

Stock Price Behavior around External Financing

by

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Abstract

This dissertation redefines the patterns of the stock performance around corporate financing activities and provides an explanation based on moral hazard to the long-term post-financing stock underperformance. I partition firms according to their internal funds at the time of their financing activities and find that pre-financing price run-up is much stronger among firms with high internal funds at the time of financing, while post-financing stock underperformance is concentrated among firms with low internal funds at the time of external financing. This new finding is different from the traditional association between pre-financing price run-up and post-financing stock underperformance. I also investigate how external financing affects incentives and long-term post-financing stock performance conditioned on the availability of internal funds. First, Post-financing stock underperformance is disproportionately large during earnings announcement periods. Furthermore, these firms experience less decrease in post-financing average selling, general, and administrative expenses due to economies of scale from expansion. Finally, related to their external financing activities, these firms have a weaker information environment represented by more optimistic analyst earnings forecasts, larger forecast dispersion, and lower analyst coverage. This empirical evidence is consistent with existence and underestimation of a moral hazard problem induced by conflicts between current shareholders and new claimholders when firms lack internal funds.

Keywords: External financing, stock underperformance, earnings surprise, analysts.

JEL Classification: G11, G12, G14, G32, M41.

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1 Introduction

Current literature on the atypical stock performance of firms that issue securities to raise funds has shown that there is a substantial price run-up over a long period before issuance and a significant price drop-down over a long period after issuance. For example, [Loughran and Ritter \(1995\)](#) report an average stock return of about 36% in the year prior to a seasoned equity offering (SEO), and five-year post-issuance abnormal returns of about -60%. Besides SEO, this effect also applies to other types of security issues which raise funds. [Bradshaw, Richardson, and Sloan \(2006\)](#) construct a net financing amount using cash flow statement to include different kinds of security issues and repurchases. Their study finds that firms with the highest net external financing amount experience nearly 90% cumulative abnormal returns over the 5 years before the financing measurement year and -30% cumulative abnormal returns over the 5 years afterwards. The empirical evidence of the pre-financing price run-up and post-financing stock underperformance has invited different theories such as managers' market timing ability ([Loughran and Ritter, 1995](#); [Baker and Wurgler, 2002](#)) and real option induced risk increase and decrease around security issuance ([Carlson, Fisher, and Giammarino, 2006](#)).

My dissertation first examines the conventional association between pre-financing price run-up and post-financing stock underperformance. I find that, after partitioning firms according to their internal cash flows from operation (CFO) at the time of their financing activities, pre-financing price run-up is much stronger among firms with high CFO at the time of financing, while post-financing stock underperformance is concentrated among firms with low CFO at the time of external financing. However, without partitioning, the whole sample exhibits the typical pre-financing price run-up and post-financing stock underperformance as documented before. This finding suggests that the previous evidence of association between pre-financing price run-up and post-financing stock underperformance is a result of averaging the whole sample.

I further use Jensen's alpha in factor regressions to measure the post-financing stock un-

derperformance. I have adopted three different factor models: Fama-French three factor model, Fama-French three factor model augmented with investment factor from [Lyandres, Sun, and Zhang \(2007\)](#), and macroeconomic risk factor model from [Eckbo, Masulis, and Norli \(2000\)](#). The magnitude of Jensen's alpha depends on which factors are used, but the qualitative results do not change. All the factor models show that Jensen's alphas are significantly negative for the whole sample and for the subsample with low internal funds, measured as CFO, but insignificant for the subsample with high internal funds. This result suggests that the post-financing long-term underperformance is mainly driven by the subsample with low internal funds.

I then explore one plausible cause for the post-financing long-term underperformance in firms with low internal funds when raising money: incentive changes. When firms raise external funds, future profits must be shared between current shareholders and new claimholders. The less internal funds there are, the less future profits the incumbent shareholders are going to get. If there is benefit associated with shirking, the incumbent shareholders will have less incentive to work hard because they will be hurt less by shirking. The empirical evidence that long-run underperformance is concentrated in firms with low internal funds is consistent with agency conflicts between current shareholders and new claimholders. Besides stock performance, I also document some evidence in the operating performance: both firms with low internal funds and high internal funds experience decrease in post-financing average selling, general, and administrative expenses. However, firms with low internal funds experience less such decrease.

In addition, I find that the stock underperformance, following external financing for firms with lower internal funds concentrates around future earnings announcements. The market reaction to earnings announcements helps distinguish between systematic risk and disappointment as potential causes of underperformance. If the source for the underperformance is systematic risk, we would not observe the underperformance concentrates around idiosyncratic informative events. Rather, the underperformance should be homogenous through time. Concentration within earnings periods would instead be consistent, for ex-

ample, with firm-specific disappointment of overoptimistic investors.

Finally, related to their external financing activities, firms with lower internal funds have a weaker information environment represented by more optimistic analyst earnings forecasts, larger forecast dispersion, and lower analyst coverage.

The remainder of the dissertation is organized as follows. Section 2 reviews the relevant literature. Section 3 examines the stock price behavior around external financing. Section 4 explores the incentive changes caused by raising external funds and its implication on post-financing operating and stock performance.

2 Overview of Current Findings

2.1 Empirical Patterns

The relation between corporate financing activities and stock price around them has generally been studied for the following three time periods: before security issues, upon the announcement, and after the security issues. Literature has consistently found that, for firms issuing securities to raise funds, there is a long-term pre-financing price run-up, a negative announcement effect, and a long-run post-financing underperformance. The empirical patterns can be illustrated by some prime examples from previous studies, as shown in Figure 2, Figure 3, and Figure 4.

Figure 2 is from [Korajczyk, Lucas, and McDonald \(1990\)](#). It depicts the cumulative excess return (benchmark is an equal-weighted index) in the 500 days preceding and 100 days following the issue announcement for seasoned equity offering (SEO). Figure 2 shows that in the 500 days prior to the issue announcement, the cumulative excess return is 43.8% for the NYSE/AMEX issuing firms and 68.8% for OTC issuing firms. Figure 2 also shows that during the two days on and preceding the equity issue announcement, there is a total abnormal price drop of 3.0% for NYSE/AMEX and 2.9% for OTC issues. Finally, the cumulative excess return over the 100 days after the issue announcement is not significantly different from 0.

Figure 3 is compiled according to the data from Table III in [Loughran and Ritter \(1995\)](#). Consistent with [Korajczyk et al. \(1990\)](#), the excess return in the first 6 months after SEO is not significantly different from 0.¹ However, subsequent to the first 6 months, the cumulative excess return is negative for as long as 5 years. The average annual excess return is -22.3% in the 5-year-period after SEO. For the period after the 5-year horizon, [Ritter \(2003\)](#) notes in his survey that the abnormal returns attenuates to close to zero by year five and the underperformance does not persist forever.

¹ In the first six months after security issues, firms do not underperform. This is probably due to a combination of momentum effects and issuers' effort to avoid litigation by making sure that earnings numbers meet analyst forecasts in the first two quarters after issuing (negative earnings surprises are rare immediately following an SEO ([Korajczyk et al., 1990](#); [Loughran and Ritter, 1995](#)).

Figure 4 is from [Bradshaw et al. \(2006\)](#). This figure depicts the long-term stock price movement before and after firms raise external funds. It illustrates the cumulative size-adjusted returns over 11 years surrounding the event year in which net external financing amount is measured. Net external financing amount is calculated as the cash raised through equity and debt minus the cash used in stock repurchasing and debt repayments. Firms are ranked to deciles according to their net external financing amount. The portfolio with the most net external financing amount is labeled as issuers and the portfolio with the least net external financing amount (negative amount) is labeled as repurchasers. Year 0, the shaded area, represents the event year. For issuers, there is a long-term price run-up before raising funds and a long-term price drop-down after raising funds. On the contrary, for repurchasers, there is a long-term price drop-down before net repurchasing and a long-term price run-up after net repurchasing. [Bradshaw et al. \(2006\)](#) also regress the size-adjusted stock returns in one year after the event year on net external financing amount and find that the coefficients on net external financing amount are significantly negative.

In summary, for firms that raise external funds, they experience stock price run-ups before raising the funds, negative announcement effects, and long-term stock underperformance afterwards.

Among the three time periods examined around corporate financing activities, the pre-financing period is studied the least and mainly studied for SEOs. Besides [Korajczyk et al. \(1990\)](#), [Korwar and Masulis \(1986\)](#) find that industrial firms have an average daily portfolio return of 0.14% above the market for the 60-day pre-announcement period, in contrast to 0.02% for the 60-day post-announcement period. [Asquith and Mullins \(1986\)](#) find positive cumulative abnormal return of 33% in the two years before equity issues. [Loughran and Ritter \(1995\)](#) report that firms conducting SEOs typically have high returns in the year prior to issuing. The issuer experiences a total return of 72 percent on average, among which half of this return is due to market run-ups, and the other half is due to the issuers outperforming the market. [Bradshaw et al. \(2006\)](#) report that highest fund raising firms have experienced a dramatic 90% cumulative stock return over the 5 years ending in the financing measurement

year.

There is a substantial literature which examines the announcement effect of security issues. In general, for SEOs, studies consistently document an announcement effect in the scale from -2% to -3% (Asquith and Mullins, 1986; Korwar and Masulis, 1986; Korajczyk et al., 1990; Bayless and Chaplinsky, 1996; Heron and Lie, 2004). For Convertible bond issues, Dann and Mikkelsen (1984) report an average two-day announcement period abnormal return of -2.31%; Kim and Stulz (1992) find an announcement effect of -1.7%. Bond offerings have slightly negative announcement reactions: Jung, Kim, and Stulz (1996) reports -0.1% and Howton, Howton, and Perfect (1998) reports -0.5%. Two other types of security issues, private placements of equity and private bank loans, however, generate positive announcements abnormal returns for the borrower. For private placements of equity, Hertz, Lemmon, Linck, and Rees (2002) report an announcement effect of 2.4% abnormal returns. For private bank loans, Lummer and McConnell (1989) find an announcement effect of 1.93% abnormal returns, and Billett, Flannery, and Garfinkel (2006) document the effect as 0.6%.

Several studies have examined the relationship between the pre-financing price run-up and the negative announcement effect. Asquith and Mullins (1986) find that the negative announcement effect for SEOs is less stronger if there is a larger pre-financing stock price run-up in the 11 month-period before SEOs. However, Korwar and Masulis (1986) document that the negative announcement effect for SEOs is stronger if there is a larger pre-financing stock price run-up in the 3 month-period before SEOs. Korajczyk et al. (1990) reconcile these two studies' results by documenting a positive relation between long-term pre-financing price returns (-500 to -251 days) and announcement returns, and a negative relation between medium term returns (-100 to -2 days) and announcement returns. Korajczyk et al. (1990) suggest that there is no compelling theory to predict the direction of relation.

Loughran and Ritter (1995) is one of the first studies that document stock underperformance in the long-term after firms' SEO. They conclude that "An investor would have had

to invest 44 percent more money in the issuers than in nonissuers of the same size to have the same wealth five years after the offering date.” Since then, many studies have examined the post-financing stock performance for different kinds of security issues.

Unlike the announcement effect, the long-term post-financing stock performance is found to be universally negative for all kinds of financing activities, whether it be equity issues, debt issues, public issues or private issues. For example, [Spiess and Affleck-Graves \(1999\)](#) find that convertible debt issuers (straight debt issuers) experience an average underperformance of -36.95% (-14.30%) compared to their size-and-book-to-market-matched firms over the five-year period after issuance. [Hertzel et al. \(2002\)](#) find that although private placements of equity has positive announcement effect, public firms that place equity privately have a mean three-year buy-and-hold abnormal returns of -23.8% following private equity issue announcements, relative to a size-and-book-to-market matched sample of control firms. Similarly, as for private placements of debt, [Billett et al. \(2006\)](#) find that for bank loans, although they have positive announcement effects, their long-term stock returns subsequent to the private lending agreements substantially underperform their peer groups. Over the three year period after financing, the underperformance is on average -27.2%.

[Bradshaw et al. \(2006\)](#) unify the results of long-term post-financing stock performance by constructing a comprehensive measure of net external financing activities. They illustrate a negative relation between net external financing amount (and also its equity and debt components) and future stock returns.

Another fact worth noting is that the long-term stock performance after equity issuance is sensitive to the time period being examined. [Loughran and Ritter \(1995\)](#) note that when firms issue during market-wise high-volume issuing activity, their stocks underperform severely afterwards. However, when firms issue during low-volume periods, they do not underperform much at all in the future. For example, in an extensive survey study, [Ritter \(2003\)](#) points out that SEOs from the heavy-volume period of 1970-1972 did very poorly in the bear market of 1973-1974 and failed to recover in the small stock rally of 1975-1976. Post-financing stock underperformance is also pervasive during the bursting of the tech

stock bubble in 2000. On the other hand, when NYSE-listed issuing firms in the 1960s are included, the post-financing stock under performance disappeared due to a small number of issuing firms with high returns.

2.2 Theoretical Explanations

For price run-ups before firms' financing activities, there are very limited studies to examine the reasons behind it. The only two studies I am aware of are [Lucas and McDonald \(1990\)](#) and [Carlson et al. \(2006\)](#) .

[Lucas and McDonald \(1990\)](#) develop a theory of pre-SEO price run-ups based on the adverse selection problem when firms issue new securities ([Myers and Majluf, 1984](#)). In their model, information asymmetry between managers and outsider investors is temporary and the value of firms will be corrected over time. They further assume that the projects which need funding are long-lived and waiting is not too costly. In this scenario, undervalued firms which receive projects will choose to delay the investment in the projects and security issuance until their market value rises to correct the undervaluation. Therefore, for undervalued firms, there will be above average stock performance before their security issuance. On the other hand, overvalued firms will choose to issue new securities immediately and have average stock performance before issuance. These two paths of stock performance before issuance for undervalued firms and overvalued firms will on average generate positive abnormal performance prior to new issues.

[Carlson et al. \(2006\)](#) utilize a real options framework to explain the stock behavior around new issues. In their model, when firms raise funds and make investment, real options are converted into asset in place. Because real options are exercised only when they move sufficiently into the money, above average returns precede security issuance as a result of ex post selection bias.

For the negative announcement effect of equity issuance, the most popular explanation is the adverse selection model from [Myers and Majluf \(1984\)](#). In their model, managers have more information about firms' value than outside investors and managers act in the best in-

terest of existing shareholders. When firms are undervalued, managers will not issue equity since doing so will dilute the fractional ownership of existing shareholders. On the other hand, if firms are overvalued, managers will choose to issue equity. Under rational expectation, investors will interpret an equity issue announcement as conveying management's opinion that the stock is overvalued. Therefore, the stock price falls upon the announcement of security issues. Because the information is revealed in the announcement, adverse selection model only predicts the price adjustment upon announcement but not the post-issue stock underperformance.

For the long-term stock underperformance subsequent to security issues, there is a lot of debate over the reason for it. Since abnormal returns in the post-announcement periods are in the same direction as abnormal returns in the announcement periods for many types of security issues, such as SEOs, convertible bonds, and bonds, one explanation is under-reaction toward the information conveyed in the issue announcements. However, for private placements of equity and bank loans, the underreaction explanation does not hold since their announcement effect is positive while their long-term post-financing performance is negative.

Since there are long-term price run-ups before issues and long-term stock underperformance afterwards, managers appear to have superior timing ability. This management timing interpretation also requires that investors under-react toward the information revealed by the issuing event (Spiess and Affleck-Graves, 1995). Besides the timing ability regard their own firms' stock performance, Baker and Wurgler (2002) show that issuing firms display *market* timing ability for equity issues. They find that equity proportion of external financing predicts the next calendar year's stock market return better than either the market dividend yield or the market's market-to-book ratio.

One stream of the literature attributes the stock underperformance to investors' disappointment in post-issue operating performance. The sources of the disappointment include extrapolation of the strong pre-issue operating performance (Loughran and Ritter, 1997),

earnings management (Teoh, Welch, and Wong, 1998a,b; Jo and Kim, 2007),² and over-investment (Heaton, 2002).

Alternatively, studies favoring rational asset pricing propose factor-related systematic risk as the cause. For example, Eckbo et al. (2000) argue that firms issuing equity have a lower leverage and thus a lower exposure to inflation and default risks. They thus build a six-factor macroeconomic risk model and do not find stock underperformance with their sample.³ As discussed before, Carlson et al. (2006) use a real options framework to explain the stock behavior around new issues. When firms raise funds and make investment, they convert real options into asset in place. Since asset in place is less riskier than real options, expected returns decrease endogenously. This provides a rational explanation for the long-run stock underperformance subsequent to new issues. Lyandres et al. (2007) use an investment factor, long in low-investment stocks and short in high-investment stocks, to explain the new issues puzzle. The rationale behind the investment factor is that given the expectation of future cash flows, net present values of new investment is inversely related to the cost of capital. If external funds are raised to fund new investment, external financing activity will be associated with lower cost of capital, thus, lower long-run post-financing stock returns. In their sample, issuers invest more than non-issuers and post-financing stock underperformance is either attenuated or disappeared after including investment factor for different types of security issues.

The market reaction to earnings announcements can help distinguish between systematic risk and disappointment as potential causes of underperformance. Jegadeesh (2000) and Denis and Sarin (2001) find a disproportionately large portion of long-run post-SEO abnormal stock returns around earnings announcements. This evidence suggests that investors are disappointed with the information in the earnings announcement. Since systematic risk will predict homogenous stock returns across earnings announcement and non-announcement periods, a misspecification of the model of systematic risk and expected re-

² Shivakumar (2000) shows that investors rationally undo the earnings management. Chen, Gu, and Tang (2009) attribute the earnings management as a consequence instead of a cause of the overvaluation prior to SEO.

³ Ritter (2003) suggests that their result can partly be attributable to high returns on a small number of NYSE-listed issuing firms in the 1960s.

turns is unlikely to be the sole cause of measured underperformance.

3 Understanding Stock Price Behavior Around External Financing

As shown in Figure 4 in Section 2, the stylized pattern illustrates that there are long-term price run-ups before external financing and long-term price drift-downs afterwards. Several studies suggest that the association is negative between the pre-issue long-term price run-ups and post-issue long-term price drift-downs. For example, [Loughran and Ritter \(1995\)](#) note that the pattern of pronounced long-term underperformance following substantial run-ups in the year prior to issuing resembles the long-term mean reversion. In [Carlson et al. \(2006\)](#)'s real options model, the riskier the real options are before financing and investing, the larger the reduction in exposure from delevering after the option exercise. Thus, the higher the positive returns before issues, the more negative returns after issues.

This chapter examines the association between the pre-issue long-term price run-ups and post-issue long-term price drift-downs. I partition the whole sample into subsamples according to firms' internal cash flow when they raise external funds and find that the conventional association between the pre-issue long-term price run-ups and post-issue long-term price drift-downs is a result of averaging these two subsamples. The pre-issue long-term price run-ups are concentrated in issuers with high internal cash flow while the post-issue long-term price drift-downs are mainly associated with issuers with low internal cash flow.

Two methodologies are used: buy-and-hold abnormal returns and factor regressions. Buy-and-hold abnormal returns are measured starting 4 years before the year I measure and sort firms' external financing amount. I control for size, book-to-market ration, momentum, and investment when measuring buy-and-hold abnormal returns. Factor regressions are used mainly to examine the post-issue long-term price drift-downs. Several factor regression models are used, including Fama-French three factor model, Fama-French three factor model augmented with investment factor ([Lyandres et al., 2007](#)), and a macroeconomic risk factor model ([Eckbo et al., 2000](#)).

The following is organized as follows. Subsection 1 defines the key variables and their

measurement. Subsection 2 describes the sample and data. Subsection 3 discusses the tests and empirical results. Subsection 4 concludes.

3.1 Key Variable Measurement

I use the Compustat annual files for accounting variables, and the CRSP monthly return files for stock performance.

3.1.1. External Financing Activities

I follow Bradshaw et al. (2006) to construct comprehensive measures for net external financing (XF), net equity financing (ΔE), and net debt financing (ΔD) by using the statement of cash flows. I define year 0 as the fiscal year when XF , ΔE , and ΔD are measured.⁴ These measurements are defined as follows:

$$XF = \Delta E + \Delta D. \quad (1)$$

Where,

$$\begin{aligned} \Delta E = & \text{Compustat item 108, cash from sale of common/preferred stock} \\ & - \text{Compustat item 115, cash purchases of common/preferred stock} \\ & - \text{Compustat item 127, cash dividends paid,} \end{aligned} \quad (2)$$

and

$$\begin{aligned} \Delta D = & \text{Compustat item 111, cash from sale of long-term debt} \\ & - \text{Compustat item 114, cash repayments of long-term debt} \\ & - \text{Compustat item 301, change in current debt,} \end{aligned} \quad (3)$$

⁴ 'Year' means fiscal year unless calendar year is used explicitly.

Since I focus on firms with net external funds raised, I require ΔE and ΔD to be non-negative and XF to be positive. All financial statement variables used in this study are deflated by total assets (Compustat item 6) at the beginning of year 0.

The comprehensive measurements of net equity financing and net debt financing bear the benefit suggested by Bradshaw et al. (2006): they capture a firm's entire portfolio of corporate financing activities when a firm undertakes transactions with opposite directions (raising funds and distributing cash), within financing categories or across financing categories, and at the same time or within a short period of time. Fama and French (2005) provide evidence that firms issue and repurchase equity in the same year with a surprisingly high frequency. Billett, Flannery, and Garfinkel (2008) show that nearly two fifths of their sample firms are associated with the issuance of two or more claim types. Also, firms issue debt and retire debt concurrently, issue stock to retire debt, and borrow to repurchase stock or distribute dividends (Ofer and Thakor, 1987).

3.1.2. Internal funds

Internal funds are measured as the ratio of internal funds at the beginning of year 0 (IF) to external funds raised in year 0 (XF).⁵ I use cash flow from operations (Compustat item 308) from year -1, noted as CFO_{-1} , to proxy for internal funds at the beginning of year 0 (IF). Cash flow from operations is the main source whereby firms create wealth and accumulate internal funds, and it is fairly persistent over time (Sloan, 1996). Thus, cash flow from operations is one of the most commonly used measurements for the availability of internal funds (Fazzari, Hubbard, Petersen, Blinder, and Poterba, 1988; Gilchrist and Himmelberg, 1995; Lamont, 1997; Shyam-Sunder and Myers, 1999; Frank and Goyal, 2003). The ratio of internal funds to external funds, which I call the internal funds ratio, is defined as follows.

$$IFR_{CFO} = \frac{CFO_{-1}}{XF}, \quad (4)$$

⁵ Using total assets instead of external funds raised as deflator does not change the results qualitatively.

3.1.3. Long-term Stock Performance Around External Financing

To capture the abnormal returns, I use buy-and-hold abnormal returns (BHARs) relative to the returns of a benchmark portfolio (*BENCH*) (Lyon, Barber, and Tsai, 1999).⁶ I construct benchmark portfolios by matching on size and book-to-market ratio (*B/M*). Going beyond controlling just for firm size is important. Ritter (2003) notes that “(only) using a size benchmark, however, introduces a confounding effect. Issuing firms tend to be growth firms, and nonissuers tend to be value firms.” Additionally, Barber and Lyon (1997) show that controlling for size and book-to-market ratio yields well-specified long-run test statistics in all of their sampling situations. To construct the benchmark portfolios, I adapt the method from Daniel, Grinblatt, Titman, and Wermers (1997). The formation date for portfolios is the last day of June each year. The end of June is chosen to assure data is available for all firms for this fiscal year since firms have different fiscal year ending months. I first assign each stock to a size quintile on the formation day. The size breakpoints are market equity quintiles formed based on all firms in this sample on NYSE on the formation day. Then, within each size quintile, I rank all the stocks based on their book-to-market ratios, and assign them to book-to-market quintiles. The *B/M* breaking points are based on all firms within each size quintiles no matter whether they are on NYSE, AMEX or Nasdaq. The book-to-market ratio is the book equity (Compustat item 216 + item 74 + item 208 - item 56) for the fiscal year end previous to the formation date divided by market equity for December of the previous calendar year.⁷

Stock return data are from the CRSP monthly files. Since I measure the external financing amount by using financial statement data for fiscal year 0, I define the third month ($m=3$) after the end of fiscal year 0 as the ending month for calculating long-term stock performance before external financing and the fourth month ($m=4$) as the starting month for calcu-

⁶ BHARs are used in stead of cumulative abnormal returns (CARs) because CARs are biased predictors of the long-run abnormal returns (Lyon et al., 1999).

⁷ Instead of book-to-market ratio, I also used industry adjusted book-to-market ratio to rank the stocks in untabulated tests. The results are similar. The correlation between book-to-market ratio and external financing is much stronger than the correlation between industry adjusted book-to-market ratio and external financing. Thus, I choose book-to-market ratio over industry adjusted book-to-market ratio.

lating long-term stock performance after external financing. The fourth month after the end of fiscal year 0 is used to allow investors to get sufficient financial information and also to accommodate the need to test hypothesis related to earnings announcement period returns in the next section.⁸

To calculate the *BHAR*, I first calculate the buy-and-hold return (*BHR*) for each firm for a period ranging from 4 years before year 0 to 5 years after year 0:

$$BHR_{\tau} = \left[\prod_{m=-47}^{12*\tau} (1 + R_{m+3}) \right] - 1, \quad (5)$$

where τ is from -3 to 5. For example, BHR_{-3} is the buy-and-hold return for a firm from 4 years before year 0 to 3 years before year 0; BHR_1 is the buy-and-hold return for a firm from 4 years before year 0 to 1 year after year 0.

When a stock is delisted before the compounding period, I apply the CRSP delisting return in the delisting month. Following [Shumway \(1997\)](#), if the delisting return is missing, I substitute -0.3 if the delisting is due to poor performance (delisting codes 500 and 520–584), and 0 otherwise. Return compounding ends the last day of CRSP reported trading or the last day of the 3-year period, whichever is earlier. Evidence in [Barber and Lyon \(1997\)](#) suggests that long-run results are generally robust to truncating versus filling in the missing returns after delisting. This method of compounding returns is consistent with the long-window methods used in previous research ([Loughran and Ritter, 1995](#); [Spiess and Affleck-Graves, 1995](#); [Dichev and Piotroski, 1999](#)).

The benchmark adjusted buy-and-hold abnormal return is defined as:

$$BHAR_{\tau} = BHR_{\tau} - BENCH_{\tau}, \quad (6)$$

where τ is from -3 to 5 and $BENCH_{\tau}$ is the buy-and-hold return of the benchmark portfolio. $BENCH$ is calculated by compounding the benchmark portfolio's monthly returns,

⁸ Conventionally, the fifth month after the end of fiscal year is used as the starting month to compound long-term returns to insure the availability of financial reports ([Piotroski, 2000](#)). I used the fifth month as the starting month with no qualitative change in results.

defined as the value weighted returns of all firms in this portfolio, where the value is the firms' market equity at the beginning of each month. Updating the value each month helps alleviate the rebalancing concern in [Lyon et al. \(1999\)](#).

Besides compounding from 4 years before year 0, I also compound the returns from year 0, i.e., the fourth months after the fiscal year ending month of year 0. In this case, buy-and-hold abnormal returns are noted as $BHAR_{0\tau}$, where τ is from 1 to 5.

3.2 Sample and Data

The sample period is from fiscal year 1988 to 2003. The starting date is determined by the availability of cash flow from operations in the statement of cash flows. The ending date reflects availability of sufficient post-financing returns. Utility firms (SIC code 4900–4999) and financial firms (SIC code 6000–6999) are excluded since these firms are regulated and the nature of their external financing activities is different from that of firms in the other industries. The sample has 10,657 firm-year observations. Variables are winsorized at 0.5% and 99.5% to mitigate the impact of data errors and outliers on the analysis.

Table 1 presents univariate statistics and correlations. Panel A reports univariate statistics. For firms' characteristics, the mean and median of the size (market value) are \$734 million and \$65 million. Firms raising external funds are smaller compared to the average size, \$1,537 million, of firms with no restriction to be net external fund raisers. Size varies considerably in the sample as evidenced by the large standard deviations. The mean and median of the book-to-market ratio are 0.667 and 0.486. They are smaller than the mean and median book-to-market ratio, 0.827 and 0.579, of the firms with no restriction to be net external fund raisers. For external financing variables, on average, net external financing is 18.0 percent of the total assets, net equity financing is 10.7 percent of the total assets, and net debt financing is 7.4 percent of the total assets. Consistent with the findings in [Frank and Goyal \(2003\)](#), the medians for external financing activities are smaller for both equity and debt. The standard deviations of ΔE and ΔD are 0.379 and 0.183, respectively, indicating that variation is greater in the equity component of financing. For abnormal returns

around financing activities, I report $BHAR_{-3}$, $BHAR_3$, and $BHAR_{03}$ to represent the buy-and-hold abnormal returns before and after financing activities. $BHAR_{-3}$ is compounded from 4 years before year 0 to 3 years before year 0; $BHAR_3$ is compounded from 4 years before year 0 to 3 years after year 0; $BHAR_{03}$ is compounded from year 0 to 3 years after year 0. $BHAR_{-3}$ on average is 0.123, reflecting the price run-ups before financing; $BHAR_{03}$ on average is -0.035, reflecting the price drift-down after financing.

Panel B reports Pearson and Spearman correlations. Several of the correlations are noteworthy. First, the Pearson correlation is -0.180 between B/M and ΔE , and it is -0.059 between B/M and ΔD . These correlations indicate that growth firms tend to raise more external funds. Secondly, the correlations between the external financing activities and subsequent buy-and-hold abnormal return ($BHAR_{03}$) are negative. Thirdly, the Pearson correlations between the external financing activities and previous buy-and-hold abnormal return ($BHAR_{-3}$) are in general not significant, while the Spearman correlations are significantly positive. Lastly, the Pearson correlation between $BHAR_{-3}$ and $BHAR_{03}$ is insignificant, while the Spearman correlation is positive. This is in contrary to the reversal pattern observed in returns around financing in the literature.

3.3 Empirical Results

3.3.1 Buy-and-hold Abnormal Returns

To examine the abnormal returns around financing activities for firms with different levels of internal funds, I first rank all firms each year into two groups by internal funds ratio IFR_{CFO} , defined in (7) as the ratio of internal funds to net external financing. I refer to the group with a ratio lower than the median ratio as the IFR_L group, and the group with a ratio higher than or equal to the median ratio as the IFR_H group. Then, within each subgroup, I rank firms to deciles according to their net external financing amount XF . The portfolio with the most net external financing amount is referred as the top issuer portfolio. Buy-and-hold abnormal returns are calculated for the top issuer portfolios for ten years,

starting four years before year 0.

Figure 5 illustrates the stock performance for top issuers in the IFR_H group and the IFR_L group. The top issuer portfolio from the IFR_H group exhibits a strong price run-up before year 0. However, there is no price drift-down afterwards. On the other hand, for top issuer portfolio from the IFR_L group, the pre-financing price run-up is much less stronger than that of top issuers in the IFR_H group, while the post-financing price drift-down is very clear. When I plot the average return of these two portfolios, the return pattern resembles that of the issuers from Bradshaw et al. (2006). These results illustrate that pre-financing price run-up observed for the issuers in literature is mainly associated with the IFR_H group, while the post-financing stock underperformance observed for the issuers in literature is mainly associated with the IFR_L group. The association of the pre-financing price run-up and the post-financing stock underperformance is the result of pooling issuing firms with high internal cash flow and low internal cash flow together.

Furthermore, to compare the stock performance of the IFR_H group and the IFR_L group, I pick one portfolio from each group with similar XF , the top issuer portfolio from the IFR_H group with $XF=0.52$ and the 3rd top issuer portfolio from the IFR_L group with $XF=0.45$. I plot the portfolio's stock performance in Figure 6. The portfolio from the IFR_H group has slightly higher external funds raised than the portfolio from the IFR_L group. However, the portfolio from the IFR_H group does not exhibit downward stock performance as does the portfolio from the IFR_L group. In the mean time, the portfolio from the IFR_L group does not exhibit the pre-financing price run-up. These results are consistent with the pattern in Figure 5.

Besides controlling for size and book-to-market ratio, I further control for investment factor (Lyandres et al., 2007) and momentum factor (Brav, Geczy, and Gompers, 2000) to check whether these additional benchmarks in previous literature diminish the pre-finance price run-up for the top issuer portfolio from the IFR_H group and post-finance price drift-down for the top issuer portfolio from the IFR_L group. The assignment of the size, book-to-market ratio, and momentum benchmark portfolio is from Daniel et al. (1997). The in-

vestment factor is measured following Lyandres et al. (2007) as the annual change in gross property, plant, and equipment (COMPUSTAT annual item 7) plus the annual change in inventories (item 3) divided by the lagged book value of assets (item 6). Property, plant, and equipment is used to measure real investment in long-lived assets used in operations over many years such as buildings, machinery, furniture, computers, and other equipment. Inventories are used to measure real investment in short-lived assets used in a normal operating cycle such as merchandise, raw materials, supplies, and work in progress. After the triple sort as in Daniel et al. (1997), stocks are further assigned to investment quintiles at the end of June. Abnormal returns adjusted for size, book-to-market ratio, momentum, and investment is thereafter referred to as SBMI-adjusted returns.

Figure 7 plots the SBMI-adjusted buy-and-hold abnormal returns for top issuer portfolios from the IFR_H group and the IFR_L group, together with the average of them. Although the post-finance price drift down for the average and the top issuer portfolio from the IFR_L group is less stronger compared with that in Figure 6, the qualitative results do not change: the pre-financing price run-up observed for the issuers in literature is mainly associated with the IFR_H group, while the post-financing stock underperformance observed for the issuers in literature is mainly associated with the IFR_L group. And the average of these two groups illustrate the conventional price reversal pattern.

3.3.2. Factor Regressions

In this section, I use factor regressions to examine the long-term post-financing stock underperformance for firms with different levels of internal funds. The post-financing underperformance is measured as Jensen's alphas in factor regressions. Lyon et al. (1999) suggest that besides buy-and-hold abnormal returns, factor regression is another method with well specified test statistics.

I first use Fama and French (1993) three-factor model. The dependant variables in the regressions are top issuer portfolios' returns in excess of one-month treasury bill rate. Each year, firms are ranked to deciles according to their net external financing amount. The top

issuer portfolios consist of firms which have been in the top decile in a year in the past 1 year, 3 years, or 5 years, respectively. The portfolio return is value-weighted returns of firms in the portfolio. The monthly returns of the [Fama and French \(1993\)](#) factors and the risk-free rate are from Kenneth French's website.

Table 2 reports the results of the factor regressions for top issuer portfolios in the whole sample, in the IFR_H group, and in the IFR_L group, respectively. There are several important results from the table. First, the alphas from the [Fama and French \(1993\)](#) model are significantly negative for the whole sample and the IFR_L group for all three time horizons, 1 year, 3 years, and 5 years. This is consistent with the previous literature. In general, the alphas are comparable to the value of alphas in [Lyandres et al. \(2007\)](#). Second, the alphas for the IFR_L group are significantly negative and consistently more negative than the alphas for the whole sample. For example, the alpha is -1.067% per month ($t=-3.9$) for the whole sample when the portfolio consists of top issuers in the past year, and the alpha is -1.550% per month ($t=-4$) for the IFR_L group accordingly. Thirdly, the alphas are insignificant for the IFR_H group for none of the three horizons. Fourthly, The magnitude of alphas decrease when the time horizon expands from 1 year to 3 years and 5 years. For example, the alpha is -0.699% per month ($t=-3.7$) for the whole sample when the portfolio consists of top issuers in the past 3 years, and the alpha is -1.042% per month ($t=-3.28$) for the IFR_L group accordingly. These results are consistent with the results from the previous section with the buy-and-hold returns in that they both illustrate that the post-financing long-term underperformance is mainly driven by the IFR_L group.

The loadings on the factors are worth noting too. The loadings of the top issuer portfolios on the MKT factor are bigger than one for the whole sample and subsamples, and the loadings of the IFR_L group are the largest. It suggests that the top issuers bear relatively high risk and the IFR_L group bears higher risk than the IFR_H group. For the 1-year and 3-year horizons, the loadings of the IFR_L group and the whole sample on the SMB factor are significantly positive, while the loadings of the IFR_H group on the SMB factor are not significant. For the 1-year and 5-year horizons, the loadings of the IFR_L group and the

whole sample on the HML factor are significantly negative, while the loadings of the IFR_H group on the HML factor are not significant. These results suggest that top issuers in the IFR_L group are small and growth firms.

Besides using Fama and French (1993) three-factor model, the second factor model I use is a four-factor model from Lyandres et al. (2007). This model uses the three factors from Fama and French (1993) and a fourth factor of investment factor. Lyandres et al. (2007) argue and find that the investment factor explains the post-financing long-term underperformance because firms with lower expected returns seek financing and use the funds for investment. Following Lyandres et al. (2007), I perform a triple sort on size, book-to-market, and investment-to-assets a la Fama and French (1993). Investment-to-assets is the annual change in gross property, plant, and equipment (COMPUSTAT annual item 7) plus the annual change in inventories (item 3) divided by the lagged book value of assets (item 6). I independently sort stocks in each June on size, book-to-market, and investment-to-assets into three groups, the top 30%, the medium 40%, and the bottom 30%. By taking intersections of these nine portfolios, I classify stocks into 27 portfolios. The investment factor, denoted as INV, is defined as the average returns of the nine low investment-to-assets portfolios minus the average returns of the nine high investment-to-assets portfolios.

Table 3 reports the results of the factor regressions for top issuer portfolios in the whole sample, in the IFR_H group, and in the IFR_L group, respectively. Adding the investment factor into standard factor regressions reduces the magnitude of the post-issue underperformance but does not make it insignificant.⁹ For example, the alpha decreases from -1.067% (t=-3.9) per month to -0.983% (t=-3.48) for the whole sample of top issuers in the past year, and the alpha decreases from -1.550% (t=-4) per month to -1.305% (t=-3.27) for the IFR_L group accordingly, and the alpha remains insignificant for the IFR_H group. For the 3-year and 5-year horizons, similar to the three-factor regressions, the alphas are smaller than the

⁹ Lyandres et al. (2007) find that adding the investment factor reduces the magnitude of the alphas and make them insignificant for IPO, SEO, straight debt issues, with some exceptions for convertible debt issues. The design of my tests is different from that of Lyandres et al. (2007) in that I use a comprehensive measure of firms' external financing activities while Lyandres et al. (2007) focus on specific financing events. This might explain the stronger post-financing underperformance documented in this study.

alphas in the 1-year horizon, and they are also smaller than the alphas from the three-factor regressions. In summary, the investment factor explains partially the post-financing underperformance, but does not change the findings that the post-financing underperformance is mainly driven by the IFR_L group.

For the loadings on the investment factor, there are some interesting observations. The loadings of top issuers on INV are mostly negative and significant for the whole sample and both subsamples. This result suggests that issuers are firms with high investment. However, the loadings of the IFR_H group are much larger in magnitude than the loadings of the IFR_L group. For example, in the 1-year horizon, the loading is -0.792 ($t=-5.57$) for the IFR_H group while it is -0.449 ($t=-2.21$) for the IFR_L group. In the 3-year horizon, the loading is -0.645 ($t=-7.21$) for the IFR_H group while it is -0.195 ($t=-1.06$) for the IFR_L group. This result suggests that the explanation power of the investment factor is larger for the IFR_H group's post-financing performance while in the meantime, the post-financing underperformance is mainly driven by the IFR_L group.

The third factor model I use is the macroeconomic risk factor model from [Eckbo et al. \(2000\)](#). [Eckbo et al. \(2000\)](#) argue that issuer underperformance reflects lower systematic risk exposure for issuing firms relative to the matches. Their study mainly targets equity issuers since the rationale is that equity financing would lower firms' leverage, and thus firms' exposures to unexpected inflation and default risks decrease. However, they also document that their macroeconomic risk factor model explains the underperformance after debt issues.

In the macroeconomic risk factor model, there are six macro factors: the market excess return (MKT), the return spread between Treasury bonds with 20-year and one-year maturities (20y-1y), the return spread between 90- and 30-day Treasury bills (TBILLSpr), the seasonally adjusted percent change in real per capita consumption of nondurable goods (ΔRPC), the difference in the monthly yield change on BAA-rated and AAA-rated corporate bonds (BAA-AAA), and unexpected inflation (UI). The factor returns MKT are from Kenneth French's website. The returns on Treasury bonds and Treasury bills, and the con-

sumer price index used to compute unexpected inflation are from the CRSP bond file. Consumption data are from the U.S. Department of Commerce, Bureau of Economic Analysis (FRED database). Corporate bond yields are from Moody's Bond Record.¹⁰ Expected inflation is modeled by running a regression of real T-bill returns (returns on 30-day Treasury bills less inflation) on a constant and 12 of its lagged values. Of the six factors, three are security returns, and the remaining three, Δ RPC, BAA-AAA, and UI, are measured by using factor-mimicking portfolios following Eckbo et al. (2000).¹¹

Table 4 reports the results from the macro factor regressions. When the top issuer portfolios consist of firms with the most external financing amount in the past 1 year, the alphas are significantly positive for the whole sample (alpha=-0.686, t=-1.89) and the IFR_L group (alpha=-1.595, t=-2.82), but insignificant for the IFR_H group. This pattern is consistent with the results from previous tests that the post-financing underperformance is mainly driven by the IFR_L group. When the time horizon of past top issuers expand from 1 year to 3 years and 5 years, the alphas become insignificant for the whole sample and both subsamples. In other words, the macro factor model helps explain the post-financing underperformance in 3-year and 5-year horizon. The factor loadings on MKT are all bigger than 1, indicating that top issuers have relatively higher exposure to market risk. The factor loadings on the other five macro risk factor are mostly negative, suggesting that top issuers have lower post-issue exposure to unanticipated macro risk, such as inflation, default spread, etc. These results are consistent with Eckbo et al. (2000)'s expectation.

¹⁰ Both FRED database and Moody's Bond Record are publicly available from Federal Reserve Bank of St. Louis Fed's research website: <http://research.stlouisfed.org/>.

¹¹ A factor mimicking portfolio is constructed by first regressing the returns on each of the 25 size and book-to-market sorted portfolios of Fama and French on the set of six factors, i.e., 25 time-series regressions producing a (25*6) matrix B of slope coefficients against the six factors. If V is the (25*25) covariance matrix of error terms for these regressions (assumed to be diagonal), then the weights on the mimicking portfolios are formed as $w = (B'V^{-1}B)^{-1}B'V^{-1}$. For each factor k, the return in month t on the corresponding mimicking portfolio is determined by multiplying the kth row of factor weights with the vector of month t returns for the 25 Fama-French portfolios.

3.4 Conclusion

This section uses two empirical tests, buy-and-hold abnormal returns and factor regressions, to explore the stock price behavior around firms' external financing. Instead of using specific events of equity or debt financing, I use a comprehensive external financing amount from a firm's cash flow statement to measure its total external financing activities in that fiscal year. A comprehensive measurement has the advantage of capturing a firm's entire portfolio of external financing activities.

By using the buy-and-hold abnormal returns starting 4 years before the fiscal year when I measure the comprehensive external financing amount until 5 years afterwards, I find that the stock price pattern around external financing activities, i.e., pre-financing price run-up and post-financing long-term stock underperformance, is the result of averaging two subgroups, issuing firms with high internal funds and issuing firms with low internal funds, where internal funds are measured by the cash flow from operation. Specifically, pre-financing price run-up observed for the issuers in literature is mainly associated with the IFR_H group, while the post-financing stock underperformance observed for the issuers in literature is mainly associated with the IFR_L group.

By using different factor models, including Fama-French three factor model, Fama-French three factor mode augmented with investment factor from [Lyandres et al. \(2007\)](#), and macroeconomic risk factor model from [Eckbo et al. \(2000\)](#), I consistently show that alphas are significantly negative for the whole sample and for the subsample with low internal funds, but insignificant for the subsample with high internal funds. These results are consistent with results from the tests using the buy-and-hold returns to illustrate that the post-financing long-term underperformance is mainly driven by the subsample with low internal funds.

4 Internal Funds, Moral Hazard, and Post-Financing Stock Underperformance

Among the first studies, [Loughran and Ritter \(1995\)](#) find that stocks of common stock issuers subsequently underperform nonissuers matched on size and book-to-market ratio for five years, which they call “the new issues puzzle.” This section dissects this puzzle by exploring the incentive changes caused by raising external funds. [Tirole \(2006\)](#) emphasizes in *The Theory of Corporate Finance*: “Because the essence of corporate finance is that investors cannot appropriate the full benefit attached to the investments they enable, we must distinguish two slices in the overall cake: that for the insiders and the rest for the outsiders.” The stake change for the incumbent shareholders associated with external financing will tend to cause a moral hazard problem when a firm has a low internal funds ratio, defined as the ratio of internal funds to external funds.¹² Specifically, the less internal funds a firm has relative to the external funds it raises, the more incentives incumbent shareholders have to extract private benefit and the less incentives to behave diligently.

The costs of moral hazard could lead to post-financing underperformance if the market incorporates information about them gradually. If so, then underperformance should appear in, or be worse in, firms that lack internal funds at the time of financing. This prediction is borne out clearly in the findings from previous section: there is no stock underperformance in firms with ample internal funds, and thus the new issues puzzle is confined to firms that lack internal funds at time of financing. In this section, I further use regressions which also control for accrual anomaly and possible earnings management before the new issues and find consistent results.

Since managers are more likely to have control and leeway to hide private benefit extraction in selling, general, and administrative expenses (SGAE), the sample firms’ income statements are checked for evidence ([Chen, Lu, and Sougiannis, 2008](#); [Lazere, 1997](#); [White](#)

¹² The incumbent shareholders can be viewed as the insiders while the new claimholders can be viewed as the outsiders. A simple model in Appendix illustrates how a moral hazard problem arises when the internal funds ratio is below a certain level.

and Dieckman, 2005; Wilson, 2000). In general, due to economies of scale from expansion, SGAE (scaled by total assets) decreases subsequent to net external financing.¹³ Nevertheless, firms with the lowest internal funds experience the weakest decrease in post-financing SGAE. Total expenses, however, tend to decrease more equally. This result lends more support to the conjecture of a moral hazard problem.

Two other sets of tests find evidence consistent with incomplete or gradual information incorporation in firms that appear most subject to moral hazard problems. The first set of tests partitions post-financing periods into earnings announcement periods and non-announcement periods. The underperformance for firms with a low ratio of internal funds to external funds is much stronger in the announcement periods, the times of most intense update of firm-specific information.

The second set of tests shows a weaker information environment for firms at the highest risk of moral hazard problems related to their external financing activities. Firms with a low internal funds ratio have more optimistic analyst earnings forecasts, larger forecast dispersion, and lower analyst coverage than firms with a high internal funds ratio. These results are consistent with *ex ante* underestimation of the moral hazard problem in firms with a low internal funds ratio and slower information discovery and dissemination for these firms.¹⁴

Ultimately, the market reaction to earnings announcements helps distinguish between systematic risk and disappointment as potential causes of underperformance. If the source of underperformance is only risk change associated with new issuance, the risk change should apply to the following time periods homogeneously. Thus, stock returns related to risk should have the same magnitude in the earnings announcement periods and non-earnings announcement periods. The disappointment of overoptimistic investors would instead predict a more concentrated underperformance during the periods when the investors are given new information like earnings news. The more intense stock underperformance around earnings announcements for firms with low internal funds relative to external funds raised not only is consistent with the disappointment explanation, but also reinforces the

¹³ SGAE and other expenses are scaled by total assets in all the following discussions.

¹⁴ The empirical results discussed above are summarized into a flowchart in Figure 8.

moral hazard problem associated with these firms as a plausible source for the disappointment. One thing worth clarifying is that the results do not reject systematic risk change as a partial explanation. Rather, the evidence shows that a misspecification of the model of expected returns is unlikely to be the sole cause of measured underperformance. In addition, analyst earnings forecast error provides direct evidence of overoptimism for firms with low internal funds relative to external funds, which could be caused by the underestimation of the agency cost associated with these firms.

While not exhaustive, the results are more consistent with a moral hazard conjecture rather than a signal conjecture, where the amount of internal funds a firm chooses to retain relative to external funds it raises can be a signal of insiders' private information [Myers and Majluf \(1984\)](#). A low internal funds ratio can signal insiders' information about high risk or low cash flows in the future. A high risk signal conjecture is not consistent with the long-term stock underperformance for firms with a low internal funds ratio. If a low internal funds ratio is a signal for low cash flows, long-term stock underperformance will follow when the market underreacts to this signal. In the meantime, if underreaction is symmetrical for both good and bad signals, long-term stock overperformance will follow from external financing when the market underreacts to a high ratio as a good signal. This is not observed in the empirical results. Still, if underreaction mainly occurs with bad signals, the signal conjecture cannot be rejected. However, the results from SGAE changes are more consistent with the moral hazard conjecture than with the signal conjecture since the latter does not predict different patterns of SGAE changes from other types of expense changes.

The results suggest effects more pervasive, but less severe, than those anticipated by the literature on financial constraints. Previous literature focuses on market breakdown from anticipation of the moral hazard problem associated with low internal funds and relevant remedies.¹⁵ The novelty of this study is to apply insights from the theoretical literature

¹⁵ Examples include credit rationing resulting from anticipation of the agency costs associated with debt financing ([Jaffee and Russell, 1976](#); [Stiglitz and Weiss, 1981](#); [Bester and Hellwig, 1987](#)); the ramifications of insufficient financing caused by agency costs: investment-cash flow sensitivity ([Fazzari et al., 1988](#); [Lamont, 1997](#); [Moyen, 2004](#)) and amplification of the business cycle ([Holmström and Weiss, 1985](#); [Williamson, 1987](#); [Bernanke and Gertler, 1989](#)); and mechanisms to minimize this agency cost to avoid market breakdown, including screening, reputation based on credit ratings, financial intermediation, and delegated monitoring ([Diamond, 1984](#),

on capital market imperfections and financial constraints to the empirical evidence of post-financing stock underperformance.

The remainder of this section is organized as follows. Subsection 2 develops the hypotheses. Subsection 3 illustrates how the variables are measured. Subsection 4 discusses the sample formation. Subsection 5 reports the empirical tests and results. Subsection 6 concludes.

4.1 Development of Hypotheses

Issuing new securities to raise external funds are essential corporate activities for firms to operate, grow, and expand. Under the [Modigliani and Miller \(1958\)](#) assumptions, financing policies have no impact on firm value. However, when these assumptions are relaxed, firms' financing activities are no longer irrelevant. In Appendix, a simple model highlights the effects of stake changes when funds are raised externally and when incumbent shareholders are able to exert hidden actions to extract private benefit.

The model illustrates a threshold for the ratio of internal funds to external funds below which the moral hazard problem arises, when incumbent shareholders can extract private benefit.¹⁶ The economic intuition is that whenever incumbent shareholders are able to exert hidden actions, they might attempt to compensate for stake losses through private benefit extraction. Although extracting private benefit will jeopardize the firm's future profit, incumbent shareholders will do so and sacrifice the firm's total value when private benefit outweighs their share of profit decrease. In other words, incumbent shareholders face a tradeoff between the private benefit and the decrease in their share of the profit. The less the internal funds are, the smaller stake incumbent shareholders have, and the more likely their private benefit is to exceed the decrease in their slice of the profit. When internal funds are scarce, the incumbent shareholders do not care about decrease in profit as much as when internal funds are ample since the loss is now shared more amongst other parties. With

1991; [Bester, 1985](#); [Besanko and Kanatas, 1993](#); [Holmström and Tirole, 1997](#)).

¹⁶ The model uses the ratio of internal funds to total funds for simplicity of derivation. Discussion of the ratio of internal funds to total funds is equivalent to the discussion of the ratio of internal funds to external funds.

low stake in the future financial outcome, the incumbent shareholders will exert negative externality and induce diversion of wealth from other investors.

In summary, when the ratio of internal funds to external funds is low enough, the moral hazard problem will arise. Private benefit extraction or less diligent behavior will decrease the resources of the firm, monetary-wise or human resources-wise. Decrease of the firm value and stock underperformance will then follow. Since there is a threshold below which incumbent shareholders' incentive changes, the moral hazard-caused stock underperformance is more likely to be observed in firms with less internal funds. Thus, I form Hypothesis 1 as follows, stated in alternative form:

Hypothesis 1 *Firms with a lower ratio of internal funds to external funds are more likely to experience post-financing stock underperformance.*

Motivated by the moral hazard problem being modeled as private benefit extraction in literature such as [Holmström and Tirole \(1997\)](#) and [Tirole \(2006\)](#), I examine and compare the expense changes subsequent to external financing between firms with low internal funds and firms with more internal funds. I focus on SGAE because managers have more leeway in controlling this item. Since the firms I examine have raised net external funds, expansion is likely to follow. If economies of scale due to expansion is a dominant economic force subsequent to external financing, both types of firms will experience decrease in expenses. However, when the moral hazard problem is more likely to arise in firms with low internal funds, the increased agency costs will offset part of the cost advantage due to expansion. Thus, I develop Hypothesis 2 as follows, in the alternative form:

Hypothesis 2 *Subsequent to external financing, firms with a lower ratio of internal funds to external funds will experience less decreases in SGAE than firms with higher internal funds.*

After firms issue new securities and raise external funds, the moral hazard problem associated with internal funds below the threshold can translate into future long-term stock underperformance through multiple paths. First, the extent of potential conflict and its total realized cost over the life of the investments might not be fully revealed at the time of

financing. If this moral hazard problem is underestimated, shortfalls in future profits might surprise uninformed parties and contribute to long-term stock underperformance in the future.

Second, investors might be aware of the moral hazard problem and plan to use monitoring to ward off the problem, but the effectiveness of monitoring falls short of expectation. As discussed before, literature is rich in remedies to overcome the moral hazard problem caused by low internal funds to avoid market breakdown. One important mechanism is monitoring (Diamond, 1984, 1991; Besanko and Kanatas, 1993; Holmström and Tirole, 1997). I deem these mechanisms as *ex ante* commitment. However, the efficacy of monitoring is not assured *ex post*.¹⁷ When the monitoring is not carried out as successfully as planned, the realization of the agency cost will be higher than anticipated, and stock price downward adjustment will follow.

Third, since the agency costs are not fully visible to outsiders, different opinions will more likely be formed around firms with potential problems. When the market has short-sale restrictions, negative opinions are less incorporated into the price than positive opinions. Miller (1977) was one of the first to recognize the implication of costly short-sale constraints on stocks with a wide divergence of opinion: stock will be overpriced when less optimistic investors cannot fully participate in setting the price. Temporary price inflation at the beginning will be gradually corrected when financial results are realized and when information is released. This leads to long-term stock underperformance. Although Diamond and Verrecchia (1987) argue that the overpricing cannot survive rational expectations, they acknowledge that short-sale constraints "reduce the speed of price adjustment, especially to bad news." In addition, many empirical studies find evidence suggesting that dispersion of opinions with short-sale constraints contributes to long-term stock underperformance (Ackert and Athanassakos, 1997; Houge, Loughran, Suchanek, and Yan, 2001; Diether, Mal-

¹⁷ For example, two important types of monitors in the market, financial analysts and credit rating agencies, are heavily criticized for their practice in the 2008 financial crisis and in some corporate collapses, like Enron's. Even the SEC, the supposed ultimate regulator of the market, admits its failure to uncover Mad-off's Ponzi scheme despite numerous credible and detailed complaints, in a 22 page executive summary (<http://www.sec.gov/news/studies/2009/oig-509-exec-summary.pdf>).

loy, and Scherbina, 2002; Jones and Lamont, 2002; Boehme, Danielsen, and Sorescu, 2006; Mashruwala, Mashruwala, and Sarath, 2010).

All three paths have one common ingredient - information update. No matter whether it is because the market does not fully anticipate the moral hazard problem in firms with low internal funds, or because the market price does not fully incorporate related negative opinions, the market will update beliefs through informational events, such as earnings announcements. If the market's downward revision can be triggered by earnings release, post-financing stock underperformance for firms with low internal funds should be stronger in this period than in non-earnings announcement periods.

Examining stock returns in different periods can also help shed some light on whether post-financing stock underperformance is simply a manifestation of a misspecified model that does not capture risk and expected return changes associated with financing. If misspecification of the expected return is the sole cause, the misspecification should apply similarly across the post-financing periods.

Based on the conjecture that firms with low internal funds are more plagued by the moral hazard problem and outside investors get more information regarding the costs of this problem during earnings announcement periods, I form Hypothesis 3 as follows, in alternative form:

Hypothesis 3 *Firms with a lower ratio of internal funds to external funds experience stronger post-financing stock underperformance in earnings announcement periods than in non-earnings announcement periods.*

Finally, I examine the information environment represented by analyst forecasts. Three facets of analyst forecasts are analyzed: analyst earnings forecast error, analyst forecast dispersion, and analyst coverage.

If the market underestimates the agency costs for firms with low internal funds at the time of external financing and the market's earnings expectation is related to analyst earnings forecasts (Brown, Hagerman, Griffin, and Zmijewski, 1987; Brown and Kim, 1991;

Brown and Caylor, 2005), I expect to observe more over-optimistic earnings forecasts for these firms. This leads to Hypothesis 4a:

Hypothesis 4a *Firms with a lower ratio of internal funds to external funds have more over-optimistic analyst earnings forecasts than firms with higher internal funds subsequent to external financing.*

Since firms with low internal funds are subject to the moral hazard problem, these firms have an extra dimension for investors to consider when forming their opinions relative to firms with ample internal funds. In addition, the underlying problem for outsiders to estimate is hidden or manipulated. Thus, I expect to observe larger analyst opinion dispersion for firms with less internal funds. Larger analyst opinion dispersion, in turn, contributes to post-financing stock underperformance for these firms when short-sale constraints exist. Thus, I state Hypothesis 4b as follows:

Hypothesis 4b *Firms with a lower ratio of internal funds to external funds have larger analyst forecast dispersion than firms with higher internal funds subsequent to external financing.*

Literature shows that analyst coverage is a result of self-selection. McNichols and O'Brien (1997), among others, document that analysts are more likely to forecast for firms with favorable expectations because of various strategic concerns such as currying favor with management or generating trading commissions. Since firms with low internal funds are more likely to be plagued by moral hazard problems, these firms might attract fewer analysts to follow. Lower analyst coverage could in turn contribute to long-term stock underperformance for these firms. Hong, Lim, and Stein (2000) show that lower analyst coverage leads to slower information discovery and dissemination, especially for bad news. Thus, I form Hypothesis 4c as follows:

Hypothesis 4c *Firms with a lower ratio of internal funds to external funds have lower analyst coverage than firms with higher internal funds subsequent to external financing.*

4.2 Measurement of Variables

To measure the variables needed for testing the hypotheses, I use the Compustat annual files for accounting variables, the Compustat quarterly files for earnings announcement dates, the CRSP monthly returns files for return measurement, and the I/B/E/S summary files for analyst data. A timeline for the variable measurement is provided in Figure 9.

4.2.1. External Financing Activities

External financing activities including net external financing (XF), net equity financing (ΔE), and net debt financing (ΔD) are measured the same way as in the previous section.

4.2.2. Internal funds

Internal funds, relative to external funds, is measured as the ratio of internal funds at the beginning of year 0 (IF) to external funds raised in year 0 (XF). Internal funds are measured by three proxies. Besides cash flow from operations (Compustat item 308) from year -1, noted as CFO_{-1} , the other two measurements are book value of common equity (Compustat item 60) at the beginning of year 0, noted as EQ_{-1} , and cash and short-term investment (Compustat item 1) at the beginning of year 0, noted as $Cash_{-1}$. The ratio of internal funds to external funds, which I call the internal funds ratio, is defined as follows.

$$IFR_{CFO} = \frac{CFO_{-1}}{XF}, \quad (7)$$

$$IFR_{EQ} = \frac{EQ_{-1}}{XF}, \quad (8)$$

$$IFR_{Cash} = \frac{Cash_{-1}}{XF}. \quad (9)$$

4.2.3. Long-term Post-financing Stock Performance

Stock return data are from the CRSP monthly files. I choose buy-and-hold return (BHR) over 3 years after external financing activities as the long-term stock performance.¹⁸ Returns are compounded for 36 months starting the fourth months after the end of fiscal year 0.¹⁹ The starting month is chosen to allow investors to get sufficient financial information and also to accommodate the decomposition of earnings announcement period returns and non-earnings announcement period returns needed in testing Hypothesis 3.²⁰ I define R_m as raw return including distributions for the m th month after the end of fiscal year 0. The 3-year total raw post-financing return after year 0 is defined as:

$$BHR = \left[\prod_{m=1}^{36} (1 + R_{m+3}) \right] - 1. \quad (10)$$

When a stock is delisted before the 3-year period, I apply the CRSP delisting return in the delisting month. Following Shumway (1997), if the delisting return is missing, I substitute -0.3 if the delisting is due to poor performance (delisting codes 500 and 520–584), and 0 otherwise. Return compounding ends the last day of CRSP reported trading or the last day of the 3-year period, whichever is earlier. Evidence in Barber and Lyon (1997) suggests that long-run results are generally robust to truncating versus filling in the missing returns after delisting. This method of compounding returns is consistent with the long-window methods used in previous research (Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995; Dichev and Piotroski, 1999).

I define buy-and-hold abnormal return ($BHAR$) relative to the return of a benchmark portfolio ($BENCH$) (Lyon et al., 1999). I construct benchmark portfolios by matching on size and book-to-market ratio (B/M). To construct the benchmark portfolios, I adapt the method from Daniel et al. (1997). The method is the same as the previous section. I first

¹⁸ I have used different horizons from 1 to 5 years as the return periods. The results do not change qualitatively.

¹⁹ Note the difference of time horizon for calculating buy-and-hold returns in this section and the previous section. In this section, compounding starts from year 0. In the previous section, compounding starts from 4 years before year 0.

²⁰ I have used starting from the fifth month after the end of fiscal year 0 with no qualitative change in results.

assign each stock to a size decile at the end of June. The end of June is chosen to assure size is available for all firms in that fiscal year since firms have different fiscal year ending months. The size breakpoints are market equity deciles formed based on all firms in this sample on NYSE at the end of June. Then, within each size decile, I rank all the stocks based on their book-to-market ratios, and assign them to book-to-market deciles. The B/M breaking points are based on all firms within each size deciles no matter whether they are on NYSE, AMEX or Nasdaq. The book-to-market ratio is the book equity (Compustat item 216 + item 74 + item 208 - item 56) for the fiscal year end previous to June divided by market equity for December of the previous calendar year.²¹

The benchmark adjusted buy-and-hold abnormal return in the 3-year period after year 0 is defined as:

$$BHAR = BHR - BENCH, \quad (11)$$

where $BENCH$ is the 3-year buy-and-hold return of the benchmark portfolio. $BENCH$ is calculated by compounding the benchmark portfolio's monthly returns, defined as the value weighted return of all firms in this portfolio, where the value is the firms' market equity at the beginning of each month. Updating the value each month helps alleviate the rebalancing concern in [Lyon et al. \(1999\)](#).

4.2.4. Earnings Announcement Period Returns

I decompose BHR , defined in (10), as follows,

$$BHR = (1 + BHRE) \times (1 + BHRNE) - 1, \quad (12)$$

where $BHRE$ is the buy-and-hold return for earnings announcement periods during the 3-year period, and $BHRNE$ is the buy-and-hold return for non-earnings announcement

²¹ Instead of book-to-market ratio, I also used industry adjusted book-to-market ratio to rank the stocks in untabulated tests. The regression results are similar. The correlation between book-to-market ratio and external financing is much stronger than the correlation between industry adjusted book-to-market ratio and external financing. Thus, I choose book-to-market ratio over industry adjusted book-to-market ratio.

periods during the 3-year period.

An earnings announcement period is a three-trading day window centered around the earnings announcement date. Suppose the 3-year post-financing period contains T total trading days and I denote r_d as day d raw return including distributions, the return realized during earnings announcement windows is

$$BHRE = \left[\prod_{d=1}^T (1 + r_d \times D_{d,earn}) \right] - 1, \quad (13)$$

where $D_{d,earn} = 1$ if day d falls within an earnings announcement window, and $D_{d,earn} = 0$ otherwise. The 3-year post-financing period contains 12 earnings announcements and thus 36 trading days in total when no earnings announcement is missing.²²

The return for non-earnings announcement periods, $BHRNE$, compounds all other days' returns. Because the total BHR s are the compounding of returns for earnings announcement periods and non-earnings announcement periods, I can calculate $BHRNE$ s as follows:

$$BHRNE = \frac{1 + BHR}{1 + BHRE} - 1. \quad (14)$$

The same analysis decomposes benchmark portfolio returns as follows into benchmark portfolio returns during earnings announcement periods ($BENCHE$) and non-earnings announcement periods ($BENCHNE$):

$$BENCHE = \left[\prod_{d=1}^T (1 + BENCH_d \times D_{d,earn}) \right] - 1, \quad (15)$$

and

$$BENCHNE = \frac{1 + BENCH}{1 + BENCHE} - 1. \quad (16)$$

²² I do not require firms to have all earnings announcement dates available to be included in the sample. I compound the return whenever there is a recorded earnings announcement. This yields less than 36 days when there are missing earnings announcements. I require the earnings announcement date to be within a year after the correspondent fiscal quarter end. For example, if a firm's earnings announcement date for fiscal quarter ended June 30, 2000 is after June 30, 2001, I treat it as if there is no earnings announcement. These two situations work against the hypothesis because the length of the earnings announcement periods is shorter and the market reaction around the earnings announcement periods will be harder to detect.

Buy-and-hold abnormal return during the earnings announcement period ($BHARE$) and buy-and-hold abnormal return during the non-earnings announcement period ($BHARNE$) are defined as follows:

$$BHARE = BHRE - BENCHE, \quad (17)$$

and

$$BHARNE = BHRNE - BENCHNE. \quad (18)$$

4.2.5. Expense Changes

To examine the post-financing expense changes, SGAE are used to detect traces of the moral hazard problem, and total expenses are used as a benchmark. They are measured as follows:

$$SGAE = \text{Compustat item 189, selling, general, and administrative expenses} \quad (19)$$

and

$$\begin{aligned} Exp = & \text{Compustat item 12, sales} \\ & - \text{Compustat item 172, net income} \end{aligned} \quad (20)$$

These measurements are scaled by the total assets at the beginning of the fiscal year.

Since the post-financing return period is 3 years, expense changes are measured as the average annual change from year 0 over the 3 year-period:

$$\Delta SGAE = \frac{(SGAE_1 - SGAE_0) + (SGAE_2 - SGAE_0) + (SGAE_3 - SGAE_0)}{3}, \quad (21)$$

and

$$\Delta Exp = \frac{(Exp_1 - Exp_0) + (Exp_2 - Exp_0) + (Exp_3 - Exp_0)}{3}, \quad (22)$$

I require at least one year of data after year 0. If the expense item is missing for one or two years after year 0, the expense change will be the average of non-missing years' changes.

4.2.6. Analyst Earnings Forecasts

I obtain forecasts of 1-year-ahead annual EPS from I/B/E/S. To match the compounding start date of the buy-and-hold returns, I take the analyst earnings forecast data in the 4th month after the previous fiscal year-end.

Analyst forecast error, by convention, is defined as actual realized earnings minus the mean consensus analyst earnings forecast, scaled by the stock price at the end of the forecast month. Hence, negative forecast error means optimistic analyst forecasts, while positive forecast error means pessimistic analyst forecasts. Since I study the 3-year period after external financing activities, I cover analyst data in these 3 years as well. I define FE_1 as the 1-year-ahead forecast error for year 1, FE_2 as the 1-year-ahead forecast error for year 2, and FE_3 as the 1-year-ahead forecast error for year 3. FE is defined as the average of the non-missing values of FE_1 , FE_2 , and FE_3 .

Analyst forecast standard deviation is defined as the standard deviation of all available analyst forecasts scaled by the stock price at the end of the forecast month. [Boehme et al. \(2006\)](#) suggest that the most common proxy for dispersion of opinion is the standard deviation in analysts forecasts and [Diether et al. \(2002\)](#) show that analyst forecast dispersion does not proxy for risk. $FSTD_1$, $FSTD_2$, and $FSTD_3$ are the analyst forecast standard deviations in the corresponding years. $FSTD$ is the average of the non-missing values of $FSTD_1$, $FSTD_2$, and $FSTD_3$.

Analyst coverage is the number of analysts providing an annual earnings forecast ([Lang and Lundholm, 1996](#)). $FNUM_1$, $FNUM_2$, and $FNUM_3$ are the analyst coverages in the corresponding years. $FNUM$ is the average of the non-missing values of $FNUM_1$, $FNUM_2$, and $FNUM_3$. In the regression, $LgFNUM$, natural log of $FNUM$, is used as the dependent variable.

4.2.7. Control Variables

When examining post-financing returns conditioned on internal funds (Hypotheses 1 and 3), I control for cash flow from operation of year 0 (CFO_0), the accrual component of the earnings of year 0 ($ACCR_0$), discretionary current accruals of year -1 ($DCAC_{-1}$), and discretionary long-term accruals of year -1 ($DLAC_{-1}$). Following [Hribar and Collins \(2002\)](#), I measure accruals using data from the statement of cash flows instead of successive changes in balance sheet accounts to avoid measurement error due to acquisitions, divestitures, and accounting changes. $ACCR_0$ is measured as income before extraordinary items (Compustat item 123) minus CFO_0 (Compustat item 308). I follow [Teoh et al. \(1998b\)](#) to measure $DCAC_{-1}$ and $DLAC_{-1}$. For details, please check Appendix of [Teoh et al. \(1998b\)](#).

In tests for the association between external financing and $\Delta SGAE$ or ΔExp (Hypothesis 2), I control for changes in sales (Compustat item 12) and changes in research and development expense (Compustat item 46). They are defined as follows:

$$\Delta Sales = \frac{(Sales_1 - Sales_0) + (Sales_2 - Sales_0) + (Sales_3 - Sales_0)}{3}, \quad (23)$$

and

$$\Delta R\&D = \frac{(R\&D_1 - R\&D_0) + (R\&D_2 - R\&D_0) + (R\&D_3 - R\&D_0)}{3}, \quad (24)$$

I require at least one year of data after year 0. If the item is missing for one or two years after year 0, the change will be the average of non-missing years' changes.

When examining analyst forecast data, I control for firm size ($LgSize$) and book-to-market ratio (B/M). $Size$ is the market value of equity, defined as stock price multiplying shares outstanding at the end of fiscal year 0. $LgSize$ is natural log of $Size$. B/M is measured as the book equity (Compustat item 216 + item 74 + item 208 - item 56) divided by market equity at the end of fiscal year 0.

4.3 Sample and Data

The sample period is from fiscal year 1988 to 2005. The starting date is determined by availability of cash flow from operations in the statement of cash flows. The ending date reflects availability of sufficient post-financing returns. Utility firms (SIC code 4900–4999) and financial firms (SIC code 6000–6999) are excluded since these firms are regulated and the nature of their external financing activities is different from that of firms in the other industries. The sample has 13,799 firm-year observations without requiring analyst forecast data. Variables are winsorized at 0.5% and 99.5% to mitigate the impact of data errors and outliers on the analysis.

Table 5 presents univariate statistics and correlations. Panel A reports univariate statistics. For firms' characteristics, the mean and median of the size (market value) are \$586 million and \$92 million. Firms raising external funds are smaller compared to the average size, \$1,290 million, of firms with no restriction to be net external fund raisers. Size varies considerably in the sample as evidenced by the large standard deviations. The mean and median of the book-to-market ratio are 0.611 and 0.436. They are smaller than the mean and median book-to-market ratio, 0.744 and 0.538, of the firms with no restriction to be net external fund raisers. For external financing variables, on average, net external financing is 26.0 percent of the total assets, net equity financing is 13.4 percent of the total assets, and net debt financing is 12.6 percent of the total assets. Consistent with the findings in [Frank and Goyal \(2003\)](#), the medians for external financing activities are smaller for both equity and debt. The standard deviations of ΔE and ΔD are 0.406 and 0.262, respectively, indicating that variation is greater in the equity component of financing. Asset-scaled expenses decrease subsequent to external financing, likely due to the economies of scale after expansion. Post-financing stock performance is on average negative, with a mean of -0.049 and a median of -0.341.

Panel B reports Pearson and Spearman correlations. Several of the correlations are noteworthy. First, the Pearson correlation is -0.178 between B/M and ΔE , and it is -0.085 between B/M and ΔD . These correlations indicate that growth firms tend to raise more exter-

nal funds. Second, there is a strong negative correlation between external financing activities and expense changes. For example, the Pearson correlation is -0.450 and the Spearman correlation is -0.396 between XF and $\Delta SGAE$. Finally, consistent with previous research, the correlations between the external financing activities and subsequent buy-and-hold abnormal return are negative. Overall, the sample statistics correspond quite closely with those in Bradshaw et al. (2006).

4.4 Empirical Tests and Results

4.4.1. Test of Hypothesis 1: Post-Financing Stock Underperformance Conditioned on Internal Funds Ratio

Hypothesis 1 predicts that the negative association between long-term stock performance and financing activity is dependent on internal funds ratio. To test Hypothesis 1, I rank all firms each year into two groups by internal funds ratio IFR_{CFO} , defined in (7) as the ratio of internal funds to net external financing. I refer to the group with a ratio lower than the median ratio as the IFR_L group, and the group with a ratio higher than or equal to the median ratio as the IFR_H group.

Besides the evidence presented in the previous section, I apply the following regression analysis to test Hypothesis 1. I fit the following cross-sectional regressions to all firms each year,

$$\begin{aligned}
 BHAR = & \alpha_0 + \alpha_1 XF + \alpha_2 CFO_0 + \alpha_3 ACCR_0 + \alpha_4 DCAC_{-1} + \alpha_5 DLAC_{-1} \\
 & + \text{Industry Dummies} + \nu_n,
 \end{aligned} \tag{25}$$

$$\begin{aligned}
 BHAR = & \alpha_0 + \alpha_1 \Delta E + \alpha_2 \Delta D + \alpha_3 CFO_0 + \alpha_4 ACCR_0 + \alpha_5 DCAC_{-1} + \alpha_6 DLAC_{-1} \\
 & + \text{Industry Dummies} + \nu_n.
 \end{aligned} \tag{26}$$

I control for CFO_0 and $ACCR_0$ in the regression since Cohen and Lys (2006) suggest that

analysis of post-financing returns is closely related to the accrual anomaly literature (Sloan, 1996): the cash flow identity implies that financing and operating cash flows are negatively related. Both CFO_0 and $ACCR_0$ are controlled because Sloan (1996) suggests that accrual anomaly is underestimation of the persistence of the cash flow component of earnings and overestimation of the persistence of the accrual component of earnings. In addition, controlling for CFO_0 and $ACCR_0$ also helps control for the implication of previous operating performance on the post-financing returns.

I also control for $DCAC_{-1}$ and $DLAC_{-1}$ because literature suggests that earnings management before issuing is associated with pre-financing stock price run-up and post-financing stock price downward adjustment (Teoh et al., 1998a,b; Jo and Kim, 2007; Chen et al., 2009).

Table 6 shows the means of the time-series coefficients from annual regressions following the Fama and MacBeth (1973) procedure. The associated t-statistics are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure (Newey and West, 1987). Fama-French industry dummies are used to control for industry effect and the associated coefficients are omitted in the table.

Panel A of Table 6 reports the result for regression (25). I first conduct the regression on the whole sample without including control variables CFO_0 , $ACCR_0$, $DCAC_{-1}$, and $DLAC_{-1}$. The test is comparable to the test in Table 5 of Bradshaw et al. (2006), and the results are similar. The coefficient on net external financing, XF , is negative (-0.189) and statistically significant ($t=10.61$).

I then add the control variables into the regression. The coefficient on XF is less negative (-0.138), but still significant ($t=6.49$). These results are consistent with the stock underperformance subsequent to external financing activities documented by literature. As for control variables, the coefficient on CFO_0 is significantly positive, which is consistent with the evidence in Sloan (1996) that investors underestimate the persistency of the cash flow component of earnings. However, the coefficient on $ACCR_0$ is not significantly different from 0. This result is similar to the findings in Desai, Rajgopal, and Venkatachalam (2004) that after controlling for the cash flow-to-price ratio, they do not observe any relation between

accruals and future abnormal returns.

I illustrate the difference between the IFR_L group and the IFR_H group by conducting the regression on each group separately. The results for the IFR_L group are similar to the results for the whole sample: the coefficient on XF is significantly negative. But for the IFR_H group, the coefficient on XF is not significantly different from 0. The results are consistent with the prediction of Hypothesis 1 that firms with low internal funds are more likely to experience stock underperformance in the future.

Panel B of Table 6 reports the result for regression (26) with external financing decomposed into its components ΔE and ΔD . For the whole sample and the IFR_L group, similar to the results of Bradshaw et al. (2006), both ΔE and ΔD have significant negative coefficients. For the IFR_H group, however, both coefficients on ΔE and ΔD are no longer significant. One result worth noting is that for the whole sample, the coefficient on ΔD (-0.087) is more negative than the coefficient on ΔE (-0.232) and the difference is significant (F=5.532 and p=0.02). This is consistent with the findings in Bradshaw et al. (2006) and Cohen and Lys (2006). This pattern also holds for the IFR_L group. Since dilution of incumbent shareholders' interest is commonly understood to be connected with external equity issues, the discrepancy between the anticipation of the moral hazard problem association with low internal funds ratio and the real level of the problem maybe less for external equity issues than for external debt issues. The analysis of analyst forecast data in the tests for Hypothesis 4 will help shed some light on the comparison of investors' anticipation more directly.

In Table 7, I modify (25) and (26) to include a dummy variable specification nesting the IFR_L group and IFR_H group. I fit the following cross-sectional regressions to all firms each year,

$$\begin{aligned}
 BHAR = & \alpha_0 + \alpha_{1,L} IFR_L XF + \alpha_{1,H} IFR_H XF & (27) \\
 & + \alpha_2 CFO_0 + \alpha_3 ACCR_0 + \alpha_4 DCAC_{-1} + \alpha_5 DLAC_{-1} + Industry\ Dummies + \nu_n,
 \end{aligned}$$

$$\begin{aligned}
BHAR = & \alpha_0 + \alpha_{1,L} IFR_L \Delta E + \alpha_{2,L} IFR_L \Delta D + \alpha_{1,H} IFR_H \Delta E + \alpha_{2,H} IFR_H \Delta D \quad (28) \\
& + \alpha_3 CFO_0 + \alpha_4 ACCR_0 + \alpha_5 DCAC_{-1} + \alpha_6 DLAC_{-1} + Industry \ Dummies + \nu_n,
\end{aligned}$$

where $IFR_L = 1$ if a firm is in the IFR_L group and zero otherwise, and $IFR_H = 1$ if a firm is in the IFR_H group and zero otherwise. Therefore, the coefficient before $IFR_L XF$, $IFR_L \Delta E$, or $IFR_L \Delta D$ is the association of stock performance and external financing for the IFR_L group; while the coefficient before $IFR_H XF$, $IFR_H \Delta E$, or $IFR_H \Delta D$ is the association of stock performance and external financing for the IFR_H group.

Besides using cash flow from operations of year -1 (CFO_{-1}) as a proxy for internal funds to calculate the internal funds ratio, I use two additional proxies: book value of common equity at the beginning of year 0 (EQ_{-1}) and cash and short-term investment at the beginning of year 0 ($Cash_{-1}$). Table 7 shows the means of the time-series coefficients from annual regressions following the [Fama and MacBeth \(1973\)](#) procedure. The associated t-statistics are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure ([Newey and West, 1987](#)). Fama-French industry dummies are used to control for industry effect and the associated coefficients are omitted in the table. Panel A of Table 7 reports the result for regression (27). Panel B of Table 7 reports the result for regression (28) with external financing decomposed into its components ΔE and ΔD . With all three proxies for the internal funds ratio, the coefficients on $IFR_L XF$, $IFR_L \Delta E$, and $IFR_L \Delta D$ are significantly negative, while the coefficients on $IFR_H XF$, $IFR_H \Delta E$, and $IFR_H \Delta D$ are not significantly different from zero.

Overall, consistent with Hypothesis 1, the results document the post-financing stock underperformance for firms with a low internal funds ratio, but show no association between future stock performance and external financing activities for firms with a high internal funds ratio.

4.4.2. Test of Hypothesis 2: Post-Financing Expense Changes

Hypothesis 2 suggests that firms with a low internal funds ratio will experience a smaller decrease in SGAE than firms with a high internal funds ratio subsequent to net external financing. I fit the following cross-sectional regressions to all firms each year,

$$\begin{aligned} Expense\ Changes = & \alpha_0 + \alpha_{1,L} IFR_L XF + \alpha_{1,H} IFR_H XF + \Delta Sales + \Delta R\&D \\ & + Industry\ Dummies + \nu_n, \end{aligned} \quad (29)$$

$$\begin{aligned} Expense\ Changes = & \alpha_0 + \alpha_{1,L} IFR_L \Delta E + \alpha_{2,L} IFR_L \Delta D + \alpha_{1,H} IFR_H \Delta E + \alpha_{2,H} IFR_H \Delta D \\ & + \Delta Sales + \Delta R\&D + Industry\ Dummies + \nu_n. \end{aligned} \quad (30)$$

where *Expense Changes* is $\Delta SGAE$ or ΔExp . $\Delta SGAE$ is the focus of this test, while ΔExp serves as a baseline. Because company-sponsored research and development expense is included in SGAE, I control for $\Delta R\&D$ in the regression to avoid the influence from this item. The results with or without controlling for $\Delta R\&D$ are qualitatively similar.

Table 8 shows the means of the time-series coefficients from annual regressions following the [Fama and MacBeth \(1973\)](#) procedure. The associated t-statistics are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure ([Newey and West, 1987](#)). Fama-French industry dummies are used to control for industry effect and the associated coefficients are omitted in the table. The comparison between the coefficients on external financing activities of the IFR_L group and the IFR_H group is based on the time-series coefficients from annual regressions and the F-statistics are reported in the last column(s).

The first thing worth noting in the results is that most coefficients on external financing variables are significantly negative, illustrating a decrease in expenses subsequent to external financing. The force affecting the changes could be economies of scale subsequent to expansion by using the net external funds raised.

Second, when the dependent variable is $\Delta SGAE$, the coefficients on external financing variables are significantly less negative in the IFR_L group than in the IFR_H group. For example, the coefficient is -0.085 on $IFR_L XF$ for the IFR_L group, while it is -0.105 for the IFR_H group; the difference is significant (F=10.354). When the net external financing is decomposed into equity and debt financing, the pattern still holds. For example, the coefficient is -0.089 on $IFR_L \Delta E$ for the IFR_L group, while it is -0.116 for the IFR_H group; the difference is significant (F=8.032). In summary, the results show that the decrease in SGAE subsequent to external financing is smaller in the IFR_L group than that in the IFR_H group.

Third, when the dependent variable is ΔExp , the coefficients on external financing activity variables are no longer less negative in the IFR_L group than in the IFR_H group. For example, the coefficients on debt financing for the IFR_L group and for the IFR_H group are not significantly different, while the coefficient on equity financing is significantly negative for the IFR_L group but not significantly different from 0 for the IFR_H group.

In summary, the smaller decrease of expenses in the IFR_L group concentrated in $\Delta SGAE$ is consistent with the moral hazard prediction in the IFR_L group since private benefit extraction will most likely be buried in SGAE and offset the effect of economies of scale.

4.4.3. Test of Hypothesis 3: Post-Financing Stock Underperformance During (Non-)Earnings Announcement Periods

Hypothesis 3 predicts that post-financing stock underperformance is stronger during earnings announcement periods than during non-earnings announcement periods. To test Hypothesis 3, I use the same specification as in (27) and (28) but I change the dependent variables to $BHARE$, buy-and-hold abnormal returns during earnings announcement periods, and $BHARNE$, buy-and-hold abnormal returns during non-earnings announcement periods.

Table 9 reports the results. Panel A of Table 9 has net external financing as the independent variable. For the IFR_L group, the coefficients on $IFR_L XF$ are significantly negative

in earnings announcement periods and non-earnings announcement periods. In contrast, for the IFR_H group, these coefficients are not significant. When the dependent variable is $BHARE$, the coefficient on $IFR_L XF$ is -0.024. When the dependent variable is $BHARNE$, the coefficient on $IFR_L XF$ is -0.116. The ratio between these two coefficients, 1:5, is much higher than the ratio between the earnings announcement period length (12 trading days a year) and the non-earnings announcement period length (238 trading days a year), 1:20. This result is consistent with the findings from [Jegadeesh \(2000\)](#) and [Denis and Sarin \(2001\)](#) that there is a disproportionately large portion of long-run post-SEO abnormal stock returns around earnings announcements. Panel B of Table 9 reports the results when net external financing is decomposed into its components ΔE and ΔD . The results show a similar pattern, that the association between stock underperformance and external financing activities is more intense during earnings announcement periods.

In summary, the concentration of the association between stock underperformance and external financing activities in the earnings announcement periods shows that the stock reaction subsequent to the external financing is not homogenous across the time periods, and it is much more stronger when the investors get new information from the earnings release and update their beliefs. The non-homogenous reaction is not consistent with lower systematic risk as the only cause for post-financing stock underperformance. Furthermore, the more intense stock reaction during earnings announcement periods only occurs in the IFR_L group, which lends support for the moral hazard problem predicted for this group.

4.4.4. Test of Hypothesis 4: Post-Financing Analyst forecasts

Hypothesis 4 predicts the IFR_L group, compared to the IFR_H group, has a weaker information environment represented by analyst forecasts: higher analyst forecast error, larger analyst forecast dispersion, and lower analyst coverage. Since analyst data are needed for Hypothesis 4, yet not every firm in the whole sample is followed by analysts, the sample used to conduct tests related to forecast error is a subset of the whole sample. The Hypothesis 4 sample has 7,866 firm-year observations, which is 57% of the whole sample. Because

only firms with more than one analyst forecasts will have the forecast standard deviation, the sample to conduct tests related to the forecast standard deviation is further reduced to 6,547 firm-years.

To test Hypothesis 4, I use the same cutoff point of IFR_{CFO} from the whole sample to categorize IFR_H group and IFR_L group. Hence, division of the Hypothesis 3 sample is consistent with the division of the whole sample. In other words, the IFR_H (IFR_L) group in the Hypothesis 4 sample is a subset of the IFR_H (IFR_L) group in the whole sample. Within the Hypothesis 4 sample, the IFR_L group contains 3,359 firm-year observations and the IFR_H group contains 4,507 firm-year observations. Thus, instead of containing equal number of firm-year observations, the IFR_H group has approximately one-third more observations than the IFR_L group. This is consistent with the Hypothesis 4 prediction that the IFR_L group is followed less by analysts.

I fit the following cross-sectional regressions to all firms each year,

$$\begin{aligned} \text{Analyst Measurement} = & \alpha_0 + \alpha_{1,L} IFR_L XF + \alpha_{1,H} IFR_H XF \\ & + LgSize + B/M + \text{Industry Dummies} + \nu_n, \end{aligned} \quad (31)$$

$$\begin{aligned} \text{Analyst Measurement} = & \alpha_0 + \alpha_{1,L} IFR_L \Delta E + \alpha_{2,L} IFR_L \Delta D + \alpha_{1,H} IFR_H \Delta E + \alpha_{2,H} IFR_H \Delta D \\ & + LgSize + B/M + \text{Industry Dummies} + \nu_n. \end{aligned} \quad (32)$$

where *Analyst Measurement* is *FE*, *FSTD*, or *LgFNUM*. *LgSize* and *B/M* are control variables for firm size and book-to-market ratio since literature suggests they are important determinants for analyst forecast error, dispersion, and coverage (Hong et al., 2000). Table 10 shows the means of the time-series coefficients from annual regressions following the Fama and MacBeth (1973) procedure. The associated t-statistics are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure (Newey and West, 1987). Fama-French industry dummies are used to control for industry effect and the

associated coefficients are omitted in the table.

Panel A of Table 10 has net external financing as the independent variable. When FE is the dependent variable, the coefficient on $IFR_L XF$ is significantly negative, while the coefficient on $IFR_H XF$ is not significant. Since a more negative FE means more optimistic forecast error, the result shows that analysts are more optimistic for the IFR_L group than for the IFR_H group. The results are consistent with the prediction that the market underestimates agency costs associated with the IFR_L group.

When $FSTD$ is the dependent variable, the coefficient on $IFR_L XF$ is significantly positive, while the coefficient on $IFR_H XF$ is not significant. This result shows that analyst forecast dispersion is larger for the IFR_L group than for the IFR_H group. The moral hazard problem associated with the IFR_L group can induce opinion dispersion. In turn, with short-sale restrictions in the market, large opinion dispersion can be translated into temporarily inflated stock price and subsequent stock underperformance.

When $LgFNUM$ is the dependent variable, the coefficient on $IFR_L XF$ is not significant, while the coefficient on $IFR_H XF$ is significantly positive. This result shows that analyst coverage is lower for the IFR_L group than for the IFR_H group. In addition, the mean and median of the analyst coverage for the IFR_L group (4.95 and 3) are both lower than the mean and median of the analyst coverage for the IFR_H group (7.06 and 5). The lower coverage for the IFR_L group is consistent with the self-selection hypothesis suggested by [McNichols and O'Brien \(1997\)](#) that analysts tend to avoid forecasting for firms with less favorable expectations. On the other hand, lower analyst coverage will slow down the discovery and dissemination of the information related to agency cost for the IFR_L group.

Panel B of Table 10 reports the results when net external financing is decomposed into its components ΔE and ΔD . The results show a pattern of difference between the IFR_L group and the IFR_H group similar to that in Panel A. In addition, the magnitude of the coefficient on $IFR_L \Delta D$ is higher than the magnitude of the coefficient on $IFR_L \Delta E$ when the dependent variable is FE or $FSTD$. This result echoes the result in Table 6 and Table 7 that the coefficient on $IFR_L \Delta D$ is more negative than the coefficient on $IFR_L \Delta E$ when

$BHAR$ is the dependent variable. This is consistent with the conjecture that analyst forecast error and forecast dispersion are related to the stock performance.

In summary, the results illustrate that the IFR_L group has a weaker information environment represented by analyst forecasts, which in turn might help foster the post-financing stock underperformance for these firms.

4.5 Conclusion

This section suggests a cause for stock underperformance subsequent to external financing activities: the moral hazard problem with the current shareholders when the internal funds are diluted by external funds, either new equity or new debt. The empirical evidence supports this conjecture since the post-financing stock underperformance is mainly associated with the IFR_L group, firms with low internal funds relative to external funds.

Furthermore, although SGAE decrease for both firms with low internal funds and firms with high internal funds, the decrease is significantly less in the former. This finding lends evidence to the private benefit extraction related to the moral hazard problem in firms with low internal funds.

In addition, long-term stock underperformance subsequent to external financing activities is more intense around the earnings announcement dates than during non-earnings announcement periods. This test helps differentiate two main streams of reasons for “the new issues puzzle”: investors’ disappointment and systematic risk. The stronger reaction during earnings announcement periods indicates that new issue-related long-term abnormal return is more likely to be caused by the informational update of the market expectation during eventful periods. The results also support the potential moral hazard problem in firms with a low internal funds ratio.

Last, I use analyst forecasts to describe the market expectation more directly. I find that, for firms with low internal funds, analyst forecasts are more over-optimistic, analyst forecast dispersion is larger, and there are fewer analysts following these firms. The moral hazard problem in firms with low internal funds can induce these results, contributing to the post-

financing stock underperformance of these firms.

Overall, the results complement each other and lend evidence to the influence external financing has on the incentives and behavior of the incumbent shareholders when the internal funds are low, and the subsequent impact on post-financing stock performance. Since external financing is one of the most important activities for firms and the dynamics around it are rich in many aspects, I do not believe there is one comprehensive explanation for post-financing stock underperformance. However, the evidence is strong that the moral hazard problem is one of the forces that leads to post-financing stock underperformance. This study is useful for investors to identify the types of firms prone to the moral hazard problem and long-term stock underperformance, to form a reasonable anticipation of the problem, and to reinforce monitoring efforts with these firms.

There are some extensions for future research. First, if the moral hazard problem is one source of long-term stock underperformance, we should observe cross-sectional and time-series differences of post-financing stock performance among firms with different levels of internal control efficiency. Second, the rationale of this study can be extended to some major investment projects such as mergers and acquisitions. Cross-sectional differences should exist among firms using different amounts of internal funds to finance the investment.²³

This research could have implications beyond market fund raising. If the agency conflicts are most problematic for firms with scarce internal funds relative to external funds, perhaps policymakers in financial crises should think more carefully about the consequences of capitalizing such firms. At the very least, controversies over issues such as executive benefits and bonuses should be clearly anticipated *ex ante* partly as a likely result of the stake changes imposed in a bailout.²⁴

²³ Loughran and Vijh (1997) find that firms in stock mergers underperform (-61.7%) whereas firms in cash tender offers overperform (25%) in the five-year period after acquisition. Amihud, Lev, and Travlos (1990) find that larger managerial ownerships more likely lead to cash tender offers, and negative returns in stock mergers are concentrated in firms with low managerial ownership.

²⁴ Within this context, the bonus case of AIG when 80% of it is owned by the government and the lavish party thrown by Northern Trust using TARP money do not seem that surprising after all.

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Appendix: A Simple Illustration of Incentives Influenced by External Financing Conditioned on Internal Funds

Setup

Consider a firm with a project opportunity.²⁵ The project yields a gross payoff of $R > 0$ if it succeeds, or 0 if it fails. This project requires a fixed investment I . The firm initially has internal funds $IF < I$. To implement the project, therefore, the firm needs to raise additional external funds $XF = I - IF$. With funds raised, the manager can then either work or shirk. Choosing to work returns a probability of success p_H . Choosing to shirk yields a probability of success p_L and the manager can gain private benefit B from the shirking, where $B = bI$, $0 < b < 1$. The private benefit can be interpreted as perks, leisure, fame, bonuses, etc. I assume that

$$\Delta p = p_H - p_L > 0. \tag{33}$$

Thus, the model has a single period in which investment decisions are made, investment returns are realized and claims are settled. The timeline can be summarized as follows:

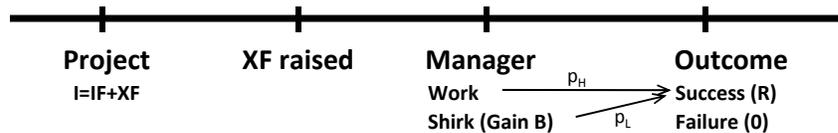


Figure 1. Timeline

Assuming, for simplicity, that everyone in the economy is risk neutral and has no time preference, the discount rate, which is also the risk free return due to risk neutrality, is thus

²⁵ The model structure follows Holmström and Tirole (1997) and Tirole (2006).

0. The expected net present value of the project, depending on the manager's effort, is either

$$NPV_H = p_H R - I, \quad (34)$$

or

$$NPV_L = p_L R - I. \quad (35)$$

We assume the manager is also the current sole shareholder of the firm with limited liability. Hence, the manager serves a dual role as existing shareholder and manager in this simple model. This assumption will help illustrate the gist for profit sharing and is not implausible with stock options and restricted stocks so widely used in management compensation.²⁶ The manager can raise the needed external funds XF either through a creditor or a new shareholder. For simplicity, I assume that $NPV_H > 0$ and $NPV_L \geq 0$ so that the manager can successfully raise the funds.

External Equity

I first consider the case where the manager raises the needed external funds by issuing equity to a new shareholder. The manager, who is also the existing shareholder, and the new shareholder hold fractions $\frac{IF}{I}$ and $\frac{XF}{I}$, respectively, of the total equity. These can be called "inside equity" and "outside equity" (Tirole, 2006). If the project succeeds, the manager and the new shareholder receive R_M and R_S , respectively, where $R_M + R_S = R$. If the project fails, both parties get zero. The sharing rule is proportional to the funds contributed, such that $R_M = \frac{IF}{I}R$ and $R_S = \frac{XF}{I}R$, where $IF + XF = I$.

²⁶ A similar model can be constructed with a shareholder who can have influence on management or expropriation, such as a block shareholder.

When the manager chooses whether to shirk or work, he faces a tradeoff between the private benefit B and the expected decrease in his share of the profit, $\Delta p R_M$. The condition under which the manager will choose to shirk and extract private benefit from the project's resources, and thus diminish the firm's profit is

$$B > \Delta p R_M. \quad (36)$$

Substituting $B = bI$ and manager's share of the revenue $R_M = \frac{IF}{I} R$ into condition (36) and rearranging yields the following threshold, T_E , for internal funds level relative to total investment in the case when the external fund comes from outside equity. If the ratio $\frac{IF}{I}$ is below T_E the manager will shirk since the private benefit B outweighs change in success probability of the project:

$$\frac{IF}{I} < T_E = \frac{bI}{\Delta p R}. \quad (37)$$

Fixing I , the composition of T_E illustrates that more internal funds are needed to avoid the agency conflicts when the manager is able to extract more private benefit (bI). On the other hand, less internal funds are needed to avoid the agency conflicts when the marginal productivity $\Delta p R$ is higher since the potential high loss in revenue keeps the shirking behavior at bay. But if the internal funds are too scarce such that the manager's stake in the total revenue is small enough, he will not care about the loss in revenue compared to the private benefit, and the incentive to shirk will arise.

External Debt

Consider now the case when the manager raises the needed external funds by borrowing from a creditor. If the project succeeds, the payoff R is shared by the manager and the creditor as R_M and R_C , where $R_M + R_C = R$. If the project fails, both parties get 0. The lending market is competitive such that $p_H R_C = XF$, which is the binding individual rationality constraint for the creditor (IR_C) to lend money. Thus, I have:

$$\begin{aligned}
 R_M &= R - R_C \\
 &= R - \frac{XF}{p_H} \\
 &= R - \frac{(I - IF)}{p_H}.
 \end{aligned} \tag{38}$$

Again, the manager faces a tradeoff between the private benefit B and the expected decrease in payoff, $\Delta p R_M$. The condition under which the manager will shirk and extract private benefit from the project's resources is the same as in (36). Substituting (38) into the inequality (36) above and rearranging gives the following threshold level, T_D , in the case when the external funds come from outside debt. If ratio $\frac{IF}{I}$ is below T_D , the manager will shirk since the private benefit B outweighs the higher probability of success of the project:

$$\frac{IF}{I} < T_D = \frac{p_H b}{\Delta p} - \frac{NPV_H}{I}. \tag{39}$$

The composition of T_D illustrates that more internal funds are needed to avoid the agency conflict when the likelihood ratio $\Delta p/p_H$ is lower, when the manager is able to extract more private benefit b , when the value of the project conditional on working, NPV_H , is

lower, or when the total investment is higher.²⁷

Comparison of T_E and T_D

T_E and T_D can be compared as follows:

$$T_E - T_D = \frac{NPV_H}{I} \left(1 - \frac{B}{\Delta p R}\right). \quad (40)$$

Since I assume $NPV_H > 0$, I will have $T_E \leq T_D$ when $B \geq \Delta p R$, and I will have $T_E > T_D$ when $B < \Delta p R$. A lower threshold means the manager is less likely to have incentive to shirk when the same amount of external funds is raised.

$B < \Delta p R$ is the condition for $T_E > T_D$. When B and Δp are fixed, the higher the value of R , the more likely $\Delta p R$ is smaller than B , and the more likely T_E is higher than T_D . The economic intuition is that with the increase of the total R , the revenue for outside shareholders increases in lockstep, but the revenue for creditors remains constant. Hence, when the funds are raised through debt, inside shareholders see a faster increase in revenue, and the incentive to shirk is less.

$B \geq \Delta p R$ is the condition for $T_E \leq T_D$, but it is actually trivial. Because when $\Delta p R \leq B$, we will have $\Delta p R m < \Delta p R \leq B$, and the tradeoff the manager faces in (36) favors private benefit extraction no matter whether the funds are raised through equity or debt. The mathematical constraint is that in (37), when $\Delta p R < B$, $\frac{B}{\Delta p R}$ is bigger than 1, while by definition $\frac{IF}{T}$ is smaller than 1, such that (37) always holds although $T_E \leq T_D$. Hence, it is trivial to

²⁷ The likelihood ratio is often defined as p_H/p_L . It is equivalent to use $\Delta p/p_H$. The likelihood ratio measures the informativeness of the performance variable. Here, it is equally a measure of the marginal productivity of effort by the manager. When the likelihood ratio is lower, the change of productivity from shirking to working is smaller. The tradeoff with B , the decrease in the manager's share of the profit, is determined by the change of productivity and his share. The smaller change of productivity from shirking to working, the higher his share and thus IF is needed in place to prevent shirking.

compare T_E and T_D when $\Delta pR < B$. The economic intuition is that whenever $NPV_H > 0$, the incentive to shirk is always higher when the external funds are raised through equity instead of debt, if not equal. With debt issues, the current shareholders retain all the economic rent, the profit above the market interest rate, while with equity issues, the current shareholder needs to share this profit.

Figure 2. Cumulative Excess Returns around Equity Issues

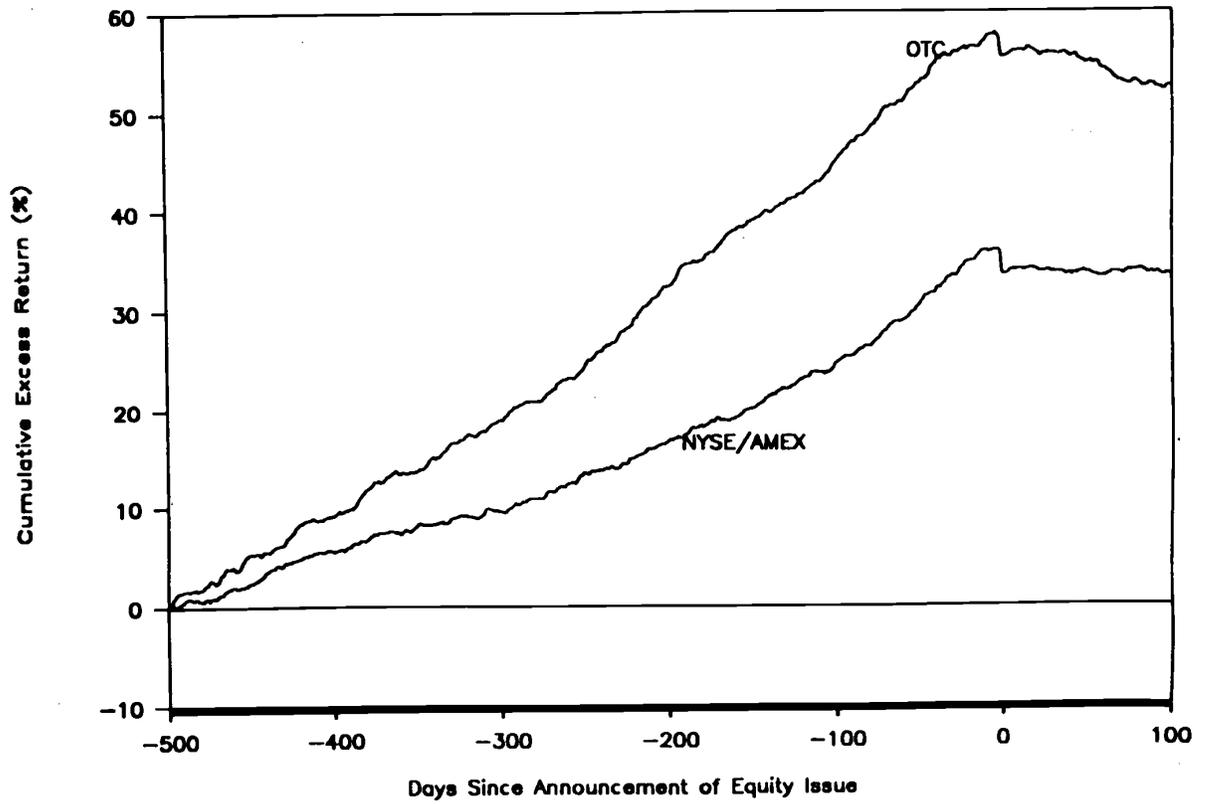


Fig. 1

Figure 3. Cumulative Abnormal Returns after Equity Issues

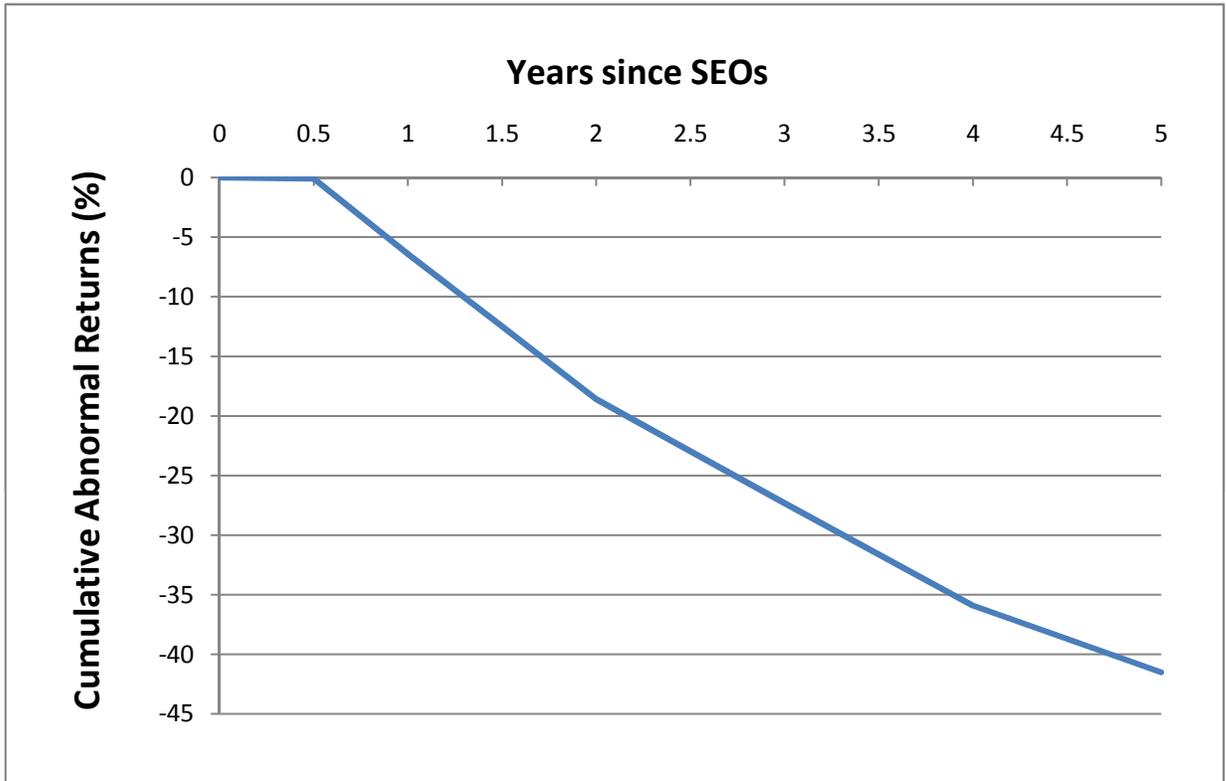


Figure 4. Cumulative size-adjusted returns for extreme external financing deciles over the 11-year window centered on the external financing measurement year

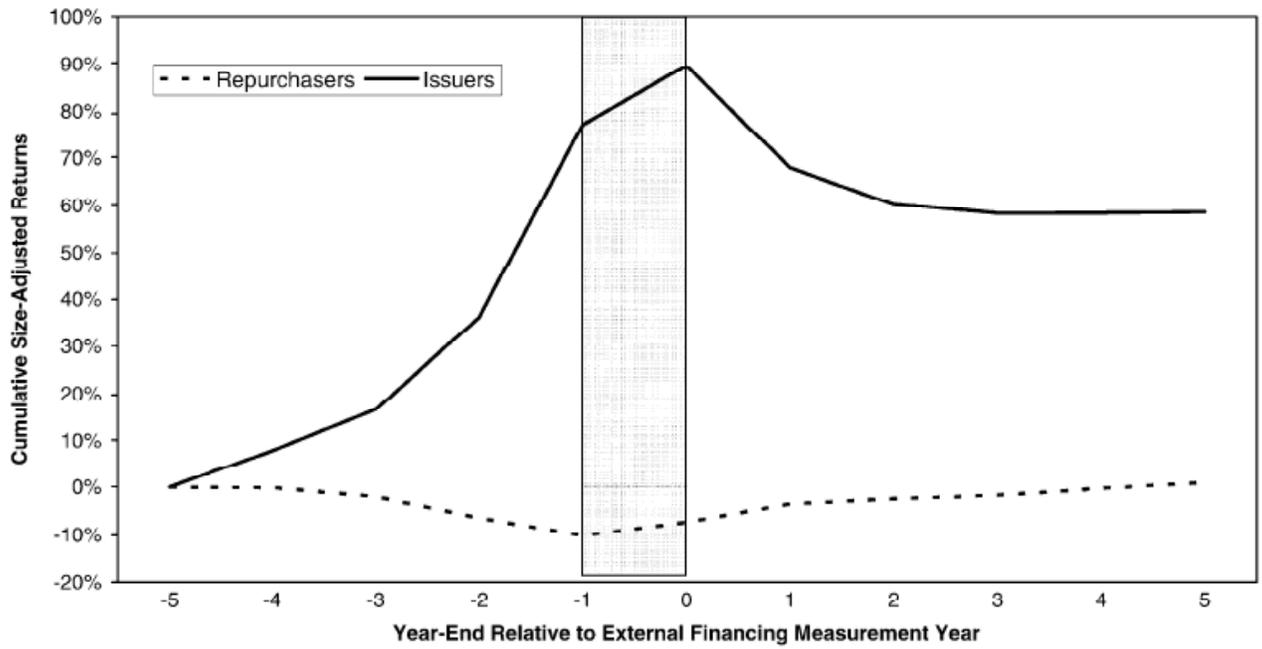
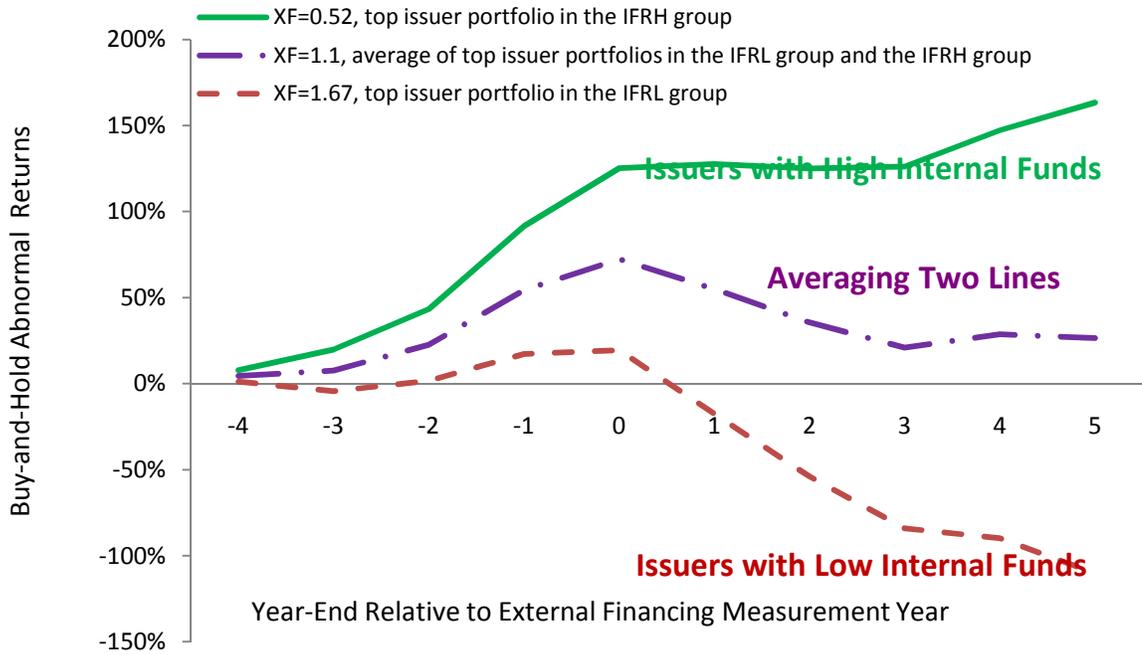
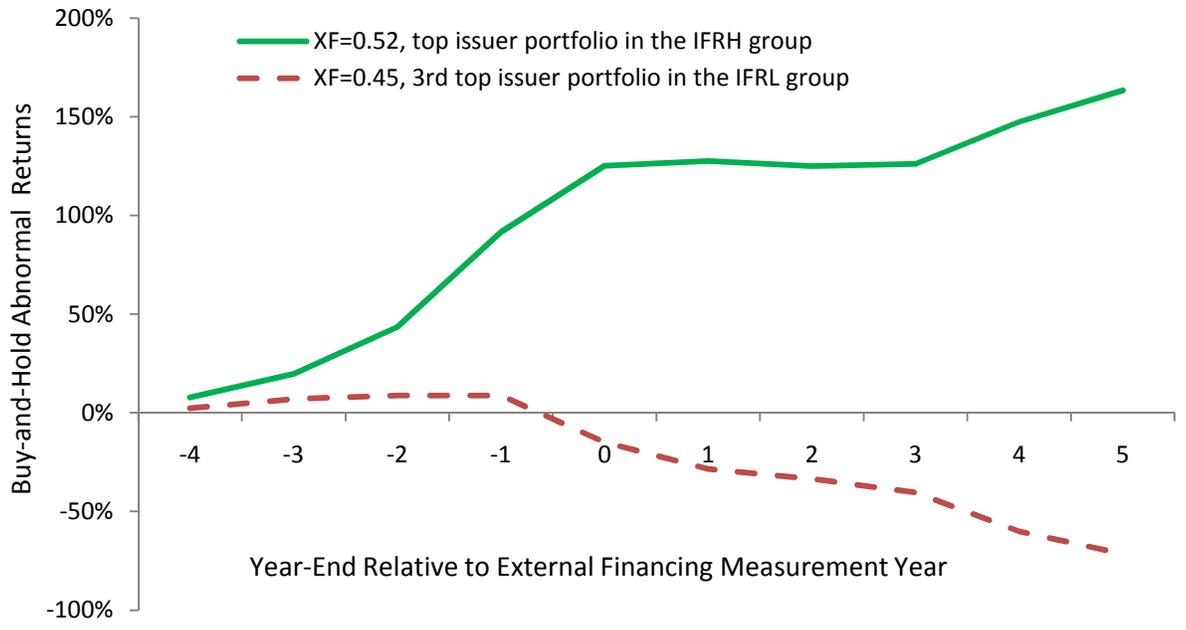


Figure 5. Buy-and-hold abnormal returns for top issuer portfolios from the IFRH group and the IFRL group over the 10-year window centered on the external financing measurement year*



* The IFRH group has a high ratio of internal funds to external funds.
The IFRL group has a low ratio of internal funds to external funds.

Figure 6. Buy-and-hold abnormal returns for comparable issuer portfolios from the IFRH group and the IFRL over the 10-year window centered on the external financing measurement year*



* The IFRH group has a high ratio of internal funds to external funds.
The IFRL group has a low ratio of internal funds to external funds.

Figure 7. SBMI-adjusted BHARs for top issuer portfolios from the IFRH group and the IFRL group over the 10-year window centered on the external financing measurement year

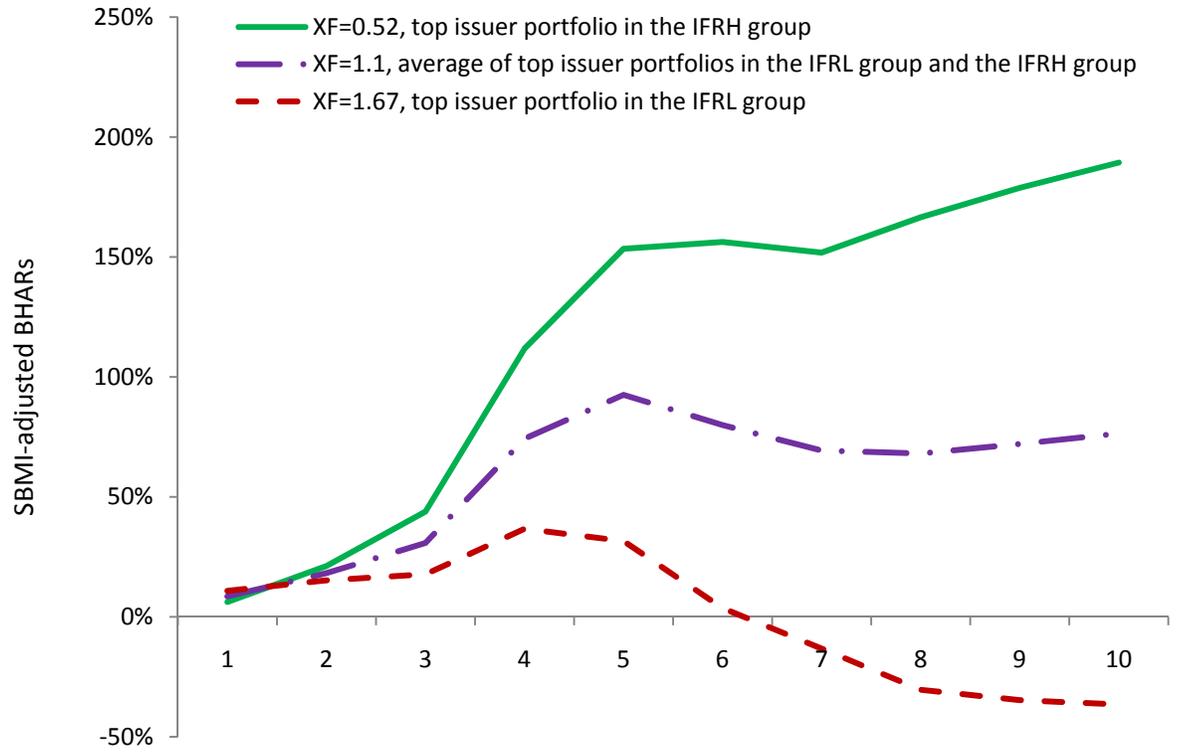


Figure 8. Flowchart of Empirical Results

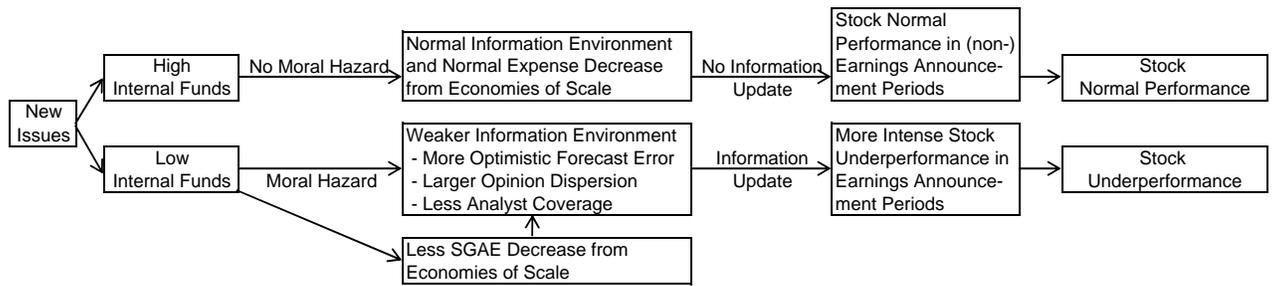


Figure 9. Timeline for Variable Measurement

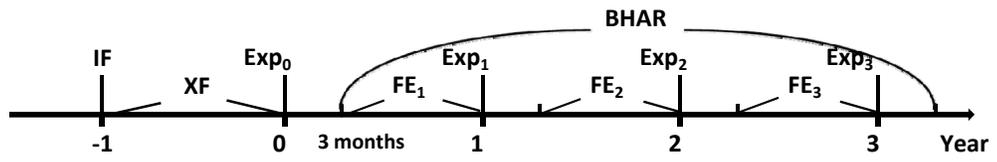


Table 1
Summary Statistics

The sample consists of 10,657 firm-years from 1988 to 2003.

<i>Panel A: Univariate statistics</i>					
	Mean	Std.	Q1	Median	Q3
<i>Size</i> (in \$ mil.)	734.162	5492.141	18.114	65.529	281.241
<i>B/M</i>	0.667	0.662	0.257	0.486	0.855
<i>XF</i>	0.180	0.523	0.010	0.048	0.155
ΔE	0.107	0.379	0.001	0.008	0.039
ΔD	0.074	0.183	0.000	0.003	0.074
$BHAR_{-3}$	0.123	1.368	-0.535	-0.125	0.283
$BHAR_3$	0.067	1.434	-0.665	-0.112	0.228
$BHAR_{03}$	-0.035	1.457	-0.819	-0.316	0.192

<i>Panel B: Pair-wise correlations† Pearson (above diagonal) and Spearman (below diagonal)</i>								
	<i>Size</i>	<i>B/M</i>	<i>XF</i>	ΔE	ΔD	$BHAR_{-3}$	$BHAR_3$	$BHAR_{03}$
<i>Size</i>	-	-0.076	-0.012	-0.010	-0.007	0.052	0.094	0.008
<i>B/M</i>	-0.395	-	-0.166	-0.180	-0.059	-0.130	-0.191	0.027
<i>XF</i>	0.095	-0.323	-	0.837	0.452	-0.012	0.017	-0.072
ΔE	0.365	-0.531	0.547	-	0.046	-0.010	0.007	-0.069
ΔD	-0.110	0.072	0.619	-0.114	-	-0.005	0.026	-0.043
$BHAR_{-3}$	0.229	-0.174	0.028	0.090	-0.010	-	0.279	0.001
$BHAR_3$	0.364	-0.334	0.083	0.205	-0.034	0.427	-	0.418
$BHAR_{03}$	0.140	-0.028	-0.087	-0.032	-0.050	0.029	0.550	-

All correlations greater than 0.02 in absolute magnitude are significant at the 0.01 level.

Table 2
Calendar-time three-factor regressions for the top issuer portfolio excess returns

This table reports calendar-time Fama and French (1993) three-factor regressions for the top issuer portfolio excess returns. The top issuer portfolios consist of firms which have been in the top decile in a year in the past 1 year, 3 years, or 5 years, respectively. It reports the results of the factor regressions for top issuer portfolios in the whole sample, in the IFR_H group, and in the IFR_L group, respectively. The factor returns of MKT, SMB, HML, and the risk-free rates are from Kenneth French's website. The t-statistics (in parentheses) are calculated by using the White (1980) heteroskedasticity-consistent standard errors.

Top issuers in the past	1 Year			3 Years			5 Years		
	Whole Sample	IFR_L	IFR_H	Whole Sample	IFR_L	IFR_H	Whole Sample	IFR_L	IFR_H
α	-1.067*** (-3.9)	-1.550*** (-4)	-0.372 (-1.36)	-0.699*** (-3.7)	-1.042*** (-3.28)	-0.046 (-0.24)	-0.603*** (-3.59)	-0.764** (-2.54)	0.002 (0.01)
MKT	1.242*** (15.32)	1.300*** (12.57)	1.201*** (14.73)	1.277*** (23.15)	1.412*** (16.68)	1.141*** (21.5)	1.252*** (27.44)	1.309*** (15.85)	1.156*** (25.81)
SMB	0.669*** (6.33)	0.884*** (7.27)	0.202 (1.42)	0.649*** (8.99)	0.956*** (9.66)	0.158 (1.56)	0.586*** (10.09)	0.782*** (7.97)	0.192*** (2.64)
HML	-0.438*** (-3.86)	-0.954*** (-5.95)	-0.187 (-1.58)	-0.287*** (-3.92)	-0.694*** (-5.8)	-0.155** (-2.1)	-0.236*** (-4.02)	-0.694*** (-6.43)	-0.080 (-1.31)
Adj. R^2	77%	72%	75%	86%	77%	87%	88%	76%	92%

Table 3

Calendar-time factor regressions augmented with the investment factor for the top issuer portfolio excess returns

This table reports calendar-time factor regressions augmented with the investment factor for the top issuer portfolio excess returns. The top issuer portfolios consist of firms which have been in the top decile in a year in the past 1 year, 3 years, or 5 years, respectively. It reports the results of the factor regressions for top issuer portfolios in the whole sample, in the IFR_H group, and in the IFR_L group, respectively. I augment the Fama and French (1993) three-factor model with the investment factor, denoted INV. INV is constructed from a triple sort on size, book-to-market, and investment-to-assets. The investment-to-assets ratio is measured as the annual changes in gross property, plant, and equipment (COMPUSTAT annual item 7) plus the annual changes inventories (item 3) divided by the lagged book value of assets (item 6). In June of each year, I sort stocks in ascending order independently on size, book-to-market, and investment-to-assets, and classify them into three groups, the top 30%, the medium 40%, and the bottom 30%. The investment factor is defined as the average returns of the nine low-investment portfolios minus the average returns of the nine high-investment portfolios. The factor returns MKT, SMB, and HML are from Kenneth French's website. The t-statistics (in parentheses) are calculated by using the White (1980) heteroskedasticity-consistent standard errors.

Top issuers in the past	1 Year		3 Years		5 Years		
	Whole Sample	IFR_L	Whole Sample	IFR_L	Whole Sample	IFR_L	IFR_H
α	-0.983*** (-3.48)	-1.305*** (-3.27)	-0.476** (-2.47)	-0.952*** (-2.8)	-0.472** (-2.55)	-0.787** (-2.59)	0.219 (1.33)
MKT	1.203*** (13.97)	1.276*** (12.46)	1.184*** (20.42)	1.316*** (13.48)	1.195*** (22.25)	1.271*** (14.91)	1.132*** (22.75)
SMB	0.676*** (6.29)	0.925*** (8.21)	0.671*** (10.02)	0.971*** (9.4)	0.599*** (10.86)	0.850*** (8.82)	0.241*** (4.31)
HML	-0.448*** (-3.87)	-0.950*** (-5.94)	-0.312*** (-4.38)	-0.772*** (-6.11)	-0.215*** (-3.46)	-0.628*** (-5.74)	-0.011 (-0.19)
INV	-0.459*** (-3.87)	-0.449** (-2.21)	-0.341*** (-3.97)	-0.195 (-1.06)	-0.264*** (-3.38)	-0.244* (-1.71)	-0.492*** (-6.27)
Adj. R^2	78%	72%	86%	76%	86%	77%	91%

Table 4

Macroeconomic risk factor regressions for the top issuer portfolio excess returns

This table reports macroeconomic risk factor regressions for the top issuer portfolio excess returns following Eckbo et al. (2000). The top issuer portfolios consist of firms which have been in the top decile in a year in the past 1 year, 3 years, or 5 years, respectively. It reports the results of the factor regressions for top issuer portfolios in the whole sample, in the IFR_H group, and in the IFR_L group, respectively. In the macroeconomic risk factor model, there are six macro factors: the market excess return (MKT), the return spread between Treasury bonds with 20-year and one-year maturities (20y-1y), the return spread between 90- and 30-day Treasury bills (TBILLSpr), the seasonally adjusted percent change in real per capita consumption of nondurable goods (Δ RPC), the difference in the monthly yield change on BAA-rated and AAA-rated corporate bonds (BAA-AAA), and unexpected inflation (UI). The factor returns MKT are from Kenneth French's website. The returns on Treasury bonds and Treasury bills, and the consumer price index used to compute unexpected inflation are from the CRSP bond file. Consumption data are from the U.S. Department of Commerce, Bureau of Economic Analysis (FRED database). Corporate bond yields are from Moody's Bond Record. Expected inflation is modeled by running a regression of real T-bill returns (returns on 30-day Treasury bills less inflation) on a constant and 12 of its lagged values. Of the six factors, three are security returns, and the remaining three, Δ RPC, BAA-AAA, and UI, are measured by using factor-mimicking portfolios following Eckbo et al. (2000). The t-statistics (in parentheses) are calculated by using the White (1980) heteroskedasticity-consistent standard errors.

Top issuers in the past	1 Year		3 Years		5 Years		
	Whole Sample	IFR_L IFR_H	Whole Sample	IFR_L IFR_H	Whole Sample	IFR_L IFR_H	
α	-0.686* (-1.89)	-1.595*** (-2.82)	-0.387 (-1.45)	-0.591 (-1.25)	-0.350 (-1.41)	-0.627 (-1.46)	0.024 (0.12)
MKT	1.435*** (16.34)	1.727*** (12.55)	1.408*** (23.56)	1.675*** (16.12)	1.371*** (25.18)	1.569*** (16.99)	1.190*** (28.14)
20y-1y	-0.296** (-2.03)	-0.439** (-2.23)	-0.250** (-2.42)	-0.347* (-1.78)	-0.226*** (-2.61)	-0.361** (-2.09)	-0.118* (-1.92)
TBILLSpr	-4.919** (-2.39)	-2.271 (-1.06)	-4.232** (-2.36)	-3.011** (-2.24)	-5.447** (-1.99)	-4.879 (-1.58)	-4.739 (-1.11)
Δ RPC	-0.054** (-2.49)	-0.116*** (-3.74)	-0.048** (-2.79)	-0.113*** (-3.71)	-0.044*** (-2.83)	-0.085*** (-3.53)	-0.005 (-0.55)
BAA-AAA	0.002 (0.31)	-0.012 (-1.19)	0.003 (0.55)	-0.007 (-0.74)	0.006 (1.39)	-0.004 (-0.55)	0.012*** (3.94)
UI	-0.122*** (-3.9)	-0.113*** (-3.4)	-0.092*** (-5.18)	-0.123*** (-4.45)	-0.078*** (-5.43)	-0.097*** (-4.01)	-0.053*** (-5.24)
Adj. R^2	69%	61%	79%	68%	81%	68%	92%

Table 5
Summary Statistics

The sample consists of 13,799 firm-years from 1988 to 2005.

<i>Panel A: Univariate statistics</i>					
	Mean	Std.	Q1	Median	Q3
<i>Size</i> (in \$ mil.)	585.639	2518.780	28.486	92.114	352.061
<i>B/M</i>	0.611	0.652	0.239	0.436	0.768
<i>XF</i>	0.260	0.503	0.025	0.086	0.262
ΔE	0.134	0.406	0.001	0.010	0.056
ΔD	0.126	0.262	0.000	0.039	0.134
ΔExp	-0.124	0.600	-0.296	-0.051	0.113
$\Delta SGAE$	-0.037	0.203	-0.085	-0.015	0.027
<i>BHAR</i>	-0.049	1.586	-0.841	-0.341	0.297

<i>Panel B: Pair-wise correlations – Pearson (above diagonal) and Spearman (below diagonal)</i>								
Variable	<i>Size</i>	<i>B/M</i>	<i>XF</i>	ΔE	ΔD	ΔExp	$\Delta SGAE$	<i>BHAR</i>
<i>Size</i>	-	-0.102	0.004	0.003	0.003	-0.039	-0.042	0.017
<i>B/M</i>	-0.347	-	-0.188	-0.178	-0.085	0.108	0.116	0.003
<i>XF</i>	0.059	-0.295	-	0.855	0.595	-0.357	-0.450	-0.045
ΔE	0.268	-0.473	0.474	-	0.092	-0.244	-0.381	-0.030
ΔD	-0.052	0.046	0.643	-0.136	-	-0.311	-0.275	-0.039
ΔExp	-0.136	0.159	-0.383	-0.178	-0.291	-	0.718	0.118
$\Delta SGAE$	-0.112	0.184	-0.396	-0.216	-0.259	0.788	-	0.077
<i>BHAR</i>	0.122	-0.047	-0.074	0.008	-0.071	0.125	0.082	-

All correlations greater than 0.02 in absolute magnitude are significant at the 0.01 level.

Table 6

Post-Financing Abnormal Performance with Separate Groups

I rank all firms each year into two groups by internal funds ratio level IFR_{CFO} , defined in (7) as the ratio of internal funds to net external financing in year 0. I refer to the group with a ratio higher than or equal to the median ratio as the IFR_H group, and the group with a ratio lower than the median ratio as the IFR_L group. I fit the following cross-sectional regressions to all firms each year,

$$BHAR = \alpha_0 + \alpha_1 XF + \alpha_2 CFO_0 + \alpha_3 ACCR_0 + \alpha_4 DCAC_{-1} + \alpha_5 DLAC_{-1} + Industry\ Dummies + \nu_n,$$

$$BHAR = \alpha_0 + \alpha_1 \Delta E + \alpha_2 \Delta D + \alpha_3 CFO_0 + \alpha_4 ACCR_0 + \alpha_5 DCAC_{-1} + \alpha_6 DLAC_{-1} + Industry\ Dummies + \nu_n.$$

where $BHAR$ is the post-financing abnormal stock performance, XF is net equity financing, ΔE is net equity financing, and ΔD is net debt financing. Additional variable definitions are given in Appendix B. Fama-French industry dummies are used to control for industry effect and the associated coefficients are omitted in the table. Reported coefficients are means of the time-series coefficients from annual regressions following the Fama and MacBeth (1973) procedure. The associated t-statistics (reported in parentheses below coefficient estimates) are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure (Newey and West, 1987). ***, **, and * denote significance at the 1%, 5% and 10% level, two-tail.

Panel A: Net external financing

Sample	Intercept	XF	CFO_0	$ACCR_0$	$DCAC_{-1}$	$DLAC_{-1}$	Adj. R^2
Whole Sample	0.051 (1.21)	-0.189*** (-10.61)					0.021
Whole Sample	0.057 (1.46)	-0.138*** (-6.49)	0.252*** (4.55)	0.090 (0.79)	-0.159* (-1.92)	-0.131 (-1.64)	0.026
IFR_L	0.022 (0.77)	-0.127*** (-3.86)	0.222*** (4.03)	0.109 (0.74)	-0.027 (-0.24)	-0.021 (-0.46)	0.030
IFR_H	0.064 (1.22)	-0.020 (-0.93)	0.324 (1.09)	0.304 (0.98)	-0.409* (-1.81)	-0.327 (-1.58)	0.028

Panel B: Equity and debt components of net external financing

Sample	Intercept	ΔE	ΔD	CFO_0	$ACCR_0$	$DCAC_{-1}$	$DLAC_{-1}$	Adj. R^2
Whole Sample	0.054 (1.27)	-0.152*** (-5.09)	-0.264*** (-6.64)					0.022
Whole Sample	0.061 (1.54)	-0.087*** (-4.06)	-0.232*** (-5.08)	0.274*** (4.76)	0.102 (0.88)	-0.161* (-1.93)	-0.127 (-1.59)	0.027
IFR_L	0.028 (0.89)	-0.085*** (-3.17)	-0.155** (-2.64)	0.247*** (4.16)	0.121 (0.79)	-0.040 (-0.34)	-0.020 (-0.44)	0.029
IFR_H	0.074 (1.35)	-0.031 (-0.34)	-0.070 (-1.09)	0.266** (2.15)	0.327 (0.99)	-0.491* (-1.77)	-0.383 (-1.50)	0.028

Table 7

Post-Financing Abnormal Performance with Nested Groups

I rank all firms each year into two groups by internal funds ratio level IFR_{CFO} , IFR_{EQ} , or IFR_{Cash} , defined in (7), (8), or (9), as the ratio of internal funds to net external financing in year 0. I refer to the group with a ratio higher than or equal to the median ratio as the IFR_H group, and the group with a ratio lower than the median ratio as the IFR_L group. I fit the following cross-sectional regressions to all firms each year,

$$BHAR = \alpha_0 + \alpha_{1,L} IFR_L XF + \alpha_{1,H} IFR_H XF + \alpha_2 CFO_0 + \alpha_3 ACCR_0 + \alpha_4 DCAC_{-1} + \alpha_5 DLAC_{-1}$$

$$+ Industry Dummies + \nu_n,$$

$$BHAR = \alpha_0 + \alpha_{1,L} IFR_L \Delta E + \alpha_{2,L} IFR_L \Delta D + \alpha_{1,H} IFR_H \Delta E + \alpha_{2,H} IFR_H \Delta D$$

$$+ \alpha_3 CFO_0 + \alpha_4 ACCR_0 + \alpha_5 DCAC_{-1} + \alpha_6 DLAC_{-1} + Industry Dummies + \nu_n.$$

where $BHAR$ is the post-financing abnormal stock performance, XF is net equity financing, ΔE is net equity financing, ΔD is net debt financing, $IFR_L = 1$ if a firm is in the IFR_L group and zero otherwise, and $IFR_H = 1$ if a firm is in the IFR_H group and zero otherwise. Additional variable definitions are given in Appendix B. Fama-French industry dummies are used to control for industry effect and the associated coefficients are omitted in the table. Reported coefficients are means of the time-series coefficients from annual regressions following the Fama and MacBeth (1973) procedure. The associated t-statistics (reported in parentheses below coefficient estimates) are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure (Newey and West, 1987). ***, **, and * denote significance at the 1%, 5% and 10% level, two-tail.

Panel A: Net external financing

Group	Dividing Var.	Intercept	$IFR_L XF$	$IFR_H XF$	CFO_0	$ACCR_0$	$DCAC_{-1}$	$DLAC_{-1}$	Adj. R^2
IFR_{CFO}		0.057 (1.32)	-0.145*** (-8.18)	-0.010 (-0.06)	0.242*** (3.86)	0.085 (0.75)	-0.148 (-1.61)	-0.129 (-1.63)	0.027
IFR_{EQ}		0.047 (1.42)	-0.131*** (-6.06)	0.322 (0.86)	0.252*** (4.56)	0.090 (0.78)	-0.182** (-2.11)	-0.147* (-1.77)	0.027
IFR_{Cash}		0.051 (1.39)	-0.146*** (-5.95)	-0.003 (-0.03)	0.253*** (4.67)	0.094 (0.82)	-0.156* (-1.87)	-0.130 (-1.63)	0.026

Panel B: Debt and equity components of net external financing

Group	Dividing Var.	Intercept	$IFR_L \Delta E$	$IFR_L \Delta D$	$IFR_H \Delta E$	$IFR_H \Delta D$	CFO_0	$ACCR_0$	$DCAC_{-1}$	$DLAC_{-1}$	Adj. R^2
IFR_{CFO}		0.063 (1.48)	-0.121*** (-5.79)	-0.218*** (-4.29)	0.050 (0.30)	-0.042 (-0.57)	0.253*** (3.90)	0.108 (0.91)	-0.161* (-1.94)	-0.130 (-1.62)	0.026
IFR_{EQ}		0.052 (1.50)	-0.083*** (-3.40)	-0.212*** (-5.14)	0.290 (1.41)	0.249 (0.49)	0.278*** (5.00)	0.108 (0.92)	-0.180* (-2.04)	-0.142 (-1.68)	0.025
IFR_{Cash}		0.059 (1.53)	-0.091*** (-4.05)	-0.238*** (-4.89)	-0.068 (-0.96)	0.009 (0.03)	0.290*** (4.82)	0.107 (0.92)	-0.157* (-1.84)	-0.133 (-1.62)	0.025

Table 8

Expense Changes Subsequent to External Financing

I rank all firms each year into two groups by internal funds ratio level IFR_{CFO} , defined in (7), as the ratio of internal funds to net external financing in year 0. I refer to the group with a ratio higher than or equal to the median ratio as the IFR_H group, and the group with a ratio lower than the median ratio as the IFR_L group. I fit the following cross-sectional regressions to all firms each year,

$$Expense\ Changes = \alpha_0 + \alpha_{1,L} IFR_L XF + \alpha_{1,H} IFR_H XF + \Delta Sales + \Delta R\&D + Industry\ Dummies + \nu_n,$$

$$Expense\ Changes = \alpha_0 + \alpha_{1,L} IFR_L \Delta E + \alpha_{2,L} IFR_L \Delta D + \alpha_{1,H} IFR_H \Delta E + \alpha_{2,H} IFR_H \Delta D + \Delta Sales + \Delta R\&D + Industry\ Dummies + \nu_n.$$

Expense Changes is $\Delta SGAE$ or ΔExp . XF is net equity financing, ΔE is net debt financing, ΔD is net debt financing, $IFR_L = 1$ if a firm is in the IFR_L group and zero otherwise, and $IFR_H = 1$ if a firm is in the IFR_H group and zero otherwise. Additional variable definitions are given in Appendix B. Fama-French industry dummies are used to control for industry effect and the associated coefficients are omitted in the table. Reported coefficients are means of the time-series coefficients from annual regressions following the Fama and MacBeth (1973) procedure. The associated t-statistics (reported in parentheses below coefficient estimates) are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure (Newey and West, 1987). F statistics are provided in the last column(s) to compare the coefficients on the corresponding external financing measure interacting with the dummies for high and IFR_H groups. ***, **, and * denote significance at the 1%, 5% and 10% level, two-tail.

Panel A: Net external financing

Dep. Var.	Intercept	$IFR_L XF$	$IFR_H XF$	$\Delta Sales$	$\Delta R\&D$	Adj. R^2	F (XF)
$\Delta SGAE$	0.011* (1.92)	-0.085*** (-15.67)	-0.105*** (-6.47)	0.171*** (41.46)	0.928*** (8.92)	0.591	10.354***
ΔExp	0.023* (1.82)	-0.073** (-2.17)	0.002 (0.61)	0.862*** (74.66)	0.995*** (6.08)	0.705	18.209***

Panel B: Debt and equity components of net external financing

Dep. Var.	Intercept	$IFR_L \Delta E$	$IFR_L \Delta D$	$IFR_H \Delta E$	$IFR_H \Delta D$	$\Delta Sales$	$\Delta R\&D$	Adj. R^2	F (ΔE)	F (ΔD)
$\Delta SGAE$	0.010* (1.76)	-0.089*** (-11.19)	-0.073*** (-7.77)	-0.116*** (-6.49)	-0.092*** (-4.92)	0.173*** (35.21)	0.921*** (8.98)	0.593	8.032***	5.875**
ΔExp	0.025 (1.68)	-0.063*** (-5.06)	-0.092*** (-7.05)	0.015 (0.44)	-0.096*** (-4.25)	0.856*** (62.44)	0.939*** (9.12)	0.772	26.587***	0.226

Table 9

External Financing and Earnings Period Abnormal Performance

I rank all firms each year into two groups by internal funds ratio level IFR_{CFO} , defined in (7), as the ratio of internal funds to net external financing in year 0. I refer to the group with a ratio higher than or equal to the median ratio as the IFR_H group, and the group with a ratio lower than the median ratio as the IFR_L group. I fit the following cross-sectional regressions to all firms each year,

$$\begin{aligned}
 BHARE &= \alpha_0 + \alpha_{1,L} IFR_L XF + \alpha_{1,H} IFR_H XF + \alpha_2 CFO_0 + \alpha_3 ACCR_0 + \alpha_4 DCAC_{-1} + \alpha_5 DLAC_{-1} \\
 &\quad + Industry Dummies + \nu_n, \\
 BHARNE &= \alpha_0 + \alpha_{1,L} IFR_L XF + \alpha_{1,H} IFR_H XF + \alpha_2 CFO_0 + \alpha_3 ACCR_0 + \alpha_4 DCAC_{-1} + \alpha_5 DLAC_{-1} \\
 &\quad + Industry Dummies + \nu_n, \\
 BHARE &= \alpha_0 + \alpha_{1,L} IFR_L \Delta E + \alpha_{2,L} IFR_L \Delta D + \alpha_{1,H} IFR_H \Delta E + \alpha_{2,H} IFR_H \Delta D \\
 &\quad + \alpha_3 CFO_0 + \alpha_4 ACCR_0 + \alpha_5 DCAC_{-1} + \alpha_6 DLAC_{-1} + Industry Dummies + \nu_n, \\
 BHARNE &= \alpha_0 + \alpha_{1,L} IFR_L \Delta E + \alpha_{2,L} IFR_L \Delta D + \alpha_{1,H} IFR_H \Delta E + \alpha_{2,H} IFR_H \Delta D \\
 &\quad + \alpha_3 CFO_0 + \alpha_4 ACCR_0 + \alpha_5 DCAC_{-1} + \alpha_6 DLAC_{-1} + Industry Dummies + \nu_n.
 \end{aligned}$$

where $BHARE$ is the post-financing abnormal stock performance during earnings announcement periods, $BHARNE$ is the post-financing abnormal stock performance during non-earnings announcement periods, XF is net equity financing, ΔE is net equity financing, ΔD is net debt financing, $IFR_L = 1$ if a firm is in the IFR_L group and zero otherwise, and $IFR_H = 1$ if a firm is in the IFR_H group and zero otherwise. Additional variable definitions are given in Appendix B. Fama-French industry dummies are used to control for industry effect and the associated coefficients are omitted in the table. Reported coefficients are means of the time-series coefficients from annual regressions following the Fama and MacBeth (1973) procedure. The associated t-statistics (reported in parentheses below coefficient estimates) are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure (Newey and West, 1987). ***, **, * and * denote significance at the 1%, 5% and 10% level, two-tail.

Panel A: Net external financing

Dep. Var.	Intercept	$IFR_L XF$	$IFR_H XF$	CFO_0	$ACCR_0$	$DCAC_{-1}$	$DLAC_{-1}$	Adj. R^2
$BHARE$	0.035*** (5.06)	-0.024*** (-4.45)	-0.018 (-0.28)	0.086*** (4.48)	-0.020 (-0.57)	-0.005 (-0.42)	0.012 (1.26)	0.004
$BHARNE$	0.018 (0.55)	-0.116*** (-6.54)	-0.041 (-0.31)	0.079** (2.09)	-0.006 (-0.06)	-0.149* (-1.85)	-0.158*** (-3.12)	0.030

Panel B: Debt and equity components of net external financing

Dep. Var.	Intercept	$IFR_L \Delta E$	$IFR_L \Delta D$	$IFR_H \Delta E$	$IFR_H \Delta D$	CFO_0	$ACCR_0$	$DCAC_{-1}$	$DLAC_{-1}$	Adj. R^2
$BHARE$	0.035*** (5.21)	-0.030*** (-5.72)	-0.024* (-1.92)	-0.001 (-0.66)	0.015 (0.33)	0.081*** (4.23)	-0.022 (-0.60)	-0.005 (-0.40)	0.012 (1.26)	0.015
$BHARNE$	0.024 (0.75)	-0.076*** (-4.19)	-0.191*** (-3.71)	0.061 (0.45)	-0.192 (-0.88)	0.099*** (2.22)	0.013 (0.14)	-0.162* (-1.87)	-0.156*** (-3.07)	0.029

Table 10

External Financing and Analyst forecasts

I rank all firms each year into two groups by internal funds ratio level IFR_{CFO} , defined in (7), as the ratio of internal funds to net external financing in year 0. I refer to the group with a ratio higher than or equal to the median ratio as the IFR_H group, and the group with a ratio lower than the median ratio as the IFR_L group. I fit the following cross-sectional regressions to all firms each year,

$$\begin{aligned} \text{Analyst Measurement} &= \alpha_0 + \alpha_{1,L} IFR_L XF + \alpha_{1,H} IFR_H XF + LgSize + BM + \text{Industry Dummies} + \nu_n, \\ \text{Analyst Measurement} &= \alpha_0 + \alpha_{1,L} IFR_L \Delta E + \alpha_{2,L} IFR_L \Delta D + \alpha_{1,H} IFR_H \Delta E + \alpha_{2,H} IFR_H \Delta D \\ &\quad + LgSize + BM + \text{Industry Dummies} + \nu_n. \end{aligned}$$

where *Analyst Measurement* is *FE*, *FSTD*, or *LgFNUM*, *XF* is net equity financing, ΔE is net equity financing, ΔD is net debt financing, $IFR_L = 1$ if a firm is in the IFR_L group and zero otherwise, and $IFR_H = 1$ if a firm is in the IFR_H group and zero otherwise. Additional variable definitions are given in Appendix B. Fama-French industry dummies are used to control for industry effect and the associated coefficients are omitted in the table. Reported coefficients are means of the time-series coefficients from annual regressions following the Fama and MacBeth (1973) procedure. The associated t-statistics (reported in parentheses below coefficient estimates) are based on the standard error of the annual coefficient estimates adjusted by the Newey-West procedure (Newey and West, 1987). ***, **, and * denote significance at the 1%, 5% and 10% level, two-tail.

Panel A: Net external financing

Dep. Var.	Intercept	$IFR_L XF$	$IFR_H XF$	<i>LgSize</i>	<i>B/M</i>	Adj. R^2
<i>FE</i>	-0.109*** (-5.69)	-0.042*** (-3.81)	-0.028 (-1.52)	0.016*** (5.78)	-0.027** (-2.67)	0.053
<i>FSTD</i>	0.025*** (5.26)	0.006** (2.55)	0.003 (0.65)	-0.022*** (-4.44)	0.002 (1.07)	0.039
<i>LgFNUM</i>	-0.080*** (-27.16)	0.083 (1.40)	0.134** (2.32)	0.487*** (34.44)	-0.046 (-1.46)	0.636

Panel B: Debt and equity components of net external financing

Dep. Var.	Intercept	$IFR_L \Delta E$	$IFR_L \Delta D$	$IFR_H \Delta E$	$IFR_H \Delta D$	<i>LgSize</i>	<i>B/M</i>	Adj. R^2
<i>FE</i>	-0.110*** (-5.61)	-0.023** (-2.76)	-0.052** (-2.49)	0.034 (1.18)	-0.053 (-1.04)	0.026*** (3.46)	-0.022** (-2.67)	0.057
<i>FSTD</i>	0.023*** (4.64)	0.006*** (3.12)	0.010*** (5.03)	0.001 (1.08)	0.002 (1.16)	-0.035** (-2.20)	0.005*** (5.24)	0.040
<i>LgFNUM</i>	-0.102*** (-18.62)	0.029 (1.22)	-0.077 (-0.67)	0.323*** (3.99)	0.003 (1.47)	0.490*** (37.96)	-0.058 (-1.59)	0.618