents the estimation results of equation (9). In all specifications, we find that the coefficient of the interaction term $Q \times FF \times COUNTRY$ is negative with a value ranging from -1.232 to -1.693 and is highly significant at the 1% level. These findings are consistent with the argument that managers of equity-dependent firms will invest more in response to an increase in their stock price when the associated costs of raising external equity are lower, which is the case in countries with more developed institutions. Therefore, more developed institutions allow managers who are adept at timing the market to exploit the mispricing in stock prices. In addition, consistent with the evidence in Panel B of Table 7, we find that the coefficient of $Q \times COUNTRY$ continues to be positive for all specifications at the 1% level. Furthermore, consistent with the evidence in Panel D of Table 3 and Panel C of Table 4, the coefficient of $Q \times FF$ continues to be negative and significant at the 1% level for all five specifications.

Finally, we also include two interaction terms, $Q \times COUNTRY$ and $Q \times FF \times COUNTRY$, and repeat the robustness tests in Section 3.4. Our findings (unreported) are unchanged. That is, the interaction coefficient on $Q \times COUNTRY$ retains its expected positive sign, while the coefficients on $Q \times FF$ and on $Q \times FF \times COUNTRY$ remain negative and significant at least at the conventional levels. On the whole, our results suggest that the equity-financing channel and the catering channel work together in driving managers' investment decisions for our international sample

6. An Alternative Interpretation of Some of our Results: The q-Theory

Equation (3) states that the positive relation between corporate investment and stock mispricing is stronger for firms in countries with low market frictions than for firms in countries with high market frictions. This relation is also consistent with the *q*-theory with investment frictions or adjustment costs proposed by Cochrane (1991, 1996), Li and Zhang (2010), among others. The *q*-theory with investment frictions proposed by Li and Zhang (2010) suggests that corporate investment is more responsive to the change in the cost of capital for firms in countries with low investment frictions than for firms in countries with high investment frictions. The measures of investment frictions would be empirically distinguishable from the measures of market frictions. Therefore, if the change in the cost of capital reflects the change in mispricing, our results in Tables 7 and 8 are also supportive of the *q*-theory with investment frictions when *ACCESS*, *DEV*, and *ANTISELF* are used as the inverse measures of market frictions. [14]

Although the predictions from the q-theory and the catering theory are the same, the underlying intuitions and assumptions are different. The *q*-theory assumes that the stock market is always rational, but the cost of capital may change from time to time and across firms due to the change in investor risk aversion. Managers of firms will invest more when the expected cost of capital is lower and invest less when the expected cost of capital is higher. On the other hand, the catering theory assumes that due to investor irrationality, stock markets may be overvalued or undervalued from time to time and across firms. If mangers are assumed to cater to short-term shareholders, they will invest more when their shares are overvalued and invest less when their shares are undervalued.

7. Conclusions

[14] Li and Zhang (2010) have shown that $\frac{d}{d\lambda}\left|\frac{dK}{dR}\right| < 0$, where $\lambda > 0$ is a cost parameter (i.e., a measure of investment frictions) and R is the gross discount rate. Since the market value of a firm (V^{mkt}) and its expected cost of capital (R) are negatively correlated (i.e., $\frac{dV^{mkt}}{dR} < 0$), it is easy to show that $\frac{d^2K}{d\lambda dV^{mkt}} < 0$. Since λ is analogous to our measure of market frictions (f) and V^{mk} is positively associated with our measure of mispricing (α), our equation (3) is equivalent to Li and Zhang's equation (6).

We have investigated how stock market mispricing affects corporate investment decisions through the equity-financing channel proposed by Baker, Stein, and Wurgler (2003) and the catering channel suggested by Polk and Sapienza (2009) using an international sample covering 44 countries. Our first main result is that the previous finding that the equity-financing channel affects the sensitivity of corporate investment to stock prices extends to our international sample. We have then shown that corporate investment is more sensitive to stock prices for firms in countries with more developed capital markets, higher share turnover, and higher R&D intensity. Since the degree of capital market development proxies for the cost of raising external capital, the result is consistent with the prediction of the extended catering theory of investment. In addition, by examining the interaction between firm-level equity dependence and country-level institutions, we have found that the sensitivity of investment to stock prices is most pronounced for equity-dependent firms in countries with more developed capital markets, higher share turnover, and higher R&D intensity. The analysis based on capital market development suggests that managers of equity-dependent firms are better able to engage in market timing in countries where the costs of raising external equity are relatively lower.

As an aside, we have provided corroborating evidence that helps to explain the cross-country difference in the determinants of corporate investment decisions. In addition, by using the sensitivity of investment to stock prices as a measure of the efficiency of capital allocation as Baker, Stein, and Wurgler (2003) have done, we have shown that the presence of strong institutions enables equity-dependent firms to allocate capital to investment projects more efficiently, through the equity-financing channel and the catering channel.

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Appendix: Variable definition

Variable name	Definition	Source
Country-level variables		
ACCESS	Access to external equity index	La Porta, Lopez-de-Silanes, and Shleifer, (2006)
DEV	A dummy variable which equals 1 for developed countries and 0 for emerging countries.	IMF
ANTISELF	Anti-self-dealing index	Djankov et al. (2008)
TURNOVER	Share turnover index, calculated as the average total value of stocks traded as a fraction of the shares outstanding for the period 1996-2005.	World Bank Development Indicators at http://www.worldbank.org
RD	R&D intensity, calculated as the average of firm-level research and development expenditures divided by total sales.	Worldscope
Firm-Level Variables		
CAPX	Capital investment, calculated as capital expenditures in year *t* divided by total assets at the end of year *t*-1.	Worldscope
CAPXRD	Alternative measure of capital investment, calculated as capital expenditures plus research and development expenditures in year *t* divided by total assets at the end of year *t*-1.	Worldscope
CAPXRDA	Alternative measure of capital investment, calculated as capital expenditures plus research and development expenditures plus acquisitions in year *t* divided by total assets at the end of year *t*-1.	Worldscope
FF	Financial flexibility index	Doidge, Karolyi, Lins, Miller, and Stulz (2009)
Q	The logarithm of Tobin's *Q*, calculated as market value of equity plus total assets minus total equity in year *t*-1divided by total assets at the end of year *t*-1.	Worldscope
CF	Cash flow, calculated as income before extraordinary items plus depreciation and amortization in year *t* divided by total assets at the end of year *t*-1.	Worldscope

Table 1
Country-level variables

This table presents the country-level variables for our sample. *ACCESS* is a country-level measure of ease of access to external equity markets. *ANTISELF* is the anti-self-dealing index. *TURNOVER* is the share turnover index. *RD* is the R&D intensity index. The detailed definitions of these variables are provided in the Appendix. The sample consists of 44 countries and covers the period from 1982 to 2008.

Panel A: Developed markets					
Country	Firm-year observations	*ACCESS*	*ANTISELF*	*TURNOVER*	*RD*
Australia	6,846	6.00	0.76	64.08	0.018
Austria	1,122	4.89	0.21	36.10	0.011
Belgium	1,492	5.70	0.54	27.91	0.013
Canada	10,648	6.39	0.64	62.12	0.029
Denmark	2,072	5.87	0.46	69.68	0.021
Finland	1,699	6.37	0.46	80.77	0.022
France	8,726	5.75	0.38	77.60	0.013
Germany	8,289	5.93	0.28	107.82	0.018
Greece	1,253	5.28	0.22	58.71	0.003
Hong Kong	5,932	5.50	0.96	54.12	0.004
Ireland	932	5.29	0.79	48.51	0.010
Italy	2,976	4.41	0.42	96.87	0.009
Japan	34,950	4.92	0.50	69.52	0.014
The Netherlands	2,708	6.43	0.20	112.11	0.012
New Zealand	901	5.82	0.95	38.40	0.004
Norway	1,851	5.57	0.42	87.98	0.015
Portugal	696	4.50	0.44	59.98	0.000
Singapore	4,076	5.50	1.00	47.17	0.003
Spain	1,969	5.09	0.37	172.89	0.003
Sweden	3,128	6.15	0.33	95.72	0.032
Switzerland	2,787	6.07	0.27	89.37	0.027
United Kingdom	20,758	6.26	0.95	81.11	0.020
United States	68,482	6.74	0.65	140.88	0.047
Mean		5.67	0.53	77.37	0.015
Std dev		0.62	0.26	34.00	0.011

Table 1 - Continued

Panel B: Emerging markets					
Country	Firm-year observations	*ACCESS*	*ANTISELF*	*TURNOVER*	*RD*
Argentina	539	3.23	0.34	16.563	0.000
Brazil	2,104	4.05	0.27	47.499	0.001
Chile	1,418	4.80	0.63	10.020	0.000
Colombia	209	2.78	0.57	7.070	0.000
Egypt	139	5.20	0.20	24.279	0.000
India	5,228	5.30	0.58	152.992	0.004
Indonesia	1,862	4.53	0.65	45.155	0.000
Israel	895	5.35	0.73	45.973	0.086
Korea (South)	6,992	5.02	0.47	247.772	0.009
Malaysia	6,632	5.11	0.95	39.230	0.001
Mexico	1,080	3.90	0.17	30.437	0.000
Pakistan	935	.	0.41	286.200	0.000
Peru	511	3.84	0.45	14.485	0.002
Philippines	1,008	4.62	0.22	23.812	0.001
South Africa	3,271	5.94	0.81	34.400	0.002
Sri Lanka	159	.	0.39	17.242	0.000
Taiwan	7,825	5.54	0.56	314.740	0.024
Thailand	3,165	4.24	0.81	79.703	0.000
Turkey	1,368	5.03	0.43	156.107	0.003
Venezuela	148	3.51	0.09	10.771	0.000
Zimbabwe	126	4.93	0.39	14.543	0.003
Mean		4.57	0.48	77.095	0.006
Std dev		0.84	0.23	95.955	0.019
Overall mean		5.18	0.51	77.237	0.011
Overall Std dev		0.91	0.24	69.813	0.016

Table 2
Summary statistics

Panel A of this table presents the summary statistics of the financial variables. *CAPX* is a measure of capital investment. *CAPXRD* is a measure of *CAPX* plus R&D expenditures. *CAPXRDA* is a measure of *CAPXRD* plus acquisitions. Ln(*Q*) is the natural logarithm of Tobin's *Q*. *CF* is cash flow. *FF* is the financial flexibility index. Panel B presents the correlations among the firm-level financial variables. Panel C presents the Pearson correlations among the country-level variables. *ACCESS* is a country-level measure of ease of access to external equity. *DEV* is a dummy variable that equals one for developed countries and zero for emerging countries. *ANTISELF* is the anti-self-dealing index. *TURNOVER* is the share turnover index. *RND* is the R&D intensity index. The detailed definitions of these variables are provided in the Appendix. The sample period is from 1982 to 2008.

Panel A: Summary statistics

Variable	N	Mean	Median	Std dev	Min	Max	1st Quartile	3rd Quartile
CAPX (%)	239,907	7.389	4.581	10.022	0.000	88.686	2.057	8.799
CAPXRD (%)	239,907	9.480	6.061	12.421	0.000	130.359	2.745	11.558
CAPXRDA (%)	239,907	11.524	6.860	16.723	0.000	165.624	3.049	13.453
Ln(*Q*)	239,907	0.300	0.191	0.524	-0.736	3.483	-0.032	0.532
CF (%)	239,907	11.459	12.007	20.114	-443.100	75.238	5.851	18.785
FF	239,907	1.155	1.000	0.715	0.000	3.000	1.000	2.000

Panel B: Correlations among firm-level variables

Variable	*CAPX*	*CAPXRD*	*CAPXRDA*	Ln(*Q*)	*CF*
CAPXRD	0.859				
CAPXRDA	0.687	0.800			
Ln(*Q*)	0.203	0.333	0.333		
CF	0.151	0.129	0.134	0.321	
FF	0.124	-0.030	-0.003	0.072	0.179

Panel C: Correlations among country-level institutional variables

	ACCESS	*DEV*	*ANTISELF*	*TURNOVER*
DEV	0.608			
ANTISELF	0.264	0.101		
TURNOVER	0.336	0.002	-0.034	
RD	0.501	0.274	0.133	0.159

Table 3
Financial flexibility and corporate investment

Panels A to C of this table present the coefficients of investment regressions based on equation (6) in the main text for each portfolio formed according to the measures of financial flexibility. The dependent variables are *CAPX*, *CAPXRD*, and *CAPXRDA*, respectively. *CAPX* is a measure of capital investment. *CAPXRD* is a measure of *CAPX* plus R&D expenditures. *CAPXRDA* is a measure of *CAPXRD* plus acquisitions. *Q* is Tobin's *Q*. *CF* is cash flow. *FF* is the financial flexibility index. The detailed definitions of these variables are provided in the Appendix. Panel D presents the results for the pooled sample obtained by including the interaction term, $Q \times FF$. Standard errors are reported in parentheses, clustered by country and robust to heteroskedasticity. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1) *FF*1	(2) *FF*2	(3) *FF*3	(4) *FF*4
Panel A: *CAPX* is the dependent variable				
Q	5.194***	5.085***	2.359***	0.075***
	(0.897)	(0.630)	(0.260)	(0.027)
CF	0.073***	0.016	0.089***	0.003***
	(0.012)	(0.018)	(0.031)	(0.001)
Industry and year fixed effects	Yes	Yes	Yes	Yes
Observations (N)	37,222	136,549	57,807	8,329
R-squared	0.252	0.144	0.184	0.371
Panel B: *CAPXRD* is the dependent variable				
Q	7.076***	8.505***	5.733***	2.018***
	(0.253)	(0.163)	(0.210)	(0.303)
CF	0.038***	-0.054	-0.034***	-0.076***
	(0.011)	(0.006)	(0.010)	(0.021)
Industry and year fixed effects	Yes	Yes	Yes	Yes
Observations (N)	37,222	136,549	57,807	8,329
R-squared	0.229	0.190	0.180	0.266
Panel C: *CAPXRDA* is the dependent variable				
Q	9.642***	10.770***	7.029***	2.992***
	(0.325)	(0.203)	(0.257)	(0.398)
CF	0.089***	-0.050***	-0.006	-0.057**
	(0.015)	(0.009)	(0.013)	(0.024)
Industry and year fixed effects	Yes	Yes	Yes	Yes
Observations (N)	37,222	136,549	57,807	8,329
R-squared	0.206	0.179	0.147	0.129

Panel D: Pooled sample regressions			
Independent variables	(1) *CAPX*	(2) *CAPXRD*	(3) *CAPXRDA*
Q	6.868***	9.703***	9.808***
	(1.059)	(0.881)	(1.113)
CF	0.043**	-0.038	0.065***
	(0.017)	(0.034)	(0.018)
FF	-2.371***	-2.127***	-2.490***
	(0.182)	(0.175)	(0.255)
$Q \times FF$	-2.148***	-1.922***	-3.018***
	(0.495)	(0.577)	(0.430)
Industry and year fixed effects	Yes	Yes	Yes
Observations (N)	239,907	239,907	239,907
R-Squared	0.191	0.199	0.159

Table 4
Financial flexibility and corporate investment controlling for investment opportunities

Panels A and B of this table present the investment regression coefficients based on equation (7) for each portfolio formed according to the measures of financial flexibility (*FF*). The dependent variable is *CAPX*. *CAPX* is a measure of capital investment. *Q* is Tobin's *Q*. *CF* is cash flow. *FF* is the financial flexibility index. *TAG* is total assets growth and *SG* is sales growth. The detailed definitions of these variables are provided in the Appendix. Panel C presents the results for the pooled sample. Standard errors are reported in parentheses, clustered by country and robust to heteroskedasticity. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1) *FF*1	(2) *FF*2	(3) *FF*3	(4) *FF*4
Panel A: *TAG* as the measure of growth opportunities				
Q	3.653***	2.579***	1.211***	0.075***
	(0.206)	(0.102)	(0.097)	(0.020)
TAG	0.067***	0.060***	0.044***	-0.000
	(0.003)	(0.001)	(0.002)	(0.000)
CF	0.047***	0.042***	0.080***	0.003***
	(0.007)	(0.004)	(0.003)	(0.001)
Industry and year fixed effects	Yes	Yes	Yes	Yes
Observations (N)	37,222	136,549	57,807	8,329
R-squared	0.323	0.273	0.304	0.371
Panel B: *SG* as the measure of growth opportunities				
Q	3.980***	3.402***	1.797***	0.071***
	(0.204)	(0.115)	(0.107)	(0.026)
SG	0.044***	0.047***	0.040***	0.050**
	(0.262)	(0.162)	(0.211)	(0.024)
CF	0.082***	0.050***	0.087***	0.003***
	(0.008)	(0.006)	(0.005)	(0.001)
Industry and year fixed effects	Yes	Yes	Yes	Yes
Observations (N)	36,705	135,120	57,029	8,297
R-squared	0.279	0.175	0.232	0.375

Panel C: Pooled sample		
Independent variables	(1)	(2)
Q	4.157***	4.853***
	(0.140)	(0.142)
TAG	0.074***	
	(0.002)	
SG		0.053***
		(0.002)
CF	0.053***	0.066***
	(0.003)	(0.004)
FF	-2.319***	-2.227***
	(0.034)	(0.034)
$Q \times FF$	-1.528***	-1.567***
	(0.076)	(0.075)
$TAG \times FF$	-0.015***	
	(0.002)	
$SG \times FF$		-0.007***
		(0.001)
Industry and year fixed effects	Yes	Yes
Observations (N)	239,907	237,151
R-Squared	0.305	0.230

Table 5
Country-by-country regressions

This table presents the coefficients of the interaction term between Tobin's *Q* and the measure of financial flexibility (*FF*) obtained from the following investment regression for each country in our sample:

$$CAPX_{it} = a_o + bQ_{it-1} + b_1(Q_{it-1} \times FF_{it}) + cCF_{it} + dFF_{it} + +u_{it},$$

where *CAPX* is capital investment. *Q* is Tobin's *Q*. *CF* is cash flow. *FF* is the financial flexibility index. The detailed definitions of these variables are provided in the Appendix. Standard errors are reported in parentheses, clustered by country and robust to heteroskedasticity. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5 – Continued

Country	Coefficients on $Q \times FF$	Standard errors
Argentina	-0.704	(0.924)
Australia	-3.696^{***}	(0.623)
Austria	-2.357	(2.189)
Belgium	-2.306^{**}	(0.958)
Brazil	0.263	(1.002)
Canada	-3.386^{***}	(0.473)
Chile	-1.907	(1.290)
Colombia	-1.976	(2.024)
Denmark	-0.761	(0.582)
Egypt	-0.042	(3.345)
Finland	-0.627	(0.810)
France	-0.863^{**}	(0.398)
Germany	-1.199^{***}	(0.395)
Greece	-0.978	(0.856)
Hong Kong	-0.625	(0.390)
India	-0.020	(0.514)
Indonesia	0.178	(0.831)
Ireland	-0.360	(0.897)
Israel	-0.597	(0.453)
Italy	-1.442^{**}	(0.730)
Japan	-0.649^{***}	(0.163)
Korea	-0.854^{*}	(0.503)
Malaysia	-1.096^{***}	(0.378)
Mexico	0.659	(0.759)
The Netherlands	-0.997^{*}	(0.513)
New Zealand	-0.656	(0.837)
Norway	-0.955	(1.144)
Pakistan	-0.912	(2.686)
Peru	0.663	(0.918)
Philippines	-0.197	(0.869)
Portugal	0.033	(1.513)
Singapore	-0.202	(0.650)
South Africa	-1.614^{*}	(0.845)
Spain	-0.308	(0.794)
Sri Lanka	-1.740	(2.827)
Sweden	-1.169^{***}	(0.429)
Switzerland	-0.470	(0.488)
Taiwan	-1.457^{***}	(0.367)
Thailand	-0.738	(0.656)
Turkey	2.224	(1.449)
United Kingdom	-1.485^{***}	(0.281)
United States	-1.331^{***}	(0.125)
Venezuela	0.060	(1.769)
Zimbabwe	5.146^{*}	(2.964)

Table 6
Robustness tests

This table presents the coefficients from the investment regression for the pooled sample based on different model specifications, estimation methods, and sub-samples. The dependent variable is *CAPX*, which is a measure of capital investment. *Q* is Tobin's *Q*. *CF* is cash flow. *FF* is the financial flexibility index. *TAG* is total assets growth. *RET* is the annual stock return during year *t*-1. *KZ* is the adjusted Kaplan-Zingales (1997) index. The detailed definitions of these variables are provided in the Appendix. *LCAPX* is the lagged one-period *CAPX*. Q_t is the contemporaneous *Q*. Δ*CAPX* is the change in *CAPX* between year *t* and year *t*-1. Column (1) reports the result from the Fama-MacBeth (1973) regression procedure. Column (2) reports the result based on the weighted least squares (WLS), where the weight is the inverse of the number of firms in each country in each month. Column (3) reports the result of excluding firms from Japan, the U.K., and the U.S. Column (4) reports the result of including manufacturing firms only. Column (5) reports the result of including *TAG* as a control for investment opportunities. Column (6) reports the result of replacing *CAPX* with Δ*CAPX*. Column (7) reports the result of replacing *Q* with *RET*. Column (8) reports the result of replacing *FF* with the *KZ* index. Column (9) reports the result of including the interaction term, $FF \times CF$, as an additional control. Column (10) reports the result of including two additional controls, *LCAPX* and Q_t. Standard errors are reported in parentheses, clustered by country and robust to heteroskedasticity. *, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6 – Continued

Variables	(1) FM	(2) WLS	(3) Exclude Japan/UK/US	(4) Manufacturing firms	(5) TAG	(6) ΔCAPX	(7) RET	(8) KZ	(9) Including CF × FF	(10) Including LCAPX and Q_t
Q	5.724***	6.319***	8.414***	5.034***	40.857***	0.966***		4.994***	6.933***	4.396***
	(0.897)	(0.931)	(1.818)	(0.296)	(3.279)	(0.158)		(0.503)	(1.110)	(0.573)
RET							3.206***			
							(0.574)			
CF	0.127***	0.124***	0.060*	0.051*	-0.157	0.005	0.041**	0.070***	0.027	0.026**
	(0.018)	(0.029)	(0.034)	(0.029)	(0.126)	(0.007)	(0.019)	(0.017)	(0.022)	(0.013)
Q_t										-0.072
										(0.050)
LCAPX										0.438***
										(0.017)
FF	-2.421***	-2.345***	-2.408***	-1.628***	1.433	-2.804***	-2.804***		-2.500***	-1.358***
	(0.037)	(0.123)	(0.175)	(0.131)	(1.149)	(0.243)	(0.243)		(0.222)	(0.090)
Q × *FF*	-2.016***	-1.796***	-2.896***	-1.447***	-5.062***	-0.127**	-0.648***		-2.218***	-1.251***
	(0.127)	(0.482)	(0.723)	(0.138)	(1.329)	(0.060)	(0.251)		(0.566)	(0.286)
CF × *FF*									0.014	
									(0.016)	
KZ								0.254***		
								(0.087)		
Q × *KZ*								0.597***		
								(0.075)		
Industry and year fixed-effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations (N)		239,907	115,717	121,397	239,907	235,134	239,907	229,870	239,907	239,907
R-squared		0.233	0.175	0.147	0.120	0.007	0.161	0.158	0.192	0.382

Table 7
The catering channel and corporate investment: The effect of the cross-country difference in the cost of raising external capital

Panel A of this table presents the coefficients from the investment regressions based on equation (6) in the main text. All firms are split into two groups (High and Low) based on the scores of *ACCESS* (Columns (1) and (2)), *ANTISELF* (Columns (5) and (6)), *TURNOVER* (Columns (7) and (8)), or *RND* (Columns (9) and (10)). All firms are also split into the emerging market group (Column (3) and the developed market group (Column (4)). The dependent variable is *CAPX*, which is a measure of capital investment. *Q* is Tobin's *Q*. *CF* is cash flow. *FF* is the financial flexibility index. *ACCESS* is a country-level measure of ease of access to external equity markets. *DEV* is a dummy variable that equals one for developed countries and zero for emerging countries. *ANTISELF* is the anti-self-dealing index. *TURNOVER* is the share turnover index. *RD* is the R&D intensity index. *COUNTRY* is one of the five country-level variables above used in the pooled sample regressions. The detailed definitions of these variables are provided in the Appendix. The *F*-test is the test of the difference in coefficients of *Q* between the two sub-samples. Panel B reports the results from pooled regressions that include an interaction term, *Q* × *COUNTRY*. Standard errors are reported in parentheses, clustered by country and robust to heteroskedasticity. ***, **, * denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Split-sample regressions										
Variables	(1) Low *ACCESS*	(2) High *ACCESS*	(3) *Emerging* Markets	(4) *Developed* Markets	(5) Low *ANTISELF*	(6) High *ANTISELF*	(7) Low *TURNOVER*	(8) High *TURNOVER*	(9) Low *RD*	(10) High *RD*
Q	1.456***	4.291***	1.602***	4.056***	1.525***	4.072***	2.693***	3.947***	1.843***	3.933***
	(0.199)	(0.108)	(0.264)	(0.100)	(0.298)	(0.098)	(0.295)	(0.099)	(0.358)	(0.097)
CF	0.158***	0.024***	0.161***	0.024***	0.171***	0.025***	0.126***	0.027***	0.191***	0.026***
	(0.013)	(0.004)	(0.013)	(0.004)	(0.016)	(0.004)	(0.016)	(0.004)	(0.019)	(0.004)
p-value	11.81		75.97		65.98		16.25		31.84	
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
Industry and year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	71,199	168,708	45,614	194,293	43,622	196,285	45,614	194,293	43,622	196,285
R-squared	0.173	0.141	0.159	0.158	0.155	0.154	0.159	0.158	0.155	0.154

Table 7 – Continued

Panel B: Pooled-sample regressions					
Independent variables	(1) *ACCESS*	(2) *DEV*	(3) *ANTISELF*	(4) *TURNOVER*	(5) *RD*
Q	2.534***	3.339***	2.571***	3.528***	3.569***
	(0.108)	(0.142)	(0.156)	(0.171)	(0.177)
CF	0.040***	0.039***	0.040***	0.039***	0.039***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
COUNTRY	-0.601***	-1.616***	-0.776***	-0.394*	-0. 930***
	(0.233)	(0.232)	(0.217)	(0.222)	(0.219)
Q × *COUNTRY*	1.687***	0.611***	1.466**	0.362**	0.308*
	(0.123)	(0.150)	(0.162)	(0.178)	(0.183)
Industry and year Fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	239,907	239,907	239,907	239,907	239,907
R-squared	0.116	0.120	0.117	0.116	0.116

Table 8
The joint effects of the equity-financing channel and the catering channel on corporate investment

Panel A of this table presents the coefficients of *Q* from the investment regressions based on equation (7) in the main text. All firms are split into two groups (High and Low) based on the scores of *ACCESS* (Columns (1) and (2)), *ANTISELF* (Columns (5) and (6)), *TURNOVER* (Columns (7) and (8)), or *RD* (Columns (9) and (10)). All firms are also split into the emerging market group (Column (3) and the developed market group (Column (4)). The dependent variable is *CAPX*, which is a measure of capital investment. *Q* is Tobin's *Q*. *FF* is the financial flexibility index. *ACCESS* is a country-level measure of ease of access to external equity markets. *DEV* is a dummy variable that equals one for developed countries and zero for emerging countries. *ANTISELF* is the anti-self-dealing index. *TURNOVER* is the share turnover index. *RD* is the R&D intensity index. *COUNTRY* is one of the five country-level variables above used in the pooled sample regressions. The detailed definitions of these variables are provided in the Appendix. The *F*-test is the test of the difference in coefficients of $Q \times FF$ between the two sub-samples. Panel B reports the results from pooled regressions that include two additional interaction terms, $Q \times COUNTRY$ and $Q \times FF \times COUNTRY$. Standard errors are reported in parentheses, clustered by country and robust to heteroskedasticity. ***, **, * denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Split-sample regressions

Variables	(1) Low *ACCESS*	(2) High *ACCESS*	(3) Emerging Markets	(4) Developed Markets	(5) Low *ANTISELF*	(6) High *ANTISELF*	(7) Low *TURNOVER*	(8) High *TURNOVER*	(9) Low *RD*	(10) High *RD*
Q	3.486***	7.167***	3.892***	7.159***	4.021***	7.175***	4.878***	7.089***	4.083***	7.025***
	(0.305)	(0.175)	(0.379)	(0.168)	(0.411)	(0.166)	(0.419)	(0.166)	(0.495)	(0.163)
CF	0.174***	0.026***	0.181***	0.027***	0.186***	0.028***	0.141***	0.031***	0.210***	0.029***
	(0.014)	(0.004)	(0.014)	(0.004)	(0.017)	(0.004)	(0.016)	(0.004)	(0.020)	(0.004)
FF	-1.888***	-2.712***	-2.286***	-2.429***	-2.099***	-2.484***	-2.228***	-2.418***	-2.316***	-2.424***
	(0.055)	(0.050)	(0.079)	(0.042)	(0.095)	(0.040)	(0.091)	(0.041)	(0.099)	(0.040)
$Q \times FF$	-1.329***	-2.070***	-1.533***	-2.242***	-1.570***	-2.243***	-1.534***	-2.236***	-1.532***	-2.215***
	(0.141)	(0.095)	(0.196)	(0.087)	(0.204)	(0.086)	(0.226)	(0.085)	(0.265)	(0.084)
p-value	19.22		10.93		8.43		6.06		9.22	
	(0.00)		(0.00)		(0.00)		(0.01)		(0.00)	
Industry and year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	71,199	168,708	45,614	194,293	43,622	196,285	35,809	204,098	33,569	206,338
R-squared	0.205	0.197	0.189	0.213	0.188	0.208	0.173	0.206	0.196	0.207

Table 8 – Continued

Panel B: Pooled-sample regressions					
Independent variables	(1) *ACCESS*	(2) *DEV*	(3) *ANTISELF*	(4) *TURNOVER*	(5) *RD*
Q	3.850***	5.087***	4.209***	5.128***	5.030***
	(0.213)	(0.260)	(0.259)	(0.306)	(0.317)
CF	0.044***	0.043***	0.044***	0.044***	0.048***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
COUNTRY	-0.826***	-1.752***	-0.820***	-0.568*	-1.138***
	(0.377)	(0.401)	(0.249)	(0.325)	(0.064)
FF	-2.351***	-2.348***	-2.380***	-2.352***	-2.313***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Q × *COUNTRY*	3.622***	2.100***	3.040***	1.991***	1.859***
	(0.245)	(0.285)	(0.280)	(0.328)	(0.335)
Q × *FF*	-0.725***	-1.038***	-0.847***	-1.007***	-0.961***
	(0.114)	(0.156)	(0.146)	(0.185)	(0.201)
Q × *FF* × *COUNTRY*	-1.693***	-1.319***	-1.495***	-1.306***	-1.232***
	(0.132)	(0.168)	(0.156)	(0.195)	(0.210)
Industry and year Fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	239,907	239,907	239,907	239,907	239,907
R-squared	0.163	0.168	0.164	0.164	0.166