Cross-listing, Price Informativeness, and the Sensitivity of Investment to Stock Price

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Abstract:

This article examines the change in a firm's stock price informativeness and its sensitivity of investment to stock price changes subsequent to cross-listing. We find that with the exception of Canada stock price informativeness does not change significantly subsequent to cross-listing. This finding is inconsistent with the theoretical literature that posits that subsequent to cross-listing there is a change in the informativeness of firms' stock price. We also find that after cross-listing developed market firms decrease their sensitivity of investment to stock price. Interestingly, we do not find any change in the sensitivity of investment to stock price after cross-listing for emerging market firms.

JEL Classification: F30, G11, G14, G15

Keywords: Cross-listing; Price Informativeness (R-squared); Investment Sensitivity

Introduction

Over the past two decades stock exchanges around the world have experienced a significant increase in the number of firms that cross-list. Commensurate with this significant increase in the number of cross-listings, a body of research has developed investigating the benefits of cross-listing. The evidence indicates that significant cross-listing benefits accrue primarily to emerging market firms and not firms from developed countries. This is somewhat surprising given that theoretically benefits should accrue to firms from both developed and emerging markets. An important empirical result emerging from the cross-listing literature is that cross-listed firms, from both emerging and developed markets have a significantly higher valuation than non-cross-listed foreign firms; that is there is a cross-listing premium (see, e.g. Miller, 1999; Doidge, Karolyi, and Stulz, 2004). What is yet to be ascertained is the source of this value premium. In this paper we empirically test how price informativeness and the sensitivity of investment to stock price change after cross-listing in line with Foucault and Gehrig's (2008) proposition stating that cross-listing allows firms to obtain more precise information about their growth opportunities from the market so that they can make better investment decisions based on it.

Dow and Gorton (1997) and Subrahmanyam and Titman (1999) among others show that managers learn about their firms from the firm-specific information reflected in their stock price and use this information in making better investment decisions (Chen, Goldstein and Jiang, 2007, Bakke and Whited, 2010). In line with this literature, Foucault and Gehrig (2008) propose that firms become more sensitive to the changes in their stock price after cross-listing because, after cross-listing there is more firm-specific information reflected in the stock price. Empirically Fernandes and Ferreira (2008) find that, after controlling for firm-specific characteristics, the stock price informativeness of cross-listed firms from developed markets is higher compared to

that of non-cross-listed developed market firms, but it is lower for cross-listed emerging market firms, when compared to non-cross-listed emerging market firms. This suggests that only developed market firms' investment sensitivity to stock price increases subsequent to cross-listing and to the extent that this is the source of the value premium, only these firms are able to make better investment decisions and, thus, trade at a premium. In a larger context this suggests that developed market firms, but not emerging market ones, cross-list in order to obtain more precise information form the market and make better investment decisions based on it.

We test this conjecture empirically as follows. First, we test whether stock price informativeness increases after cross-listing, since Fernandes and Ferreira (2008) compare cross-listed firms to non-cross-listed firms, but they do not apply any within-firm analysis. Second, we estimate a Fazzari, Hubbard and Petersen (1988) type of investment equation in order to see whether the investment sensitivity to stock price increases after cross-listing. Finally, we re-estimate the investment equation including a control for stock price informativeness in order to see if the change in informativeness explains the change in the sensitivity of investment to stock price.

We conduct our analysis using 404 firms from 32 countries. First, we split our sample into emerging market firms and developed market firms. A characteristic of the data is that over half of the developed market sample is comprised of Canadian firms. Moreover, their information content vis-à-vis the US market is significantly higher than that of firms from other developed market. Consequently we also analyze them as a separate sub-sample.

Consistent with Fernandes and Ferreira (2008) and Dasgupta, Gan and Gao (2010) and opposite to the theoretical result of Foucault and Gehrig's (2008) we find that there is a statistically significant decrease in stock price informativeness subsequent to cross-listing only

for Canadian firms. Specifically, examining the change in informativeness 2 years pre- to 2 years post-cross-listing the price informativeness of Canadian firms decreases by about 7%.

Although our results do not support the literature's theoretical predictions, it is nevertheless instructive to examine how the sensitivity of investment to stock price changes after cross-listing. It should be noted that the change in sensitivity is not necessarily contingent on the direction of change in informativeness. We find that emerging market firms do not change their investment sensitivity to stock price after cross-listing. However, developed market firms significantly decrease theirs. After splitting our developed market firm sample into Canadian and non-Canadian firms, we find that these results do not hold for Canadian firms, but they are even stronger for the rest of the developed market firms.

In the final step of our analysis we include stock price informativeness in our regression equation and interact it with our stock price measure (q) following Chen, Goldstein and Jiang (2007) and consistent with the theoretical arguments of Foucault and Gehrig (2008). We find that for developed market firms, the sensitivity of investment to stock price remains significant when we control for price informativeness. With respect to emerging market firms and Canadian firms, although we find that under some specifications the investment sensitivity to stock price decreases significantly after cross-listing, it remains insignificant overall.

We make three key contributions to the cross-listing literature. First, unlike other papers that focus on the average difference of informativeness between cross-listed and non-cross-listed firms, we are the first to compare the stock price informativeness of cross-listed firms pre- and post-cross-listing. This distinction is important because foreign firms that decide to pursue a U.S. major exchange listing are, to a significant degree, not the typical firm in their country. Also, comparing the pre-cross-listing period to the post-cross-listing period is more informative about

the impact of the cross-listing event itself. Second, in addition to the well documented differences between developed market and emerging market firms in the context of cross-listing, we show that with respect to informativeness and investment sensitivity to stock price, Canadian firms are significantly different from each of these two groups. Third, and most important, we show that there is an asymmetric impact of the change in price informativeness on the sensitivity of investment to stock price after cross-listing for each of our three subsamples. Our results suggest that there is a certain level of price informativeness which determines whether and how managers react to the changes in their stock price, but mainly pre-cross-listed.

The rest of the paper is organized as follows. Section II summarizes the related literature; Section III describes the sample construction, data collection and measure construction procedures. Section IV presents our empirical analysis and Section V concludes.

II. Related Literature

II.i Cross-listing

As Foucault and Gehrig (2008) point out, "cross-listings thrive even as international financial markets become more integrated". However, the academic literature on cross-listing has not been able to fully explain the benefits and costs of listing abroad. Most studies have looked at foreign firms listed in the U.S. More specifically, they have focused on foreign firms listing on the main U.S. exchanges (NYSE, Nasdaq, and NYSE Amex), just as we do in our study. There are two ways for foreign companies to list in on U.S. exchanges: directly or through American Depositary Receipts (ADRs)[2]. The listing and reporting requirements are the same, no matter which method of listing a company decides to choose. However, most firms,

[2] For a more comprehensive definition and description of ADRs, as well as cross-listing literature review, refer to Karolyi (2006).

except for the Canadian and Israeli ones (Karolyi, 2006), prefer to use ADRs since they avoid a number of complications for investors associated with direct foreign listings.

One of the first questions that the cross-listing literature answers is the effect of cross-listing on a firm's stock price. Three of the most prominent studies that address this issue find that cross-listed firms trade at a premium. Miller (1999) uses an event-study methodology in order to shows that there is a positive average abnormal return of 2.63% around the cross-listing announcement of exchange-listed foreign firms. Foerster and Karolyi (1999) use a similar methodology and report an average abnormal return of 0.15% in each week of the year before cross-listing and an average abnormal return of -0.14% in each week of the year after cross-listing. Finally, Doidge, Karolyi, and Stulz (2004) shown that foreign firms listed in the U.S., trade at a premium compared to similar home-country firms which do not list in the U.S. Specifically, U.S. exchange traded foreign firms trade at a premium as high as 37%.

The second important question for the cross-listing literature is what are the costs and the benefits of listing abroad. As Doidge et al. (2004) summarize, the costs of cross-listing are rather low, when compared to its benefits. Usually, the direct costs of a U.S. exchange listing are limited to the initial listing fees, the Securities and Exchange Commission (SEC) compliance costs and the Generally Accepted Accounting Principles (GAAP) reporting costs. On the other hand, the benefits are multiple, including lower cost of capital, better access to equity capital, access to a wider shareholder base, as well as more sophisticated investors, improved transparency, better reputation and the ability to better bond with investors, etc. We discuss those benefits of cross-listing in more detail next.

One of the most often cited benefits of cross-listing in the U.S. is the access to lower cost of capital. Using a sample of firms cross-listing in the U.S. between 1985 and 1994, Errunza and

Miller (2000) find that the cost of capital falls by 42% after cross-listing. However, Doidge et al. (2004) point out that this effect is mostly relevant to the 1980s. On the other hand, the greater access to capital markets after cross-listing is found to be more essential. Pagano, Roell and Zechner (2002) show that European companies that list in the U.S. are high growth, export-oriented or high-tech companies, which expand rapidly through equity financing, but do not change their leverage significantly. This result is consistent with Doidge et al.'s (2004) evidence that firms cross-listed in the U.S. have about 16.5% higher Tobin's q than non-cross-listed firms. Furthermore, Lins, Strickland and Zenner (2005) show that, for emerging market firms, the sensitivity of investment to cash flows decreases significantly after cross-listing, suggesting that the greater access to external capital markets is an important factor in the emerging market firms' decision to cross-list in the U.S.

Another explanation of firms decision to cross-list in the U.S. is provided by the market segmentation hypothesis which implies that when a firm lists its shares on a foreign market, it overcomes a number of trade and liquidity barriers as it widens its shareholder base. In line with Amihud and Mendelson's (1986) liquidity hypothesis, Domowitz, Glen and Madhavan (1998), Hargis and Ramanlal (1998), Chan, Hong and Subrahmanyam (2008), and others find that cross-listing increases firm value because of improved liquidity. However, this is especially important for companies from emerging countries, where markets lack liquidity and depth, and accurate public information is scarce. Finally, Merton's (1987) investor recognition hypothesis, which is also supported by the cross-listing literature, suggests that cross-listing is a way to overcome investors' home bias and attract more outside investors who will share the risk of the investment and, again lower the cost of capital.

Further, cross-listing on U.S. exchanges requires higher disclosure that leads to improved visibility (Baker, Nofsinger and Weaver, 2002), which has been shown to have numerous favorable effects. Bailey, Karolyi and Salva (2006) find that the improved visibility after cross-listing leads to increased absolute return and volume reactions to earnings announcements, especially for developed market firms. Moreover, analyst coverage increases after cross-listing, which leads to more accurate analysts forecasts (Lang, Lins and Miller, 2003) and lower cost of equity capital (Baker et al., 2002).

Consistent with the previous explanations, Coffee (1999, 2002) suggests that firms cross-list on major U.S. exchanges in order to overcome weak small shareholder protection laws in their home countries. Similarly, Stulz (1999) offers a reputational bonding hypothesis, which suggests that managers cross-list in the U.S. in order to alleviate agency problems by decreasing information asymmetries. There are numerous studies which provide support for the bonding hypothesis (e.g. Reese and Weisbach (2002), Doidge (2004), etc.). However, according to this hypothesis, the benefits of cross-listing are again mostly applicable to emerging market firms, since they are the ones with weak legal and disclosure environments.

Another reason for firms to cross-list in the U.S. that we discuss lateris the ability of firms to obtain better information from the market so that they can make better investment decisions (Foucault and Gehrig, 2008).

II.ii Price Informativeness

The concept of price informativeness, which originates from Roll's (1988) seminal paper "R^2", is based on the efficient market hypothesis. Roll suggests that, since stock prices change due to unanticipated changes in economic factors, unanticipated changes in a firm's market

environment, or unanticipated firm-specific events, then the proportion of a firm's return that cannot be explained by the market return should be firm-specific. The more firm-specific information reflected in a firm's stock price, the more informative (about this firm) the stock price is said to be.

Morck, Yeung and Yu (2000) develop a measure of price informativeness based on Roll's (1988) original concept and they show that stock prices are more synchronous (therefore less informative) in emerging markets compared to developed markets. Further, they show that these differences are only partially explained by highly correlated fundamentals and not explained by market size in emerging economies. Rather, they find that poor protection of private property rights and overall poor governance mechanisms (which usually characterize emerging markets) are important determinants of price synchronicity since they decrease the incentives for informed trading. This is further supported by Fernandes and Ferreira (2009), which shows that the enforcement of insider trading laws leads to better price informativeness, but only in developed markets and not in emerging ones.

Further, Gelb and Zarowin (2002) and Durnev et al. (2003) show that more informative stock prices in the current period are more closely associated with future earnings, suggesting higher market efficiency. Moreover, Jin and Myers (2006) show a strong positive correlation between R^2 and various opaqueness measures. Further, Gelb and Zarowin (2002) show that greater disclosure is associated with stock prices that are more informative about future earnings. In this context, a U.S. major exchange listing is likely to be associated with changes in price informativeness, since it requires compliance with the SEC which involves the disclosure of

detailed firm-specific information, part of which is likely to be new to investors[3]. In line with this conjecture, Fernandes and Ferreira (2008) show that after cross-listing, developed market firms are more informative than emerging market firms. However, on average cross-listed firms are less informative than non-cross-listed firms, consistent with Dasgupta, Gan and Gao (2010). On the other hand, when Fernandes and Ferreira control for firm-specific characteristics, they find that after cross-listing the stock price informativeness of developed market firms is higher because of the improved disclosure, but that of emerging market firms is lower compared to the pre-listing period. Consistent with Piotroski and Roulstone (2004) and Chan and Hameed (2006), the authors attribute the lower informativeness of emerging market firms to increased analyst coverage, which leads to the production of market-wide, rather than firm specific information for emerging market firms.

II.iii. The Sensitivity of Investment to Stock Price

The investment literature has shown that managers do obtain information about their own firms from the market. Dow and Gorton (1997) propose that in stock markets, information flows in two directions: first, the market learns about the quality of managerial decisions from stock prices and, second, managers learn from stock prices about their potential future investments and cash flows. Following the same logic, Subrahmanyam and Titman (1999) further explain that, even though managers have private information about their own firms, public markets may generate better information. For example, investors may learn about one firm when looking at information about another firm (e.g. one can make inferences based on information about a firms' competitors). Furthermore, Chen, Goldstein and Jiang (2007) provide empirical evidence

[3] SEC compliance rules are the same for all firms. However, when cross-listing in the U.S., firms do not necessarily disclose the same amount of information, which is unknown to investors. In other words, firms are not equally opaque when they decide to initiate a U.S. major exchange listing.

that, in fact, managers learn about their firms' fundamentals from the private information reflected in their firm's stock. Even more, they consider this information in their investment decisions. In a similar study, Bakke and Whited (2010) further reconfirm Chen, Goldstein and Jiang's (2007) findings using an enhanced model, which allows them to distinguish between investment related and non-investment related information reflected in stock prices, as well as to control for mispricing.

II.iv Cross-listing, Price Informativeness, and the Sensitivity of Investment to Stock Price

In their recent paper, Foucault and Gehrig (2008) propose a new explanation why foreign firms cross-list in the U.S. They assume that stock price informativeness increases after cross-listing and, thus, they suggest that firms cross-list in order to obtain more precise information about their growth opportunities from the market. In turn, managers of cross-listed firms are able to make better investment decisions and so they trade at a premium.

According to Coffee's (1999, 2002) legal bonding hypothesis, foreign firms cross-list in the U.S. in order to voluntarily subject themselves to stricter laws. As a result, after cross-listing in the U.S. those firms are obliged to disclose more detailed information, which is also more accurate. Therefore as transparency increases, stock prices should become more informative in line with Jin and Myers (2006). On the other hand, Fernandes and Ferreira (2008) provide empirical evidence that, controlling for firm-specific characteristics, stock price informativeness increases after cross-listing for developed market firms precisely because of the improved disclosure and scrutiny associated with a U.S. listing. In contrast, it decreases for emerging market firms because of increased analyst coverage that leads to the production of market-wide as opposed to firm-specific information (Piotroski and Roulstone, 2004).

Based on these studies, we expect that Foucault and Gehrig's (2008) proposition may only be applicable to developed market firms and not to emerging market firms. That is the sensitivity of investment to stock price changes after cross-listing only for developed market firms. This argument is consistent with McLean, Zhang and Zhao (2011), which shows that firms from countries with higher financial development and better investment protection laws (usually developed countries) are more sensitive to changes in their stock price, when compared to firms from countries with lower financial development and poor investor protection laws (usually emerging countries). Also, Bhattacharya et al. (2000) provide evidence that informed trading in emerging markets is discouraged by insider trading. Consequently, even if price informativeness is high, it is unlikely for managers of emerging market firms to extract any new information from stock prices, which they can in turn use in making investment decisions. This is further supported by Fernandes and Ferreira (2009), which shows that improved legal enforcement of insider trading laws leads to better price informativeness, but only in developed markets and not in emerging ones. From another perspective, Fernandes and Ferreira (2008) and Dasgupta, Gan and Gao (2010) show that after cross-listing in the U.S., developed market firms are more informative than emerging market firms but on average cross-listed firms are less informative than non-cross-listed firms. At the same time, Chen, Goldstein and Jiang (2007) shows that firms whose price informativeness is high are more sensitive to stock price movements when they make investment decisions, unlike firms whose price informativeness is low.

These arguments shows strong evidence against Foucault and Gehrig's (2008) assumptions of homogeneity of firms, homogeneous motives for the decision to cross-list, and homogeneous effects of cross-listing on price informativeness and the sensitivity of investment to stock price. Specifically, emerging market firms and developed market firms do not cross-list

for the same reasons and they do not benefit from cross-listing in the same way. Further, cross-listed and non-cross-listed firms in the same country are shown to exhibit quite different characteristics. In addition, the theory suggest that cross-listing affects the sensitivity of investment to stock price through the price informativeness channel, so we expect to find asymmetric impact of cross-listing on this sensitivity. Even if informativeness is not the reason for the change in sensitivity of investment to stock price after cross-listing, we still expect to find different consequences for emerging and for developed market firms.

Next, we proceed with our data collection procedure and empirical analysis.

III. Data and Measures

III.i Data Collection and Sample Construction

We are interested in foreign firms that cross-list in the US and trade on the New York Stock Exchange (NYSE), Nasdaq, and NYSE-Amex. In order to identify those firms, we collect data from the Center for Research in Stock Prices (CRSP). After identifying 2015 foreign firms listed in the U.S. directly or through ADRs, we obtain the precise listing and delisting dates from CRSP. Data on the name history of those U.S.-cross-listed firms, which we use to identify the firms in Datastream and Worldscope are also collected from CRSP. Because, these two databases become more comprehensive in the 1990s, we only consider the 1583 firms that cross-list in the U.S. for the first time between 1990 and 2008. We identify the country of origin for each firm using the nation code from Datastream. Although our list consists of foreign firms only, due to M&A activity, Datastream identifies some of the matched firms to be of U.S. origin. After excluding these from our sample, we have 694 foreign firms cross-listed in the U.S. We are interested in comparing firms before and after they cross-list in the U.S. Therefore, we require

stock market returns, as well as accounting data, before and after our foreign firms list in the U.S., which means that we automatically exclude those firms whose first listing is in the U.S. (U.S. IPOs). Furthermore, we require each firm to have at least one year of available data pre- and post-listing in the U.S., which reduces our final sample of Datastream data to 404 firms (68 emerging market firms and 336 developed market firms, 179 of which are from Canada) and Worldscope data to 399 firms (68 emerging market firms and 331 developed market firms, 175 of which from Canada). Table 1 summarizes the number of foreign firms cross-listed in the U.S. between 1990 and 2008 based on their country of origin and year of cross-listing. We follow Fernandes and Ferreira's (2008) classification of market development in order to divide our sample into developed and emerging market countries. Because Canadian firms represent over 40% of our full sample and they exhibit characteristics significantly different from other developed market firms, we analyze them as a separate sub-sample. Table 1 Panel A presents the emerging market firms, while Panel B presents the Canadian firms and all other developed market firms in our sample. Finally, we obtain T-bill rates from CRSP and analyst coverage data from the I/B/E/S database.

[Insert Table 1 About Here]

III.ii The Measure of Stock Price Informativeness

The first step in our analysis is to estimate the non-synchronicity of cross-listed firms in the two years before and the two years after their U.S. listing. Our measure of stock price synchronicity with the market is the R^2 measure, which was initially proposed by Roll (1988)

and later developed by Morck, Yeung and Yu (2000), Jin and Myers (2006), and others. Our synchronicity measure is the R-squared from the following regression:

$$r_{i,t} = \alpha_i + \beta_{1,i} \cdot r_{m,t} + \beta_{2,i} \cdot r_{US,t} + \varepsilon_{i,t} ,$$

where $r_{i,t}$ is the stock return of firm i at time t, measured by the Return Index (Datastream code RI) in excess of the risk free rate; $r_{m,t}$ is the value-weighted local market index (also from Datastream) and $r_{m,t}$ is the value-weighted U.S. market index (from CRSP), both in excess of the risk free rate. Next, we calculate our price informativeness (nonsynchronicity) measure as $1\text{-}R^2$, which we use in our univariate analysis. Note that, as constructed, $1\text{-}R^2$ ranges between 0 and 1 (or from 0% to 100%). In our multivariate analysis, we use the following log transformation of the measure:

$$INFO_{i,t} = \log\left(\frac{1 - R_{i,t}^2}{R_{i,t}^2}\right),$$

where $INFO_{i,t}$ measures stock price informativeness as the firm-specific component relative to the market-wide component reflected in a firm's stock market return. A higher $1\text{-}R_{i,t}^2$, as well as higher $INFO_{i,t}$, mean more informative (nonsynchronous) stock price. For consistency and comparability, in estimating our non-synchronicity measure we follow Fernandes and Ferreira (2008), among others.

III.iii The Investment Equation

The second step in our analysis is based on the typical Fazzari et al. (1988) investment equation:

$$\frac{I_{i,t}}{TA_{i,t-1}} = \alpha + \beta_1 q_{i,t-1} + \beta_2 \frac{CF_{i,t}}{TA_{i,t-1}} + \gamma\, CONTROLS + \varepsilon_{i,t} . \quad (1)$$

This is a regression of investment (I) scaled by the lagged book value of assets (TA) on Tobin's *q* and cash flows (CF) scaled by the lagged book value of assets (TA). Tobin (1969) shows that marginal *q* is a predictor of investment. Particularly, there is a positive relationship between the stock price movements and the level of investment, which means that the β_1 coefficient in the above equation is positive and significant. However, marginal q is unobservable, so we follow the extant literature and use average *q* instead. [1]

Foucault and Gehrig (2008) propose that "The sensitivity of investment to stock price for a given firm is larger when it is cross-listed than when it is not." Moreover, they explain this with the "improvement in price informativeness" after cross-listing. The authors propose that if stock price informativeness is controlled for in the investment equation, the sensitivity of investment to stock price becomes insignificant. Furthermore, they suggest that larger (smaller) increases in price informativeness lead to higher (lower) sensitivity of investment to stock price.

To test Foucault and Gehrig's (2008) proposition, we modify the investment equation twice. First, we test whether the sensitivity of investment to stock price increases after cross-listing by estimation the following equation:

$$\frac{I_{i,t}}{TA_{i,t-1}} = \alpha + \beta_1 q_{i,t-1} \cdot POST + \beta_2 \frac{CF_{i,t}}{TA_{i,t-1}} + \beta_3 q_{i,t-1} + \beta_4 POST + \gamma\, CONTROLS + \varepsilon_{i,t}. \quad (2)$$

Here POST is a dummy variable, which equals 1 if the time period is after the cross-listing event and 0 if the time period is before the cross-listing event. Based on Foucault and Gehrig's (2008) the coefficient β_1 in equation (2) is expected to be positive. Second, we test whether the significance of this coefficient disappears when we control for stock price informativeness and

[1] Refer to McLean, Zhang and Zhao (2010) for a detailed survey of the literature on the use of Tobin's *q* in equation (1).

whether there is a nonlinear effect of INFO on the coefficient of q. Therefore, we estimate the equation below:

$$\frac{I_{i,t}}{TA_{i,t-1}} = \alpha + \beta_1 q_{i,t-1} \cdot POST \cdot INFO_{i,t-1} + \beta_2 \frac{CF_{i,t}}{TA_{i,t-1}} + \beta_3 q_{i,t-1} + \beta_4 POST + \beta_5 INFO_{t-1}$$
$$+ \beta_6 q_{i,t-1} \cdot POST + \beta_7 q_{i,t-1} \cdot INFO_{i,t-1} + \beta_8 POST \cdot INFO_{i,t-1}$$
$$+ \beta_9 \frac{CF_{i,t}}{TA_{i,t-1}} \cdot INFO_{i,t-1} + \gamma CONTROLS + \varepsilon_{i,t}, \quad (3)$$

where $INFO_{i,t-1}$ is the nonsynchronicity measure that accounts for stock price informativeness. We include INFO separately and in an interaction with $q \cdot POST$ in order to account for the nonlinearity suggested by Foucault and Gehrig (2008). This also captures the nonlinear effect of price informativeness on the investment sensitivity to stock price documented by Chen, Goldstein and Jiang (2007). It is important to note that we lag our measure of nonsynchronicity INFO in order to see how the nonsynchronicity in the current period is associated with the investment levels over the next period. Finally, to control for the effect of informativeness on the relation between a firm's cash flow and its investment expenditures, we interact *CF* with *INFO*.

III.iv Variable Definitions

The dependent variable in both equations is investment, which we proxy in three different ways. The first proxy is INVEST1 which is defined as capital expenditure plus R&D expense scaled by lagged total assets. Our second proxy, INVEST2, is the change in total assets plus R&D expense scaled by lagged total assets. Our final proxy is INVEST3 defined as the percentage change in total assets. Worldscope has complete data on all variables required for the calculation of our three investment measures, except for R&D expense. Therefore, we have about twice as many observations for our third measure, compared to our other two measures.

We conduct our main tests with all three measures and conduct our supplementary tests with INVEST3.

The independent variables in our main specifications are Tobin's *q*, cash flows, nonsynchronicity and a dummy variable that takes the value of 1 to indicate the post-listing period and 0 to indicate the pre-listing period. We measure q as the market value of equity plus total assets minus total stockholders' equity scaled by total assets. Cash flows (CF) are earnings before interest, tax, depreciation and amortization minus cash dividends scaled by lagged total assets. INFO is the log transformation of the nonsynchronicity measure. POST is a dummy variable equal to 1 after the cross-listing year and to 0 before the cross-listing year. We also include the necessary interactions of q, INFO and POST, where required.

We follow Chen, Goldstein and Jiang (2007) in selecting our controls. First, we include the inverse of the lagged total assets ($1/TA_{t-1}$), since our variables of interest as well as the dependent variable are scaled by the lagged book assets. Therefore, controlling for $1/TA_{t-1}$ extracts the common component and controls for firm size as well[1]. Note that unlike Chen, Goldstein and Jiang (2007) who control for the effect of market timing on investment by including a measure of future returns we do not do this because we use the cross-listing year as a base year (t=0).

In order to further explore the investment equation in the context of cross-listing, we consider how different levels of financial constraints, firm size, analyst coverage and information content affect the change in sensitivity of investment to stock price. As a measure of financial constraints we use a four variable KZ score (KZ4) per Kaplan and Zingales (1997), excluding Tobin's q following Baker et al. (2003):

[1] If we control for the inverse of total assets in the Fazzari et al. (1988) investment equation and then multiply both sides by TA_{t-1}, we have: $I_{i,t} = \alpha\, TA_{i,t-1} + \beta_1 q_{i,t-1} TA_{i,t-1} + \beta_2 CF_{i,t} + \gamma \cdot 1 + \varepsilon_{i,t}$.

$$KZ4_{i,t} = -1.001909\,\frac{CF_{i,t}}{TA_{i,t}} + 3.139193\,\frac{LTD_{i,t}}{TA_{i,t}} - 39.3678\,\frac{DIV_{i,t}}{TA_{i,t}} - 1.314759\,\frac{CASH_{i,t}}{TA_{i,t}},$$

where CF stands for cash flows, LTD stands for long term debt, DIV stands for cash dividends, CASH stands for cash and cash equivalents and TA stands for firm size, measured by total assets. Next, we measure the level of analysts following a firm (Analysts) as the highest number of analysts which follow a firm during the year (based on monthly observations). Last, information content is measured by INFO, the log-transformation of the nonsynchronicity measure.

All accounting data in Worldscope is reported in a firm's home-country currency. Therefore, before we construct our measures, we convert all variables into U.S. dollars. This is important because most, but not all of the variables we use are expressed as proportions. Therefore, in order to make them comparable, we need to express them in a common currency. Second, some of our measures are scaled by a lagged variable. This is somewhat problematic because some countries experience extreme levels of inflation and year-to-year accounting measures are difficult to compare. The U.S. dollar is reasonably stable, so converting foreign currencies into U.S. dollars is a way to overcome this problem.

Variable definitions and summary statistics are presented in Table 2. Since we consider three different subsamples, Table 2 presents the summary statistics for our full sample, as well as emerging market firms, developed market firms, developed market firms excluding Canadian ones, and Canadian firms separately. All variables are winsorized at the 1- and 99-percentile.

[Insert Table 2 about here]

Overall, Canadian firms have the highest investment levels, followed by emerging market firms and then other developed market firms based on all three investment measures. On the

other hand, emerging market firms have average q of 1.92, developed market firms excluding Canada 2.07, and Canadian firms 2.41. They have mean cash flows (CF) of 0.15, 0.09 and -0.05 respectively. Most financially constrained, on average, are Canadian firms with average KZ4 of 0.03, followed by other developed market firms -0.41 and emerging market firms -0.75. In terms of Analysts, the highest mean (median) levels are those of Canadian firms 6.19 (4.00), followed by other developed market firms 3.45 (2.00), and emerging market firms 2.87 (1.00). The nonsynchronicity measure is discussed in more detail in our univariate analysis section.

IV. Empirical Analysis

IV.i Univariate Analysis

The first step in our empirical analysis is to examine the change in information content following cross-listing. Fernandes and Ferreira (2008) find that non-cross-listed firms have higher information content measured as $1\text{-}R^2$ (as described previously) compared to cross-listed firms. They also show that developed market firms are less synchronous with the market, compared to emerging market firms. Our results are consistent with their findings. Further, we find that after cross-listing the average firm-specific information reflected in stock price decreases for Canadian firms, but does not change significantly for other developed market firms and emerging market firms.

A characteristic of our sample is that about 40% of the firms are from Canada, so we consider Canadian firms as separate from other developed market firms to make sure that they do not drive our results. We find that Canadian firms exhibit significantly higher nonsynchronicity compared to other developed market firms. Consequently, we look at Canadian firms as a separate subsample. In fact, Canadian firms are different from all other firms in the context of

cross-listing, because it is legally and geographically easier for them to list in the U.S. Further, their local reporting standards are very similar to U.S. GAAP and in often Canadian firms follow different U.S. listing procedures – they list directly, rather than through ADRs.

Table 3 reports the summary statistics and mean comparison analysis of information content measured as $1\text{-}R^2$. The reported estimates are based on the following time period specifications, where week 0 is the cross-listing week: for time t-2 we use weeks -104 to -53; for time t-1 we use weeks -52 to -1; for time t+1 we use weeks 1 to 52; for time t+2 we use weeks 53 to 104. We use two alternative estimations of nonsynchronicity. For our first alternative measure we exclude the 12 weeks before and the 12 weeks after the cross-listing week from our estimation, that is for period t-2 we use weeks -116 to -67, for period t-1 we use weeks -66 to -13, for period t+1 we use weeks 13 to 66, and for period t+2 we use weeks 67 to 116. For our second alternative measure we use the 4 calendar years around the year of cross-listing (2 years before and 2 years after). Under all specifications, we find similar results. However, we only report those using the market returns immediately before and after the cross-listing week for brevity.

[Insert Table 3 about here]

We present the summary statistics of each subsample in Table 3 Panel A. First, we show that for all subsamples, nonsynchronicity decreases each year from t-2 to t+2, with only one exception, but this decrease is significant only for Canadian firms. Panel A presents the difference in means through subsamples in each time period. One interesting result is that emerging market firms and developed market firms have similar levels of information content two years before cross-listing, which suggests that the U.S. market attracts firms with similar informativeness. However, from t-1 to t+2 emerging market firms have, over 8% lower

information content when compared to developed market firms. Next, we find that at any time period relative to cross-listing Canadian firms are at least 11% more informative than other developed market firms. This difference is about 17% two years before cross-listing. Finally, emerging market firms have over 21% lower information content, when compared to Canadian firms. In summary, Canadian firms have the highest information content, followed by other developed market firms and then emerging market firms. Since these three subsamples exhibit different levels of price informativeness, we expect cross-listing to have asymmetric impact on their sensitivity of investment to stock price. This is consistent with Morck, Yeung, and Yu (2000) and others, which show that developed market firms have higher information content with Canada amongst the top 3 highest.

Table 3 Panel B presents paired t-tests comparing the change in nonsynchronicity levels over time around cross-listing for the full sample of firms as well as each subsample. From t-2 to t+2 (excluding the base year) nonsynchronicity decreases significantly only for Canadian firms and this decrease is most pronounced in the two years around cross-listing. Specifically, there is a 4.7% drop in the price informativeness of Canadian firms. Overall, our results are consistent with the univariate results of Dasgupta, Gan and Gao (2010) and Fernandes and Ferreira's (2008), which show that non-cross-listed firms have higher price informativeness when compared to cross-listed firms. However, in our case, these results are mostly driven by Canadian firms.

Baker, Nofsinger and Weaver (2002) and Lang, Lins and Miller (2003) provide evidence that analyst coverage increases after cross-listing. Further, Fernandes and Ferreira (2008) show that this increase is associated with lower stock price informativeness, since analysts produce market-wide, rather than firm-specific information (Piotroski and Roulstone, 2008). Their results

are significant for both emerging and developed market firms, but the impact of analysts on price informativeness is much stronger for emerging market firms. The authors also suggest that the disclosure of information associated with a U.S. cross-listing has a positive effect on price informativeness, which it is mitigated by the analyst coverage effect. Consistent with Coffee's (1999, 2002) legal bonding hypothesis, when they cross-list in the U.S. emerging country firms disclose much more information new to investors compared to developed country firms. Therefore, the information disclosure effect can be neutralized by the analyst coverage effect for both emerging and developed country firms, as our results suggest.

Another explanation for the absence of significant change in price informativeness after cross-listing for emerging and developed market firms is that when a firm cross-lists in the U.S., it releases a lot of information prior to its listing and it implicitly promises to continue releasing as detailed information in the years to come. Consequently, it may be unfeasible for U.S. investors as well as home country ones to produce any additional costly information in the years immediately following a foreign firm's listing. Moreover, if detailed information is released for the first time, then investors may not know whether a firm is performing better or worse than before so, they may only be able to compare it to other similar firms. This in turn only leads to the production of industry- or market-specific and not firm-specific information. In this context, Canadian firms are different from the rest because they are much closer to the U.S. legally, culturally and geographically, which allows investors to obtain firm-specific information easier.

IV.ii Multivariate Analysis

So far, our results indicate that subsequent to cross-listing there is a significant decline in stock price informativeness only for Canadian firms. However, the theoretical work of Foucault

and Gehrig's (2008) suggests that price informativeness increases after cross-listing and, as a result of that increase, the sensitivity of investment to stock price increase as well. Although our results do not support this proposition so far, the effect of cross-listing on the sensitivity of investment to stock price is still worth exploring. In order to address this issue, we estimate the two modified investment equations – (2) and (3). We present the OLS estimates of the Fazzari, et al. (1988) style investment equations for the full sample of firms and for each subsample in different panels. All panels have the same structure, which is described next.

[Insert Table 4 about here]

Table 4, odd numbered models show the estimated results of Equation (2), where investment is regressed on Tobin's q and cash flows, controlling for the common component – the inverse of total assets, while even numbered ones show the estimates of Equation (3), where a nonsynchronicity control is included separately and also interacted with the variable of interest (*q*) and with cash flows (*CF*). The dependent variable, investment, is measured as follows: INVEST1 represents capital expenditure and R&D expense as a proportion of the previous year's total assets in models (1), (2), (7) and (8); INVEST2 is the change in total assets plus R&D expense as a proportion of the previous year's total assets in model (3), (4), (9), and (10); INVEST3 is the percentage change in total assets in models (5), (6), (11), and (12). Finally, Models (1)-(6) are based on all of the available data, while Models (7)-(12) are based on the two years surrounding the cross-listing year. We report results without industry, country and year fixed effects, but we re-estimate our models including these controls and find similar results. Including more variables in our analysis is that our tests lose their power due to the small sample size.

In order to interpret the effect of cross-listing on the sensitivity of investment to stock price (the change in the Tobin's q coefficient), we rewrite equations (2) and (3). Equation (2) is equivalent to:

$$\frac{I_{i,t}}{TA_{i,t-1}} = \left(\alpha + \beta_2 \frac{CF_{i,t}}{TA_{i,t-1}} + \beta_4 POST + \gamma\ CONTROLS\right) + (\boldsymbol{\beta_1 \cdot POST} + \boldsymbol{\beta_3})\, \boldsymbol{q_{i,t-1}} + \varepsilon_{i,t},$$

while equation (3) is equivalent to:

$$\frac{I_{i,t}}{TA_{i,t-1}} = \left(\alpha + \beta_2 \frac{CF_{i,t}}{TA_{i,t-1}} + \beta_4 POST + \beta_5 INFO_{t-1} + \beta_8\, POST \cdot INFO_{i,t-1} + \beta_9 \frac{CF_{i,t}}{TA_{i,t-1}} \cdot INFO_{i,t-1} + CONTROLS\right)$$

$$+ \left(\boldsymbol{\beta_1 POST \cdot INFO_{i,t-1}} + \boldsymbol{\beta_3} + \boldsymbol{\beta_6 POST} + \boldsymbol{\beta_7 INFO_{i,t-1}}\right) \boldsymbol{q_{i,t-1}} + \varepsilon_{i,t}.$$

We are interested in the bolded part in front of q in each of these equations, all else equal. Namely, we consider $(\beta_1 \cdot POST + \beta_3)$ from equation 2, where POST is 0 or 1 in order to see the difference in sensitivity pre- and post-cross-listing. Further we consider $\left(\beta_1 POST \cdot INFO_{i,t-1} + \beta_3 + \beta_6 POST + \beta_7 INFO_{i,t-1}\right)$ from equation 3, where we replace INFO with the mean, one standard deviation below the mean, and one standard deviation above the mean of the INFO measure relevant to each particular estimation. Analogical to our approach regarding Equation (2), we look at the difference between the pre- (POST=0) and the post- (POST=1) cross-listing period. In interpreting our results, we focus on the regressions with dependent variable INVEST3, since this continues to be our focus throughout the paper because our other two investment measures are based on R&D expense that is often unavailable for international firms. Although we do not explicitly report the coefficient interpretations from our regressions of INVEST1 and INVEST2, their implications are consistent with those of INVEST3.

Panel A of Table 4 shows the OLS regression results using the full sample of firms. Overall, we can see that the sensitivity of investment to stock price after cross-listing decreases significantly under most specifications, both when we do not and when we do control for the level of firm-specific information reflected in stock prices. Our result is consistent both when we include all firm-year observations and when we use only 1 year before and 1 year after the cross-listing. The fact that the negative effect of cross-listing on the sensitivity of investment to stock price persists after controlling for information content supports Foucault and Gehrig's (2008) nonlinearity proposition in that context. In order to further explore the change in sensitivity of investment to stock price after cross-listing, we will look at each of our subsamples, which have been shown to exhibit different characteristics in terms of information content as well as in the more general context of cross-listing.

Emerging market firm results are in Panel B. First of all, we find that these firms' sensitivity of investment to stock price is insignificant both before and after cross-listing if we do not control for the level of price informativeness. This is consistent with McLean, Zhang, and Zhao (2011), who show that firms from countries with low market development and poor legal protection do not pay much attention to the changes in market prices. However, when we include the nonsynchronicity measure in the analysis, we find that firms with low informativeness have low sensitivity of investment to stock price, but firms with mean or above mean informativeness have sensitivity coefficients of, respectively, 0.12 and 0.24 pre-cross-listing, which become less than 0.01 after cross-listing. That is, holding all else equal, only managers of emerging market firms with high price informativeness base their investment decisions on information obtained from the market pre-cross-listing. This is consistent with Chen, Goldstein and Jiang (2010), who show that the investment levels of firms with low informativeness are not sensitive to the

changes in market prices. On the other hand, this behavior does not persist after cross-listing, resulting in a decrease in the sensitivity of investment to stock price.

Next, we look at the second subsample that consists of the developed market firms (results are reported in Table 4 Panel C). We find that the sensitivity of investment to stock price significantly decreases after cross-listing if we do not control for stock price informativeness. For each unit increase in q before cross-listing, there is a 0.07 increase in investment to total assets. However, this coefficient is only 0.01 after cross-listing. The level of price informativeness does not have a significant impact on the change in sensitivity of investment to stock price after cross-listing, which is consistent with our proposition that only developed market firms modify their investment policies to stock price movements after cross-listing.

Since more than 50% of our developed market firms come from Canada, we look at Canadian firms and other developed market firms separately for numerous reasons. First, we want to see if our results are driven by Canadian firms. Second, we want to see if Canadian firms differ from other developed market firms in the context of cross-listing, as we show that they do otherwise. Third, Canada is in close geographical, legal and cultural proximity to the U.S., which may affect the impact of cross-listing on the sensitivity of investment to stock price.

We look at the developed market sub sample, excluding Canadian firms and report the results in Table 4 Panel D. We find a persistent decrease in the sensitivity of investment to stock price after cross-listing both when we do not and when we do control for the level of price informativeness. When we exclude nonsynchronicity from our analysis we show that a one unit increase in Tobin's q is associated with a 0.17 increase in investment to total assets before cross-listing, but only with a 0.001 decrease after cross-listing. When we consider nonsynchronicity, we find that at low, mean and high levels of INFO a one unit increase in q is associated with,

respectively, a 0.11, a 0.19, and a 0.28 increase in investment before cross-listing and only about 0.08 increase after cross-listing . Overall, we show that the sensitivity of investment to stock price decreases after cross-listing for developed market firms.

Finally, we report the results from our analysis of Canadian firms in Table 4 Panel E. Overall, we show that the sensitivity of investment to stock price of Canadian firms is insignificant both before and after cross-listing. Canadian firms are the most financially constrained in our sample and at the same time they have the highest growth opportunities (as proxied by Tobin's q). In addition, those firms have the highest price informativeness, which decreases significantly after cross-listing. In that case, it is possible that Canadian firms approach U.S. capital markets, which are geographically close and offer better access to equity capital in order to finance their growth opportunities even at the expense of price informativeness. We explore this issue proposition in more detail in the following section.

IV.iii Financial Constraints and the Sensitivity of Investment to Stock Price

In this section we split our sample into positive and negative KZ4 firms since we do not control for financial constraints in our baseline regressions. We re-estimate equations (2) and (3) for each subsample over positive and over negative KZ4 scores. As Baker, Stein and Wurgler (2003) show, high KZ4 (financially constrained) firms have higher Q coefficients, which means that more constrained firms are more attentive to changes in stock price. Similarly, managers of low KZ4 firms (financially unconstrained ones), pay less attention to stock prices when they make investment decisions. Therefore, we expect that if the sensitivity of investment to stock price changes significantly after cross-listing, it is more likely to happen for more financially

constrained but not as much for unconstrained firms. Estimation results over KZ4 scores are reported in Table 5: negative KZ4 results are in Panel A and positive KZ4 results are in Panel B.

[Insert Table 5 about here]

When we look at the financially unconstrained firms, we find that emerging market firms are still indifferent to the changes in their stock prices pre- and post-cross-listing. Developed market firms excluding Canadian ones decrease their sensitivity of investment to stock price if their price informativeness is high. Finally, it is interesting to find that unconstrained Canadian firms increase their sensitivity of investment to stock price after cross-listing. We find that before cross-listing there is only a 0.05 decrease in investment for each unit increase in q, but after cross-listing there is a 0.16 increase in investment for each unit increase in q. When we consider price informativeness, we find that unconstrained Canadian firms increase their sensitivity of investment to stock price. Specifically, the q coefficients increase from pre- to post-cross-listing as follows: from 0.08 to 0.17 when INFO is held constant at a standard deviation below the mean, from -0.77 to .50 when INFO is held at its mean, and from -1.63 to 0.84 when INFO is held at a standard deviation above the mean. This suggests that unconstrained Canadian firms approach cross-listing in the U.S. in order to obtain from the market valuable information, which they use to make better investments, as suggested by Foucault and Gehrig (2008).

When we look at the financially constrained firms, we find that only the emerging market firms have significant sensitivity of investment to stock price. Without considering the informativeness measure in our analysis, we show that the sensitivity of investment to stock price of these firms is 0.32 pre- and about 0.05 after cross-listing. Considering price informativeness: at low informativeness firms increase their q coefficient from -0.24 to 0.06; at

mean informativeness, the q coefficient decreases from 0.33 to about 0.07; at high informativeness, the q coefficient decreases from 0.91 to about 0.08. Lins, Strickland, and Zenner (2005) show that emerging market firms approach U.S. equity markets in order to get better access to capital and, at the same time, after cross-listing the increased access to capital is more pronounced for those firms when compared to developed market firms. Together with our findings, this suggests that highly constrained emerging market firm benefit from cross-listing because they are better able to finance, rather than simply evaluate, their growth opportunities. This is in line with our proposition that price informativeness is not the major reason form emerging market firms to cross-list in the U.S. Finally, we do not find significant changes in the sensitivity of investment to stock price around cross-listing for highly constrained developed market firms.

IV.iv Firm Size and the Sensitivity of Investment to Stock Price

Although we control for firm size in all of our regressions, we are interested in the direct effect of firm size on the sensitivity of investment to stock price. Chen, Goldstein and Jiang (2007) show that the investment to stock price sensitivity of larger firms is lower compared to that of small firms. The explanation that the authors provide is that changes in large firms' stock prices are unlikely to affect those firms' ability to finance promising investments. We split our sample of firms based on size: low TA (total assets) firms are those with total assets below the sample median, while high TA firms are those with total assets above the sample median. We expect that large firms are less sensitive to stock prices when they make their investments compared to small firms. Similarly, large firm are less likely to change their investment

sensitivity to stock price after cross-listing unlike small firms. Estimation results over TA levels are reported in Table 6: low TA results are in Panel A and high TA results are in Panel B.

[Insert Table 6 about here]

We find that emerging market and Canadian firms do not change their investment sensitivity to stock price after cross-listing regardless of their firm size. Further, small developed market firms (excluding the Canadian ones) significantly decrease their sensitivity of investment to stock price after cross-listing from 0.36 to -0.01. On the other hand, large developed market firms (excluding the Canadian ones) significantly increase their sensitivity of investment to stock price after cross-listing from -0.01 to 0.09. When we incorporate price informativeness in the analysis, we find that these firms increase their sensitivity of investment to stock price at all informativeness levels from 0.01 at low INFO, -0.03 at mean INFO, and -0.07 at high INFO before cross-listing to about 0.18 after cross-listing. This suggests that only large developed market firms can obtain valuable information from the market after cross-listing in the U.S., which they can use in their investment decisions.

IV.v Analyst Coverage and the Sensitivity of Investment to Stock Price

We consider the effect of analyst coverage on the changes in the sensitivity of investment to stock price because the literature suggests that higher analyst coverage is associate with lower price informativeness (Piotroski and Roulstone, 2004; Chan and Hameed, 2006). Since analysts' information is usually not new to managers, the more the analysts following a firm, the more times the information they produce feeds into the stock price (Dow and Gorton, 1997). Consequently, managers of firms with higher levels of analysts are less likely to benefit from the firm-specific information in their stock prices (considering the construction of the

nonsynchronicity measure). We look at low analyst coverage (Analysts below the sample median) and high analyst coverage (Analysts above the sample median) separately. We expect that a higher (lower) number of analysts after cross-listing will cause lower (higher) sensitivity of investment to stock price. We report our estimation results over analyst coverage levels in Table 7: Panel A reports low Analyst results and Panel B high Analyst results.

[Insert Table 7 about here]

Overall, low analyst coverage emerging market and Canadian firms do not change their sensitivity of investment to stock price after cross-listing. However, other low analyst coverage developed market firms decrease their q coefficient from 0.12 pre- to -0.01 post-cross-listing. When we incorporate price informativeness into our analysis, we find low price informativeness firms increase their sensitivity of investment to stock price from 0.01 pre- to 0.14 post-cross-listing, but mean price informativeness ones decrease it from 0.12 to 0.13 and high price informativeness ones from 0.23 to 0.12. On the other hand, high analyst coverage emerging market firms decrease their q coefficient from 0.12 pre- to 0.01 post-cross-listing. The effect of price informativeness is marginal. Also, high analyst coverage developed market firms (excluding Canadian ones) decrease their sensitivity of investment to stock price from 0.27 pre- to 0.01 post-cross-listing. However, high analyst coverage Canadian firms significantly increase their investment sensitivity to stock price after cross-listing, from -0.01 to 0.17, while the level of price informativeness is insignificant. Overall analyst coverage has asymmetric impact on the sensitivity of investment to stock price around cross-listing, which is particularly interesting in the case of Canada. We suggest that this is due to the close geographical proximity to the U.S., which allows analysts to obtain more firm-specific information that is also new to managers.

IV. vi Stock Price Informativeness and the Sensitivity of Investment to Stock Price

The next step in our analysis is to see how our coefficients of interest change over different levels of stock price informativeness. Although we control for nonsynchronicity in one of our model specifications, we divide our sample into low and high nonsynchronicity for more robustness. The even numbered models in Table 8 are based on the below-median observations of stock price informativeness, while the odd numbered models on the above-median ones.

[Insert Table 8 about here]

Once again, we show that the sensitivity of investment to stock price of emerging market and Canadian firms does not change significantly after cross-listing. In terms of other developed market firms, we find that over low informativeness, the sensitivity of investment to stock price decreases from 0.14 pre-cross-listing to 0.06 post-cross-listing for each unit of increase in q and over high informativeness it decreases from 0.31 pre-cross-listing to -0.03 post-cross-listing for each unit of increase in q. These results are consistent with our initial interpretations.

V. Conclusion

We explore a sample of 404 firms from 32 countries which create a dual listing on one of the main U.S. exchanges in addition to their home market listing. We are interested in the changes in those firms' price informativeness and sensitivity of investment to stock price movements after cross-listing. In short, we show that there is a significant decrease in the price informativeness of Canadian firms after cross-listing and a significant decrease in the sensitivity of investment to stock price after cross-listing for other developed market firms. Based on our analysis, we infer that there is an information content threshold above which firms incorporate

stock price informativeness into their investment decisions. In addition, there is an information content threshold below which firms change their sensitivity of investment to stock price after cross-listing. Also, the changes in investment sensitivity to stock price after cross-listing are not due to the changes in the level of price informativeness.

Overall, we acknowledge a number of caveats. First, the literature suggests that managers will incorporate information into their investment decisions only if it is new to them. However, we do now have a way to control for the level of managerial information. Second, we are unable to distinguish between investment-related and non-investment related information reflected in stock price movements. Finally, we are unable to control for firm ownership, which may also impact our analysis. Adding any of these three important variables to our analysis will improve the precision of our study and add to the generalizability and the inferences based of our results.

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Table 1. Sample Description: Distribution of Foreign Firm Cross-listings by Country and Year of U.S. Listing

Table 1 presents the ADRs and directly listed foreign firms listed on major U.S. exchanges (NYSE, Nasdaq, and NYSE Amex). The firms in this table have initiated a U.S. listing for the first time between 1990 and 2008. There are at least 30 weeks of daily stock price data available from Datastream for each firm both before and after their cross-listing week. Also, for most of these firms, accounting information is available from Worldscope for at least the year before and the year after the cross-listing year. Cross-listing dates are obtained from the CRSP database, while the country of origin of each firm is obtained from the Worldscope database. Firms, which have been acquired by U.S. firms are excluded from the sample. Also, we require firms to be listed on their home country market before listing in the U.S., which automatically excludes foreign firm U.S. IPOs from our sample. There is enough return data, but not enough accounting data available for 4 Canadian firms, 3 of which cross-listed in the U.S. in 1995 and 1 in 1998, and for 1 Luxembourg firm cross-listed in the U.S. in 1998.

Panel A summarizes the number of emerging market firms, while panel B summarizes the number of developed market firms by country and year of U.S. listing. We follow Fernandes and Ferreira's (2008) classification of market development for consistency. In our study we explore Canadian firms as a separate category, although the Canadian market is a developed market.

Panel A. Emerging Market

Country	Cross-listing Year																			
Emerging Markets	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	**Total**
ARGENTINA	-	-	-	2	2	-	-	1	-	-	-	1	-	-	-	-	1	-	-	**7**
BRAZIL	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	**1**
CHILE	-	-	-	3	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	**6**
CHINA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	**1**
COLOMBIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	**1**
GREECE	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	**2**
HONG KONG	-	-	-	-	-	1	-	-	-	1	2	-	-	-	-	1	-	-	-	**5**
INDIA	-	-	-	-	-	-	-	-	-	2	4	4	-	-	1	1	-	1	-	**13**
ISRAEL	-	-	-	-	-	1	-	-	-	-	-	-	2	-	-	2	-	2	-	**7**
KOREA (SOUTH)	-	-	-	-	2	-	1	-	-	1	-	1	-	2	-	-	-	-	-	**7**
MEXICO	-	-	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	**3**
PORTUGAL	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
SOUTH AFRICA	-	-	-	-	-	-	2	1	2	-	-	-	1	-	-	-	-	-	-	**6**
TAIWAN	-	-	-	-	-	-	1	1	-	-	2	-	1	2	-	-	-	-	-	**7**
VENEZUELA	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
Total Emerging	**0**	**0**	**1**	**6**	**7**	**2**	**4**	**3**	**4**	**6**	**8**	**6**	**5**	**4**	**2**	**4**	**1**	**3**	**2**	**68**

Panel B. Developed Markets

Developed Markets	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	**Total**
CANADA	**1**	**5**	**4**	**5**	**9**	**16***	**12**	**12**	**8***	**8**	**13**	**7**	**8**	**11**	**16**	**19**	**8**	**12**	**5**	**179**
AUSTRALIA	2	1	2	1	1	-	2	-	-	2	-	1	1	-	1	2	-	1	2	**19**
DENMARK	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	**1**
FINLAND	-	-	-	-	-	1	1	-	-	2	1	1	-	-	-	-	-	-	-	**6**
FRANCE	-	2	1	-	-	1	1	-	-	-	3	4	2	-	1	-	-	-	-	**15**
GERMANY	-	-	-	-	-	-	1	2	-	-	5	4	1	-	1	1	-	-	1	**16**
IRELAND	1	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	**4**
ITALY	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	**2**
JAPAN	-	-	-	-	2	-	1	-	-	1	-	3	3	-	-	-	1	-	-	**11**
LUXEMBOURG	-	-	-	1	-	-	-	-	1*	-	-	-	-	-	-	-	-	-	-	**2**
NETHERLANDS	-	1	-	-	1	1	-	2	-	-	-	3	-	-	-	-	-	-	-	**8**
NEW ZEALAND	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	**1**
NORWAY	-	-	1	1	-	1	1	-	-	1	-	-	1	-	-	-	-	-	-	**6**
SPAIN	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1**
SWEDEN	-	-	-	-	-	-	1	1	1	-	-	-	1	-	-	-	-	-	-	**4**
SWITZERLAND	-	-	-	-	-	1	-	-	-	-	3	2	-	-	-	-	-	-	-	**6**
UNITED KINGDOM	4	4	4	-	1	3	6	3	6	6	7	6	2	1	-	1	-	1	-	**55**
Total Developed (Excluding Canada)	**7**	**8**	**8**	**4**	**6**	**10**	**16**	**8**	**8**	**12**	**19**	**25**	**12**	**1**	**3**	**4**	**1**	**2**	**3**	**157**
Total	**8**	**13**	**13**	**15**	**22**	**28**	**32**	**23**	**20**	**26**	**40**	**38**	**25**	**16**	**21**	**27**	**10**	**17**	**10**	**404**

* There is return data, but not enough accounting data for 4 Canadian firms, 3 cross-listed in the U.S. in 1995 and 1 in 1998, and for 1 Luxembourg firm cross-listed in the U.S. in 1998.

Table 2. Variable Definitions and Summary Statistics

Variable	Definition
INVEST1	Capital expenditure plus R&D expense scaled by lagged total assets
INVEST2	Change in total assets plus R&D expense scaled by lagged total assets
INVEST3	Change in total assets scaled by lagged total assets
TA	Total assets in millions
INVTA	Inverse of total assets
CF	Earnings before interest, tax, depreciation and amortization minus cash dividends scaled by lagged total assets
Q	Market value of equity plus total assets minus total stockholders' equity scaled by total assets
KZ4	Four variable KZ score (excluding Tobin's Q) per Kaplan-Zingales (1997)
INFO	Log transformation of the nonsynchronicity measure log((1-R2)/R2)
Analysts	Maximum number of analysts following a firm over the calendar year
POST	Dummy variable equal to 1 when the time period is after the cross-listing date and 0 when it is before the cross-listing date

	Full Sample					
Variable	N	Mean	SD	1%	Median	99%
INVEST1	652	0.20	0.21	0.01	0.13	1.16
INVEST2	662	0.49	1.00	-0.47	0.18	6.00
INVEST3	1341	0.46	1.11	-0.50	0.15	7.52
TA	1341	24.10	101.00	0.00	0.57	772.00
CF	1249	0.04	0.30	-1.46	0.09	0.70
Q	1284	2.19	2.39	0.40	1.32	17.67
ROA	1171	0.06	0.12	-0.46	0.07	0.40
KZ4	864	-0.34	1.14	-5.27	-0.13	1.88
INFO	1348	1.51	1.47	-1.29	1.38	5.86
Analysts	1348	4.50	5.55	0.00	3.00	23.00

	Emerging						Developed					
Variable	N	Mean	SD	1%	Median	99%	N	Mean	SD	1%	Median	99%
INVEST1	106	0.18	0.17	0.01	0.13	0.75	546	0.21	0.22	0.01	0.13	1.16
INVEST2	110	0.27	0.39	-0.29	0.18	1.67	552	0.53	1.08	-0.47	0.19	6.00
INVEST3	235	0.31	0.72	-0.44	0.15	3.97	1106	0.49	1.17	-0.50	0.14	7.52
TA	235	9.57	26.40	0.02	1.87	156.00	1106	27.20	110.00	0.00	0.44	772.00
CF	204	0.15	0.19	-0.46	0.14	0.70	1045	0.02	0.32	-1.46	0.09	0.68
Q	223	1.92	2.52	0.40	1.19	17.67	1061	2.24	2.36	0.42	1.37	14.17
ROA	191	0.10	0.12	-0.40	0.09	0.40	980	0.05	0.12	-0.46	0.06	0.39
KZ4	159	-0.75	1.35	-5.27	-0.48	1.88	705	-0.24	1.07	-4.93	-0.09	1.66
INFO	237	0.75	1.33	-1.63	0.53	4.30	1111	1.68	1.45	-1.21	1.52	5.90
Analysts	237	2.87	3.91	0.00	1.00	17.00	1111	4.85	5.79	0.00	3.00	23.00

	Developed Excluding Canada						Canada					
Variable	N	Mean	SD	1%	Median	99%	N	Mean	SD	1%	Median	99%
INVEST1	318	0.16	0.17	0.01	0.12	1.02	228	0.28	0.27	0.01	0.18	1.16
INVEST2	324	0.39	0.88	-0.42	0.15	5.36	228	0.73	1.27	-0.47	0.27	6.00
INVEST3	542	0.29	0.84	-0.50	0.10	4.40	564	0.69	1.39	-0.50	0.23	7.52
TA	542	52.00	152.00	0.01	2.90	772.00	564	3.44	21.40	0.00	0.10	166.00
CF	510	0.09	0.22	-0.60	0.10	0.59	535	-0.05	0.38	-1.46	0.05	0.70
Q	520	2.07	2.11	0.73	1.33	12.72	541	2.41	2.57	0.40	1.42	16.82
ROA	497	0.08	0.11	-0.34	0.08	0.39	483	0.02	0.13	-0.46	0.03	0.39
KZ4	434	-0.41	1.11	-5.27	-0.23	1.56	271	0.03	0.94	-4.93	0.07	1.88
INFO	546	1.18	1.41	-1.32	1.06	5.27	565	2.16	1.33	-0.25	1.97	7.06
Analysts	546	3.45	4.78	0.00	2.00	24.00	565	6.19	6.33	0.00	4.00	23.00

Table 3. Summary Statistics and Mean Comparison Tests of Nonsynchronicity Estimates

Table 3 presents the summary statistics and mean comparison tests for the nonsynchronicity measure (1-R^2). R^2 is the R-squared from the regression of each firm's weekly return on the value-weighted market indices of its home country market and that of the U.S. market ($r_{i,t} = \alpha_i + \beta_{1,i} \cdot r_{m,t} + \beta_{2,i} \cdot r_{US,t} + \varepsilon_{i,t}$), following Roll's (1988) model, later developed by Morck, Yeung and Yu (2000) and others. Here, (1-R^2) measures the level of nonsynchronicity of each firms with the market in the four years surrounding the cross-listing event. We consider the two 52-week periods before as well as after the cross-listing week in estimating the nonsynchronicity measure. A minimum of 30 weekly returns are required in order to estimate R^2. Higher nonsynchronicity means that there is more firm-specific and less marketwide information reflected in the stock price; lower nonsynchronicity means that there less firm-specific and more marketwide information reflected in the stock price. Higher nonsynchronicity levels are considered more favorable, since a firm's stock moves due to events directly related to the firm, rather than such related to the industry or the whole market.

Panel A shows the summary statistics of each subsample at each time period (t-2, t-1, t+1, t+2). It also presents the difference in means of each subsample in each time period. N is the number of observations. Panel B presents paired t-tests comparing the nonsynchronicity levels around the cross-listing event. It is divided into five parts: full sample, emerging market firms, developed market firms, developed market firms excluding Canada, and Canadian firms. First, it presents the changes in nonsynchronicity of the full sample and each subsample over time. Year 0 is the cross-listing year and week 0 is the cross-listing week. The estimates are based on the following time periods: for time t-2 we use weeks -104 to -53; for time t-1 we use weeks -52 to -1; for time t+1 we use weeks 1 to 52; for time t+2 we use weeks 53 to 104.

***Significant at 1%; **Significant at 5%; *Significant at 10%.

Panel A: Summary Statistics

	Summary Statistics										Paired t-tests							
	Full Sample		Emerging Market		Developed Market		Developed Market (Excluding Canada)		Canada		Emerging - Developed		Emerging - Developed (No Canada)		Developed (No Canada) - Canada		Emerging - Canada	
Time	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	diff	t-stat	diff	t-stat	diff	t-stat	diff	t-stat
t-2	364	0.7830	62	0.6729	302	0.8057	142	0.7174	160	0.8840	-0.1328	-5.4075***	-0.0445	-1.5056	-0.1666	-9.7834***	-0.2111	- 10.321***
t-1	404	0.7797	68	0.6472	336	0.8065	157	0.7295	179	0.8741	-0.1593	-6.5187***	-0.0823	-2.7345***	-0.1446	-8.1590***	-0.2268	-10.8205***
t+1	404	0.7455	68	0.6148	336	0.7719	157	0.7089	179	0.8272	-0.1571	-6.351***	-0.0941	-3.0893***	-0.1183	-6.4291***	-0.2124	-9.3633***
t+2	382	0.7359	65	0.6108	317	0.7615	149	0.6912	168	0.8239	-0.1508	-5.494***	-0.0804	-2.3623**	-0.1328	-6.4632***	-0.2132	-8.7173***

Panel B

Time A	Time B	Full Sample N	Mean A	Mean B	diff	t-stat	Emerging Market N	Mean A	Mean B	diff	t-stat	Developed Market N	Mean A	Mean B	diff	t-stat
t-2	t-1	364	0.783	0.774	0.010	1.1140	62	0.673	0.640	0.033	1.3560	302	0.806	0.801	0.005	0.5280
t-1	t+1	404	0.780	0.746	0.034	4.0786***	68	0.647	0.615	0.032	1.2176	336	0.807	0.772	0.035	4.0436***
t+1	t+2	382	0.740	0.736	0.004	0.4853	65	0.612	0.611	0.002	0.0707	317	0.766	0.762	0.005	0.5115
t-2	t+2	344	0.778	0.734	0.044	3.9158***	60	0.663	0.612	0.052	1.5259	284	0.802	0.760	0.042	3.6530***

Time A	Time B	Developed Market Excluding Canada N	Mean A	Mean B	diff	t-stat	Canada N	Mean A	Mean B	diff	t-stat
t-2	t-1	142	0.717	0.718	0.000	-0.0231	160	0.884	0.875	0.009	0.9202
t-1	t+1	157	0.730	0.709	0.021	1.531	179	0.874	0.827	0.047	4.3212***
t+1	t+2	149	0.701	0.691	0.010	0.7129	168	0.824	0.824	0.000	-0.0153
t-2	t+2	135	0.712	0.688	0.024	1.1788	149	0.884	0.825	0.058	4.9545***

Table 4. The Sensitivity of Investment to Stock Price

Table 4 presents the OLS estimates of the investment equation following Fazzari, et al. (1988). Detailed variable definitions are presented in Table 2. Models (1), (3), (5), (7), (9), and (11) follow the traditional investment equation, where investment is regressed on Tobin's q and cash flows, controlling for the common component, the inverse of total assets. In models (2), (4), (6), (8), (10), and (12), a control for nonsynchronicity is included separately and also interacted with the variable of interest (Q) and with cash flows (CF). In order to construct the measure of nonsynchronicity INFO, we first estimate the following regression $r_{i,t} = \alpha_i + \beta_{1,i} \cdot r_{m,t} + \beta_{2,i} \cdot r_{US,t} + \varepsilon_{i,t}$, where $r_{i,t}$ is the stock return of firm i at time t in excess of the risk free rate; $r_{m,t}$ is the value-weighted local market index and $r_{m,t}$ is the value-weighted U.S. market index in excess of the risk free rate. Then, we calculate $INFO_i = \log\left(\frac{1-R_i^2}{R_i^2}\right)$, where R_i^2 is the R-squared from the above regression. Since we are interested in the difference in investment sensitivity to stock price around the cross-listing event, we also include a dummy variable POST, which equals 1 if the firm-year observations are after the cross-listing date and 0 if the firm-year observations are before the cross-listing date. The dependent variable is the level of investment. Particularly, INVEST1 represents capital expenditure and R&D expense as a proportion of the previous year's total assets; INVEST2 is the change in total assets plus R&D expense as a proportion of the previous year's total assets; INVEST3 is the percentage change in total assets. Q represents Tobin's q, CF represents cash flows.
Panel A shows the regression results using the full sample of firms, Panel B only the emerging market firms, Panel C only the developed market firms, Panel D the developed market firms excluding Canada, and Panel E only the Canadian firms. In each panel, there are two sets of estimations – the first one shows the regression results using all available observations for each firm, while the second one shows only the results from the regression of the 2 years surrounding the cross-listing year for each firm (years t-1 and t+1).
***Significant at 1%; **Significant at 5%; *Significant at 10%. Standard errors reported in parentheses. Coefficients of interest in bold.

Panel A

	All											
	All years						1 year around					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3
Q	0.0149***	0.0109*	0.102***	0.0718**	0.0603**	0.0508*	0.0167***	0.0114*	0.118***	0.0833**	0.0725**	0.0599*
	(0.0049)	(0.0058)	(0.0241)	(0.0282)	(0.0234)	(0.0293)	(0.0062)	(0.0066)	(0.0341)	(0.0364)	(0.0308)	(0.0346)
QxPOST	**-0.0120****	-0.00313	**-0.0919*****	-0.0168	**-0.0501***	-0.0314	**-0.0159****	-0.0013	**-0.118*****	-0.0339	**-0.0867****	-0.0852*
	(0.0057)	(0.0075)	(0.0279)	(0.0367)	(0.0265)	(0.0354)	(0.0073)	(0.0107)	(0.0404)	(0.0589)	(0.0350)	(0.0451)
POST	-0.0107	-0.00472	-0.0404	-0.124	-0.0597	-0.0325	0.000431	-0.00689	-0.0623	-0.155	-0.0609	0.000406
	(0.0200)	(0.0279)	(0.0977)	(0.1360)	(0.0767)	(0.1060)	(0.0273)	(0.0396)	(0.1500)	(0.2170)	(0.1080)	(0.1460)
CF	-0.0933***	-0.0135	-0.0413	0.0902	0.362***	0.350*	-0.127***	-0.00944	-0.537***	-0.128	-0.097	0.241
	(0.0253)	(0.0440)	(0.1240)	(0.2150)	(0.1080)	(0.1840)	(0.0372)	(0.0587)	(0.2050)	(0.3240)	(0.1600)	(0.2580)
QxPOSTxINFO		**-0.00799***		**-0.0679*****		**-0.0148**		**-0.0167****		**-0.103*****		**-0.00287**
		(0.0045)		(0.0220)		(0.0195)		(0.0065)		(0.0361)		(0.0263)
INFO		0.00334		-0.0349		-0.00409		-0.0141		-0.128		-0.00984
		(0.0109)		(0.0530)		(0.0410)		(0.0142)		(0.0782)		(0.0537)
QxINFO		0.00513		0.0386**		0.00887		0.0119**		0.0766***		0.0119
		(0.0036)		(0.0176)		(0.0162)		(0.0047)		(0.0261)		(0.0209)
POSTxINFO		0.00212		0.0974		-0.0149		0.0216		0.16		-0.0384
		(0.0147)		(0.0718)		(0.0540)		(0.0207)		(0.1140)		(0.0745)
CFxINFO		-0.0388**		-0.0835		0.000223		-0.0563***		-0.205*		-0.144
		(0.0170)		(0.0830)		(0.0701)		(0.0217)		(0.1200)		(0.0903)
1/TA	1971.6***	1781.4***	8570.2***	7791.8***	12114.3***	12027.5***	1111.8***	910.6**	6041.5***	5044.3**	12042.4***	11972.5***
	(190.0)	(199.1)	(930.0)	(973.9)	(785.8)	(824.0)	(372.3)	(375.4)	(2053.1)	(2075.5)	(1440.5)	(1486.4)
Intercept	0.147***	0.130***	0.209***	0.205**	0.192***	0.192**	0.153***	0.142***	0.335***	0.349**	0.276***	0.262**
	(0.0151)	(0.0212)	(0.0740)	(0.1030)	(0.0596)	(0.0833)	(0.0204)	(0.0279)	(0.1120)	(0.1530)	(0.0833)	(0.1100)
N	609	609	612	612	1193	1193	326	326	328	328	635	635
R-sq	0.307	0.320	0.233	0.249	0.231	0.232	0.168	0.203	0.165	0.196	0.194	0.199
adj. R-sq	0.301	0.308	0.227	0.236	0.227	0.226	0.155	0.178	0.152	0.170	0.187	0.186
F	53.370	28.120	36.790	19.880	71.120	35.710	12.930	8.042	12.710	7.717	30.220	15.500

Panel B

	Emerging											
	All years						1 year around					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3
Q	0.0059	0.00867	0.0269	0.0590***	-0.0102	0.0604	0.00291	0.0128	-0.004	0.0516**	0.0126	0.0589
	(0.0078)	(0.0088)	(0.0173)	(0.0176)	(0.0378)	(0.0400)	(0.0100)	(0.0119)	(0.0205)	(0.0203)	(0.0393)	(0.0455)
QxPOST	**-0.000518**	-0.00699	**-0.0271**	-0.0487**	**-0.0198**	-0.0652	**0.00917**	-0.00724	**-0.0214**	-0.054	**-0.0219**	-0.052
	(0.0095)	(0.0098)	(0.0209)	(0.0195)	(0.0427)	(0.0428)	(0.0131)	(0.0253)	(0.0267)	(0.0433)	(0.0457)	(0.0499)
POST	-0.0227	0.00198	-0.0479	-0.115	-0.0754	0.0322	-0.0646	-0.0409	-0.0514	-0.113	-0.12	-0.161
	(0.0378)	(0.0428)	(0.0831)	(0.0842)	(0.1360)	(0.1470)	(0.0578)	(0.0762)	(0.1170)	(0.1280)	(0.1680)	(0.1930)
CF	0.102	0.217**	0.772***	0.536**	1.412***	0.422	0.112	0.168	1.461***	0.836***	0.637	0.00836
	(0.0752)	(0.1060)	(0.1670)	(0.2110)	(0.3150)	(0.4250)	(0.1290)	(0.1700)	(0.2650)	(0.2910)	(0.4480)	(0.5770)
QxPOSTxINFO		**-0.00941**		**-0.0991*** **		**-0.103** **		**-0.0181**		**-0.107** **		**-0.0825**
		(0.0114)		(0.0227)		(0.0508)		(0.0267)		(0.0456)		(0.0592)
INFO		-0.0228		-0.243***		-0.0102		-0.0373		-0.220***		-0.175
		(0.0237)		(0.0470)		(0.0922)		(0.0333)		(0.0561)		(0.1120)
QxINFO		0.0185*		0.103***		0.0841*		0.0269**		0.109***		0.0879*
		(0.0097)		(0.0194)		(0.0433)		(0.0127)		(0.0217)		(0.0500)
POSTxINFO		0.0166		0.298***		-0.0249		0.0418		0.262***		0.173
		(0.0320)		(0.0635)		(0.1200)		(0.0570)		(0.0970)		(0.1540)
CFxINFO		-0.0789**		-0.128*		0.465***		-0.0837		-0.0269		0.142
		(0.0344)		(0.0684)		(0.1420)		(0.0507)		(0.0861)		(0.1910)
1/TA	197.6000	-712.3	9830.7***	7540.2***	9310.6*	651.4	-116.9000	-3685.3	22624.7***	14107.5***	6701.8	5101.9
	(1096.1)	(1268.9)	(2422.2)	(2527.7)	(4916.7)	(5556.5)	(2276.7)	(2695.0)	(4642.2)	(4603.8)	(7886.7)	(9391.1)
Intercept	0.144***	0.114***	0.0475	0.107	0.1480	0.134	0.174***	0.156***	(0.0543)	0.0581	0.272**	0.351**
	(0.0310)	(0.0357)	(0.0679)	(0.0701)	(0.1120)	(0.1220)	(0.0471)	(0.0574)	(0.0946)	(0.0952)	(0.1350)	(0.1570)
N	97	97	98	98	192	192	51	51	52	52	103	103
R-sq	0.071	0.167	0.408	0.570	0.142	0.233	0.106	0.237	0.553	0.732	0.060	0.107
adj. R-sq	0.020	0.070	0.375	0.521	0.119	0.191	0.007	0.046	0.504	0.666	0.012	0.010
F	1.401	1.723	12.660	11.530	6.140	5.509	1.069	1.241	11.380	11.190	1.243	1.106

Panel C

	Developed											
	All years						1 year around					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3
Q	0.0152**	0.0133	0.125***	0.116**	0.0697**	0.0975**	0.0191**	0.0144	0.161***	0.149**	0.0954**	0.143**
	(0.0061)	(0.0089)	(0.0313)	(0.0453)	(0.0285)	(0.0440)	(0.0085)	(0.0112)	(0.0496)	(0.0654)	(0.0421)	(0.0585)
QxPOST	**-0.0145****	-0.00288	**-0.117*****	-0.0216	**-0.0582***	-0.0511	**-0.0223****	-0.00952	**-0.169*****	-0.0932	**-0.116****	-0.182**
	(0.0068)	(0.0111)	(0.0350)	(0.0566)	(0.0316)	(0.0528)	(0.0094)	(0.0146)	(0.0548)	(0.0857)	(0.0456)	(0.0719)
POST	-0.00912	0.000787	-0.0107	-0.0595	-0.0522	0.0134	0.0161	0.0325	0.00657	0.0803	-0.0218	0.227
	(0.0230)	(0.0359)	(0.1180)	(0.1830)	(0.0891)	(0.1380)	(0.0314)	(0.0496)	(0.1840)	(0.2890)	(0.1300)	(0.1960)
CF	-0.118***	-0.0448	-0.0637	0.297	0.301**	0.521**	-0.166***	-0.0483	-0.643***	0.165	-0.142	0.463
	(0.0280)	(0.0528)	(0.1430)	(0.2700)	(0.1200)	(0.2130)	(0.0407)	(0.0728)	(0.2380)	(0.4260)	(0.1790)	(0.3110)
QxPOSTxINFO		**-0.00736**		**-0.0596***		**-0.00148**		**-0.0108**		**-0.0592**		**0.0448**
		(0.0060)		(0.0305)		(0.0262)		(0.0081)		(0.0474)		(0.0361)
INFO		0.015		0.0594		0.0515		0.0057		0.0355		0.0981
		(0.0140)		(0.0713)		(0.0516)		(0.0191)		(0.1120)		(0.0707)
QxINFO		0.00242		0.0114		-0.0185		0.00734		0.0298		-0.0302
		(0.0048)		(0.0246)		(0.0214)		(0.0064)		(0.0376)		(0.0287)
POSTxINFO		-0.00461		0.0391		-0.0438		-0.00208		-0.00885		-0.161*
		(0.0182)		(0.0928)		(0.0663)		(0.0251)		(0.1460)		(0.0937)
CFxINFO		-0.0344*		-0.194*		-0.119		-0.0528**		-0.368**		-0.254**
		(0.0207)		(0.1060)		(0.0823)		(0.0268)		(0.1570)		(0.1100)
1/TA	1971.3***	1761.8***	8342.3***	7214.6***	11847.4***	11625.9***	1086.4***	896.8**	5330.5**	4419.1*	11881.5***	11861.9***
	(198.2)	(211.5)	(1016.6)	(1080.3)	(828.5)	(872.9)	(379.3)	(386.8)	(2219.7)	(2262.9)	(1533.7)	(1584.5)
Intercept	0.148***	0.117***	0.200**	0.0764	0.187***	0.101	0.147***	0.117***	0.302**	0.129	0.249**	0.0657
	(0.0176)	(0.0280)	(0.0901)	(0.1430)	(0.0694)	(0.1100)	(0.0244)	(0.0381)	(0.1430)	(0.2230)	(0.1040)	(0.1540)
N	512	512	514	514	1001	1001	275	275	276	276	532	532
R-sq	0.337	0.349	0.232	0.251	0.243	0.247	0.209	0.236	0.175	0.203	0.206	0.218
adj. R-sq	0.331	0.336	0.224	0.237	0.239	0.239	0.194	0.207	0.160	0.173	0.199	0.203
F	51.480	26.870	30.680	16.900	63.730	32.450	14.220	8.134	11.460	6.747	27.310	14.560

Panel D

Developed Excluding Canada

	All years						1 year around					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3
Q	0.0279***	0.0131*	0.180***	0.114***	0.169***	0.123***	-0.000356	0.0177*	0.0285	0.143**	-0.0484	0.159***
	(0.0065)	(0.0077)	(0.0337)	(0.0404)	(0.0295)	(0.0349)	(0.0194)	(0.0099)	(0.1130)	(0.0578)	(0.0774)	(0.0491)
QxPOST	**-0.0297*** **	0.00149	**-0.191*** **	-0.0252	**-0.170*** **	-0.0291	**-0.00652**	0.00601	**-0.0629**	0.0141	**0.00662**	-0.0026
	(0.0075)	(0.0110)	(0.0390)	(0.0578)	(0.0340)	(0.0496)	(0.0200)	(0.0142)	(0.1170)	(0.0825)	(0.0796)	(0.0713)
POST	0.0182	-0.00329	0.0937	-0.0852	0.139	-0.0315	-0.0251	0.00355	-0.101	-0.179	-0.187	-0.108
	(0.0245)	(0.0342)	(0.1270)	(0.1790)	(0.0936)	(0.1250)	(0.0626)	(0.0483)	(0.3660)	(0.2790)	(0.2130)	(0.1910)
CF	-0.029	0.011	-0.550***	-0.386	0.0432	0.144	-0.199***	-0.0377	-0.0601	-1.350**	0.134	-1.042**
	(0.0394)	(0.0721)	(0.2040)	(0.3790)	(0.1650)	(0.2910)	(0.0634)	(0.1070)	(0.3700)	(0.6190)	(0.2540)	(0.4560)
QxPOSTxINFO		**-0.0328*** **		**-0.160*** **		**-0.117*** **		**-0.0361*** **		**-0.187*** **		**-0.123*** **
		(0.0076)		(0.0397)		(0.0313)		(0.0095)		(0.0552)		(0.0439)
INFO		-0.0169		-0.108		-0.0719		-0.0184		-0.166		-0.0494
		(0.0183)		(0.0961)		(0.0599)		(0.0239)		(0.1390)		(0.0865)
QxINFO		0.0233***		0.102***		0.0607**		0.0221***		0.101**		0.0398
		(0.0063)		(0.0330)		(0.0252)		(0.0078)		(0.0456)		(0.0350)
POSTxINFO		0.0333		0.204*		0.154**		0.0421		0.25		0.149
		(0.0218)		(0.1140)		(0.0763)		(0.0283)		(0.1640)		(0.1110)
CFxINFO		-0.0364		-0.176		-0.116		-0.0647		-0.177		0.0145
		(0.0332)		(0.1740)		(0.1320)		(0.0458)		(0.2660)		(0.1920)
1/TA	1925.0***	1434.1***	11691.8***	9936.6***	13925.8***	13221.7***	966.8*	539.4	9006.5***	2048	14557.0***	3676.1
	(386.8)	(400.6)	(2002.0)	(2106.1)	(1806.6)	(1915.2)	(546.9)	(858.2)	(3194.7)	(4991.8)	(2045.3)	(4416.7)
Intercept	0.107***	0.100***	0.1320	0.149	(0.0081)	0.0307	0.218***	0.0915**	0.545*	0.29	0.463***	0.15
	(0.0188)	(0.0273)	(0.0976)	(0.1440)	(0.0720)	(0.0967)	(0.0487)	(0.0392)	(0.2850)	(0.2280)	(0.1720)	(0.1490)
N	302	302	304	304	489	489	116	159	116	160	276	256
R-sq	0.193	0.275	0.281	0.334	0.225	0.253	0.227	0.251	0.135	0.346	0.241	0.202
adj. R-sq	0.179	0.250	0.269	0.311	0.217	0.238	0.192	0.200	0.096	0.302	0.227	0.170
F	14.120	11.040	23.280	14.700	28.110	16.210	6.458	4.961	3.443	7.892	17.140	6.210

Panel E

	Canada											
	All years						1 year around					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3	INVEST1	INVEST1	INVEST2	INVEST2	INVEST3	INVEST3
Q	-0.00929	-0.00935	0.00797	-0.192	-0.049	-0.161	-0.000356	-0.0167	0.0285	-0.581*	-0.0484	-0.189
	(0.0121)	(0.0373)	(0.0618)	(0.1860)	(0.0508)	(0.1440)	(0.0194)	(0.0560)	(0.1130)	(0.3180)	(0.0774)	(0.2040)
QxPOST	**0.0121**	0.0171	**0.00532**	0.299	**0.0608**	0.176	**-0.00652**	-0.0241	**-0.0629**	0.473	**0.00662**	0.00224
	(0.0130)	(0.0389)	(0.0661)	(0.1940)	(0.0534)	(0.1490)	(0.0200)	(0.0563)	(0.1170)	(0.3200)	(0.0796)	(0.2080)
POST	-0.0631	-0.0801	-0.181	-0.597	-0.242	-0.383	-0.0251	0.051	-0.101	-0.575	-0.187	-0.00331
	(0.0447)	(0.1000)	(0.2280)	(0.4990)	(0.1500)	(0.3310)	(0.0626)	(0.1360)	(0.3660)	(0.7740)	(0.2130)	(0.4440)
CF	-0.170***	-0.0595	0.128	0.845*	0.318*	0.683**	-0.199***	-0.0709	-0.0601	1.14	0.134	1.111**
	(0.0422)	(0.0863)	(0.2150)	(0.4310)	(0.1730)	(0.3170)	(0.0634)	(0.1250)	(0.3700)	(0.7090)	(0.2540)	(0.4450)
QxPOSTxINFO		**-0.00233**		**-0.131***		**-0.0448**		**0.0139**		**-0.198**		**0.0438**
		(0.0156)		(0.0777)		(0.0590)		(0.0230)		(0.1310)		(0.0812)
INFO		-0.00687		-0.118		-0.112		-0.0204		-0.368		-0.0809
		(0.0319)		(0.1590)		(0.1130)		(0.0454)		(0.2580)		(0.1520)
QxINFO		0.000248		0.0834		0.0441		0.00614		0.254**		0.0525
		(0.0144)		(0.0720)		(0.0554)		(0.0216)		(0.1230)		(0.0762)
POSTxINFO		0.00816		0.193		0.0437		-0.0492		0.146		-0.168
		(0.0405)		(0.2020)		(0.1330)		(0.0586)		(0.3330)		(0.1800)
CFxINFO		-0.0498		-0.345**		-0.16		-0.049		-0.426*		-0.332**
		(0.0321)		(0.1600)		(0.1180)		(0.0439)		(0.2490)		(0.1520)
1/TA	1756.4***	1636.6***	8434.6***	6909.3***	11846.0***	11769.7***	966.8*	1269.8**	9006.5***	10404.1***	14557.0***	15595.9***
	(282.0)	(301.7)	(1435.9)	(1505.9)	(1134.2)	(1171.4)	(546.9)	(562.8)	(3194.7)	(3198.2)	(2045.3)	(2037.7)
Intercept	0.215***	0.228***	0.406**	0.694	0.419***	0.685**	0.218***	0.250**	0.545*	1.315*	0.463***	0.621
	(0.0336)	(0.0842)	(0.1710)	(0.4200)	(0.1180)	(0.2910)	(0.0487)	(0.1170)	(0.2850)	(0.6660)	(0.1720)	(0.3930)
N	210	210	210	210	512	512	116	116	116	116	276	276
R-sq	0.389	0.397	0.221	0.262	0.245	0.254	0.227	0.276	0.135	0.233	0.241	0.289
adj. R-sq	0.374	0.367	0.202	0.225	0.238	0.239	0.192	0.207	0.096	0.160	0.227	0.262
F	25.960	13.120	11.610	7.082	32.890	17.050	6.458	3.997	3.443	3.197	17.140	10.780

Table 5. Financial Constraints and the Sensitivity of Investment to Stock Price

Table 5 looks at the effects of financial constraints on the sensitivity of investment to stock price. It shows the OLS estimates of the investment equation following Fazzari, et al. (1988) based on the level of financial constraints. We measure investments constraints using a four variable KZ score per Kaplan-Zingales (1997), excluding Tobin's Q following Baker, Stein and Wurgler (2003): $KZ4_{i,t} = -1.001909\,CF_{i,t} + 3.139193\frac{LTD_{i,t}}{TA_{i,t}} - 39.3678\frac{DIV_{i,t}}{TA_{i,t}} - 1.314759\frac{CASH_{i,t}}{TA_{i,t}}$, where LTD stands for long term debt, DIV stands for dividends, and CASH stands for cash and cash equivalents. We split the full sample of observations based on the median KZ4 value. Panel A presents the estimation results for the negative (financially unconstrained) KZ4 firms, while Panel B presents the positive (financially constrained) KZ4 firms.
Detailed variable definitions are presented in Table 2. Models (1), (3), (5), and (7) follow the traditional investment equation, while in models (2), (4), (6), (8), (10), and (12) we include a control for nonsynchronicity (INFO). The dependent variable is the level of investment measured by INVEST3: the percentage change in total assets. Each panel presents the estimation results using the full sample of firms, only the emerging market firms, only the developed market firms except for Canada, and the Canadian firms. All available observations for each firm are included in the regressions (years t-2, t-1, t+1, t+2).
***Significant at 1%; **Significant at 5%; *Significant at 10%. Standard errors reported in parentheses. Coefficients of interest in bold.

KZ negative

	All		Emerging		Developed Excluding Canada		Canada	
	(1) INVEST3	(2) INVEST3	(3) INVEST3	(4) INVEST3	(5) INVEST3	(6) INVEST3	(7) INVEST3	(8) INVEST3
Q	0.00347	0.0222	-0.0445	0.0473	0.0372	-0.00325	-0.0476	0.617**
	(0.029)	(0.031)	(0.045)	(0.048)	(0.039)	(0.045)	(0.116)	(0.286)
QxPOST	**0.0144**	0.0114	**0.00507**	-0.0556	**-0.0278**	0.121**	**0.233***	-0.418
	(0.032)	(0.036)	(0.050)	(0.049)	(0.043)	(0.061)	(0.121)	(0.305)
POST	-0.0729	0.0637	-0.181	0.0625	0.00961	-0.184	-0.522*	1.126
	(0.104)	(0.132)	(0.200)	(0.208)	(0.131)	(0.179)	(0.310)	(0.699)
CF	1.344***	0.636**	2.018***	0.562	1.269***	0.961**	1.381***	0.699
	(0.2)	(0.3)	(0.5)	(0.6)	(0.3)	(0.4)	(0.4)	(0.8)
QxPOSTxINFO		**-0.00846**		**-0.0847**		**-0.119*** **		**0.252** **
		(0.026)		(0.059)		(0.041)		(0.123)
INFO		0.00992		0.0556		-0.102		0.546**
		(0.058)		(0.118)		(0.098)		(0.228)
QxINFO		0.00476		0.071		0.0574*		-0.264**
		(0.022)		(0.051)		(0.034)		(0.109)
POSTxINFO		-0.0918		-0.22		0.156		-0.644**
		(0.077)		(0.163)		(0.117)		(0.276)
CFxINFO		0.341***		0.679***		0.0341		0.224
		(0.115)		(0.182)		(0.206)		(0.294)
1/TA	15085.2***	14486.7***	12716.4	4250.7	18748.2***	18451.7***	8712.1***	8952.0***
	(1324.900)	(1374.800)	(7818.600)	(8156.000)	(2261.400)	(2363.000)	(2383.500)	(2588.100)
Intercept	0.0804	0.065	0.114	0.102	-0.041	0.0552	0.426*	-0.991
	(0.081)	(0.104)	(0.166)	(0.172)	(0.104)	(0.145)	(0.242)	(0.624)
N	486	486	111	111	262	262	113	113
R-sq	0.287	0.308	0.199	0.346	0.308	0.349	0.381	0.441
adj. R-sq	0.28	0.293	0.161	0.28	0.294	0.323	0.352	0.386
F	38.65	21.14	5.215	5.281	22.79	13.44	13.18	8.037

	KZ positive							
	All		Emerging		Developed Excluding Canada		Canada	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3
Q	-0.129**	-0.238	0.321***	0.00816	0.077	-0.0901	-0.198**	-0.39
	(0.055)	(0.159)	(0.088)	(0.096)	(0.113)	(0.203)	(0.079)	(0.302)
QxPOST	**0.0459**	0.111	**-0.274****	0.0519	**-0.113**	0.0472	**0.0868**	0.189
	(0.056)	(0.163)	(0.124)	(0.125)	(0.119)	(0.217)	(0.081)	(0.304)
POST	-0.273*	-0.297	0.212	-0.229	-0.103	-0.357	-0.281	0.166
	(0.143)	(0.290)	(0.196)	(0.204)	(0.204)	(0.341)	(0.282)	(0.670)
CF	-0.957***	-0.27	0.785**	1.253***	-0.569**	0.275	-1.304***	-0.64
	(0.197)	(0.335)	(0.355)	(0.440)	(0.254)	(0.579)	(0.328)	(0.546)
QxPOSTxINFO		**-0.00793**		**-0.415*****		**-0.0752**		**-0.00938**
		(0.065)		(0.114)		(0.091)		(0.119)
INFO		-0.0278		-0.567***		-0.108		0.0139
		(0.106)		(0.139)		(0.122)		(0.215)
QxINFO		0.0408		0.433***		0.087		0.0696
		(0.061)		(0.089)		(0.079)		(0.116)
POSTxINFO		-0.038		0.546***		0.132		-0.307
		(0.128)		(0.173)		(0.151)		(0.294)
CFxINFO		-0.299**		0.0155		-0.402*		-0.273
		(0.1)		(0.3)		(0.2)		(0.2)
1/TA	10011.4***	9614.2***	13965.4	25696.6**	6659.4**	5342.9	9611.2***	9375.4***
	(1356.300)	(1361.600)	(9403.300)	(10763.300)	(3077.300)	(3247.500)	(2044.300)	(2045.000)
Intercept	0.560***	0.645**	-0.340**	0.0185	0.283	0.472	0.673***	0.68
	(0.113)	(0.261)	(0.157)	(0.165)	(0.175)	(0.304)	(0.210)	(0.549)
N	343	343	40	40	156	156	147	147
R-sq	0.377	0.397	0.468	0.711	0.127	0.154	0.43	0.461
adj. R-sq	0.368	0.379	0.39	0.611	0.098	0.096	0.41	0.421
F	40.74	21.88	5.979	7.126	4.378	2.647	21.3	11.62

Table 6. Firm Size and the Sensitivity of Investment to Stock Price

Table 6 looks at the effects of firm size on the sensitivity of investment to stock price. It shows the OLS estimates of the investment equation following Fazzari, et al. (1988) based on firm size. We measure firm size by total assets (TA). We split the full sample of observations based on the median TA value. Panel A presents the estimation results for the low (below median) TA firms, while Panel B presents the high (above median) TA firms.
Detailed variable definitions are presented in Table 2. Models (1), (3), (5), and (7) follow the traditional investment equation, while in models (2), (4), (6), (8), (10), and (12) we include a control for nonsynchronicity (INFO). The dependent variable is the level of investment measured by INVEST3: the percentage change in total assets. Each panel presents the estimation results using the full sample of firms, only the emerging market firms, only the developed market firms except for Canada, and the Canadian firms. All available observations for each firm are included in the regressions (years t-2, t-1, t+1, t+2).
***Significant at 1%; **Significant at 5%; *Significant at 10%. Standard errors reported in parentheses. Coefficients of interest in bold.

	TA low							
	All		Emerging		Developed Excluding Canada		Canada	
	(1) INVEST3	(2) INVEST3	(3) INVEST3	(4) INVEST3	(5) INVEST3	(6) INVEST3	(7) INVEST3	(8) INVEST3
Q	0.0742**	0.0595	-0.0358	0.09	0.357***	0.349***	-0.0572	-0.22
	(0.035)	(0.047)	(0.050)	(0.055)	(0.062)	(0.091)	(0.058)	(0.170)
QxPOST	**-0.0684***	-0.0639	**-0.0116**	-0.082	**-0.367*****	-0.342***	**0.0658**	0.224
	(0.039)	(0.056)	(0.056)	(0.055)	(0.067)	(0.118)	(0.062)	(0.177)
POST	-0.0944	0.0111	-0.158	0.0489	0.323	0.685	-0.263	-0.487
	(0.142)	(0.247)	(0.285)	(0.344)	(0.248)	(0.497)	(0.197)	(0.442)
CF	0.346**	0.365	2.087***	0.415	-0.0636	0.494	0.311	0.740**
	(0.150)	(0.270)	(0.470)	(0.746)	(0.260)	(0.558)	(0.199)	(0.374)
QxPOSTxINFO		**-0.00477**		**-0.0947**		**-0.042**		**-0.0614**
		(0.029)		(0.062)		(0.067)		(0.070)
INFO		-0.0349		0.218		0.0425		-0.183
		(0.073)		(0.149)		(0.150)		(0.142)
QxINFO		0.00949		0.0599		0.0309		0.0638
		(0.024)		(0.053)		(0.056)		(0.065)
POSTxINFO		-0.0493		-0.0696		-0.123		0.0771
		(0.102)		(0.210)		(0.221)		(0.170)
CFxINFO		-0.00778		0.654***		-0.318		-0.179
		(0.100)		(0.220)		(0.241)		(0.137)
1/TA	11338.2***	11426.6***	8193.7	-6266	9865.0***	8983.4***	11534.0***	11510.1***
	(1078.8)	(1111.4)	(7415.1)	(7686.4)	(2708.7)	(2892.4)	(1306.6)	(1345.2)
Intercept	0.282***	0.347*	0.159	-0.0898	-0.155	-0.349	0.487***	0.938**
	(0.105)	(0.183)	(0.243)	(0.252)	(0.178)	(0.336)	(0.148)	(0.377)
N	602	602	70	70	135	135	397	397
R-sq	0.219	0.221	0.283	0.468	0.386	0.408	0.224	0.236
adj. R-sq	0.212	0.208	0.227	0.378	0.362	0.361	0.214	0.217
F	33.36	16.81	5.056	5.186	16.24	8.56	22.54	11.95

TA high								
	All		Emerging		Developed Excluding Canada		Canada	
	(1) INVEST3	(2) INVEST3	(3) INVEST3	(4) INVEST3	(5) INVEST3	(6) INVEST3	(7) INVEST3	(8) INVEST3
Q	-0.0183	-0.0154	-0.151	-0.051	-0.00608	0.00167	-0.0223	0.117
	(0.027)	(0.030)	(0.176)	(0.190)	(0.029)	(0.032)	(0.078)	(0.203)
QxPOST	**0.0690***	0.115***	**0.135**	0.035	**0.0994****	0.176***	**0.0341**	-0.115
	(0.036)	(0.042)	(0.179)	(0.197)	(0.044)	(0.049)	(0.096)	(0.224)
POST	-0.152**	-0.233***	-0.286	-0.137	-0.192**	-0.343***	-0.0905	0.125
	(0.071)	(0.084)	(0.258)	(0.286)	(0.094)	(0.107)	(0.128)	(0.281)
CF	0.654***	0.429*	0.314	0.432	0.692**	0.162	1.044***	1.135***
	(0.188)	(0.233)	(0.482)	(0.538)	(0.272)	(0.348)	(0.244)	(0.368)
QxPOSTxINFO		**-0.0659****		**0.36**		**-0.0972*****		**0.0653**
		(0.032)		(0.288)		(0.037)		(0.115)
INFO		-0.0491		0.461		-0.0743		0.0778
		(0.045)		(0.296)		(0.059)		(0.110)
QxINFO		-0.0135		-0.388		-0.0275		-0.0681
		(0.023)		(0.249)		(0.029)		(0.090)
POSTxINFO		0.107*		-0.482		0.196**		-0.104
		(0.060)		(0.372)		(0.079)		(0.141)
CFxINFO		0.294*		0.0432		0.632***		-0.0769
		(0.152)		(0.466)		(0.221)		(0.200)
1/TA	16439.7	41109.3	123848.3	131840	-41571	-3686	45359.4	66679.7
	(51989.2)	(53901.1)	(159026.0)	(165307.0)	(78291.5)	(80313.5)	(58378.7)	(61108.4)
Intercept	0.165***	0.209***	0.441*	0.298	0.134*	0.201**	0.0771	-0.091
	(0.057)	(0.068)	(0.235)	(0.259)	(0.069)	(0.080)	(0.102)	(0.248)
N	591	591	122	122	354	354	115	115
R-sq	0.035	0.058	0.024	0.051	0.048	0.103	0.169	0.19
adj. R-sq	0.027	0.041	-0.018	-0.035	0.034	0.077	0.13	0.112
F	4.286	3.544	0.571	0.596	3.491	3.926	4.42	2.433

Table 7. Analyst Coverage and the Sensitivity of Investment to Stock Price

Table 7 looks at the effects of the number of analysts following the firm on the sensitivity of investment to stock price. It shows the OLS estimates of the investment equation following Fazzari, et al. (1988) based on analyst coverage. We measure the number of analysts as the maximum number of analysts following the firm during the calendar year (Analysts). We split the full sample of observations based on the median Analysts value. Panel A presents the estimation results for the low (below median) Analysts firms, while Panel B presents the high (above median) Analysts firms.
Detailed variable definitions are presented in Table 2. Models (1), (3), (5), and (7) follow the traditional investment equation, while in models (2), (4), (6), (8), (10), and (12) we include a control for nonsynchronicity (INFO). The dependent variable is the level of investment measured by INVEST3: the percentage change in total assets. Each panel presents the estimation results using the full sample of firms, only the emerging market firms, only the developed market firms except for Canada, and the Canadian firms. All available observations for each firm are included in the regressions (years t-2, t-1, t+1, t+2).
***Significant at 1%; **Significant at 5%; *Significant at 10%. Standard errors reported in parentheses. Coefficients of interest in bold.

ANALYSTS low

	All		Emerging		Developed Excluding Canada		Canada	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3
Q	0.0181	0.00172	-0.0397	0.0725	0.116***	0.0264	-0.0899	-0.318
	(0.032)	(0.039)	(0.048)	(0.059)	(0.039)	(0.046)	(0.083)	(0.283)
QxPOST	**-0.0182**	0.0263	**-0.00529**	-0.108	**-0.127*** **	0.118*	**0.0952**	0.349
	(0.037)	(0.048)	(0.068)	(0.079)	(0.045)	(0.065)	(0.086)	(0.287)
POST	-0.183	-0.146	-0.0402	0.0732	0.0194	-0.183	-0.516*	-1.056
	(0.113)	(0.150)	(0.197)	(0.218)	(0.115)	(0.150)	(0.294)	(0.660)
CF	0.249*	0.214	1.478***	0.0562	-0.213	0.429	0.126	0.541
	(0.148)	(0.264)	(0.413)	(0.584)	(0.201)	(0.416)	(0.270)	(0.531)
QxPOSTxINFO		**-0.0346**		**-0.136**		**-0.180*** **		**-0.103**
		(0.026)		(0.092)		(0.039)		(0.110)
INFO		-0.0157		0.0843		-0.0652		-0.276
		(0.055)		(0.130)		(0.068)		(0.212)
QxINFO		0.0168		0.0695		0.0768***		0.086
		(0.021)		(0.065)		(0.029)		(0.106)
POSTxINFO		-0.0189		0.021		0.149		0.223
		(0.076)		(0.191)		(0.091)		(0.244)
CFxINFO		0.00181		0.623***		-0.343**		-0.174
		(0.093)		(0.180)		(0.173)		(0.186)
1/TA	11604.8***	11455.7***	7742.1	-5762.4	14514.7***	14912.6***	10882.1***	10892.4***
	(969.5)	(1012.4)	(5977.5)	(7123.3)	(1883.8)	(1958.6)	(1687.3)	(1728.5)
Intercept	0.273***	0.283**	0.202	0.165	0.0939	0.124	0.549**	1.251**
	(0.082)	(0.111)	(0.145)	(0.156)	(0.085)	(0.114)	(0.212)	(0.574)
N	680	680	129	129	322	322	229	229
R-sq	0.253	0.26	0.116	0.243	0.263	0.332	0.251	0.266
adj. R-sq	0.248	0.249	0.08	0.179	0.251	0.31	0.235	0.232
F	45.75	23.48	3.22	3.794	22.5	15.45	14.99	7.893

ANALYSTS high

	All		Emerging		Developed Excluding Canada		Canada	
	(1) INVEST3	(2) INVEST3	(3) INVEST3	(4) INVEST3	(5) INVEST3	(6) INVEST3	(7) INVEST3	(8) INVEST3
Q	0.135***	0.195***	0.115**	-0.157	0.270***	0.248***	-0.00997	-0.0808
	(0.032)	(0.047)	(0.047)	(0.145)	(0.048)	(0.059)	(0.055)	(0.131)
QxPOST	**-0.102*** **	-0.182***	**-0.126*** **	0.127	**-0.267*** **	-0.184**	**0.171*** **	0.137
	(0.036)	(0.054)	(0.045)	(0.141)	(0.054)	(0.088)	(0.065)	(0.161)
POST	0.11	0.211	0.0887	-0.083	0.376**	0.163	-0.279*	-0.187
	(0.096)	(0.145)	(0.131)	(0.187)	(0.162)	(0.223)	(0.148)	(0.327)
CF	0.697***	0.655**	1.039***	1.581***	0.794**	0.502	0.990***	1.008**
	(0.157)	(0.262)	(0.347)	(0.467)	(0.316)	(0.469)	(0.222)	(0.443)
QxPOSTxINFO		**0.0648** **		**-0.275* **		**-0.0522**		**0.0202**
		(0.030)		(0.143)		(0.060)		(0.068)
INFO		0.0522		-0.309*		-0.0451		-0.0788
		(0.065)		(0.182)		(0.119)		(0.120)
QxINFO		-0.0478*		0.283*		0.0207		0.0315
		(0.026)		(0.142)		(0.052)		(0.053)
POSTxINFO		-0.0877		0.29		0.148		-0.0557
		(0.073)		(0.184)		(0.151)		(0.140)
CFxINFO		0.0619		-0.341		0.127		-0.0125
		(0.130)		(0.301)		(0.275)		(0.202)
1/TA	20924.0***	22020.7***	26669.5***	35431.0***	14951.3	14200	22109.9***	22118.0***
	(2064.0)	(2330.9)	(9926.4)	(11105.0)	(13268.7)	(15453.2)	(2354.4)	(2652.8)
Intercept	-0.0306	-0.0976	-0.0924	0.0531	-0.288**	-0.218	0.15	0.323
	(0.083)	(0.128)	(0.121)	(0.181)	(0.141)	(0.177)	(0.121)	(0.282)
N	513	513	63	63	167	167	283	283
R-sq	0.223	0.232	0.537	0.6	0.222	0.236	0.278	0.285
adj. R-sq	0.216	0.217	0.496	0.523	0.197	0.187	0.265	0.259
F	29.15	15.19	13.2	7.8	9.169	4.81	21.32	10.85

Table 8. Stock Price Informativeness and the Sensitivity of Investment to Stock Price

Table 8 looks at the effects of nonsynchronicity on the sensitivity of investment to stock price. It shows the OLS estimates of the investment equation following Fazzari, et al. (1988) based on the measure of price informativeness. To obtain the measure of nonsynchronicity, we first estimate the following regression $r_{i,t} = \alpha_i + \beta_{1,i} \cdot r_{m,t} + \beta_{2,i} \cdot r_{US,t} + \varepsilon_{i,t}$, where $r_{i,t}$ is the stock return of firm i at time t in excess of the risk free rate; $r_{m,t}$ is the value-weighted local market index (also from Datastream) and $r_{m,t}$ is the value-weighted U.S. market index (from CRSP) in excess of the risk free rate. Then, we calculate $INFO_i = \log\left(\frac{1-R_i^2}{R_i^2}\right)$, where R_i^2 is the R-squared from the above regression. We split the full sample of observations based on the median INFO value. Models (1), (3), (5), and (7) present the estimation results for the low (below median) INFO firms, while models (2), (4), (6), and (8) present the high (above median) INFO firms.

Detailed variable definitions are presented in Table 2. The dependent variable is the level of investment measured by INVEST3: the percentage change in total assets. The table presents the estimation results using the full sample of firms, only the emerging market firms, only the developed market firms except for Canada, and the Canadian firms. All available observations for each firm are included in the regressions (years t-2, t-1, t+1, t+2).

***Significant at 1%; **Significant at 5%; *Significant at 10%. Standard errors reported in parentheses. Coefficients of interest in bold.

	All		Emerging		Developed Excluding Canada		Canada	
	INFO low	INFO high	INFO low	INFO high	INFO low	INFO high	INFO low	INFO high
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3	INVEST3
Q	0.0497*	0.0874**	0.0242	0.151	0.141***	0.312***	-0.243*	-0.00572
	(0.027)	(0.041)	(0.033)	(0.267)	(0.033)	(0.068)	(0.134)	(0.054)
QxPOST	**-0.0694****	**-0.0705**	**-0.0229**	**-0.34**	**-0.0765***	**-0.345*****	**0.164**	**0.0393**
	(0.031)	(0.046)	(0.036)	(0.360)	(0.044)	(0.070)	(0.137)	(0.060)
POST	0.0634	-0.129	-0.109	0.124	0.0749	0.298*	-0.307	-0.305*
	(0.093)	(0.125)	(0.130)	(0.594)	(0.118)	(0.171)	(0.305)	(0.179)
CF	0.620***	0.243	0.309	2.216***	0.202	-0.277	1.016***	0.0916
	(0.176)	(0.148)	(0.415)	(0.625)	(0.281)	(0.217)	(0.325)	(0.209)
1/TA	18833.4***	10076.9***	6066.8	9508.4	9435.2	11510.8***	21784.6***	9258.7***
	(1488.7)	(1026.8)	(6563.6)	(10110.7)	(10913.8)	(2177.0)	(2353.7)	(1296.0)
Intercept	0.123	0.225**	0.282**	-0.0202	-0.0294	-0.136	0.662**	0.407***
	(0.075)	(0.094)	(0.113)	(0.436)	(0.092)	(0.134)	(0.269)	(0.132)
N	596	597	145	47	296	193	155	357
R-sq	0.248	0.233	0.055	0.33	0.091	0.399	0.404	0.219
adj. R-sq	0.242	0.227	0.021	0.249	0.075	0.383	0.384	0.207
F	38.92	35.93	1.626	4.043	5.774	24.83	20.17	19.63