Understanding Stock Price Behavior around External Financing*

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Abstract: The negative association between pre-financing price run-ups and post-financing price drift-downs is well documented in the literature. We find that firms experiencing pre-financing run-ups and firms experiencing post-financing long-term underperformance may not always be the same firms. The firms with high levels of cash flows experience pre-financing price run-ups but do not suffer post-financing price drift-downs. On the other hand, firms with low cash flow levels do not have pre-financing price run-ups but experience post-financing long-term underperformance even after controlling for various well-documented anomalies. Profitability analyses around external financing suggest that high-cash-flow firms' pre-financing price run-ups could be driven by their robust profitability, whereas low-cash-flow firms' post-financing underperformance might be attributable to their losses.

Keywords: external financing, net issuance puzzle, stock price run-ups, stock underperformance

JEL classification: G32, G34

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1 Introduction

Under the Modigliani and Miller assumptions (1958), external financing activities have no impact on firm value. In contrast, the literature on the stock returns of firms that issue securities to raise funds has established that there is a substantial abnormal price run-up before issuance, a negative announcement effect, and a significant long-run underperformance after issuance (Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995, 1999; Billett et al., 2001; Eberhart and Siddique, 2002; Daniel and Titman, 2006; Bradshaw et al., 2006; Lyandres et al., 2008; Pontiff and Woodgate, 2008).

The significant long-run underperformance after issuance is a widespread and consistent phenomenon across different types of external financing activities: public offerings of equity (Ritter, 1991; Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995), private placements of equity (Hertzel et al., 2002), public debt offerings (Spiess and Affleck-Graves, 1999; Eberhart and Siddique, 2002), and bank borrowings (Billett et al., 2001). From an investor's viewpoint, this systematic price pattern may present trading opportunities to earn superior returns. The abnormal performance calls into question the informational efficiency of external financing activities. This paper empirically examines the link between pre-financing run-ups and post-financing stock underperformance. We find that the levels of cash flow are relevant to understanding pre-financing run-ups and post-financing stock underperformance.

The empirical patterns of stock performance around external financing, based on examples from previous studies, are summarized in Figure 1. Figure 1 (a), which is from Korajczyk et al. (1990), depicts the cumulative abnormal returns from 500 days before equity issues to 100 days afterward.

Figure 1 (b) is compiled from Table III in Loughran and Ritter (1995) for the cumulative abnormal returns in the five-year period after seasoned equity offerings. Figure 1 (c), which is from Bradshaw et al. (2006), constructs a measure nesting all external financing activities and finds that the highest issuers, which are firms with the highest net external financing amount, experience nearly 90% cumulative abnormal returns over the five years before the financing measurement year and -30% cumulative abnormal returns over the five years afterward.

Several studies have focused on this negative association between pre-financing price run-ups and post-financing long-term underperformance. Loughran and Ritter (1995) test whether the long-term underperformance of issuers following run-ups in the year before issuing is a manifestation of long-term mean reversions. Carlson et al. (2006) use a real options model associated with investment to explain the negative association between pre-financing price run-ups and post-financing long-term drift-downs: The riskier a firm's real investment options before exercise, the larger the reduction in priced risk exposure from de-levering after exercise.

Most existing literature studies pre-financing price run-ups and post-financing long-term underperformance as aggregate phenomena across sample firms. However, Lucas and McDonald (1990) develope a theoretical model, supported by their simulations, that distinguishes issuing firms into two different types: undervalued and overvalued firms. Our study is based on this foundational model.

Lucas and McDonald (1990) posit that information asymmetry between managers and outside investors is transient, leading to eventual correction in firm valuation over time. In their model, there are undervalued and overvalued firms. They further assume that the projects that require funding are long-lived and that waiting is not too costly. In this scenario, undervalued firms that receive projects will choose to delay 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 security issuance. In contrast, overvalued firms will choose to issue new securities immediately and have average stock performance before issuance. On average, these two paths of stock performance before issuance for undervalued and overvalued firms generate positive abnormal performance before new issues. Specifically, Lucas and McDonald (1990) conclude that,

"This timing behavior by the two types of firms has a clear implication for the price path preceding the announcement of equity issue. ... Overvalued firms which receive a project will have average performance prior to their equity issue announcement since they issue immediately upon receiving a project. However, undervalued firms which receive a project will wait to issue. They will therefor have above average performance preceding the equity issue since they have waited for the undervaluation to vanish before issuing. Given these two price paths, equity issuers on average have positive abnormal returns preceding the issue."

Based on Lucas and McDonald (1990), our study examines the inferred link between pre-financing run-ups and post-financing stock underperformance as documented in the literature. Unlike previous studies, instead of taking the inferred link as given, we identify whether two types of firms are behind the averaged results. Our findings suggest that this is the case and thus shed new light on the current understanding of stock price behavior around external financing.

As Lucas and McDonald (1990) suggest, undervalued firms wait to issue securities for their market value to correct and thus experience pre-financing run-ups. Although Lucas and McDonald (1990) do not explicitly address post-financing performance, it stands to reason that there will be no post-financing long-term underperformance for the previously undervalued firms since their value has reached the correct value. Conversely, for overvalued firms, Lucas and McDonald (1990) conclude that they have average stock performance before issuance while awaiting the arrival of a profitable investment project. Once these overvalued firms raise external financing, the market may come to recognize the overvaluation, resulting in post-financing underperformance. Aggregating these divergent patterns, the existing empirical literature has generally documented a negative association between pre-financing run-ups and post-financing long-term underperformance across broader samples of issuing firms. This pattern, however, may mask the underlying heterogeneity in stock price dynamics, as predicted by the Lucas and McDonald (1990) framework.

Following Lucas and Mcdonald (1990), we differentiate between undervalued and overvalued firms by employing operating cash flows as our primary metric, drawing on established findings in the literature. Prior studies have consistently documented that cash flow from operations serves as a fundamental valuation metric for investors (Bowen et al., 1987; Cheng et al., 1996; DeFond and Hung, 2003; Wasley and Wu, 2006; Hashim and Strong, 2018; Oh et al., 2020). The value-relevance of operating cash flows is particularly pronounced when firms face increased financing needs (Johnson and Lee, 1994; Kumar and Krishnan, 2008; Bepari et al., 2013; Lee et al., 2017). A substantial body of research demonstrates systematic mispricing patterns related to cash flows, where investors tend to undervalue high-cash-flow firms while overvaluing their low-cash-flow counterparts (Lang et al., 1991; Dechow, 1994; Sloan, 1996; Houge and Loughran, 2000; Desai et al., 2004; Hirshleifer et al., 2009; Ball et al., 2016; Foerster et al., 2017; Wang 2019; Beneish and Nicholas, 2023). Moreover, operating cash flows offer practical advantages as they are readily accessible from standardized cash flow statements and align closely with conventional investor valuation practices. The confluence of these factors—the demonstrated importance of cash flows in firm valuation, their heightened relevance for firms with financing needs, documented market mispricing patterns, and practical measurement considerations—establishes cash flow from operations as an optimal metric for distinguishing between overvalued and undervalued firms with financing needs.

We find that the partition of firms conditioned on the level of cash flow from operations at the time of their financing activities separates the stock price behavior around external financing into two different patterns. There are pre-financing run-ups for firms with high cash flow but no post-financing underperformance. In contrast, for firms with low cash flow, there are either pre-financing run-ups or average stock performance before issuance, depending on the external financing amount, and there is clear post-financing underperformance. It is only upon averaging the entire cross-section of firms that the well-established combined pattern becomes evident. Our results are consistent with the implication of the model developed by Lucas and McDonald (1990).

We further explore how some established results of long-term post-financing stock underperformance are affected by this new evidence. We use various factor models and find that the magnitude of the alpha depends on which factors are used. Still, the qualitative results do not deviate from our main findings: All the factor models show that the alphas are significantly negative for firms with low cash flow but insignificant for those with high cash flow.

Lastly, profitability analyses around external financing suggest that high-cash-flow firms' pre-financing price run-ups could be driven by their robust profitability, whereas low-cash-flow firms' post-financing underperformance might be attributable to their losses.

We formerly developed our hypotheses as follows.

Hypothesis 1 (H1): For firms with high cash flow, there are pre-financing run-ups but no post-financing underperformance.

Hypothesis 2 (H2): For firms with low cash flow, there are either pre-financing run-ups or average stock returns before issuance, and there is post-financing underperformance.

The remainder of this paper is organized as follows: Section 2 describes variable measurements and data, Section 3 and Section 4 report the empirical results and analysis, Section 5 examines issuing firms' profitability, and Section 6 concludes.

2 Variable measurements and data

The issuers included in our sample are those listed on the NYSE, AMEX, or NASDAQ exchanges. The issuer must have a CRSP share code of 10 or 11. The sample excludes issues by utility firms (SIC code 4910–4949), financial firms (SIC code 6000–6999), closed-end funds, real estate investment trusts, American depository receipts, and foreign stocks.[5] To measure the

[5] Utility firms and inancial firms are excluded because they are highly regulated and the nature of their external financing activities is different from that of firms in other industries (Loughran and Ritter, 1995; Spiess, Affleck-

variables needed, we use the Compustat annual files for accounting variables and the CRSP monthly return files for stock performance. The final sample runs from the fiscal year 1988 to 2021.

2.1 External financing activities

We follow Bradshaw et al. (2006) to construct comprehensive measures for net external financing (XF), net equity financing (ΔE), and net debt financing (ΔD) using the statement of cash flows.

This comprehensive and parsimonious measure of the net amount of cash raised through corporate financing activities differs from previous research that concentrates on individual categories of corporate financing transactions. First, because all types of external financing activities are followed by significant long-term underperformance, this design allows for the simultaneous examination of the relationship between a firm's entire portfolio of financing activities and stock returns. Second, the measure of net external financing cancels out offsetting issuance and repurchase transactions both within and across financing categories, which occurs frequently, as shown by Fama and French (2005). As a result, this measure provides an improvement over previous studies on individual financing transactions.

Graves, 1995; Cohen and Lys, 2006). Including financial firms produces qualitatively similar results regarding the main findings.

We define Year 0 as the fiscal year when XF, ΔE, and ΔD are measured.[6] These measurements are defined as follows:

$$XF = \Delta E + \Delta D, \tag{1}$$

where

$$\begin{aligned} \Delta E = {} & \text{Sale of Common and Preferred Stock (Compustat item SSTK)} \\ & - \text{Purchase of Common and Preferred Stock (Compustat item PRSTKC)} \\ & - \text{Cash Dividends (Compustat item DV)} \end{aligned} \tag{2}$$

and

$$\begin{aligned} \Delta D = {} & \text{Long-Term Debt Issuance (Compustat item DLTIS)} \\ & - \text{Long-Term Debt Reduction (Compustat item DLTR)} \\ & + \text{Current Debt Changes (Compustat item DLCCH)} \end{aligned} \tag{3}$$

Because we focus on firms with net external funds raised, we require XF to be positive and ΔE and ΔD to be nonnegative. We require the availability of Compustat data for each of the above variables, except Compustat item DLCCH (current debt changes), which is set to zero if missing (Bradshaw et al., 2006). All the financial statement variables used in this study are deflated by total assets (Compustat item AT) at the beginning of Year 0. We follow the standard procedure of winsorizing observations at the 1% and 99% levels to mitigate a small number of extreme outliers.[7]

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[6] "Year" henceforth means fiscal year unless calendar year is used explicitly. Without subscripts, variables are measured as the event year—that is, Year 0.

[7] We also winsorize observations with a value greater than one, because situations in which individual financing amounts are more than total assets are unusual. Extreme outliers can occur when new financing is raised but is invested in activities that cannot be categorized as assets for accounting purposes (e.g., research and development expenses and marketing expenses) because the denominator, assets, does not increase accordingly. Following Cohen and Lys (2006), we delete those observations.

2.2 Cash flow from operations

Cash flow from operations (hereafter CF) is defined as cash flow (Compustat item OANCF) from Year -1, by total assets (Compustat item AT) in Year 0.

$$CF = \frac{OANCF_{-1}}{AT}, \tag{4}$$

2.3 Buy-and-hold abnormal returns

The stock return data are from the CRSP monthly files. To capture the abnormal returns, we use buy-and-hold abnormal returns (*BHARs*) relative to the returns of a benchmark portfolio (*BENCH*).[8] We construct benchmark portfolios by matching the size and book-to-market (B/M) ratio. Going beyond controlling only for firm size is essential. Ritter (2003) notes that "(only) using a size benchmark, however, introduces a confounding effect. Issuing firms tend to be growth firms, and non-issuers tend to be value firms." Additionally, Barber and Lyon (1997) show that controlling for size and B/M ratio yields well-specified long-run test statistics in all of their sampling situations.

To construct the size-and-B/M (SBM) benchmark portfolios, we adopt the method from Daniel et al. (1997). The formation date for portfolios is the last day of June each year. The end of June is chosen to ensure that the data are available for all the firms for this fiscal year because firms have different fiscal year-ending months. We first assign each stock to a size

[8] *BHAR*s are used instead of cumulative abnormal returns (*CAR*s) because *CAR*s are biased predictors of long-run abnormal returns (Lyon et al., 1999).

quintile on the formation day. The size breakpoints are market equity quintiles based on all the firms in this sample on the NYSE on formation day. Then, within each size quintile, we rank all the stocks based on their B/M ratios and assign them to B/M quintiles. The B/M breaking points are based on all firms within each size quintile regardless of whether they are on the NYSE, AMEX, or NASDAQ. The B/M ratio is the book equity (i.e., shareholder equity plus deferred taxes minus preferred stock) for the fiscal year-end before the formation date divided by market equity for December of the previous calendar year.[9]

2.3.1. Windows around external financing

We define Year 0 as the fiscal year in which external financing amounts are measured. To allow sufficient time to release the financial statement data, we define Month 0 as the third month after the end of Year 0. R_0 indicates the stock's total return that month. The following month begins the post-financing period, and R_1 denotes its total return. Rm is a stock's total return for the $(m+3)^{\text{th}}$ month in calendar time after Month 0.[10] To analyze from the fourth year before the financing year up through the fifth year afterward, we are potentially interested in an overall 10-year window from Year -4 up through Year 5. We define BHR_τ as the buy-and-hold return over the window from Year -4 up through Year τ. Computed from monthly returns, this means

[9] Please refer to the appendix for a detailed definition. Further, instead of only the B/M ratio, we also used the industry-adjusted B/M ratio to rank the stocks for the robustness check. The results are similar.

[10] Some studies use the fifth month after the end of the fiscal year as a starting month to compound the long-term returns to ensure the availability of financial reports (Piotroski, 2000). We used both the fourth and fifth months as the starting months, respectively, with no qualitative changes in the results.

$$BHR_\tau = \left[\prod_{m=-59}^{12*\tau} (1+R_m) \right] - 1, \tag{5}$$

where $\tau \in \{-4,\ldots,5\}$. If a stock is delisted during the computation period, we apply the CRSP delisting return in the delisting month.[11]

The benchmark-adjusted *BHAR* is defined as

$$BHAR_\tau = BHR_\tau\text{-}BENCH_\tau, \tag{6}$$

where $\tau \in \{-4,\ldots,5\}$ and $BENCH_\tau$ is the buy-and-hold return of the benchmark portfolio. $BENCH_\tau$ is calculated using the benchmark portfolio's monthly returns, defined as the value-weighted returns of all the firms in this portfolio, where the value is a firm's market equity at the beginning of each month. Updating the value each month helps alleviate the rebalancing concern indicated by Lyon et al. (1999).

2.3.2. Windows after external financing

We move the *BHAR* window's beginning to the event year to measure post-financing stock performance. The returns are compounded from the fourth month after the end of Year 0. Our analyses use three-year *BHAR*, denoted as $BHAR_{post}$. The three-year post-financing buy-and-hold return after Year 0 is defined as

[11] Following Shumway (1997), if the delisting return is missing, we substitute -0.3 if the delisting is due to poor performance (delisting codes 500 and 520–584), and 0 otherwise. The 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).

$$BHR_{post} = \left[\prod_{m=1}^{36} (1 + R_m) \right] - 1, \tag{7}$$

and the abnormal return is

$$BHAR_{post} = BHR_{post} - BENCH_{post}, \tag{8}$$

where $BENCH_{post}$ is the three-year buy-and-hold return of the benchmark portfolio.

2.4 Summary statistics

The sample has 24,089 firm-year observations from 1988 to 2021. Table 1 reports that, consistent with previous studies, firm size is relatively small for the sample firms, with the average market capitalization of our sample being 1,132 million dollars. These firms tend to be growth ones, with an average B/M ratio of 0.76. On average, net external financing is 11% of total assets, net equity financing is 7% of total assets, and net debt financing is 9% of total assets. Consistent with the findings of Frank and Goyal (2003), the medians for external financing activities are smaller for both equity and debt. For abnormal returns around financing activities, $BHAR_{-3}$ is compounded from Year -4 up through Year -3, $BHAR_3$ is compounded from Year -4 up through Year 3, and $BHAR_{post}$ is compounded from Year 0 up through Year 3. $BHAR_{-3}$ on average is 0.17, reflecting the price run-ups before financing. $BHAR_{post}$ on average is -0.04, reflecting the price drift-downs after financing.

[Insert Table 1 here]

3 A new look at external financing and abnormal return patterns

Because the effects of the pre-issuance run-ups and post-issuance underperformance were discovered separately, we have no reason ex-ante to believe that the effects are occurring in the same firms. It is only upon averaging the entire cross-section of firms that we view the well-established combined pattern as evident. We examine whether there are two types of firms behind an average firm and whether there is truly a combined pattern of pre-issuance run-ups and post-issuance underperformance.

3.1 Run-ups and underperformance occur in different firms

To examine the abnormal returns around financing activities for firms with different levels of CF, we first rank all firms each year into two groups by CF. We refer to the group with a ratio lower than the median as the low CF group and the group with a ratio higher than or equal to the median as the high CF group. Then, within each group, we rank firms into deciles according to their net external financing XF. After sorting, there are 20 portfolios in total — 10 XF deciles each for the high and low CF firms.

For both high and low CF firms, the top decile of XF is referred to as the top issuer portfolio. Figure 2 illustrates the stock performance for the top issuers in the high CF group and the low CF group. The *BHARs* are calculated for each top issuer portfolio for 10 years, starting four years before Year 0.

[Insert Figure 2 here]

For the top issuer portfolio in the high CF group, the size-and-B/M-adjusted *BHAR* is 122% in the five-year period before and including Year 0 and remains similar afterward, such that the

BHAR in the 10-year period around Year 0 is 120%. For the top issuer portfolio in the low CF group, the size-and-B/M-adjusted *BHAR* is 10% in the five-year period before and including Year 0 but drops to -39% for the *BHAR* in the 10-year period around Year 0. Averaging these two portfolios, the *BHAR* is 66% in the five-year period before and including Year 0, but the *BHAR* in the 10-year period around Year 0 drops to 41%. These results support H1 and H2.

3.2 Controlling for external funds raised

In Figure 2, the top issuers in the low CF group have raised more funds externally (*XF* = 0.74) than the top issuers in the high CF group (*XF* = 0.60). To address this, we match the levels of external financing by selecting the 3rd decile portfolio from the low CF group and the 2nd decile portfolio from the high CF group. These two portfolios have similar levels of external financing, 0.29, but different levels of CF.

Figure 3 illustrates that the difference in CF available is important, not the disparity in *XF*. The different patterns between the high CF and the low CF groups, controlling for similar *XF*, are consistent with the pattern in Figure 2 and also support H1 and H2.

[Insert Figure 3 here]

In summary, the top issuer portfolio from the high CF group exhibits a strong price run-up before Year 0, but there is no price drift-down afterward. Conversely, the low CF group captures all the post-financing price drift-down. These results illustrate that the pre-financing price run-up observed in the literature is mainly driven by the high CF group of firms, but the post-financing stock underperformance observed in the literature is mainly driven by the low CF group of firms.

When we plot the average return of these two portfolios, the return pattern resembles that of the issuers from Bradshaw et al. (2006). Thus, the association between the pre-financing price run-up and the post-financing stock underperformance results from the pooling of issuing firms with high CF and low CF.

3.3 Ruling out size, book-to-market ratio, momentum, and investment

Besides controlling for size and B/M ratio, we further control for momentum (Bravet al., 2000) and investment (Lyandres et al., 2008) to determine whether these additional benchmarks in the previous literature diminish the pre-finance price run-ups for the top issuer portfolio from the high CF group and post-finance price drift-downs for the top issuer portfolio from the low CF group. The assignment of the size, B/M ratio, and momentum benchmark portfolio follows Daniel et al. (1997). Abnormal returns adjusted for size, B/M ratio, and momentum are hereafter referred to as SBMM-adjusted returns. Similarly, we form the size, book-to-market ratio, and investment benchmark portfolios (Lyandres et al., 2008). Abnormal returns adjusted for size, B/M ratio, and investment are hereafter referred to as SBMI-adjusted returns.

Figures 4 and 5 plot the SBMM- and SBMI-adjusted BHARs for top issuer portfolios from the high CF and low CF groups together with the average of the two groups. Compared to those in Figure 3, the qualitative results do not change: The pre-financing price run-ups observed for the issuers in the literature are associated with the high CF group. In contrast, the post-financing stock underperformance observed for the issuers in the literature is associated with the low CF group. The average of these two groups illustrates the conventional price-reversal pattern.

The results illustrate that H1 and H2 still hold after controlling for size, book-to-market ratio, momentum, and investment.

[Insert Figures 4 and 5 here]

4 Cash flow from operations and post-financing underperformance: Regression analysis

In this section, we further explore how CF levels at the time of financing potentially affect the established results regarding long-term post-financing stock underperformance. Brav et al. (2000) argue that using buy-and-hold returns tends to magnify the post-issuance underperformance. Lyon et al. (1999) suggest that time-series factor regression is a useful method with well-specified test statistics besides buy-and-hold abnormal returns. We use factor regressions to examine the long-term post-financing stock underperformance for top issuers with different levels of CF. The top issuer portfolios consist of firms that have been in the top decile in the whole sample, the high CF group or the low CF group in the past one year, two years, or three years, respectively. The dependent variables in the regressions are the top issuers' value-weighted returns in excess of the one-month Treasury bill rate.

4.1 Can value, size, and momentum capture the underperformance?

Brav et al. (2000) document that value, size, and momentum may account for the underperformance of IPOs and SEOs to some extent, using Fama-French's (1993) three-factor model and Carhart's (1997) four-factor model. Can value, size, and momentum explain the underperformance of new issuers, particularly for firms with low cash flow? To explore this, we apply Carhart's (1997) four-factor model in our setting, as it includes the momentum factor in addition to the Fama and French's (1993) three factors:

$$R_{p,t} - R_{f,t} = \alpha + \beta(R_{MK,t} - R_{f,t}) + sSMB_t + hHML_t + mUMD_t + v_t, \quad (9)$$

where the portfolio returns $R_{p,t}$ are the value-weighted monthly returns of the firms in the portfolio. The monthly returns of the market (MKT), the size (SMB), the value (HML), the momentum (UMD) portfolios, and the risk-free rates are from Kenneth French's website.

The results are summarized in Table 2. The alphas are significantly negative for the whole sample and the low CF group for all top issuer measurement horizons: one year, two years, or three years. In contrast, the alphas are insignificant for the high CF group for all horizons. Moreover, the alphas for the low CF group are consistently more negative than the alphas for the whole sample. For example, the alpha is -0.60% per month (*t*-statistic = -2.76) for the whole sample when the portfolio consists of top issuers in the past year, and the alpha is -1.30% per month (*t*-statistic = -3.99) for the low CF group. These results are consistent with H1 and H2.

[Insert Table 2 here]

4.2 How about the investment factor?

Prior studies have suggested that the investment factor may play a role in explaining the observed post-financing long-term underperformance. Specifically, Lyandres et al. (2008) posit that firms with lower expected returns seek external financing and use the funds for investment, consequently showing low returns after financing. To investigate the implications of this investment channel for the new issuance puzzle, we employ Fama-French's (2015) five-factor model, which includes the investment factor in addition to the market, size, value, and profitability factors. We regress the excess returns of the top-issuer portfolios on the Fama–French five factors, with the specification as below:

$$R_{p,t} - R_{f,t} = \alpha + \beta(R_{MK,t} - R_{f,t}) + sSMB_t + hHML_t + rRMW_t + cCMA_t + v_t, \tag{10}$$

where the monthly returns of the market (MKT), the size (SMB), the value (HML), the profitability (RMW) and investment (CMA) are from Kenneth French's website.

Table 3 reports the estimated alphas and factor loadings of the top issuer portfolios measured across different horizons. Including the investment factor in the standard factor regressions reduces the magnitude of post-issue underperformance but does not make it insignificant.[12] The alpha shrinks from -0.60% (*t*-statistic = -2.76) per month in Table 2 to -0.44% (*t*-statistic = -1.94) in Table 3 for the whole sample of top issuers in the past year, and the alpha shrinks from -1.30% (*t*-statistic = -3.99) per month to -1.07% (*t*-statistic = -3.24) for the low CF group accordingly. The alpha remains insignificant for the high CF group. Two observations arise. First, our results for the whole sample are consistent with those of Fama and French (2016), who demonstrate that their five-factor model can capture net share issues. Second, and more importantly, the investment factor cannot change the finding that the low CF group drives post-financing underperformance. The results are consistent with H1 and H2.

[Insert Table 3 here]

[12] Lyandres et al. (2008) find that adding the investment factor reduces the magnitude of the alphas and makes them insignificant for IPO, SEO, straight debt issues, with some exceptions for convertible debt issues. The design of our tests is different from that of Lyandres et al. (2008) in that we use a comprehensive measure of firms' external financing activities, while Lyandres et al. (2008) focus on specific financing events. This might contribute to the stronger post-financing underperformance documented in this study.

4.3 Alternative models with the investment factor: The *q*-factor model and the augmented *q*-factor model

Hou et al. (2015) use the *q*-factor model, consisting of the market, size, investment, and profitability factors, to examine 74 anomalies. Both the q-factor model and the Fama-French five-factor model include the investment, size, and profitability factors. However, the *q*-factor model uses relatively high-frequency quarterly data to construct the profitability factor. Three of the anomalies they examine are related to post-financing stock underperformance. The *q*-factor model cannot explain the composite issuance underperformance (Daniel and Titman, 2006) or net stock issues underperformance (Pontiff and Woodgate, 2008) but can explain the net external financing underperformance (Bradshaw et al., 2006). Hou et al.'s (2021) augmented *q*-factor model adds an expected growth factor to the *q*-factor model, which can explain the composite issuance underperformance (Daniel and Titman, 2006) and the net stock issues underperformance (Pontiff and Woodgate, 2008).

In Table IA1 and IA2 of the Internet Appendix, we conduct robustness checks of the investment factor using the *q*-factor model (Hou et al. 2015) and the augmented *q*-factor model (Hou et al. 2021). Consistent with our hypotheses, with both models, the alphas for the low CF group remain significantly negative, the alphas for the high CF group remain insignificant, and the alphas for the whole sample become insignificant for the top issuers in the past one year and two years. All alphas are insignificant for the top issuers in the past three years. The findings are consistent with those obtained from the Fama-French five-factor model.

4.4 Does the quality-minus-junk factor play a role?

Asness et al. (2018, 2019) suggest that high-quality stocks (defined as profitable, safe, and growing) outperform low-quality stocks; accordingly, they propose the quality-minus-junk (QMJ) factor. Their study shows that the QMJ factor yields a significant premium. One may wonder whether the patterns we document are driven by quality effects—firms with high CF tend to be high-quality firms, while firms with low CF tend to be junk firms. To explore this, we add the QMJ factor of Asness et al. (2018, 2019) in addition to the Fama and French factors:

$$R_{p,t} - R_{f,t} = \alpha + \beta(R_{MK,t} - R_{f,t}) + sSMB_t + hHML_t + qQMJ_t + v_t, \tag{11}$$

where the monthly returns of the QMJ factor are from Lasse H. Pedersen's website.

The results are summarized in Table 4. The alpha for the low CF group remains significantly negative at -0.93% (*t*-statistic = -2.86) per month, the alpha for the high CF group remains insignificant, and the alpha for the whole sample of stop issuers in the past year becomes insignificantly. The results suggest that the QMJ factor does not capture the premium for the low CF group. However, if the whole sample is used, this result will be masked. This illustrates the importance of separating the low CF group from the whole sample.

[Insert Table 4 here]

5 A possible explanation of the new issuance puzzle

In this section, we explore the divergence in returns between high- and low-CF issuers by examining their profitability around external financing.[13] The factor analyses in Section 4 show

[13] We thank the reviewer's recommendation for this analysis.

that the Fama and French five-factor model, the q-factor model, and the quality-minus-junk model all appear to reduce the magnitudes of the post-financing underperformance for low CF firms to some extent. A common element across these models is the incorporation of a profitability factor. Furthermore, prior literature suggests that high (low) profitability firms are associated with high (lows) returns (e.g., Novy-Marx, 2013; Ball et al., 2016). Building on these insights, we conjecture that high-CF firms' pre-financing run-ups may be driven by their robust profitability. In contrast, low-CF firms' post-financing underperformance may be due to their weak profitability.

Figure 6 illustrates the profitability of high- and low-CF firms, with profitability defined as profits (i.e., revenues minus cost of goods sold, selling, general and administrative expenses, and interest expenses) divided by book equity.[14] The figure reveals that high-CF firms exhibit consistently high profitability before financing, which could drive their pre-financing price run-ups. In contrast, low-CF firms display negative profitability. While low-CF firms exhibit operating losses before financing, there is no stock underperformance, which is consistent with the overvaluation we have conjectured. After financing, the market corrects their valuation, and the post-financing underperformance may be driven by their negative profitability. These results suggest that the distinct stock price patterns we document around external financing events for high- and low-CF firms are likely driven by underlying differences in the profitability characteristics of these two groups of issuers.

[14] For robustness check, in the Internet Appendix, Figure IA1 reports the results when the profits are divided by total assets.

[Insert Figure 6 here]

Dittmar (2002) highlights the superiority of nonlinear models over traditional linear factor models in capturing the complexities of stock performance. While standard linear factor models, such as the Fama-French five-factor framework and the quality-minus-junk model, both of which incorporate a profitability factor, are effective in mitigating the magnitude of low-CF firms' post-issuance underperformance to some extent, they may fall short of fully accounting for the profitability effect.

We further conduct a pseudo test by investigating investment for high- and low-CF firms. Investment is defined as changes in total assets divided by lagged assets (Fama and French, 2015; Hou, Xue, and Zhang, 2015). Figure IA2 of the Internet Appendix illustrates the results. In contrast to profits, high- and low-CF firms do not show significant divergent patterns regarding their investment levels. Consequently, this pseudo test reinforces our conjecture that profitability, rather than investment, plays a more pivotal role in explaining the heterogeneous stock performance of firms with varying cash flow levels around external financing events.

6 Conclusion

The existing literature indicates a negative association between firms' pre-financing price run-ups and post-financing price drift-downs, and it has spurred the development of several different theories to explain it.

In this paper, we show that this association is artificial and is a result of averaging financing firms with different levels of cash flow. When financing firms are partitioned according to their cash flow levels at the time of financing, the negative association between firms' pre-financing price run-ups and post-financing price drift-downs no longer exists for firms with high cash flow. At the same time, firms with low cash flow either have stock price run-ups or average stock performance before external financing while consistently having stock price drift-downs after external financing. Furthermore, we illustrate that the post-financing underperformance is driven by firms with low cash flow. Further analysis of profitability around external financing suggests that high cash flow firms' price run-ups are linked to their high profitability, and low cash flow firms' underperformance is associated with low profitability.

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Appendix: Variable Definitions

The accounting data are from the Compustat annual files. The earnings announcement dates are from the Compustat quarterly files. The return measurements and market value are from the CRSP monthly returns. The analyst data are from the I/B/E/S summary files. We define Year 0 as the fiscal year when external financing *XF*, ΔE, *and* ΔD are measured.

Firm characteristics	
Size	Market value of equity, measured as number of shares outstanding times price (CRSP items SHROUT×PRC).
B/M	B/M ratio, measured as book equity divided by market equity. Book equity is shareholder equity plus deferred taxes minus preferred stock where available. Stockholders' equity is as given in Compustat data item (SEQ) if available, or common/ordinary equity plus the carrying value of preferred stock (CEQ+PSTX) if available, or total assets minus the sum of total liabilities and minority interest (AT–(LT+MIB)). Deferred taxes are deferred taxes and investment tax credits (TXDITC) if available. Preferred stock is redemption value (PSTKR) if available, or liquidating value (PSTKRL) if available, or carrying value (PSTK). Book equity is measured at the end of Year 0. Market equity is measured in December of Calendar Year 0.
Momentum	Prior one-year returns.
Profitability	Profitability is defined as operating profits divided by book equity. Operating profits are revenues (REVT) minus cost of goods sold (COGS), and selling, general and administrative expenses (XSGA), interest expenses (XINT). Book equity is shareholder equity, plus deferred taxes (TXDITC), minus preferred stock (PSTK) if it is available. Stockholders' equity is as given in Compustat item SEQ, if available, or else common/ordinary equity (CEQ) plus the carrying value of preferred stock (PSTK), if available, or total assets (AT) minus the sum of total liabilities and minority interest (LT+MIB).
Investment	Investment is defined as changes in total assets(AT), divided by lagged total assets.
External financing activity and cash flow from operations	
(all scaled by total assets at the beginning of Year 0)	
XF	Net external financing, summation of ΔE and ΔD.
ΔE	Net equity financing activities, measured as the proceeds from the sale of common and preferred stock (Compustat item SSTK) less purchase of common and preferred stock (item PRSTKC) less cash dividends (item DV).

ΔD	Net debt financing, measured as the cash proceeds from the issuance of long-term debt (item DLTIS) less cash payments for long-term debt reductions (item DLTR) plus the net changes in current debt (item DLCCH).
CF	Cash flow from operations (item OANCF) from Year -1 divided by total assets (Compustat item AT) in Year 0.
Buy-and-hold abnormal returns	
BHR_τ	Buy-and-hold returns over the window from Year -4 up through Year τ, where $\tau \in \{-4, \ldots, 5\}$.
$BENCH_\tau$	Buy-and-hold returns of the benchmark portfolio over the window from Year −4 up through Year τ, where $\tau \in \{-4, \ldots, 5\}$.
$BHAR_\tau$	Buy-and-hold abnormal returns, measured as (BHRτ − BENCHτ), over the window from Year −4 up through Year τ, where $\tau \in \{-4, \ldots, 5\}$.
$BHAR_{post}$	Buy-and-hold abnormal returns during the post-financing period: from Year 0 up through Year 3.
Fama–French and Carhart factors	
(Source: Kenneth French data library)	
MKT	MKT is the monthly return to the market portfolio minus the monthly return of 30-day Treasury bills.
SMB	SMB is the difference between the monthly returns on diversified portfolios of small and large stocks.
HML	HML is the difference between the monthly returns on a diversified portfolio of high and low B/M stocks.
UMD	UMD is the difference between the monthly returns on diversified portfolios of winners and losers.
RMW	RMW is the difference between the monthly returns on diversified portfolios with robust and weak profitability.
CMA	CMA is the difference between the monthly return on diversified portfolios of low- and high-investment firms.
The quality-minus-junk factor	
(Source: AQR website)[15]	
QMJ	QMJ is is the difference between the monthly returns on a portfolio of high-quality stocks (i.e., those stocks that are safe, profitable, growing, and well managed) and low-quality stocks.
The q-factor	
(Source: Global q-factor website)[16]	

[15] https://www.aqr.com/Insights/Datasets/Quality-Minus-Junk-Factors-Monthly
[16] http://global-q.org/index.html

ME	ME is the difference between the monthly returns on diversified portfolios of small and large stocks.
I/A	I/A is the difference between the monthly returns on diversified portfolios of low and high investment stocks.
ROE	ROE is the difference between the monthly returns on diversified portfolios of high and low profitability stocks.
EG	EG is the difference between the monthly returns on diversified portfolios of high and low growth stocks.

Table 1. Summary statistics

	Mean	Std.	Q1	Median	Q3
Size (in $ mil.)	1132	9150	29	113	490
B/M	0.76	1.47	0.25	0.48	0.86
Momentum	0.11	0.84	-0.34	-0.04	0.34
XF	0.17	0.22	0.02	0.07	0.22
ΔE	0.07	0.16	0.00	0.01	0.05
ΔD	0.09	0.15	0.00	0.03	0.12
$BHAR_{-3}$	0.17	1.22	-0.53	-0.14	0.45
$BHAR_{3}$	0.03	3.43	-1.50	-0.79	0.39
$BHAR_{post}$	-0.04	1.45	-0.82	-0.35	0.29

The sample consists of 24,089 firm-years from 1988 to 2021. Size is market value of equity. B/M is book-to-market ratio. Investment is the percentage change in total assets. Momentum is the cumulative compounding returns in the prior year. XF is net external financing, calculated as ΔE + ΔD. ΔE is net equity financing. ΔD is net debt financing. All external financing variables are deflated by total assets at the beginning of the year. Sample firm-years are those in which at least some equity or debt is externally raised, and the net financing XF is positive. BHAR-3 is the SMB-adjusted BHAR from the fourth year prior up through financing to the third year prior to financing. $BHAR_3$ is the SBM-adjusted buy-and-hold return from the fourth year prior to financing up through the third year after financing. The SBM-adjusted buy-and-hold return is defined as the raw buy-and-hold return of the portfolio minus the return on a matched size–B/M (SBM) portfolio. $BHAR_{post}$ is the SMB-adjusted buy-and-hold return over the three years post financing only. The details of the variable definitions are given in the Appendix.

Table 2. Carhart four factors

	Alpha	MKT	SMB	HML	UMD	Adj.R^2
Top issuer portfolios in the past 1 year						
All	**-0.60*****	1.24***	0.65***	-0.51***	-0.14***	70%
	(-2.76)	(3.69)	(8.07)	(-6.22)	(-2.71)	
Low	**-1.30*****	1.31***	1.13***	-0.78***	-0.13*	62%
	(-3.99)	(3.75)	(7.75)	(-7.40)	(-1.79)	
High	**-0.40***	1.22***	0.47***	-0.42***	-0.14**	62%
	(-1.67)	(3.00)	(4.10)	(-4.27)	(-2.16)	
Top issuer portfolios in the past 2 years						
All	**-0.56*****	1.24***	0.57***	-0.44***	-0.16***	73%
	(-2.83)	(3.97)	(6.08)	(-5.72)	(-2.74)	
Low	**-1.16*****	1.35***	1.16***	-0.64***	-0.12*	67%
	(-3.87)	(4.32)	(8.60)	(-6.72)	(-1.83)	
High	-0.32	1.19***	0.37***	-0.41***	-0.16**	66%
	(-1.40)	(2.75)	(2.59)	(-4.42)	(-2.06)	
Top issuer portfolios in the past 3 years						
All	**-0.35***	1.24***	0.52***	-0.42***	-0.14***	76%
	(-1.88)	(4.36)	(7.01)	(-6.74)	(-2.71)	
Low	**-0.95*****	1.39***	1.02***	-0.64***	-0.04	66%
	(-3.24)	(4.97)	(6.89)	(-6.75)	(-0.61)	
High	-0.18	1.20***	0.33***	-0.34***	-0.16**	66%
	(-0.83)	(3.03)	(2.71)	(-3.93)	(-2.42)	

We rank all firms each year into two groups by CF ratio level, which is defined as the ratio of CF to total assets in Year 0. We refer to the group with a ratio higher than or equal to the median ratio as the high CF group and the group with a ratio lower than the median ratio as the low CF group. We fit the following factor regression to the top issuer portfolios:

$$R_{p,t} - R_{f,t} = \alpha + \beta(R_{MK,t} - R_{f,t}) + sSMB_t + hHML_t + mUMD_t + v_t,$$

The top issuer portfolios consist of firms that have been in the top decile in a year in the past year, two years, or three years, respectively. The portfolio returns, $R_{p,t}$, are the value-weighted monthly returns of firms in the portfolio. The monthly returns of the market (MKT), the size (SMB), the value (HML), the momentum (UMD) factor portfolios, and the risk-free rates ($R_{f,t}$) are from Kenneth French's website. The *t*-statistics (in parentheses) are calculated using the White (1980) heteroskedasticity-consistent standard errors. Only *t*-statistics for the market slope test whether the coefficient estimate is different from 1. The sample period covers from 1988 to 2021. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 3. Fama-French five factors

	Alpha	MKT	SMB	HML	RMW	CMA	Adj.R^2
Top issuer portfolios in the past 1 year							
All	**-0.44***	1.17**	0.59***	-0.30***	-0.26**	-0.55***	71%
	(-1.94)	(2.47)	(6.61)	(-2.77)	(-2.21)	(-3.46)	
Low	**-1.07*****	1.24***	0.94***	-0.71***	-0.60***	-0.18	63%
	(-3.24)	(2.84)	(7.28)	(-4.90)	(-3.86)	(-0.87)	
High	-0.28	1.15**	0.46***	-0.18	-0.12	-0.64***	62%
	(-1.15)	(2.02)	(4.25)	(-1.48)	(-0.76)	(-3.58)	
Top issuer portfolios in the past 2 years							
All	**-0.43****	1.19***	0.50***	-0.22**	-0.27**	-0.49***	75%
	(-2.06)	(2.76)	(5.44)	(-2.16)	(-2.10)	(-3.66)	
Low	**-0.79*****	1.23***	0.92***	-0.48***	-0.78***	-0.32*	69%
	(-2.66)	(2.82)	(9.09)	(-3.72)	(-5.88)	(-1.85)	
High	-0.28	1.16**	0.36***	-0.19	-0.07	-0.51***	64%
	(-1.14)	(2.03)	(3.01)	(-1.58)	(-0.42)	(-3.03)	
Top issuer portfolios in the past 3 years							
All	-0.20	1.18***	0.45***	-0.21**	-0.29***	-0.46***	76%
	(-1.06)	(3.02)	(5.60)	(-2.37)	(-2.91)	(-3.68)	
Low	**-0.55***	1.27***	0.76***	-0.55***	-0.80***	-0.15	69%
	(-1.92)	(3.42)	(6.92)	(-4.37)	(-5.62)	(-0.89)	
High	-0.13	1.16**	0.33***	-0.10	-0.07	-0.56***	66%
	(-0.57)	(2.28)	(3.11)	(-0.85)	(-0.47)	(-3.46)	

We rank all firms each year into two groups by CF ratio level, which is defined as the ratio of CF to total assets in Year 0. We refer to the group with a ratio higher than or equal to the median ratio as the high CF group and the group with a ratio lower than the median ratio as the low CF group. We fit the following factor regression to the top issuer portfolios:

$$R_{p,t} - R_{f,t} = \alpha + \beta(R_{MK,t} - R_{f,t}) + sSMB_t + hHML_t + rRMW_t + cCMA_t + v_t,$$

The top issuer portfolios consist of firms that have been in the top decile in a year in the past year, two years, or three years, respectively. The portfolio returns, $R_{p,t}$, are the value-weighted monthly returns of firms in the portfolio. The monthly returns of the market (MKT), the size (SMB), the value (HML), the profitability (RMW), the investment (CMA) factor portfolios, and the risk-free rates ($R_{f,t}$) are from Kenneth French's website. The *t*-statistics (in parentheses) are calculated using the White (1980) heteroskedasticity-consistent standard errors. Only *t*-statistics for the market slope test whether the coefficient estimate is different from 1. The sample period covers from 1988 to 2021. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 4. Quality minus junk

	Alpha	MKT	SMB	HML	QMJ	Adj.R^2
Top issuer portfolios in the past 1 year						
All	-0.32	1.12*	0.47***	-0.49***	-0.54***	71%
	(-1.41)	(1.64)	(5.21)	(-6.02)	(-4.88)	
Low	**-0.93*** **	1.15	0.91***	-0.78***	-0.66***	63%
	(-2.86)	(1.61)	(6.38)	(-7.18)	(-4.59)	
High	-0.16	1.11	0.31**	-0.40***	-0.48***	62%
	(-0.62)	(1.37)	(2.47)	(-4.01)	(-3.57)	
Top issuer portfolios in the past 2 years						
All	-0.27	1.12	0.37***	-0.41***	-0.58***	75%
	(-1.31)	(1.68)	(3.61)	(-5.45)	(-5.64)	
Low	**-0.63** **	1.12	0.88***	-0.65***	-0.86***	69%
	(-2.17)	(1.40)	(7.24)	(-7.23)	(-6.68)	
High	-0.11	1.10	0.21	-0.37***	-0.47***	63%
	(-0.46)	(1.20)	(1.40)	(-3.83)	(-3.70)	
Top issuer portfolios in the past 3 years						
All	-0.05	1.11*	0.33***	-0.41***	-0.56***	77%
	(-0.26)	(1.78)	(4.09)	(-6.34)	(-6.08)	
Low	-0.33	1.12	0.73***	-0.69***	-0.91***	70%
	(-1.14)	(1.47)	(5.29)	(-7.46)	(-6.85)	
High	0.00	1.12	0.18	-0.30***	-0.43***	66%
	(0.01)	(1.54)	(1.41)	(-3.27)	(-3.80)	

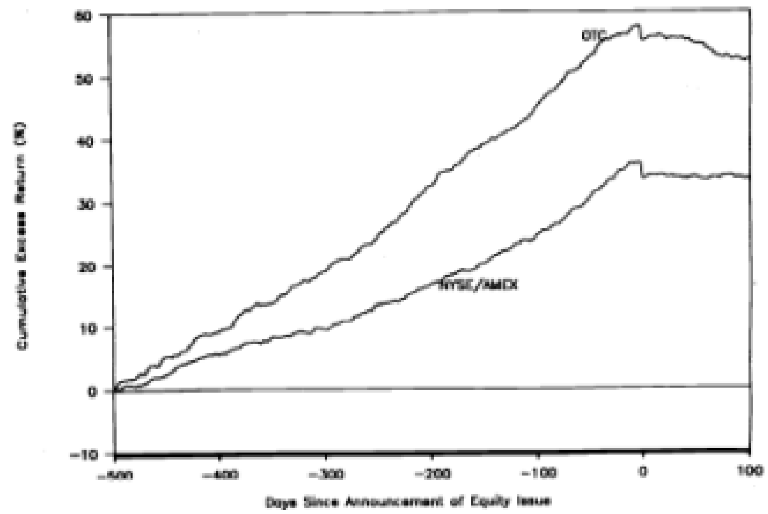
We rank all firms each year into two groups by CF ratio level, which is defined in (4) as the ratio of CF to net external financing in Year 0. We refer to the group with a ratio higher than or equal to the median ratio as the high CF group and to the group with a ratio lower than the median ratio as the low CF group. We fit the following Fama–French (1993) three-factor regressions augmented by the QMJ factor to the top issuer portfolios:

$$R_{p,t} - R_{f,t} = \alpha + \beta(R_{MK,t} - R_{f,t}) + sSMB_t + hHML_t + qQMJ_t + v_t,$$

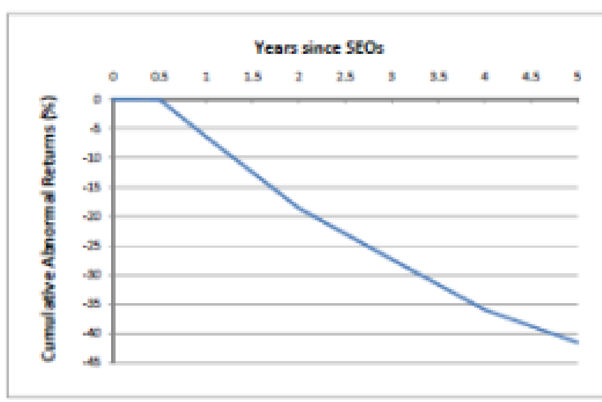
The top issuer portfolios consist of firms that have been in the top decile in a year in the past year, two years, or three years, respectively. The portfolio returns $R_{p,\,t}$ are the value-weighted monthly returns of firms in the portfolio. The monthly returns of the market (MKT), the size (SMB), the value (HML), the quality (QMJ) factor portfolios, and the risk-free rates ($R_{f,t}$) are from Kenneth French's and Lasse H. Pedersen's websites. The *t*-statistics (in parentheses) are calculated using the White (1980) heteroskedasticity-consistent standard errors. Only the *t*-statistics for the market slope test whether the coefficient estimate is different from 1. The sample period covers from 1988 to 2021. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Figure 1. Cumulative abnormal returns before, upon, and after equity issues

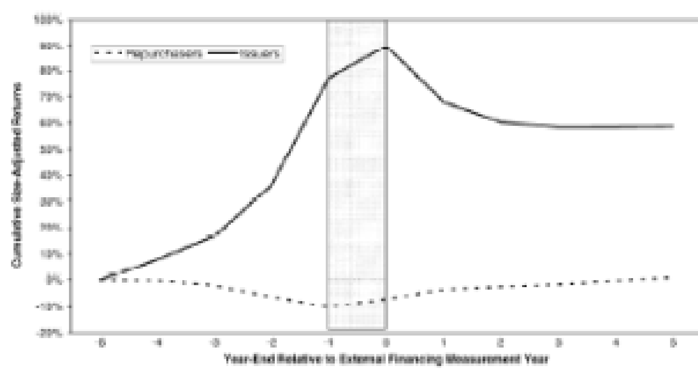
Figure 1 (a), which is from Korajczyk et al. (1990), depicts the cumulative abnormal returns from 500 days before equity issues to 100 days afterward. Figure 1 (b) is compiled from Table III in Loughran and Ritter (1995) for the cumulative abnormal returns in the five-year period after seasoned equity offerings. Figure 1 (c), which is from Bradshaw et al. (2006), constructs a measure nesting all external financing activities and reports cumulative abnormal returns five years before the financing measure and five years afterward.



(a)



(b)



(c)

Figure 2. SBM-adjusted buy-and-hold abnormal returns for top issuer portfolios from the high CF group and the low CF group

The figure reports abnormal returns for the top issuer portfolio within the high CF group (the green line), the top issuer portfolio within the low CF group (the red line), and the average of these two top issuer portfolios (the brown line) over the 10-year window from Year -4 to Year 5. Specifically, we first divide the firms with net external financing activities into high and low CF groups by the levels of CF (i.e., cash flow from operations scaled by net external funds). Then, within each group, we rank firms into deciles according to their net external financing XF. The abnormal return is defined as the buy-and-hold return of the portfolio minus the return on a matched size–B/M (SBM) portfolio. The sample period is from 1988 to 2021.

We define Year 0 as the fiscal year in which external financing amounts are measured. To allow sufficient time for the release of the financial statement data, we define Month 0 as the third month after the end of Year 0. The stock's total return that month is indicated by R_0. The following month begins the post-financing period, and its total return is denoted as R_1. In general, Rm is a stock's total return for the $(m+3)^{\text{th}}$ month in calendar time after Month 0. We define BHR_τ as the buy-and-hold return over the window from Year -4 up through Year τ:

$$BHR_\tau = \left[\prod_{m=-59}^{12*\tau} (1+R_m) \right] - 1,$$

where $\tau \in \{-4, \ldots, 5\}$. If a stock is delisted during the computation period, we apply the CRSP delisting return in the delisting month.

The benchmark-adjusted BHAR is defined as

$$BHAR_\tau = BHR_\tau\text{-}BENCH_\tau,$$

where BENCHτ is calculated using the size and B/M benchmark portfolio's monthly returns, defined as the value-weighted returns of all firms in this portfolio, where the value is a firm's market equity at the beginning of each month. We follow Daniel et al. (1997) to construct the size and B/M benchmark portfolios.

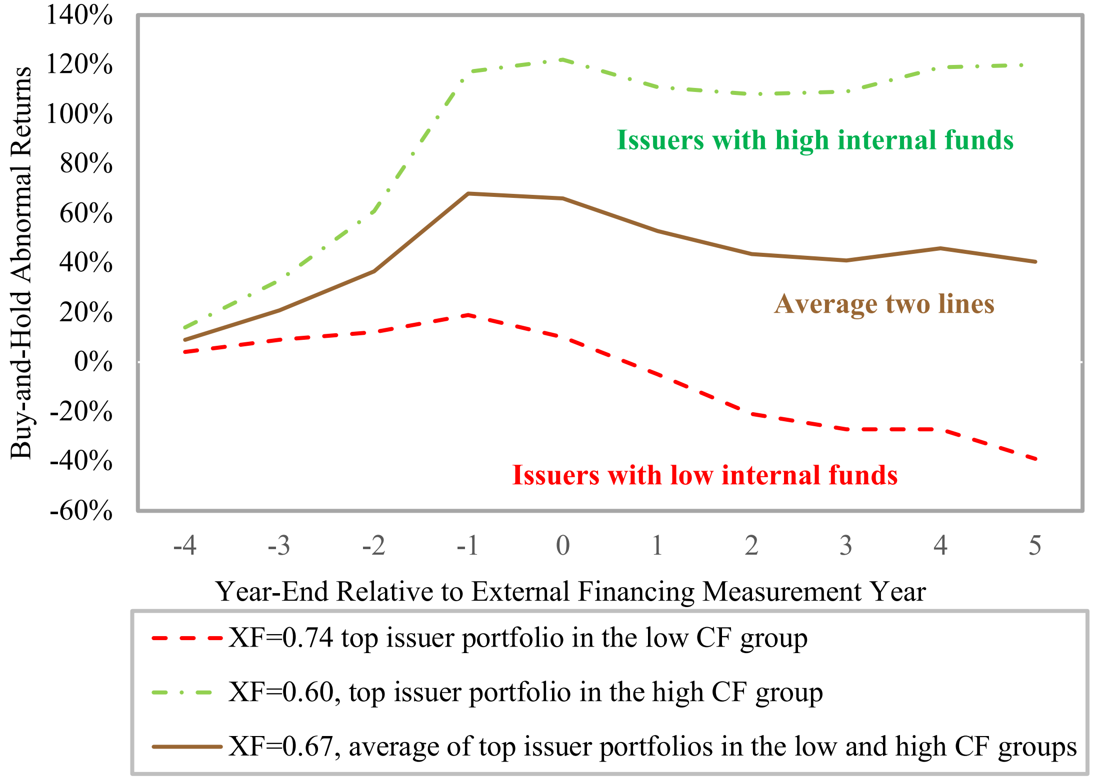

140%
120%
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
Buy-and-Hold Abnormal Returns
Issuers with high internal funds
Average two lines
Issuers with low internal funds
-4
-3
-2
-1
0
1
2
3
4
5
Year-End Relative to External Financing Measurement Year
XF=0.74 top issuer portfolio in the low CF group
XF=0.60, top issuer portfolio in the high CF group
XF=0.67, average of top issuer portfolios in the low and high CF groups

Figure 3. SBM-adjusted buy-and-hold abnormal returns for comparable issuer portfolios from the high CF group and the low CF group

The figure reports the SBM-adjusted buy-and-hold returns of the top second issuer portfolio in the high CF group (green line) and the top third issuer portfolio in the low CF group (red line). Those two portfolios have the same levels of external financing, 0.29, but different levels of CF. The sample period is from 1988 to 2021.

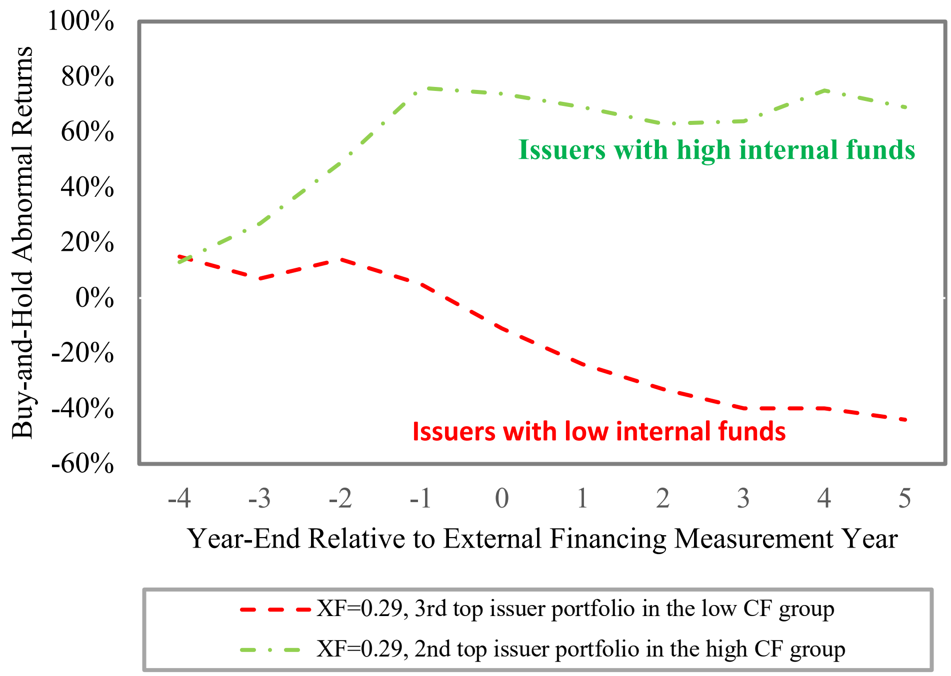


Figure 4. SBMM-adjusted buy-and-hold abnormal returns for top issuer portfolios from the high CF group and the low CF group

The figure reports abnormal returns for the top issuer portfolio within the high CF group (the green line), the top issuer portfolio within the low CF group (the red line), and the average of these two top issuer portfolios (the brown line) over the 10-year window from Year -4 to Year 5. Specifically, we first divide the firms with net external financing activities into high and low CF groups by the level of CF (i.e., cash flow from operations scaled by net external funds). Then, within each group, we rank firms into deciles according to their net external financing XF. The abnormal return is defined as the buy-and-hold return of the portfolio minus the return on a matched size–B/M–momentum (SBMM) portfolio. The sample period is from 1988 to 2021.

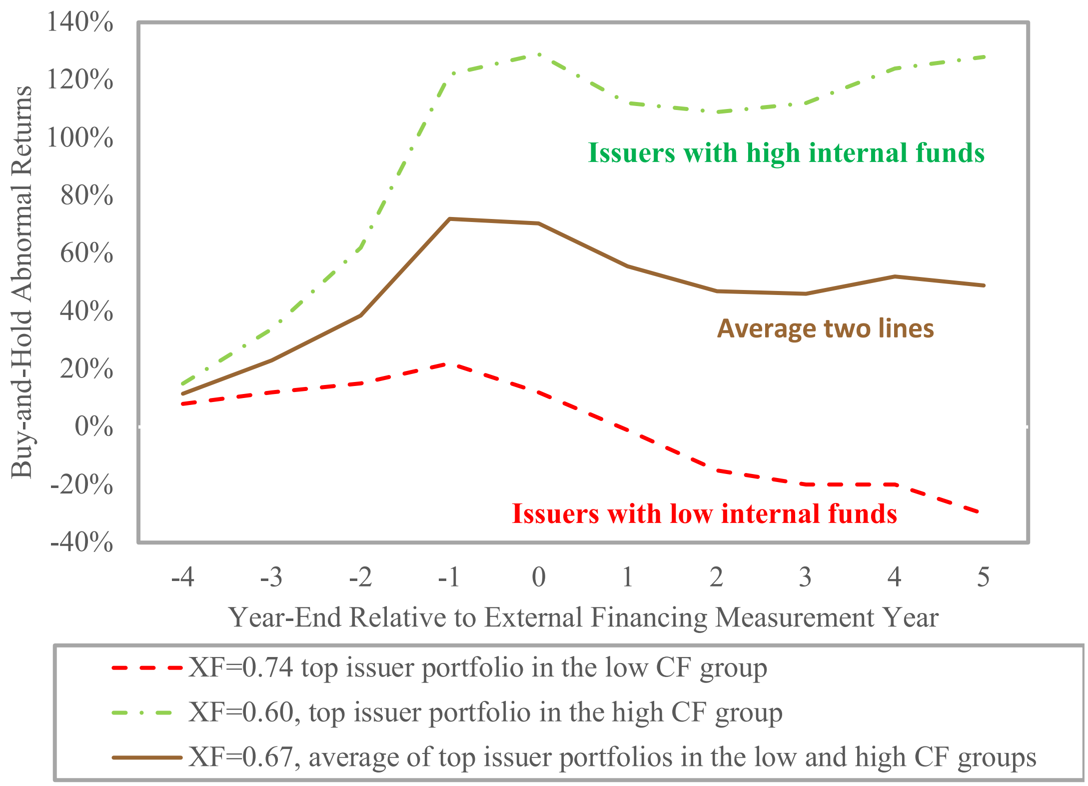


Figure 5. SBMI-adjusted buy-and-hold abnormal returns for top issuer portfolios from the high CF group and the low CF group

The figure reports abnormal returns for the top issuer portfolio within the high CF group (the green line), the top issuer portfolio within the low CF group (the red line), and the average of these two top issuer portfolios (the brown line) over the 10-year window from Year -4 to Year 5. Specifically, we first divide the firms with net external financing activities into high and low CF groups by the level of CF (i.e., cash flow from operations scaled by net external funds). Then, within each group, we rank firms into deciles according to their net external financing XF. The abnormal return is defined as the buy-and-hold return of the portfolio minus the return on a matched size–B/M–momentum–investment (SBMI) portfolio. The sample period is from 1988 to 2021.

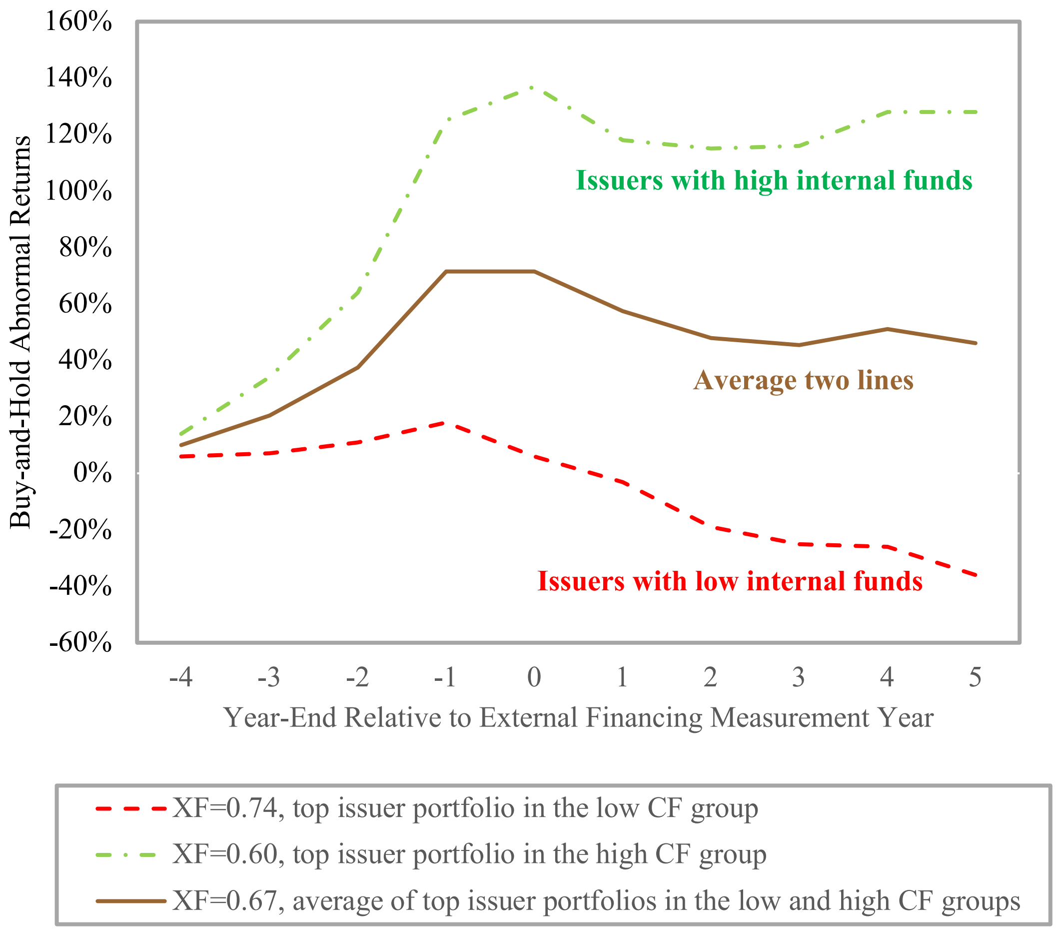
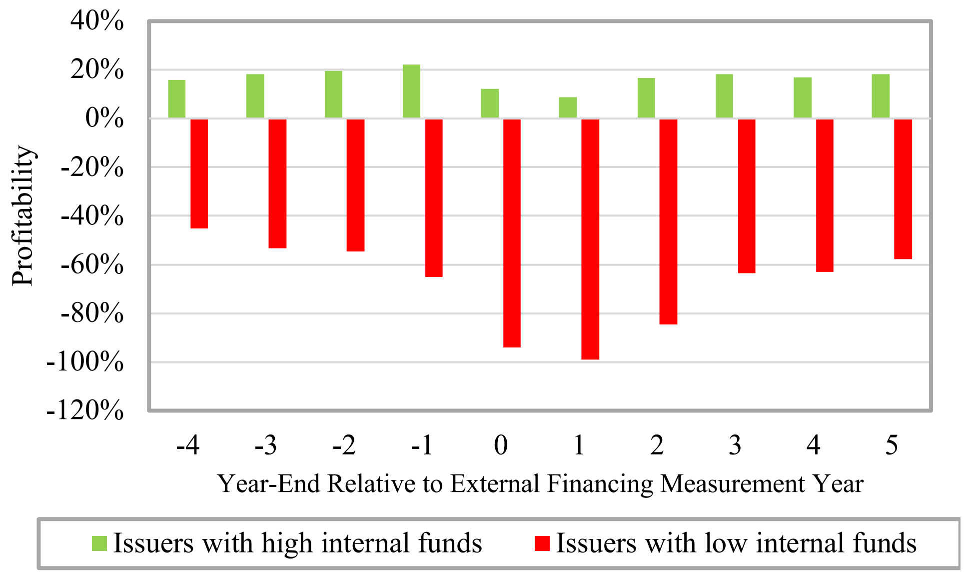


Figure 6. Profitability for top issuer portfolios from the high CF group and the low CF group

The figure reports profitability for the top issuer portfolio within the high CF group (the green bars) and the top issuer portfolio within the low CF group (the red bars) over the 10-year window from Year -4 to Year 5. Specifically, we first divide the firms with net external financing activities into high and low CF groups. Then, within each group, we rank firms into deciles according to their net external financing XF. Profitability is defined as profits (i.e., revenues minus cost of goods sold, and selling, general and administrative expenses, interest expenses) divided by book equity. The sample period is from 1988 to 2021.



Understanding Stock Price Behavior around External Financing

Internet Appendix

Table IA1. *q*-factor model

	Alpha	MK	ME	I/A	ROE	Adj.R^2
Top issuer portfolios in the past 1 year						
All	-0.31	1.13*	0.49***	-0.88***	-0.34***	69%
	(-1.35)	(1.75)	(5.96)	(-6.32)	(-3.28)	
Low	**-0.77*** **	1.10	0.88***	-1.18***	-0.67***	60%
	(-2.11)	(0.98)	(5.81)	(-7.34)	(-5.25)	
High	-0.20	1.14*	0.33***	-0.77***	-0.24*	61%
	(-0.78)	(1.75)	(2.76)	(-4.61)	(-1.91)	
Top issuer portfolios in the past 2 years						
All	-0.32	1.15**	0.40***	-0.70***	-0.35***	72%
	(-1.51)	(2.16)	(3.79)	(-5.32)	(-3.39)	
Low	**-0.61***	1.12	0.92***	-1.05***	-0.73***	67%
	(-1.87)	(1.34)	(6.78)	(-7.43)	(-6.82)	
High	-0.18	1.14	0.23	-0.62***	-0.23*	61%
	(-0.74)	(1.73)	(1.47)	(-3.72)	(-1.74)	
Top issuer portfolios in the past 3 years						
All	-0.07	1.14**	0.36***	-0.71***	-0.38***	75%
	(-0.36)	(2.28)	(4.66)	(-6.64)	(-4.01)	
Low	-0.36	1.16*	0.79***	-0.96***	-0.73***	66%
	(-1.11)	(1.75)	(5.06)	(-6.28)	(-6.39)	
High	-0.01	1.14*	0.19	-0.61***	-0.24**	66%
	(-0.06)	(1.93)	(1.42)	(-4.31)	(-2.08)	

We rank all firms each year into two groups by CF ratio level, which is defined as the ratio of CF to net external financing in Year 0. We refer to the group with a ratio higher than or equal to the median ratio as the high CF group and the group with a ratio lower than the median ratio as the low CF group. We fit the following factor regressions to the top issuer portfolios:

$$R_{p,t} - R_{f,t} = \alpha + \beta_{MK}(R_{MK,t} - R_{f,t}) + \beta_{ME}ME_t + \beta_{I/A}I/A_t + \beta_{ROE}ROE_t + v_t,$$

The top issuer portfolios consist of firms that have been in the top decile in a year in the past year, two years, or three years, respectively. The portfolio returns, $R_{p,t}$, are the value-weighted monthly returns of firms in the portfolio. The monthly returns of the market (MK), the size (ME), the investment (I/A), the ROE factor portfolios, and the risk-free rates ($R_{f,t}$) are from the following website: http://global-q.org/factors.html. The *t*-statistics (in parentheses) are calculated using the White (1980) heteroskedasticity-consistent standard errors. Only *t*-statistics for the market slope test whether the coefficient estimate is different from 1. The sample period covers from 1988 to 2021. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Table IA2. *q*-factor model plus the expected growth factor

	Alpha	MKT	ME	I/A	ROE	EG	Adj.R^2
Top issuer portfolios in the past 1 year							
All	-0.12	1.09	0.45***	-0.89***	-0.23**	-0.32**	69%
	(-0.50)	(1.22)	(5.57)	(-6.58)	(-1.98)	(-2.03)	
Low	**-0.87****	1.12	0.90***	-1.18***	-0.73***	0.16	60%
	(-2.44)	(1.26)	(5.93)	(-7.30)	(-4.62)	(0.63)	
High	0.09	1.08	0.27**	-0.78***	-0.08	-0.46***	62%
	(0.34)	(1.04)	(2.28)	(-4.88)	(-0.58)	(-2.82)	
Top issuer portfolios in the past 2 years							
All	-0.10	1.11	0.35***	-0.71***	-0.23*	-0.36**	73%
	(-0.45)	(1.56)	(3.43)	(-5.59)	(-1.81)	(-2.51)	
Low	**-0.61****	1.12	0.92***	-1.05***	-0.73***	0.01	67%
	(-1.97)	(1.42)	(6.69)	(-7.43)	(-5.86)	(0.04)	
High	0.13	1.08	0.16	-0.63***	-0.05	-0.49***	63%
	(0.50)	(1.00)	(1.07)	(-3.95)	(-0.34)	(-2.87)	
Top issuer portfolios in the past 3 years							
All	0.10	1.11*	0.32***	-0.72***	-0.28***	-0.27**	76%
	(0.50)	(1.70)	(4.37)	(-6.91)	(-2.59)	(-2.21)	
Low	-0.39	1.16	0.80***	-0.95***	-0.75	0.06	66%
	(-1.26)	(1.91)	(5.01)	(-6.28)	(-5.87)	(0.31)	
High	0.24	1.09	0.14	-0.62***	-0.10	-0.41***	66%
	(1.03)	(1.25)	(1.03)	(-4.55)	(-0.72)	(-2.77)	

We rank all firms each year into two groups by CF ratio level, which is defined as the ratio of CF to net external financing in Year 0. We refer to the group with a ratio higher than or equal to the median ratio as the high CF group and the group with a ratio lower than the median ratio as the low CF group. We fit the following factor regressions to the top issuer portfolios:

$$R_{p,t} - R_{f,t} = \alpha + \beta_{MK}(R_{MK,t} - R_{f,t}) + \beta_{ME}ME_t + \beta_{I/A}I/A_t + \beta_{ROE}ROE_t + \beta_{EG}EG_t + v_t,$$

The top issuer portfolios consist of firms that have been in the top decile in a year in the past year, two years, or three years, respectively. The portfolio returns, $R_{p,t}$, are the value-weighted monthly returns of firms in the portfolio. The monthly returns of the market (MK), the size (ME), the investment (I/A), the ROE, the expected growth (EG) factor portfolios, and the risk-free rates ($R_{f,t}$) are from the following website: http://global-q.org/factors.html. The *t*-statistics (in parentheses) are calculated using the White (1980) heteroskedasticity-consistent standard errors. Only *t*-statistics for the market slope test whether the coefficient estimate is different from 1. The sample period covers from 1988 to 2021. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Figure IA1. Profitability for top issuer portfolios from the high CF group and the low CF group: Alternative Profitability Measure

The figure reports profitability for the top issuer portfolio within the high CF group (the green bars) and the top issuer portfolio within the low CF group (the red bars) over the 10-year window from Year -4 to Year 5. Specifically, we first divide the firms with net external financing activities into high and low CF groups. Then, within each group, we rank firms into deciles according to their net external financing XF. The profitability is defined as profits (i.e., revenues minus cost of goods sold, and selling, general and administrative expenses, interest expenses) divided by total assets. The sample period is from 1988 to 2021.

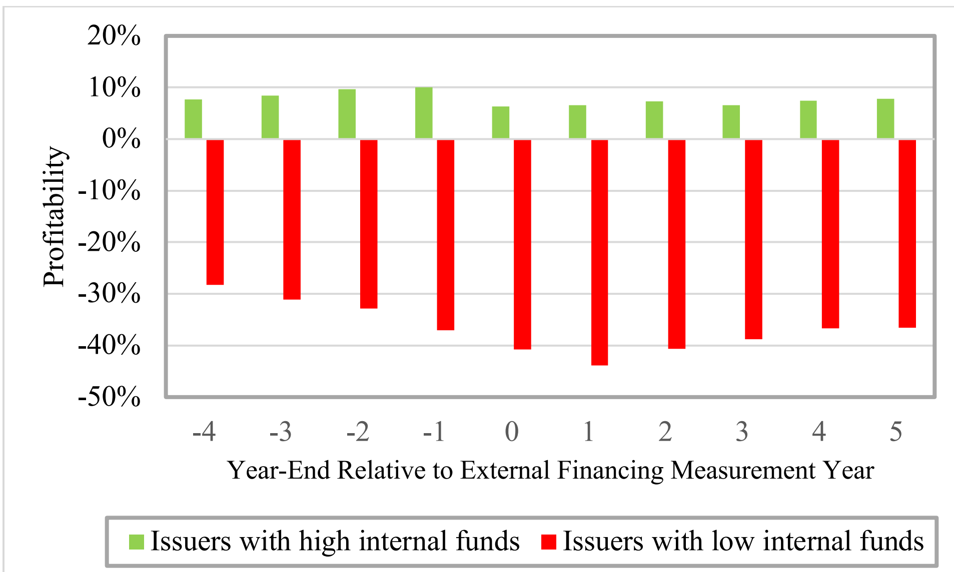


Figure IA2. Investments for top issuer portfolios from the high CF group and the low CF group

The figure reports investments for the top issuer portfolio within the high CF group (the green bars) and the top issuer portfolio within the low CF group (the red bars) over the 10-year window from Year -4 to Year 5. Specifically, we first divide the firms with net external financing activities into high and low CF groups. Then, within each group, we rank firms into deciles according to their net external financing XF. Investments is defined as changes in total assets, divided by lagged total assets. The sample period is from 1988 to 2021.