Average Cash-Savings Rates in Equity Issues: Is Cash a Side Show?

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Abstract

This study employs the average cash-savings rate, defined as the ratio of the increase in cash to issue proceeds, in exploring the forces that shape cash savings in equity issues. The marginal cash-savings rate (e.g., as high as 0.6 in McLean, 2011) overstates equity issuers' actual cash-savings rates by a wide margin. The average cash-savings rate increases with issue size and market-to-book, decreases with cash holdings, and has an inverted-U-shaped relation with sales growth. Equity-issuing firms do not prioritize cash savings over other uses like operating expenses, suggesting that cash is probably a side-show. Previously documented virtuous effects of cash all but disappear if we remove equity-issuing firms from the sample.

JEL classification: G30, G31, G32
Key words: Equity issuance, cash savings, cash holdings, operating expenses, market-to-book

1. Introduction

Equity issuance brings considerable amounts of capital to firms so it is important to investigate what equity issuers do with issue proceeds. In tackling this question, previous research has focused on the extent to which firms save cash from equity issues or those issues increase cash holdings (Kim and Weisbach, 2008; DeAngelo, DeAngelo and Stulz, 2010; McLean, 2011; Huang and Ritter, 2020). Interestingly, however, previous research presents two conflicting views. McLean (2011) reports that equity issuers save as much as over 60 percent of issue proceeds in cash so equity issues increase cash holdings substantially. In contrast, DeAngelo, DeAngelo and Stulz (2010) document that the bulk of issue proceeds are spent in the issue year so cash savings are very small.

This study seeks to shed light on the significance of cash savings from equity issues with a new measure of cash savings. In the process, we seek to unveil the forces behind equity issuers' propensity to save cash vs. spend on other uses. The extent to which firms prioritize cash savings in equity issues has relevance to a larger question of whether cash benefits firms or is rather a side show. Previous research suggests that cash creates virtuous effects in the form of higher firm value (Faulkender and Wang, 2006) and future growth (Fresard, 2010). However, these virtuous effects are not compatible with the view that firms do not prioritize cash savings as in DeAngelo et al. (2010). This study examines the nature of the value and growth effects that have been ascribed to cash.

Our prior is that actual cash-saving rates in equity issues may not be as high as McLean's (2011) estimate. Given that large cash savings raise concerns about agency problems, it is doubtful if investors supply capital to firms that save over sixty percent of issue proceeds in cash. In Graham and Harvey's (2001) survey of CFOs, cash savings are not among the top ten factors that influence managers' equity issuance decisions.[1] Similarly, in Walker and Yost's (2008) study of equity issuers' registration files, cash savings are not among the three stated usages of funds: investment, debt repayment, and general corporate purposes.[2]

In this study, we employ the *average cash-savings rate*, defined as the ratio of the increase in cash to issue proceeds ($\Delta Cash_t/SSTK_t$), to measure the propensity to save cash from equity issues. The average cash-savings rate quantifies the degree of cash savings in individual equity-issue years. In contrast, McLean

[1] Of the top ten factors identified in Graham and Harvey's (2001) survey, the factor closest to the notion of cash savings is "sufficiency of recent profits to fund activities", but this factor's relation to cash savings is rather remote.

[2] Although general corporate purposes may include cash savings, this usage category accounts for much less than half the total cases in Walker and Yost's (2008) study.

(2011) estimates the *marginal cash-savings rate*, which is a slope coefficient estimated for a group of firm-years or issue-years. We demonstrate that the marginal cash-savings rate overstates the degree of cash savings in individual equity-issue years because firms often spend more than issue proceeds (i.e., negative savings). Specifically, we predict that the average cash-savings rate increases with issue size but is lower than the marginal cash-savings rate. We also predict that the *average spending rate* on operating expenses, defined as the ratio of the increase in operating expenses to issue proceeds ($\Delta Expense_t/SSTK_t$), decreases with issue size but is higher than the *marginal spending rate* on operating expenses.[3]

Our investigation of pure equity issues over the period 1971-2016 reveals that the propensity to save cash from equity issues, as measured by the average cash-savings rate, is much more modest than is implied by the marginal cash-savings rate. Over this period, the mean average cash-savings rate is 0.251, suggesting that, on average, equity issuers save 25.1 cents on the dollar of issue proceeds. In stark contrast, the marginal cash-savings rate estimated for this period is as high as 0.682. As predicted, the average cash-savings rate increases with issue size. When we partition our sample into quintiles (from Q1 to Q5) based on issue size as measured by issue proceeds scaled by lagged assets ($SSTK_t/TA_{t-1}$), the mean average cash-savings rate for the Q1 issues (i.e., smallest issues) is negative at -0.025, whereas the corresponding mean for the Q5 issues (i.e., largest issues) is 0.416. Equity issues do not result in dramatic increases in the cash-to-assets ratio in the majority of issues. Except for the largest issues, the mean cash-to-assets ratio increases only slightly or even drops. Furthermore, across all issue-size quintiles, the mean cash-to-assets ratio decreases immediately in the post-issue years. These observations do not suggest that the cash-hoarding motive drives equity issue decisions.

To appraise whether equity issuers prioritize cash savings over other uses, we compare the average cash-savings rates with the average spending rate on operating expenses. As predicted, the average spending rate on operating expenses decreases with issue size but is higher than the marginal spending rate on those expenses. More importantly, for the full sample, the mean average spending rate on operating expenses ($\Delta Expense_t/SSTK_t$) is 0.694, which is much higher than the mean average cash-savings rate ($\Delta Cash_t/SSTK_t$) (0.251). In all issue-size quintiles except for the top quintile, the mean average spending rate on operating expenses exceeds the mean average cash-savings rate. Therefore, operating expenses appear to take

[3] A useful parallel in economics is individuals' average and marginal propensities to save or consume out of income. In general, the average propensities to save (APS) increase with income but are lower than the marginal propensity to save (MPS); conversely, the average propensities to consume (APC) decrease with income but are higher than the marginal propensity to consumer (MPC).

precedence over cash savings for the majority of equity issuers.

Our investigation reveals that, in addition to issue size, four factors are important in shaping equity issuers' cash savings: market-to-book, existing cash holdings, sales growth and institutional ownership. Market-to-book has a positive effect on the average cash-savings rate, as high market-to-book issuers increase cash holdings considerably—albeit temporarily—to support post-issue business expansions. Existing cash holdings have a negative effect, suggesting that large cash holdings allow firms to save less from equity issues. Sales growth has a positive effect at low levels of growth, but a negative effect at high levels of growth, as fast growth requires immediate deployment of issue proceeds. Institutional ownership has a positive effect, suggesting that strong governance or institutional backing allows firms to save more cash from issues.

We also examine each decade separately from the 1970s to the mid-2010s. In all five decades, the mean average cash-savings rate is substantially lower than the marginal cash-savings rate. It does not appear that the average cash-savings rate has risen over time.[4] We also consider equity issues that are accompanied by debt issues and debt retirement in the same year. Our key findings remain unchanged, regardless of whether firms issue or retire debt in the same year. We also examine whether equity issuers' propensity to save cash is high when their equity issues are motivated by temporarily high stock valuations (i.e., market-timed equity issues). Our results do not support this notion, as the average cash-savings rate is not negatively associated with post-issue stock returns. Additionally, our results provide little evidence that equity issuers' propensity to save cash increases with investment sentiment or issue cost.

Our findings suggest that cash is probably a sideshow, given that cash savings are not a priority in most equity issues. If cash is a sideshow, it probably has few virtuous effects. We revisit two previous findings that cash benefits firms in terms of stock return performance (Faulkender and Wang, 2006) and market share growth (Fresard, 2010). Our experiments show that the effects in the two studies are not necessarily the causal effects of cash *per se*. To elaborate, if we remove equity issuing firm-years from the sample, large cash increases no longer yield impressive stock returns. Thus, much of the valuation effect of cash documented in Faulkender and Wang (2006) may reflect the favorable stock return performance in equity issuing years. Similarly, if we remove equity issuing firm-years from the sample, firms with large cash holdings do not record fast market share growth. Thus, the effect of cash documented in Fresard (2010)

[4] Therefore, contrary to McLean (2011), this study does not suggest that cash savings from equity issues have contributed to the well-documented long-term increase in U.S. firms' cash holdings (e.g., Bates, Kahle and Stulz, 2009).

may arise because firms with large cash holdings issue equity frequently in large amounts, which in turn finances fast sales growth.

This study contributes to the literature on cash holdings and equity issues. First, this study elevates our knowledge of how much firms save cash from equity issues by using the average cash-savings rate, a measure of the propensity to save cash in individual equity issues. This study reveals that average cash-savings rates are generally much lower than the marginal cash-savings rate. We identify issue size, market-to-book, existing cash holdings, sales growth and institutional ownership as factors that vary systematically with the average cash-savings rate. Given that equity issues do not result in significant increases in the cash-to-assets ratio or such increases are only temporary, the precautionary motive to hoard cash does not appear to drive equity issue decisions. Moreover, equity issues are unlikely to be a major source of the long-term increase in U.S. firms' cash holdings (e.g., Bates, Kahle, and Stulz, 2009).

Second, the present study enriches our understanding of equity issuers' allocation of issue proceeds. Our findings reveal that firms allocate the highest percentage of issue proceeds to increasing operating expenses (as opposed to saving cash or increasing fixed assets). Previous studies document that equity issues are concentrated among small, high market-to-book, and young firms (e.g., DeAngelo, DeAngelo, and Stulz, 2010) and frequently exploit high stock valuations (e.g., Baker and Wurgler, 2002). However, a relatively small number of studies analyze the uses or allocation of issue proceeds. And most of these studies do not consider expenses as a use of issue proceeds.[5] Our findings are related to the observation of DeAngelo, et al. (2010), Huang and Ritter (2020) and Denis and McKeon (2020) that a high fraction of equity issuers would have run out of cash due to operating losses. Surely, firms that suffer persistent operating losses cannot afford to hoard cash from equity issues, which may explain very low or even negative average cash-savings rates in relatively small equity issues in this study.

Third, our findings suggest that cash probably adds little value to firms, given that equity issuers saves relatively little in cash or deploy issue proceeds quickly. We reinterpret the findings of prior studies suggesting that cash has virtuous effects. We demonstrate that if we remove equity issuing firm-years, positive excess stock returns from large cash increases (Faulkender and Wang, 2006) and the market share growth of firms with large cash holdings (Fresard, 2010) weaken considerably or almost disappear. Thus,

[5] For example, Kim and Weisbach (2008), Gatchev, Spindt and Tarhan (2009) and Gatchev, Pulvino and Tarhan (2010) consider increases in asset items (such as cash and total assets), investments (such as capital expenditures, acquisitions and R&D) or reduction in debt among the uses of issue proceeds, but these studies do not include overall operating expenses as a use of issue proceeds.

much of the two effects could be statistical artifacts arising from equity issues.

Finally, our findings have implications for theories of cash holdings as they relate to equity issues. The trade-off theory of cash holdings assumes that firms move toward or stay deviated from optimal cash holdings by assessing the benefit of the optimum against the cost of adjustment (e.g., Opler et al., 1999). Our findings suggest that whether equity issues move firms toward optimal cash levels is a moot point for small and medium-size issues, as those issues make relatively little or even negative impacts on the cash-to-assets ratios. Meanwhile, large issues may shift optimal cash levels, rather than moving issuing firms toward optimal levels, given that those issues increase firm size remarkably (for example, firm size almost doubles as a result of large issues). Taken together, it does not appear that firms seek to move toward optimal cash levels with equity issues, large or small.

The agency-cost theory of cash holdings maintains that managers prefer high levels of cash as a way to increase their discretion (e.g., Jung, Kim and Stulz, 1996). However, it does not appear that the agency motive to hoard cash drives equity issue decisions, as equity issues do not result in significant increases in the cash-to-assets ratio or such increases are only temporary. Instead, our results could be consistent with the agency motive to spend cash, if managers benefit themselves by spending cash fast after equity issues. In a similar vein, Harford, Mansi and Maxwell (2008) suggest that poorly governed firms hold less cash and spend cash faster.

The rest of the paper is organized as follows. Section 2 provides background on the average and marginal cash-savings rates from equity issuance and describes the data. Sections 3 and 4 discuss our empirical analyses and present the results. Section 5 concludes.

2.1. Background: marginal versus average cash-savings rate

In this section, we compare the marginal cash-savings rate (i.e., the marginal propensity to save cash) and the average cash-savings rate (i.e., the average propensity to save cash) in equity issuance. We demonstrate that the marginal cash-savings rate is a slope coefficient and, as such, is not necessarily equal to the percentage of issue proceeds that individual issuers save in cash. A useful analogy is the distinction between the marginal and average propensities to save out of income in economics.

Let's suppose that issue proceeds are either saved in cash or spent.

$$SSTK_{it} = \Delta Cash_{it} + Spending_{it} \quad (1)$$

where subscripts *i* and *t* denote firm and time, respectively. $SSTK_{it}$ is issue proceeds, $\Delta Cash_{it}$ is the change

in cash and $Spending_{it}$ encompasses an array of outlays like expenses and investing in non-cash assets.

In estimating the marginal cash-savings rate, we assume a linear relationship between the change in cash and issue proceeds:

$$\Delta Cash_{it} = a_0 + a_1 \cdot SSTK_{it} \tag{2}$$

The marginal cash-savings rate is the slope coefficient, a_1, which is estimated for a given group of equity issues. In comparison, the average cash-savings rate, $\Delta Cash_{it}/SSTK_{it}$, is the ratio of the change in cash to issue proceeds, which is measured for each individual issue. The average cash-savings rates are related to the marginal cash-savings rate as follows:

$$\frac{\Delta Cash_{it}}{SSTK_{it}} = \frac{a_0}{SSTK_{it}} + a_1 \tag{4}$$

If the intercept, a_0, is negative, then the average cash-savings rates are lower than the marginal cash-savings rate—or put differently, the marginal cash-savings rate overstates individual issues' propensity to save cash. We posit that a negative a_0 is likely because issuers' spending often exceeds issue proceeds and, as a result, their cash holdings decrease (i.e., negative cash savings). Moreover, if this is case, then the average cash-savings rates have an upward sloping relationship with issue proceeds ($SSTK_{it}$). Appendix A.1. illustrates these predictions.

Similarly, we can imagine a linear relationship between spending and issue proceeds.

$$Spending_{it} = b_0 + b_1 \cdot SSTK_{it} \tag{3}$$

We take b_1 to be the marginal spending rate (i.e. the marginal propensity to spend), which is a slope coefficient estimated for a given group of equity issues. In contrast, the average spending rate (i.e., the average propensity to spend), $Spending_{it}/SSTK_{it}$,, is calculated for individual issues and has the following relation with the marginal spending rate.

$$\frac{Spending_{it}}{SSTK_{it}} = \frac{b_0}{SSTK_{it}} + b_1 \tag{4}$$

If the intercept, b_0, is positive, then the average spending rates ($\Delta Spending_{it}/SSTK_{it}$) are higher than the marginal spending rate (b_1)—or, put differently, the marginal spending rate understates the average spending rates. We posit that a positive b_0 is likely, as issuers spend at least some fraction of issue proceeds (therefore, negative spending is unlikely). Consequently, the average spending rates have a downward

sloping relationship with issue proceeds ($SSTK_{it}$), as illustrated in Appendix A.1.

2.2. Data and variables

Our primary data source is the *Compustat* database, although we also use the *CRSP* database for stock return performance. To construct our data set, we begin with the universe of companies, both active and inactive, available in *Compustat* at any time over the period 1971-2016. We drop firms whose primary segments are regulated utilities (SIC codes 4800–4829 and 4910–4949) or financial services operations (SIC codes 6000–6999). We also drop firms if book assets are missing or book equity is nonpositive. We restrict our attention to seasoned equity issues so we drop IPOs by removing firm-years in which the firm's stock price appears first in the *CRSP* or *Compustat* database.

To measure equity issue proceeds, we use sale of common and preferred stock [SSTK], a statement-of-cash-flow item in *Compustat*, as in McLean (2011). In our main analyses, we focus exclusively on pure equity issues by dropping firm-years in which debt issues or debt retirements take place. Specifically, pure equity issues are defined as firm-years in which equity issue proceeds ([SSTK]) are at least 10% of lagged book assets but total debt does not increase or decrease by more than 10% of lagged book assets. This approach filters out small equity issues that are frequently initiated by employee stock option exercises (e.g., McKeon, 2015). A similar approach to identifying equity and debt issues has been employed in Hovakimian, Opler, and Titman (2001) and Leary and Roberts (2010).[6]

In auxiliary analyses, we compare dual equity-and-debt issues (dual issues, in short) and debt-retiring equity issues (debt-retiring issues, in short) with pure equity issues in their allocation of issue proceeds.[7] Both dual issues and debt-retiring issues are firm-years in which equity issue proceeds are at least 10 of lagged book assets. However, total debt increases and decreases by more than 10% of lagged book assets in dual issues and debt-retiring issues, respectively.

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[6] These two studies use 5% of lagged book assets as the threshold to identify equity issues. In comparison, we use 10% of lagged book assets to mitigate the extreme-value problem concerning our measure of the average cash-savings rate, defined as the ratio of the increase in cash to equity issue proceeds (denoted by $\Delta Cash_t/SSTK_t$). Because issue size is the divisor, small issues can give rise to extreme values. However, our conclusions remain unchanged qualitatively if we use 5% of lagged book assets as our threshold.

[7] We focus our attention to pure equity issues in our main analyses because dual issues and debt-retiring issues present measurement issues and/or are not so comparable to pure equity issues. In the case of dual issues, debt issue presents a challenge to accurately measuring the cash-savings rate from equity issue proceeds, as debt issue proceeds are also a source of cash savings. In the case of debt-retiring issues, a high fraction of issue proceeds is presumed to be spent on retiring debt; hence, debt-retiring issues are not comparable to pure equity issues in terms of savings or uses of issue proceeds. Hovakimian (2006) and Leary and Roberts (2010) suggest that the firm characteristics of equity issues are widely different depending on whether debt issues or retirements happen in the same year.

Appendix Table A.2 provides the definitions of the variables used in this study. To address extreme observations, we winsorize each variable at the 1st and 99th percentiles.

3. Main Empirical results

3.1. Average cash-saving rates and changes in cash holdings of the full sample of pure equity issues

In Table 1, we examine the average and marginal propensities to save cash out of equity issues along with changes in cash holdings for our sample of pure equity issues over the period 1971-2016. Our first objective is to assess how well the marginal cash-savings rate describes individual equity issues' actual propensity to save cash. As the table reports, the marginal cash-savings rate, which is estimated for the full sample using McLean's regression model, is 0.683. This estimate is line with McLean's (2011) estimates that exceed 0.6.

The table presents evidence that equity issuers save far less in cash than the marginal savings rate implies. The mean average cash-savings rate ($\Delta Cash_t/SSTK_t$) for our sample is only 0.251, which is far lower than the marginal cash-savings rate (0.683). Hence, on average, equity issuers in our sample save only 25.1 cents of a dollar of issue proceeds. Furthermore, equity issues do not increase the cash-to-assets ratio dramatically, as the mean cash-to-assets ratio increases moderately from 0.3005 at *t-1* to 0.3247 at *t* as a result of equity issues.

Additionally, the table reports two percentages. First, the percentage of equity issues in which cash holdings increase relative to the previous year ($\Delta Cash_t > 0$) is 68.6%. Although this percentage is high, it also indicates that a sizable fraction of issues (more than 30%) result in decreases in cash holdings. Second, the percentage of equity issues in which the cash-to-assets ratio increases from the previous year ($\Delta(Cash/TA)_t > 0$) is 57.4%, indicating that the cash-to-assets ratio drops in more than 40% of equity issues. Therefore, an estimated marginal cash-savings rates of 0.6 or higher paints a misleading picture, given that significant fractions of issues result in decreases in cash holdings or cash-to-assets ratios.

To shed light on where firms allocate issue proceeds, we assume that issue proceeds are used to (i) increase cash, (ii) increase noncash assets, (iii) increase fixed assets and (iv) increase operating expenses.[8] The table shows that the increase in cash holdings scaled by lagged assets ($\Delta Cash_t/TA_{t-1}$) is 0.250 and 0.069 in mean and median, respectively. In comparison, the increase in operating expense ($\Delta Expense_t/TA_{t-1}$) and

[8] We acknowledge that this breakdown of issue proceeds is not based on an accounting identity. Also, some uses of the proceeds are omitted, e.g., servicing or repaying debt. However, those omitted uses are believed to be relatively small in magnitude.

the increase in fixed assets ($\Delta FixedAssets_t/TA_{t-1}$) are either larger or comparable in size in both mean and median. For example, the increase in operating expenses is 0.256 and 0.153 in mean and median, respectively, both of which are higher than the mean and median of the increase in cash holdings. Therefore, it does not appear that equity issuers prioritize saving cash in allocating their issue proceeds.

3.2. Average cash-savings rates and key firm characteristics of subgroups by issue size

As we demonstrated in Appendix A.1, the average cash-savings rate ($\Delta Cash_t/SSTK_t$) is expected to increase with issue size but not to exceed the marginal propensity to save cash.

In Table 2, we assess these predictions by partitioning our sample of pure equity issues into quintiles, Q1 through Q5, based on issue size, as measured by issue proceeds scaled by lagged assets ($SSTK_t/TA_{t-1}$). Panel A shows that issue size increases at an increasing rate from Q1 (smallest issues) to Q5 (largest issues). The mean issue size for the Q5 issues is remarkably large (1.765); in comparison, this mean is relatively modest in the first four quintiles, ranging from 0.126 in Q1 to 0.632 in Q4.

Panel A shows that, consistent with our predictions, the average cash-savings rate ($\Delta Cash_t/SSTK_t$) increases with issue size. The mean average cash-savings rates are only 0.139 and 0.105, in Q1 and Q2, respectively, but this mean increases to 0.192 in Q3, 0.336 in Q4 and 0.482 in Q5. The Q5 issues command the highest mean average cash-savings rates, as its mean value (0.482) indicates that, on average, these issuers save almost half of issue proceeds in cash.

Furthermore, the mean average cash-savings rate of any of the issue-size quintiles does not exceed the marginal cash-savings rate estimated for the whole sample (0.683, as reported in Table 1). The means of the five quintiles (Q1-Q5), ranging from 0.1055 to 0.4828, are nowhere near the marginal cash-savings rate of 0.683. This observation suggest that the marginal cash-savings rate overstates individual issues' propensity to save cash by wide margins.

Panel B of Table 2 reports the mean and median of the cash-to-assets ratio ($(Cash/TA)_{t-1}$) over the five-year period (*t-1*, *t+3*) for the issue-size quintiles. In small issues like the Q1 and Q2 issues, the mean cash ratio drops in the issue year and continues to drop in the post-issue years. For example, the Q1 issues' mean drops from 0.209 in year *t-1* from 0.194 in year *t* and then to 0.187 in year *t+3*. In the case of the Q3 and Q4 issues, their mean cash ratios increase in the issue year but decrease gradually in the subsequent years. For example, the Q4 issues' mean cash ratio increases solidly from year *t-1* (0.362) to year *t* (0.396), but then slides to 0.311 by year *t+3*. In the case of the Q5 issues, the mean cash ratio displays remarkably

large swings over the five-year period. Their mean jumps from 0.435 in year *t-1* to 0.535 in year *t*, but it takes a nose dive, decreasing to 0.443 in year *t+1*, 0.407 in year *t+2*, and 0.382 in year *t+3*.[9]

Our observations do not support the hypothesis that cash hoarding drives equity issues. For small issues, the mean cash-to-assets ratio drops in the issue year and continues to drop later. Although large issues increase the mean cash ratio substantially in the issue year, their means cash ratios decrease rapidly later, suggesting that the issue year's increase in the cash ratio is a one-off event.

Finally, Panel C of Table 2 shows that firm characteristics vary systematically with issue size. The market-to-book ratio increases with issue size, whereas firm size ($(log(CPI\ adj.\ Sales)_{t-1}$), operating profitability ($((EBITDA/TA)_{t-1}$) and asset tangibility ($((PP\&E/TA)_{t-1}$) decrease with issue size. As a result, the Q5 issuers have the highest mean market-to-book (7.180), whereas their means of firm size (1.5785), operating profitability (-0.423) and asset tangibility (0.192) are the lowest of all quintiles. The Q5 issuers achieve fast growth in assets and sales, as their mean asset growth ($\Delta Asset_t/Assets_{t-1}$) and sales growth ($\Delta Sales_t/Sales_{t-1}$) are the highest of all quintiles. Thus, it seems that the Q5 issuers' high pre-issue market-to-book ratios reflect their growth potential and their remarkably large issues help realize their growth opportunities.

Briefly returning to Panel B, the Panel shows that pre-issue cash holdings increase with issue size so that the Q5 issuers have the highest mean pre-issue cash-to-assets ratio of 0.435 ($(Cash/TA)_{t-1}$). Hence, the Q5 issues already have large cash holdings prior to their issues, but they issue equity in large amounts and increase cash even more—although their cash-to-assets ratios drop rapidly in subsequent years.

The bottom rows of Panel C report stock return performance. Collectively, equity issuers display outstanding stock return performance in year *t-1* and year *t*, followed by poor performance in year *t+1*. For the full sample, the mean stock returns in year *t-1* and year *t* ($Stock\ return_{t-1}$ and $Stock\ return_t$) are high with 0.406 and 0.293, respectively, but is negative with -0.006 in year *t*+1 ($Stock\ return_{t+1}$). These observations are in line with the patterns of pre-issue run-up and post-issue underperformance in previous research (e.g., Loughran and Ritter, 1997; Carlson, Fisher and Giammarino, 2006). Such patterns are more prominent in the Q5 issues. In both years *t-1* and *t*, the Q5 issues exhibit the highest mean stock returns of all issue-size quintiles, whereas in year *t+1*, these issues see the lowest (negative) mean return.

[9] In unreported results, we tabulated Panel B after subtracting the industry-year average from the cash ratio of each issue as a way to mitigate the possibility that the post-issue drop in the cash level is driven by some industry or economy-wide common trend. We found that the mean industry-adjusted cash ratio decreases in all issue-size quintiles from year *t* to year *t+3*. Also, the magnitude of the decline is most prominent in the Q5 issues.

3.3. Average spending rates of subgroups by issue size

We examine how other uses of issue proceeds vary with issue size. We posited earlier (Appendix A.1) that, unlike the average cash-saving rates, the average spending rates (e.g., on operating expenses) have downward-sloping relations with issue size.

In Table 3's Panel A, we consider three additional uses of issue proceeds: the increases in (i) non-cash current assets, (ii) non-current assets and (iii) operating expenses. The top portion of the Panel reports the mean and median of these uses scaled by lagged assets (i.e., $\Delta NonCashCA_t/TA_{t-1}$, $\Delta FixedAssets_t/TA_{t-1}$, and $\Delta Expense_t/TA_{t-1}$) for each issue-size quintile. Without exception, these mean and median increase with issue size.

More importantly, however, the bottom portion of the Panel shows that the ratios of these uses to issue size (i.e., $\Delta NonCashCA_t/SSTK_t$, $\Delta FixedAssets_t/SSTK_t$, and $\Delta Expense_t/SSTK_t$) decrease with issue size. We interpret these ratios as the average spending rates (or the average propensity to spend) on respective uses from issue proceeds. The mean and median of these average spending rates all decrease with issue size. For example, the mean average spending rate on expenses ($\Delta Expense_t/SSTK_t$) is as high as 1.210 for the Q1 issues, but it decreases monotonically so that this mean ratio is only 0.341 for the Q5 issues.

In Panel B's regressions, we estimate the marginal spending rates on the above three uses (Columns (2)-(4)) along with the marginal cash-savings rate (Column (1)). The dependent variables in Columns (2)-(4) are the changes in non-cash current assets ($\Delta NonCashCA_t/TA_{t-1}$), fixed assets ($\Delta FixedAssets_t/TA_{t-1}$) and operating expenses ($\Delta Expense_t/TA_{t-1}$), respectively. We use the same set of explanatory variables as in McLean's regression model. For comparison, Column (1) reports the results of McLean's regression model where the dependent variable is the increase in cash holdings ($\Delta Cash_t/TA_{t-1}$).

In Columns (2)-(4), the estimated coefficients on issue proceeds are 0.099, 0.226 and 0.220, respectively, in the regressions of the three uses. We take these coefficients to be the marginal spending rates (or the marginal propensities to spend) from issue proceeds. These coefficients are much smaller than the marginal cash-savings rate, 0.683, as estimated in Column (1)'s regression. However, the relatively small marginal spending rates should not imply that firms prioritize cash-savings over the other uses, as the marginal propensities systematically understate or overstate individual issues' propensities considerably.

We predicted earlier that the average spending rates exceed the marginal spending rates (Appendix

A.1). The reported results in Panels A and B support this prediction. In all of the three uses, the average spending rates exceed the corresponding marginal spending rate. For example, the lowest mean average spending rate on expenses ($\Delta Expense_t/SSTK_t$) is 0.341 in Q5 (Panel A), which is much higher than the marginal spending rate on this use, 0.220 (i.e., the coefficient on $SSTK_t/TA_{t-1}$ in Column (4) of Panel B). It is helpful to contrast this observation with the pattern that the average cash-savings rates are much lower than the marginal cash-savings rate (as depicted in Tables 1 and 2).

Figure 1 aids the reader in assessing the relative importance that equity issuers assign to the four uses of issue proceeds. It illustrates that the average spending rates on the three uses all decline with issue size, whereas the average cash-savings rate increases with it. Also important is the observation that all of three average spending rates are higher than the average cash-savings rate except for high issue-size quintiles. Particularly, the average spending rate on operating expenses is highest among all average spending or cash-savings rates except for the top issue-size quintile. This indicates that operating expenses are probably the largest use of issue proceeds so cash savings are not a priority for the majority of issues.

3.4. Dynamics of cash holdings, expenses and sales

Our findings suggest that, compared to the other issues, the Q5 issues increase cash holdings significantly and also achieve high sales growth. In Figure 2, we delve into the dynamics of the Q5 issuers' cash holdings and business expansions by plotting the medians of cash holdings, operating expenses and sales over the five-year period (*t-1*, *t+3*). Instead of deflating these variables with lagged book assets, we set the year *t-1* value of each variable to 100 for all issue-years and then adjust the variable's subsequent values proportionately. Hence, if a variable's value at year *t* is 150, it implies that the variable has increased 1.5 times from year *t-1* to year *t*.

Panel A shows that the Q5 issues' median cash holdings make a big jump in the issue year (i.e., at year *t*), but then decreases slightly in the subsequent years. The scale of the spike in their cash holdings in year *t* is remarkable, as the median surges almost 3.5 times in that year. However, this spike is a one-off event, as the median cash holdings do not increase in the post-issue years. In stark contrast, the Q5 issuers' median operating expenses and sales increase in steady and consistent steps, instead of exhibiting a big one-time jump. Also, although these issuers' median sales increase by much less than their median cash holdings do in the issue year, their median sales steadily grow to ultimately exceed the growth of the median cash holdings by year *t+3*. For comparison, Panel B plots the trends of the three variables for all other equity

issues (i.e., all issues except the Q5 issues). The median cash holdings jump from year *t-1* to year *t*, but the size of this jump is much less impressive than that of the jump of the Q5 issues. The median cash holdings increase only slightly in the post-issue years; in contrast, the medians of sales and operating expenses grow steadily in those years.

The patterns illustrated in Figure 2 could suggest that the Q5 issuers stock up on cash holdings with their large issues in embarking on multi-year business expansions. It appears that these large issuers increase cash holdings considerably in anticipation of the post-issue cash requirements that grow with the size of their business.

3.5. Cross-sectional determinants of cash savings

We have learned that issue size ($SSTK_t/TA_{t-1}$) is a key determinant of the cross-sectional variation of cash savings. In this section, we seek to determine additional factors that influence cash savings. We consider market-to-book, cash holdings and sales growth as three candidate factors. First, we hypothesize that cash savings are positively associated with market-to-book for two reasons. High valuations (or investment opportunities) necessitate large equity issues, which in turn result in high cash-savings rates. Also, as we saw in Figure 2, firms with high investment opportunities may increase cash considerably with equity issues to support their business expansions in subsequent years. Second, we predict that cash savings are negatively associated with cash holdings if large existing cash holdings allow firms to save less cash. Third, we posit that cash savings are small at high levels of sales growth, because fast sales growth requires immediate deployment of issue proceeds instead of saving those proceeds in cash.[10]

In Table 4, we assess these predictions by sorting our sample of pure equity issues into quintile subgroups by each of the three candidate factors in Panels A, B and C, respectively. In Panel A, the propensity to save cash increases monotonically with market-to-book, as the mean average cash savings rate is only 0.199 in Q1 (lowest market-to-book) but increases gradually to 0.308 in Q5 (highest market-to-book). Meanwhile, Panel B shows that cash savings are negatively related to cash holdings. The mean average cash-savings rates relatively high with 0.244 in Q1 (smallest cash holdings) and 0.306 in Q3 (medium cash holding), but this mean is lowest with only 0.068 in Q5 (largest cash holdings). Finally, in

[10] We note that all three candidate factors are closely and positively linked to issue size, as high market-to-book, high cash levels and high sales growth are typical firm characteristics associated with large equity issues. It is a tall order to disentangle the effects of these three factors on cash savings from that of issue size. Nonetheless, it is worthwhile to explore the influence of these factors to gain a deeper understanding of equity issuers' cash savings behavior.

Panel C, cash savings have an inverted-U-shaped relation with sales growth. The mean average cash-savings rate increases first from 0.040 in Q1 (slowest sales growth) to 0.380 in Q3 (medium sales growth). It then decreases to 0.194 in Q5 (fastest sales growth). Thus, the average cash-savings rate peaks at the medium sales-growth levels before decreasing rapidly at the high such levels.

In summary, high market-to-book issuers save more cash than low market-to-book issuers do, potentially because firms with high investment opportunities issue equity in large amount or save cash to support fast growth in subsequent years. It appears that large cash holdings help equity issuers to save less in cash. It also appears that fast sales growth requires less cash savings or immediate deployment of issue proceeds.

In Table 5, we regress the average cash-savings rate on an array of firm characteristics. The regression results confirm the observations from Table 4. In Columns (1) and (2), market-to-book and cash holdings have significant positive and negative coefficients, respectively, suggesting that firms with high market-to-book save more cash and those with large cash holdings save less cash from equity issues. In Column (3), the regression includes sales growth ($Sales\ growth_t$) and its square ($Sales\ growth_t^2$) as explanatory variables to test the presence of an inverted-U-shaped relation between sales growth and cash savings. Indeed, sales growth and its square have significant positive and negative coefficients, respectively, suggesting that the average cash-savings rate increases first but decreases later with sales growth.

In Columns (4) and (5), we put together the explanatory variables from the earlier columns and also control for issue size along with four firm characteristics (i.e., firm size, profitability, asset tangibility and the debt ratio). Not surprisingly, issue size ($SSTK_t/TA_{t-1}$) has a significant positive coefficient in both Columns, which is consistent with our earlier observation that cash savings increases with issue size. In Column (4), the coefficient on market-to-book loses significance, potentially because issue size, which is highly correlated to market-to-book, is present in the regression. In Column (5), however, the coefficient on market-to-book regains significance when additional firm characteristics are added as explanatory variables. Finally, in both Columns (4) and (5), cash holdings continue to have a significantly negative coefficient and sales growth and its square also continue to have significantly positive and negative coefficients, respectively.

Therefore, although issue size is a potent predictor of how much firms save out of equity issues, additional factors are at play. Market-to-book and cash holdings have positive and negative effects, respectively, on the average cash-savings rate. Sales growth has a positive effect at low levels of growth,

but it has a negative effect at high levels of growth.

We consider institutional ownership as an additional factor that shapes the average cash-savings rate. Previous research takes high institutional ownership to be an indication of strong governance (e.g., Harford, Mansi, and Maxwell, 2008; others). Harford et al. (2008) document that firms with strong governance hold relatively large cash holdings because those with weak governance spend rapidly on expenses and acquisitions. Consistently, we posit that firms with high institutional ownership save a high fraction of issue proceeds in cash (vs. spending them immediately). We also posit that, with large institutional backing (i.e., high institutional ownership), managers can save cash from equity issues—in bolstering cash reserves or preparing for business growth—without the fear of being second-guessed by the market.

In Table 6, we regress the average cash-savings rate on institutional ownership ($InsOwn_{t-1}$) and long-term institutional ownership ($L\text{-}T\ InsOwn_{t-1}$). We use a number of control variables including those that are identified as determinants of the cash-savings rate in the preceding regressions (Table 5). Across all Columns (1)-(6), $InsOwn_{t-1}$ or $L\text{-}T\ InsOwn_{t-1}$ has significantly positive coefficients, suggesting that firms with high institutional (or long-term institutional) ownership keep a higher percentage of issue proceeds in cash than those with small institutional (or long-term institutional) ownership do.[11] Therefore, strong governance or institutional backing is associated with high cash-savings rates from equity issues, consistent with the notions that strong governance engenders lower spending rates or institutional backing permits firms to save cash.

3.6. Each decade over the period 1971-2016

In Table 7, we tabulate the average and marginal cash-savings rates for individual decades from the 1970s through the mid-2010s. To construct the table, we split our main sample of pure equity issues (spanning the period 1971-2016) into the four subperiods.

We put a spotlight on two observations from the table. First, the mean average cash-savings rate is substantially lower than the marginal cash-savings rate within all decades without exception. For example,

[11] In untabulated results, we find that the impact of long-term institutional ownership ($L\text{-}T\ InsOwn_{t-1}$) is significantly stronger than that of institutional ownership ($InsOwn_{t-1}$). For example, the difference between the coefficients on $L\text{-}T\ InsOwn_{t-1}$ in Column (4) and $InsOwn_{t-1}$ in Column (1) is significant in the Wald test. Assuming that high long-term institutional ownership reflects strong governance or institutional backing more precisely than high overall all institutional ownership does, this observation bolsters the impression that strong governance or institutional backing works to increase cash saving vs. increase spending.

in the 1980s, the mean average cash-savings rate is 0.249, which is much lower than that decade's marginal cash-savings rate (0.651). Second, the Q5 issues (i.e., the largest issues) exhibit high mean average cash-savings rates across all decades, as those issues' means are considerably higher than the means of the entire issues. The Q5 issues' mean average cash-savings rate is particularly high in the 1990s (0.533).

These two observations reaffirm that the marginal cash-savings rate exceeds the average cash-savings rates by wide margins and that large issues exhibit comparatively high average cash-savings rates.

Meanwhile, our results do not suggest that firms' propensity to save cash out of equity issues have increased over time, if we use the average cash-savings rate to measure such propensity. There is no discernable trend in the mean average cash-savings rates (0.268 in the 1970s; 0.249 in the 1980s; 0.276 in the 1990s; and 0.254 in the 2000s). This mean even drops to 0.165 in the 2010s.[12]

3.7. Cash savings behavior of three types of equity issues

Thus far, our main analyses have focused exclusively on pure equity issues. In this section, we explore the cash-savings behavior of dual equity-and-debt issues (or dual issues, in short) and debt-retiring equity issues (or debt-retiring issues, in short) in comparison to pure equity issues (or pure issues, in short). We identify dual and debt-retiring issues (as well as pure issues) for the period 1971-2016. As before, pure issues are firm-years in which equity issue proceeds are greater than 10% of lagged book assets but total debt does not increase or decrease by more than 10% of lagged book assets. In both dual issues and debt-retiring issues, equity issue proceeds are greater than 10% of lagged book assets, but total debt increases and decrease by more than 10% of lagged book assets in dual issues and deb-retiring issues, respectively.

In Table 8, we merge the three groups of equity issues (identified for the period 1971-2016) into a single dataset and then partition the dataset into quintile subgroups by issue size. Issue size is defined as the size of equity issues ($SSTK_t/TA_{t-1}$) for pure issues and debt-retiring issues but as the size of total issues ($(SSTK_t + DebtIssue_t)/TA_{t-1}$) for dual issues. In the last step, we tabulate the mean and median of selected variables for the issue-size quintiles separately for pure, dual and debt-retiring issues.

Panel A presents the number of observations, along with the mean and median of issue size, for

[12] Using the marginal cash-savings rate, Mclean (2011) observes that the tendency of U.S. corporations to save cash out of equity issues has increased over time. Our results in Table 6 echo his observation to some extent, as the table's last column shows that the marginal cash-savings rates of the recent three decades from the 1990s through 2010s (0.689, 0.681 and 0.683, respectively) are higher than those of the early two decades of the 1970s and 1980s (0.634 and 0.651, respectively).

the three types of issues. As the last column reports, pure issues have the highest number of observations (14,874), followed by dual issues (5,012) and debt-retiring issues (3,222). Hence, pure issues are the most common type of issues, whereas debt-retiring issues are the least common one.

In Panel B, we compare the extent to which the cash-to-assets ratio increases as a result of issues. In all three types of issues, the mean of the change in the cash ratio ($\Delta(Cash/TA)_t$) tends to increase with issue size, which is in line with the notion that large issues have high cash-savings rates and thus bring large increases in the cash ratio. Meanwhile, as the last column shows, dual issues as a whole do not increase the cash ratio, as the mean change in their cash ratio is negative (-0.004). In comparison, pure issues' mean change in the cash ratio is positive and high at 0.024. Debt-retiring issues' mean change in this ratio is even higher at 0.043; however, debt-retiring issues can mechanically lower the cash ratio because debt-retirement works to reduce total assets.

Indeed, as Panel C shows, it is not debt-retiring issues but pure issues that have the highest mean average cash-savings rate, suggesting that debt-retiring issuers save less cash than pure issuers do. For the entire debt-retiring issues, the mean average cash-savings rate is 0.186, which is lower than the corresponding mean of the entire pure issues, 0.249. Meanwhile, dual issues' mean average cash-savings rates is only 0.131.

Panel D reports the average spending rates on expenses for the three types of issues, as measured by $\Delta Expense_t / SSTK_t$ for pure and debt-retiring issues and $\Delta Expense_t / TotalIssue_t$ for dual issues. In all three issue types, the mean average spending rates on expenses (0.693, 0.650 and 0.728 for pure, dual and debt-retiring issues, respectively) are much higher than the mean average cash-savings rates reported in Panel C. Therefore, on average, all three types of issuers spend more on expenses than they save cash.

The reported numbers in Panels C and D help us to determine whether the propensities to save cash vs. spend on expenses increase or decrease with issue size. In Panel C, the average cash-savings rate tends to increase with issue size in all three types of issues.[13] In contrast, in Panel D, the average spending rate on expenses tend to decrease with issue size in all three types of issues (in Panel D). Therefore, our earlier findings from the main sample of pure issues continue to hold for dual and debt-retiring issues.

In summary, the extent to which equity issues impact the level of cash holdings varies across the

[13] Dual issues are somewhat an exception in the smallest issue-size quintile (Q1) in which the mean and median in that decile are high, potentially reflecting outliers and extremely small number of observations in that quintile. Except for the bottom quintile, both mean and median average cash-savings rates increase with issue size.

three types of issues. Pure and debt-retiring issues bring relatively large increases in the cash-to-assets ratio, compared to dual issues. On average, the average cash-savings rate is highest for pure issues, followed by debt-retiring issues and dual issues. In all three types of issues, the average cash-savings rate increases with issue size, while the average spending rate on expenses decreases with issue size. Furthermore, in all three types of issues, the mean average cash-savings rate is much lower than the mean average spending rate on expenses, suggesting that equity issuers do not prioritize cash-savings over spending on expenses regardless of the issue type.

4. Do cash holdings have virtuous effects?

In the ensuing analyses, we revisit the findings of Faulkender and Wang (2006) and Fresard (2010), which suggest that cash increases have a positive valuation effect and that large cash holdings yield market share growth, respectively. We examine whether or the extent to which the effects documented in those studies are statistical artifacts associated with equity issues.

4.1. Reinterpreting the valuation effect of cash increases

Faulkender and Wang (2006) estimate the valuation effect of cash increases by regressing excess stock returns on the increase in cash. They demonstrate that the marginal value of cash, as measured by the regression coefficient on the increase in cash, is positive and approximately, \$0.94. Although these authors do not formally consider equity issues, they assume that the major source of cash increases is equity issues—more specifically, equity issues by firms during the cash-raising phase.

We explore an alternative interpretation of Faulkender and Wang's (2006) finding. Specifically, we speculate that much of the estimated valuation effect of cash increases may not arise from cash increases *per se* but from favorable stock price performance associated with equity issues.

In Table 10, we rank the non-financial and non-utility *Compustat* firms annually into quintiles by the size of the cash increase over the period 1971-2001. We examine the same period as in Faulkender and Wang (2006). We also follow their study to measure the size of the cash increase by the ratio of the change in cash holdings to the beginning-of-the-year market value of equity (i.e., $\Delta Cash_t/MVE_{t-1}$) and create quintile subgroups based on that ratio.

Panel A shows that stock return performance is positively associated with cash increases, as the mean excess return ($Excess\ return_t$) increases monotonically from the bottom (-11.6%) to the top cash-increase quintile (7.2%). This pattern confirms Faulkender and Wang's (2006) conclusion of a positive

marginal value of cash, because a positive marginal value of cash implies that the larger the increase in cash holdings, the higher the stock return performance. We note that issue size ($SSTK_t/TA_{t-1}$) is positively associated with cash increases so the top cash-increase quintile has the largest mean equity issuance (0.184). We also note that sales growth is positively associated with cash increases so the top cash-increase quintile has the fastest mean sales growth (0.305). Potentially, much of the fast sales growth of the top cash-increase quintile is financed with large equity issues.

In Panel B, we remove firms that issue equity in year *t* from each cash-increase quintile before retabulating the mean and median of excess return. We define equity issues as firm-years in which equity issue proceeds ([SSTK]) exceed 10% of lagged assets. Across all cash-increase quintiles, the mean excess return drops. The drop is particularly large in the top cash-increase quintile in which the mean excess return decreases to only 1.2% after removal of equity issues (from 7.2% in Panel A). Therefore, after removing equity issues, the stock return performance of large cash increases is no longer impressive. This implies that much of the favorable stock return performance of large cash increases may arise from equity issues, rather than from large cash increase *per se*.

Panel C provides additional evidence that cash increases may have little direct valuation effects. We remove fast-growing firms from each cash-increase quintile of Panel A before retabulating the mean and median of excess return. To elaborate, we rank our sample firms of Panel A annually by sales growth (*sales growth*) and then remove those that belong to the top 20 percent of the distribution. To the extent that equity issues—especially, large issues—support sales growth, removing fast-growing firms from the dataset will have a similar effect to removing equity issues. Indeed, after removing fast-growing firms, the mean excess return of the top cash-increase quintile is only 0.7% (from 7.2% in Panel A). This again implies that the superior stock return performance of large cash increases may come largely from sources other than cash increases.

Taken together, our experiments suggest that much of the presumed valuation effect of cash increases can be attributed to the favorable stock return performance of large equity issues (or fast sales growth). After removing equity issues (or fast-growing firms) from the sample, large cash increases no longer yield impressive stock returns, which raises the possibility that cash increases have little direct valuation effects.[14]

[14] We acknowledge that the marginal value of cash is still positive after removing equity issues (Panels B) or fast-growing firms (in Panel C), given that the mean excess return increases from the bottom to top cash-increases quintiles. However, it is worth noting that this positive marginal value of cash is driven by not so much the positive (or barely positive) stock performance of the

4.2. Reinterpreting the market-share-growth effect of large cash holdings

Fresard (2010) argues that firms with large cash holdings relative to its industry peers enjoy a strategic advantage that can help them increase their market share (i.e., their industry-adjusted sales). Fresard (2010) does not describe the mechanism through which large cash holdings lead to an increase in market share. We posit that firms with large cash holdings do not necessarily deploy their existing cash to achieve sales growth. We hypothesize that large cash holdings are a firm trait associated with large and frequent equity issues, which facilitate market share growth through business expansions

In Table 9, we run an experiment to demonstrate the role of equity issues in helping firms with large cash holdings to achieve market share growth. We rank non-financial and non-utility *Compustat* firms into quintiles annually by cash holdings ($(Cash/TA)_{t-1}$) over the period 1973-2006. We examine the same period as in Fresard (2010) and follow his study to use the standardized cash holdings, denoted by $zCash_{t-1}$, to quantify the size of cash holdings. We then tabulate the mean and median of annual market share growth, as measured by industry-adjusted sales growth, over the period (t, t+3).

Panel A confirms Fresard's (2010) main conclusion that firms with large cash holdings increase market share faster than those with small cash holdings. For example, the top cash-holdings quintile (i.e., Q5) has a mean market share growth of 9.5 percent in year t and 5.8 percent in year $t+1$. In comparison, the other cash-holdings quintiles (i.e., from Q1 through Q4) have negative market share growth in those two years in both mean and median. We note that firms with large cash holdings issue equity in large amounts compared to firms with small cash holdings. For example, the mean of issue size in year t ($\Delta SSTK_t/TA_{t-1}$) is 0.164 for the top cash-holdings quintiles, whereas this mean is lower for the other quintiles.

In Panel B, we drop firms if they issue equity in year t-1 or year t from each cash-holdings quintile before retabulating the mean and median of market share growth. As before, we define equity issues as firm-years in which equity issue proceeds ([SSTK]) exceed 10% of lagged assets. Although the mean and median of market share growth decrease in all cash-holdings quintiles, the decrease is most pronounced in the top cash-holding quintile. The mean market share growth of the top cash-holdings quintile falls to 2.4 percent in year t and 1.5 percent in year t+1. That is, after removal of equity issues, the mean market share growth of top large cash holdings quintile is much less impressive or barely positive. This implies that much

top cash-increase quintile as the large negative stock performance of the bottom cash-cash increase quintile (in which cash holdings decrease substantially).

of the market share growth of firms with large cash holdings is financed with their equity issues.

In Panel C, we go further by dropping firms if they issue equity in any year over (t-1, t+3). The mean and median of market share growth decrease even further across all cash-holdings quintiles. Now the mean market share growth of the top cash-holdings quintile becomes negative, as it is -1.3 percent in year t and -0.9 percent in year t+1. These findings imply further that it may be equity issues, not large cash holdings *per se*, that bring about market share growth.

In short, our experiments suggest that large cash holdings do not translate to fast market share growth unless we account for equity issues. Therefore, the observed link between large cash holdings and market share growth (i.e., the strategic effect of cash holdings à la Fresard (2010)) could arise because large cash holdings are a proxy for large and frequent equity issues.

5. Additional analyses

5.1. The effect of equity-issue market timing

In Table 11's regressions, we test the question of whether equity issuers' propensity to save cash can be explained by the market-timing motive to issue equity. An underlying notion is that firms will keep a high fraction of issue proceeds in cash if their equity issues are motivated by temporarily high stock valuations. Accordingly, we hypothesize that post-issue stock returns will be negatively associated with the average cash-savings rate in the market-timing of equity issues.

The regression results do not support this hypothesis. In Column (2), we regress post-issue monthly stock returns (i.e., monthly stock returns of year t+1) on the average cash-savings rates from equity issues ($\Delta Cash_t/SSTK_t$) after controlling for firm size, market-to-book and momentum. The estimated coefficient on the average cash-savings rate is positive and significant, which is the opposite of the above hypothesis's prediction. In Column (4), this coefficient continues to be positive and significant after adding issue size ($SSTK_t/TA_{t-1}$) as an additional control variable. Therefore, it does not appear that the market-timing motive explains the cross-sectional dispersion of cash savings from equity issues.

5.3. Investment sentiment, issue cost and precautionary motive

In Table 12's regressions, we test whether investment sentiment and issue cost influence the average cash savings rate.

In Panel A, we consider three proxies for investment sentiment as explanatory variables in the regressions of the average cash-savings rate from equity issues (by using the regression model in Table 5's Column (5) as the base-line regression). Following Mclean (2011), we construct three proxies for market sentiment: the first day's return on IPOs (*RIPO*), the number of IPOs (*NIPO*) and the first principal component of *RIPO*, *NIPO* and four other investor components according to Baker and Wurgler (2006) (*SENTIMENT*). If strong investment sentiment prompts market-timed equity issues, then such sentiment can be associated with high cash-savings rates in equity issues. However, the results in Columns (1)-(3) do not consistently suggest that this is the case. Contrary to this prediction, the first two proxies in Columns (1)-(2) have significant negative coefficients, while the third proxy in Column (3) has a significant positive coefficient.

In Panel B, we test whether cash savings from equity issues are high if firms face high issue cost. Because high issue cost can deter firms from issuing equity frequently, firms may seek to save a lot of cash from each issuance. Following Mclean (2011), we construct a range of proxies for issue cost. These proxies include three firm-level measures: Amihud's (2002) illiquidity, Amivest's price impact measure and Gibb's spread estimate. They also include two economy-level indicator variables: *Contraction* and *Decline*. *Contraction* (*Decline*) is equal to one if six or more of the previous 12 months had declining GDP (industry production) and zero otherwise.

In the regression results in Columns (4)-(8), *Amivest* and *Decline* have significant positive coefficients, which is consistent with the notion that high issue cost spurs high cash-savings rates in equity issues. However, the coefficients on the other proxies, *Amihud*, *Gibb* and *Contraction*, are insignificant or even negative. Therefore, the evidence that high cost leads to high cash-savings rates is rather spotty.

5.4. Miscellaneous issues including robustness checks

In checking the robustness of our main conclusions, we considered alternative measures of equity issue proceeds. Our main measure of equity issue proceeds is sales of common and preferred stock ([SSTK]). We considered net equity issue proceeds by subtracting the amount of share purchases, measured by purchase of common and preferred stock from SSTK (i.e., [SSTK] – [PRSTKC]). We also considered the change in paid-in-capital, defined as the sum of common stock ([CSTK]) and capital surplus ([CAPS]) (i.e., [CSTK] + [CAPS]) as well as the change in paid-in-capital net of treasury stock (i.e., the change of [CSTK] + [CAPS] – [TSTK]). In untabulated results, we found that using these alternative measures makes virtually

no difference to our conclusions.

We also consider the components of operating expenses. In Appendix Table A.3, the components of operating expenses, such as COGS, SG&A, R&D and advertisements, have all downward sloping relationships with issue size. Invariably, the mean average spending rate is the highest in the Q1 issue (the smallest issue) and the lowest in the Q5 issue (the largest issue). For example, the mean spending rate on SG&A ($\Delta SGA_t/SSTK_t$) decreases monotonically from 0.350 for the Q1 issues to 0.717 for the Q5 issues. This reaffirms that the average spending rates decrease with issue size. Additionally, the last column shows that, for the full sample of pure equity issues, the mean average spending rate is highest on COGS (0.498), followed by SG&A (0.233), R&D (0.049) and advertisement (0.032). Hence, R&D does not appear to be a major activity financed with equity issues. This observation corroborates Banker, Huang, Hatarajan and Zhao's (2019) finding that R&D expenditures are only a small component of operating expenses.

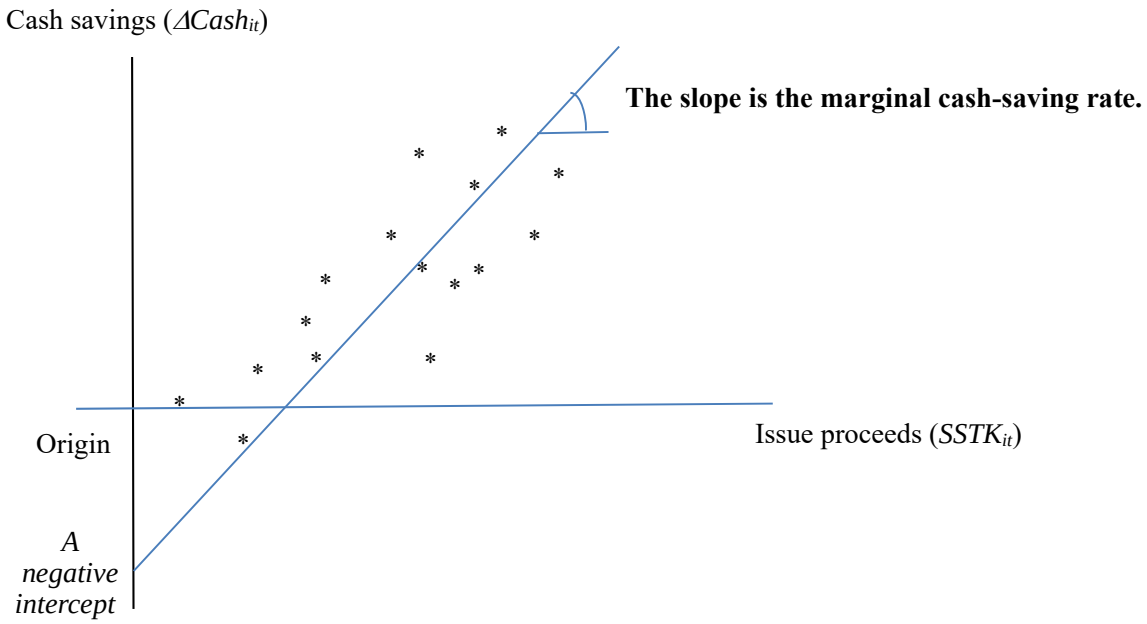
6. Concluding remarks

In this study we investigated the extent to which equity issuers allocate issue proceeds to cash holdings. We found that in contrast to the high marginal cash-savings rate found in previous studies, the mean of average cash-savings rates is approximately 0.251, suggesting that, on average, equity issuers save approximately 25.1 percent of a dollar of issue proceeds. Equity issues do not bring dramatic increases in the cash-to-assets ratio in the majority of issues. Although the cash-to-assets ratio increases considerably in large issues, their cash ratio drops immediately in the post-issue years. These observations do not support the notion that the cash-hoarding motivation drives equity issues or the notion that equity issues are the major source of U.S. firms' large cash holdings as documented by Bates et al. (2009).

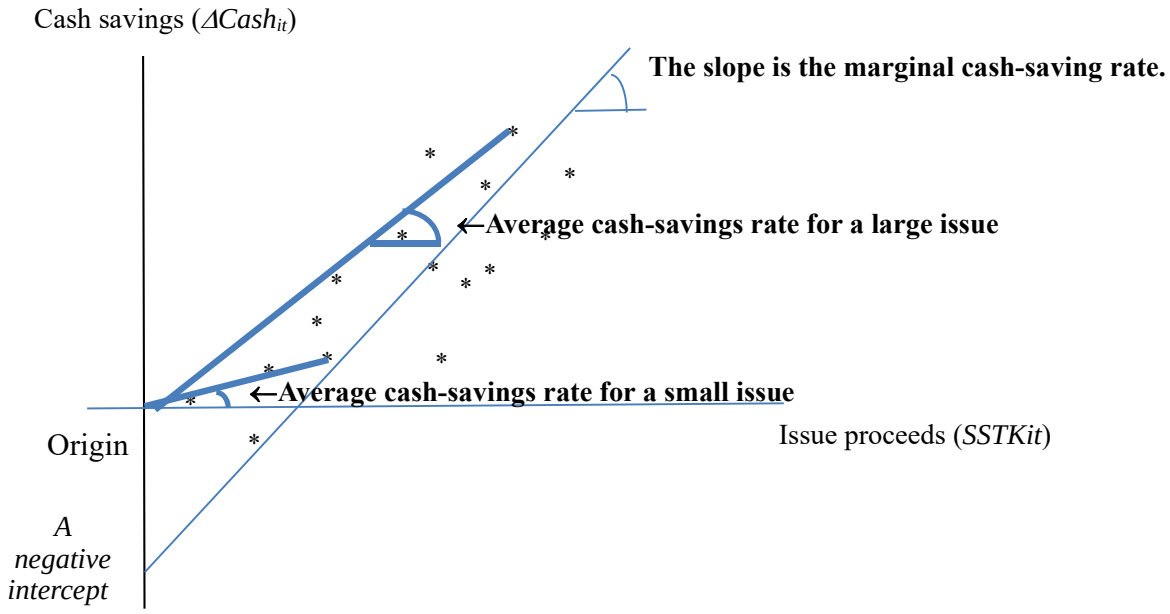
We also identified factors, such as issue size, market-to-book, cash holdings, sales growth and institutional ownership, that shape the propensity to save cash from equity issues. An interesting venue for future research would be to explore additional factors that influence this propensity by looking at other countries in the world. Country-level factors, such as financial market development, legal institution and culture, could impact the propensity to save cash (vs. spend the proceeds immediately), thereby providing us with additional insights into the forces underlying corporate decisions on equity issues and cash holdings.

Appendix Figure A1: Illustration of marginal and average savings rates

The marginal cash-savings rate is the slope coefficient on issue proceeds ($SSTK_{it}$) in the regression of the increase in cash ($\Delta Cash_{it}$) on a sample of equity issues. The intercept is likely to be negative because issuers often spend more than issue proceeds (i.e., negative cash-savings).

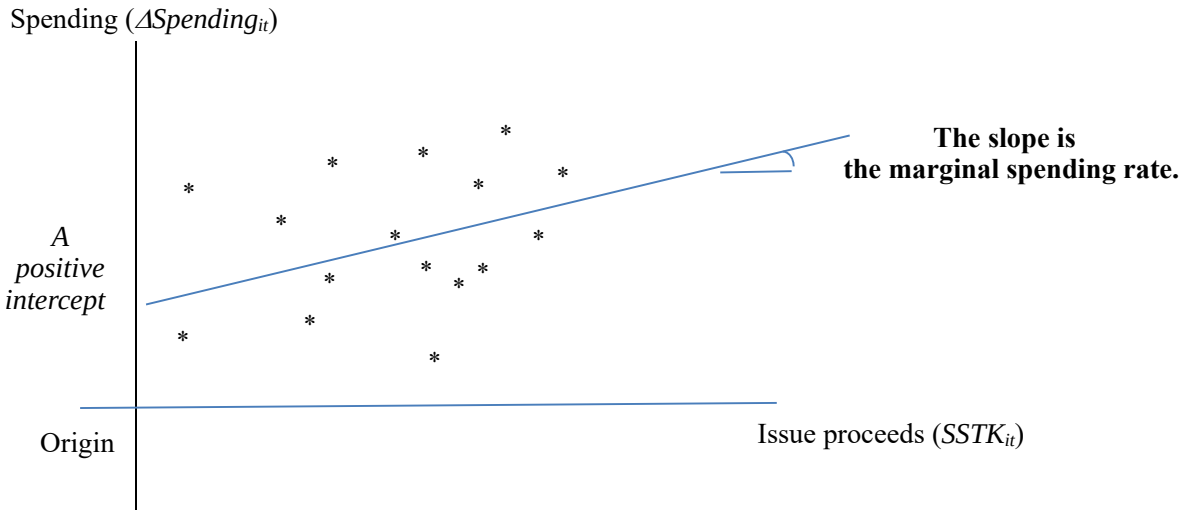


In comparison, the average cash-savings rate ($\Delta Cash_{it}/SSTK_{it}$) is measured for each individual issue. The average cash-savings rates are lower than the marginal cash-savings rate but increase with issue size.

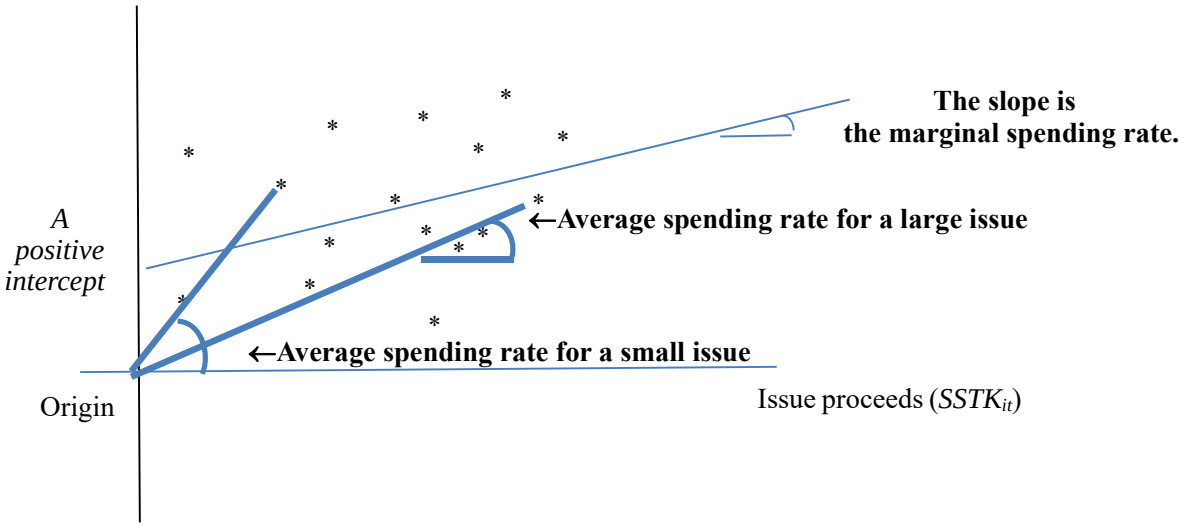


Similarly, the marginal spending rate is the slope coefficient on issue proceeds ($SSTK_{it}$) in the regression of

the increase in spending ($\Delta Spending_{it}$) on a sample of equity issues. The intercept is likely to be positive because issues spend at least a portion of issue proceeds on expenses or other items.



The average spending rate ($\Delta Spending_{it}/SSTK_{it}$) is calculated for each individual issue. The average spending rates are higher than the marginal spending rate but decreases with issue size.



An analogy is found in economics. Individuals' average propensities to save out of income are lower than their marginal propensity to save. Individuals' average propensities to consume out of income are higher than their marginal propensity to consume.

Appendix Table A1: Definitions of variables

The mnemonics in square brackets correspond to *Compustat* data items.

Equity issue proceeds (*SSTK*)	Sale of common and preferred stock [SSKT]
Cash (*Cash*)	Cash and short-term investment [CHE]
The average cash-savings rate from equity issue (*ΔCash*/*SSTK*)	The ratio of the increase in cash [CHE] to equity issue proceeds [SSTK]
The marginal cash-savings rate from equity issue	This is a regression coefficient (β_1) from McLean's regression model: $\Delta Cash_{it} = \beta_0 + \beta_1 \cdot equity\ issue\ proceeds_{it} + \beta_2 \cdot debt\ issue\ proceeds_{it} + \beta_3 \cdot cash\ flow_{it} + \beta_4 \cdot other\ sources_{it} + \beta_5 \cdot \log(TA_{it-1})$, where all dependent and independent variables are scaled by lagged assets (TA_{t-1}), except for the last variable, and *i* and *t* are firm and year subscripts. Assets are total assets [AT]
The cash-to-assets ratio (*Cash/TA*)	In short, the cash ratio ([CHE]/ [AT]).
Change in operating expense (*ΔExpense*)	The change in operating expenses [XOPR] from the previous year, where operating expenses [XOPR] are the sum of cost of goods sold [COGS] and SG&A expenses [XSGA].
Change in noncash current assets (*ΔNonCashCA*)	The change in noncash current assets from the previous year., where noncash current assets are current assets [ACT] less cash holdings [CHE].
Change in fixed assets (*ΔFixedAssets*)	The change in noncurrent assets from the previous year, where non-current assets are total assets [AT] less current assets [ACT].
Change in total debt (*DebtIssue*)	Issuance of long-term debt [DLTIS] – reduction in long-term debt [DLTR] + change in current debt [DLCCH]
Log of CPI-adjusted sales (*log(CPI adj. Sales)*)	CPI adjusted sales ([SALE]) using the year-2016 CPI as the base level
Market-to-book (*MB*)	Market-to-book assets ratio, measured by book assets less book equity plus the market equity divided by book assets, where book equity is [AT] – [LT] + [PSTK] + [TXDB] + [DCVT] and market equity is [CSHO] × [PRCC]
PP&E/TA (*PPENT/TA*)	Net property, plant, and equipment [PPENT] / Total assets [AT]
Operating profitability (*EBITDA/TA*)	Earnings before interest, taxes, and depreciation [OIBDP] / Total assets [AT]
Book debt ratio (*Debt/TA*)	Total debts [DLTT + DLC] / Total assets [AT]
Sales growth (*sales growth*)	1-year sales growth rate, where sales is [SALE]
Stock return (*Stock return*)	1-year holding period return using weekly stock returns with a minimum of 26 weeks during the year
Cash flow (*Cash flow*)	Cash flow, defined as [IB] + [DP]
Market value of equity (*MVE*)	

	Market value of equity ([CSHO] × [PRCC])
Institutional ownership (InsOwn)	Fraction of firm's shares held by institutional investors (Source: Authors' calculation based on Thomson 13-F data
Long-term institutional ownership (*LT InsOwn*)	Fraction of firm's shares held by long-term institutional investors. Long-term institutional investors are defined as investors that have average churn rates in the top tercile. The average churn rate is calculated using the method of Gaspar et al. (2005) and Attig et al. (2012). (Source: Authors' calculation based on Thomson 13-F data)
Excess stock return (*Excess return*)	Annual stock return in excess of the return to the benchmark portfolio that matches the stock's size and book-to-market, as defined in Faulkener and Wang (2006).
SG&A (*SG&A*)	Selling, General and Administrative Expense [XSGA]
R&D (*R&D*)	Research and development expense [XRD]
Advertisement expense (*Advertisement*)	Advertisement expense [XAD]
Proxies for investment sentiment	(i) First day's return on IPO (*RIPO*), (ii) the number of IPOs (*NIPO*) and (iii) the first principal component of *RIPO*, *NIPO* and four other investor components according to Baker and Wurgler (2006) (*SENTIMENT*)
Proxies for issue cost	Three firm-level variables: (i) Amihud's (2002) illiquidity (*Amihud*), (ii) Amivest's price impact measure (*Amivest*), (iii) Gibb's spread estimate (*Gibb*). Three economy-level variables: (iv) Contraction (*Contraction*) and (v) Decline (*Decline*), where *Contraction* (*Decline*) is equal to one if six or more of the previous 12 months had declining GDP (industry production) and zero otherwise.

Appendix Table A2: The average spending rates on the components of operating expenses

For our sample of pure equity issues (as defined in Table 1's caption), the table reports the mean and median of the average spending rates on the cost of goods sold, SG&A, R&D expenditures and advertisement spending, respectively (denoted by $\Delta COGS_t/SSTK_t$, $\Delta SG\&A_t/SSTK_t$, $\Delta R\&D_t/SSTK_t$ and $\Delta Adverstise_t/SSTK_t$). The sample spans the period 1971-2016. The mean and median values are reported for each quintile subgroup by issue size and all firm-years ("All obs."). To create the quintile subgroups, we split our sample of pure equity issues into quintile subgroups based on the size of equity issuance ($SSTK_t/TA_{t-1}$).

		Quintile subgroups sorted by issue size ($SSTK_t/TA_{t-1}$)					
		Q1	Q2	Q3	Q4	Q5	All obs.
$\Delta COGS_t/SSTK_t$	Mean	0.884	0.610	0.462	0.327	0.210	0.498
	Median	[0.445]	[0.314]	[0.219]	[0.162]	[0.084]	[0.194]
$\Delta SG\&A_t/SSTK_t$	Mean	0.350	0.245	0.183	0.198	0.171	0.233
	Median	[0.170]	[0.145]	[0.131]	[0.146]	[0.131]	[0.143]
$\Delta R\&D_t/SSTK_t$	Mean	0.083	0.044	0.023	0.050	0.049	0.049
	Median	[0.020]	[0.015]	[0.019]	[0.034]	[0.034]	[0.027]
$\Delta Advertise_t/SSTK_t$	Mean	0.048	0.034	0.034	0.023	0.022	0.032
	Median	[0.014]	[0.007]	[0.006]	[0.006]	[0.006]	[0.007]

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Figure 1: Average propensities to save cash vs. spend on other uses for subgroups by issue size
The graph plots the mean values of the average cash-savings rate and the average spending rates for quintile subgroups (Q1 through Q5) by issue size. Q1 is the smallest issues and Q5 is the largest issues. The sample consists of pure equity issues (as defined in Table 1's caption) over the 1971-2016. To create the quintile subgroups, we split equity issues each year into quintiles based on the size of equity issuance ($SSTK_t/TA_{t-1}$). The average propensity to save cash (labeled "Cash") is the increase in cash scaled by issue proceeds $\Delta Cash_t/SSTK_t$). The average spending rates on noncash current assets, fixed assets and operating expenses (labeled "NonCashCA", "FixedAssets" and "Expenses," respectively) are the increases in respective items scaled by issue proceeds ($\Delta NonCashCA_t/SSTK_t$, $\Delta FixedAssets_t/SSTK_t$ and $\Delta Expense_t/SSTK_t$, respectively).

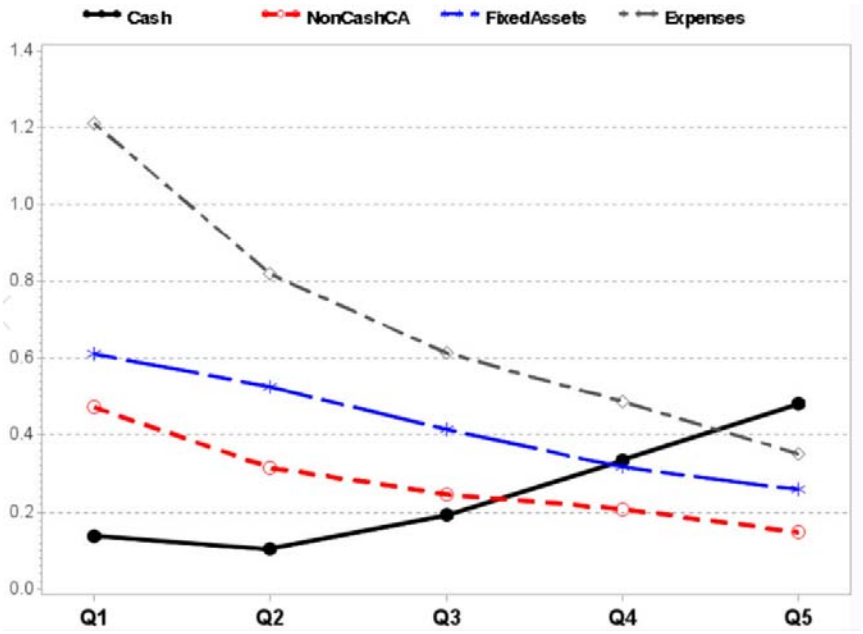
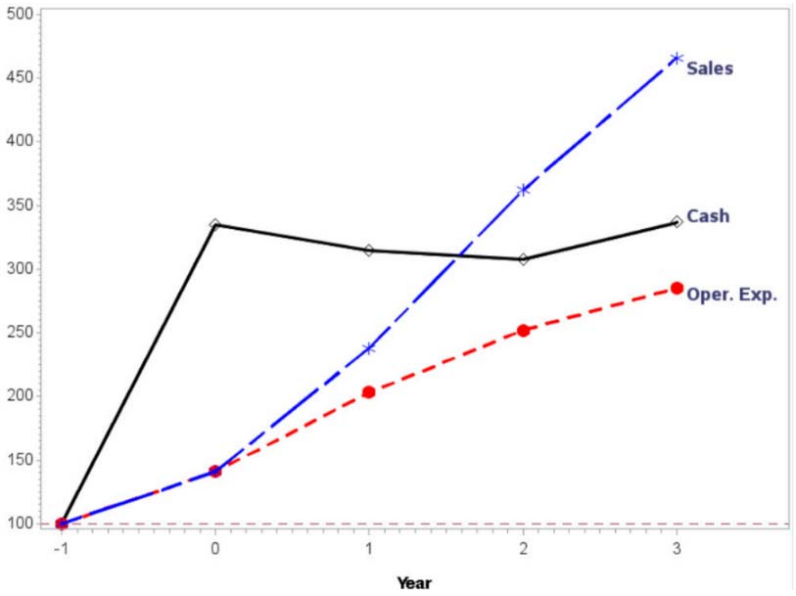


Figure 2: The trend of cash, expenses and sales of equity issuers over (t-1, t+3)
The graphs plot the median of adjusted values of cash holdings, operating expense and sales over a five-year window (*t-1*, *t+3*), where *t* is the year of equity issue. Panel A includes the Q5 issues (i.e., the top-quintile issues). Panel B includes all issues except for the Q5 issues. We set the year *t-1* value of each variable to 100 for all issue-years and adjust the variable's subsequent values over (*t*, *t+3*) proportionately; therefore, if a variable's adjusted value is 150 at year *t*, it implies that the variable has increased 1.5 times from year *t-1* to year *t*. The sample consists of pure equity issues, as described in Table 1's caption, over the period 1971-2016.

Panel A: the Q5 issues (i.e., the top-quintile issues by issue size)



Panel B: All issues except for the Q5 issues

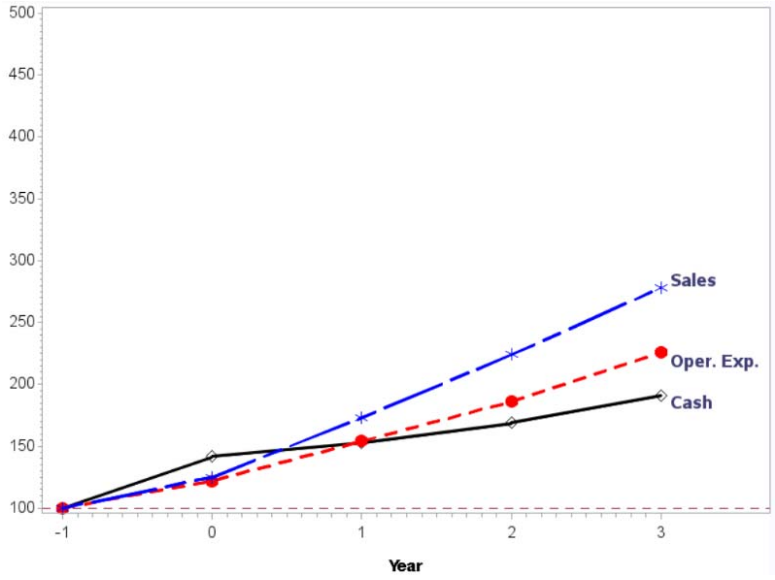


Table 1: The propensities to save cash from equity issues over the period 1971-2016

The table reports the marginal cash-savings rate and the mean, median, first and third quartiles of the average cash-savings rates for our sample consisting of pure equity issues over the period 1971-2016. Pure-equity issuances are firm-years in which equity issue proceeds ([SSTK]) are greater than 10% of lagged book assets but total debt does not increase or decrease by more than 10% of lagged book assets. The marginal cash-savings rate is McLean's regression coefficient on equity issue proceeds (β_1) in the model: $\Delta Cash_t = \beta_0 + \beta_1 \cdot equity\ issue\ proceeds_t + \beta_2 \cdot debt\ issue\ proceeds_t + \beta_3 \cdot cash\ flow_t + \beta_4 \cdot other\ sources_t + \beta_5 \cdot \log(TA_{t-1})$, where all dependent and independent variables are scaled by lagged assets (TA_{t-1}), except for the last variable. The average cash-savings rate, denoted by $\Delta Cash_t/SSTK_t$, is the increase in cash holdings scaled by equity issue proceeds. $(Cash/TA)_{t-1}$ and $(Cash/TA)_t$ are the cash-to-assets ratios at year t-1 and year t, respectively. $\Delta Cash_t/TA_{t-1}$ is the change in cash scaled by lagged assets and $\Delta(Cash/TA)_t$ is the change in the cash-to-assets ratio. $\Delta NonCashCA_t/TA_{t-1}$, $\Delta FixedAssets_t/TA_{t-1}$ and $\Delta Expense_t/TA_{t-1}$ are the increases in noncash current assets, fixed assets and operating expenses, respectively, scaled by lagged assets. The table also reports two percentages. The first is the percentage of issue-years in which cash holdings increase from the previous year (that is, $\Delta Cash_t > 0$). The second is the percentage of issue-years in which the cash-to-assets ratio increases from the previous year (that is, $\Delta(Cash/TA)_t > 0$).

Marginal cash-savings rate	0.683			
	Mean	Median	1st Q	3rd Q
Average cash-savings rate ($=\Delta Cash_t/SSTK_t$)	0.251	0.221	-0.047	0.644
$SSTK_t/TA_{t-1}$	0.616	0.332	0.175	0.706
$(Cash/TA)_{t-1}$	0.301	0.205	0.055	0.500
$(Cash/TA)_t$	0.325	0.253	0.077	0.526
$\Delta(Cash/TA)_t$	0.024	0.012	-0.043	0.104
$\Delta Cash_t/TA_{t-1}$	0.250	0.069	-0.013	0.332
$\Delta NonCashCA_t/TA_{t-1}$	0.100	0.042	-0.003	0.150
$\Delta FixedAssets_t/TA_{t-1}$	0.184	0.063	-0.012	0.234
$\Delta Expense_t/TA_{t-1}$	0.256	0.153	0.016	0.390
Percentage of obs. in which $\Delta Cash_t > 0$	68.6%	100%	0	100%
Percentage of obs. in which $\Delta(Cash/TA)_t > 0$)	57.4%	100%	0	100%
Num. of obs.	14,874			

Table 2: The propensities to save cash from equity issues for quintile subgroups by issue size

We split pure equity issues, as described in Table 1's caption, into quintile subgroups based on the size of equity issuance ($SSTK_t/TA_{t-1}$). The sample spans the period 1971-2016. Panel A reports the marginal cash-savings rate and the mean and median of the average cash-savings rates for the quintile subgroups (Q1 through Q5). The marginal cash-savings rate is McLean's regression coefficient on equity issue proceeds as described in Table 1's caption. The average cash-savings rate, denoted by $\Delta Cash_t/SSTK_t$, is the increase in cash holdings scaled by equity issue proceeds. Panel B reports means (as well as medians in square brackets) of the cash-to-assets ratio $(Cash/TA)_{t+i}$ for i = -1, 0, 1, 2 and 3—that is, for the five-year period (t-1, t+3) around equity issuance. In all Panels, "All obs." indicates all pure-equity issues in the sample. Panel C reports the mean and median of selected firm characteristics. $log(CPI\ adj.\ Sales)_{t-1}$ is CPI-adjusted sales. MB_{t-1} is the market-to-book assets ratio. $(EBITDA/TA)_{t-1}$ is operating profitability, measured by earnings before interest and taxes plus depreciation and amortization scaled b lagged assets. $(Debt/TA)_{t-1}$ is the debt-to-assets ratio. $Asset\ growth_t$ is the increase in book assets scaled by book assets ($\Delta TA_t/TA_{t-1}$). $Sales\ growth_{t-1}$ is the lagged value of one-year sales growth ($\Delta Sales_{t-1}/Sales_{t-2}$). $Stock\ return_{t-1}$, $Stock\ return_t$ and $Stock\ return_{t+1}$ are the one-year holding period returns for year t-1, t and t+1, respectively.

		Quintile subgroups sorted by issue size ($SSTK_t/TA_{t-1}$)					
		Q1	Q2	Q3	Q4	Q5	
$SSTK_t/TA_{t-1}$	Mean	0.126	0.207	0.353	0.632	1.765	
	Median	[0.123]	[0.201]	[0.338]	[0.604]	[1.387]	
Panel A: Marginal vs. average cash-savings rates							
Marginal cash-savings rate [1]		0.362	0.338	0.613	0.606	0.684	
Average cash-savings rate [2]	Mean	0.139	0.106	0.192	0.336	0.483	
	Median	[0.044]	[0.059]	[0.120]	[0.301]	[0.485]	
Gap (= [1] – Mean of [2])		0.223	0.232	0.421	0.270	0.201	
`							
Panel B. Cash-to-assets ratios							
		Q1	Q2	Q3	Q4	Q5	All obs.
$(Cash/TA)_{t-1}$	Mean	0.209	0.218	0.278	0.362	0.436	0.301
	Median	[0.105]	[0.117]	[0.179]	[0.296]	[0.422]	[0.205]
$(Cash/TA)_t$	Mean	0.194	0.211	0.288	0.396	0.535	0.325
	Median	[0.107]	[0.134]	[0.228]	[0.365]	[0.565]	[0.253]
$(Cash/TA)_{t+1}$	Mean	0.192	0.210	0.264	0.351	0.443	0.292
	Median	[0.099]	[0.124]	[0.183]	[0.292]	[0.435]	[0.207]
$(Cash/TA)_{t+2}$	Mean	0.189	0.206	0.253	0.328	0.407	0.276
	Median	[0.094]	[0.121]	[0.172]	[0.267]	[0.377]	[0.187]
$(Cash/TA)_{t+3}$	Mean	0.187	0.205	0.248	0.312	0.383	0.266
	Median	[0.095]	[0.119]	[0.166]	[0.238]	[0.347]	[0.176]
Panel C. Other firm characteristics							
		Q1	Q2	Q3	Q4	Q5	All obs.
$log(CPI\ adj.\ Sales)_{t-1}$	Mean	4.261	3.691	3.065	2.572	1.585	3.034
	Median	[4.495]	[3.827]	[3.265]	[2.822]	[1.745]	[3.209]
MB_{t-1}	Mean	2.734	2.867	3.475	4.384	7.181	4.130
	Median	[1.633]	[1.811]	[2.373]	[3.173]	[4.896]	[2.553]
$(EBITDA/TA)_{t-1}$	Mean	0.007	-0.058	-0.130	-0.200	-0.423	-0.161
	Median	[0.079]	[0.033]	[-0.046]	[-0.104]	[-0.306]	[-0.028]
$(PPENT/TA)_{t-1}$	Mean	0.327	0.310	0.277	0.225	0.192	0.266

	Median	[0.231]	[0.213]	[0.178]	[0.139]	[0.119]	[0.167]
Assets growth$_t$	Mean	0.180	0.211	0.307	0.536	1.526	0.552
	Median	[0.145]	[0.180]	[0.264]	[0.478]	[1.184]	[0.320]
Sales growth$_t$	Mean	0.379	0.450	0.518	0.683	0.998	0.606
	Median	[0.184]	[0.212]	[0.244]	[0.331]	[0.459]	[0.258]
Stock return$_{t-1}$	Mean	0.320	0.299	0.353	0.468	0.624	0.407
	Median	[0.120]	[0.060]	[0.065]	[0.145]	[0.222]	[0.115]
Stock return$_t$	Mean	0.241	0.203	0.198	0.342	0.486	0.293
	Median	[0.072]	[-0.030]	[-0.009]	[0.055]	[0.076]	[0.033]
Stock return$_{t+1}$	Mean	0.011	0.015	-0.005	-0.002	-0.049	-0.006
	Median	[-0.112]	[-0.140]	[-0.156]	[-0.194]	[-0.247]	[-0.170]

Table 3: The propensities to spend on other uses out of equity issues

For our sample of pure equity issues (as defined in Table 1's caption), Panel A reports the mean and median of three uses of equity issue proceeds—the increases in noncash current assets ($\Delta NonCashCA_t$), fixed assets ($\Delta FixedAssets_t$) and operating expenses ($\Delta Expense_t$)—scaled by either lagged book assets (TA_{t-1}) or issue proceeds ($SSTK_t$). The sample spans the period 1971-2016. The mean and median values are reported for each quintile subgroup by issue size and all firm-years ("All obs."). To create the quintile subgroups, we split our sample of pure equity issues into quintile subgroups based on the size of equity issuance ($SSTK_t/TA_{t-1}$). $\Delta NonCashCA_t/SSTK_t$, $\Delta FixedAssets_t/SSTK_t$ and $\Delta Expense_t/SSTK_t$ can be interpreted as the average propensities to spend on each respective use out of issue proceeds. In Panel B, the four uses of issue proceeds ($\Delta NonCashCA_t/TA_{t-1}$, $\Delta FixedAssets_t/TA_{t-1}$, $\Delta Expense_t/TA_{t-1}$ and $\Delta Cash_t/TA_{t-1}$) are regressed on the explanatory variables of McLean's regression model. The regressions are estimated on the entire sample of pure equity issues. The numbers in parentheses are t-values based on industry-clustered standard errors at the Fama-French 48 industries. *, ** and *** indicate two-tailed significance at the 10%, 5% and 1% levels, respectively.

Panel A. Cash savings and spending on other uses

		Quintile subgroups sorted by issue size ($SSTK_t/TA_{t-1}$)					
		Q1	Q2	Q3	Q4	Q5	All obs.
$\Delta Cash_t/TA_{t-1}$	Mean	0.021	0.029	0.078	0.222	0.900	0.250
	Median	[0.006]	[0.011]	[0.042]	[0.181]	[0.678]	[0.069]
$\Delta NonCashCA_t/TA_{t-1}$	Mean	0.063	0.064	0.081	0.113	0.180	0.100
	Median	[0.029]	[0.029]	[0.040]	[0.049]	[0.080]	[0.042]
$\Delta FixedAssets_t/TA_{t-1}$	Mean	0.089	0.115	0.145	0.194	0.374	0.184
	Median	[0.043]	[0.050]	[0.062]	[0.071]	[0.108]	[0.063]
$\Delta Expense_t/TA_{t-1}$	Mean	0.159	0.169	0.202	0.271	0.478	0.256
	Median	[0.092]	[0.106]	[0.124]	[0.190]	[0.310]	[0.153]
$\Delta Cash_t/SSTK_t$	Mean	0.139	0.106	0.192	0.336	0.483	0.251
	Median	[0.044]	[0.059]	[0.120]	[0.301]	[0.485]	[0.221]
$\Delta NonCashCA_t/SSTK_t$	Mean	0.472	0.316	0.247	0.209	0.148	0.278
	Median	[0.231]	[0.145]	[0.113]	[0.079]	[0.049]	[0.096]
$\Delta FixedAssets_t/SSTK_t$	Mean	0.612	0.526	0.414	0.318	0.259	0.425
	Median	[0.340]	[0.247]	[0.181]	[0.123]	[0.073]	[0.154]
$\Delta Expense_t/SSTK_t$	Mean	1.210	0.819	0.614	0.488	0.342	0.694
	Median	[0.742]	[0.511]	[0.367]	[0.302]	[0.201]	[0.341]

Panel B. Regressions to estimate the marginal cash-savings rate and the marginal spending rates on other uses

	Dependent variable			
	(1)	(2)	(3)	(4)
	$\Delta Cash_t/TA_{t-1}$	$\Delta NonCashCA_t/TA_{t-1}$	$\Delta FixedAssets_t/TA_{t-1}$	$\Delta Expense_t/TA_{t-1}$
$SSTK_t/TA_{t-1}$	0.683***	0.099***	0.226***	0.220***
	(20.64)	(5.08)	(5.92)	(6.25)
$DEBTISS_t/TA_{t-1}$	-0.104	0.224***	0.594***	0.192*
	(-0.93)	(3.61)	(3.15)	(1.83)
$Cash\ flow_{t-1}$	0.366***	0.131***	0.153***	0.059
	(12.71)	(8.22)	(3.35)	(1.54)
$Other_{t-1}$	0.024	-0.019	0.092***	-0.090***
	(0.81)	(-1.61)	(3.30)	(-3.94)
$Log(TA)_{t-1}$	0.015**	-0.000	0.035***	0.024***
	(2.27)	(-0.17)	(5.37)	(4.86)
Intercept	-0.169***	0.142***	-0.089***	0.267***
	(-4.78)	(4.61)	(-3.43)	(4.22)
N	14,596	14,464	14,464	14,596
Adj. R^2	0.6960	0.1676	0.1809	0.1268

Table 4: Propensities to save cash for subgroups by market-to-book, cash holdings and sales growth
We split the sample of pure equity issues, as described in Table 1's caption, into quintile subgroups (Q1 through Q5) based on the market-to-book assets ratio (MB_{t-1}) (Panel A), the level of cash holdings ($(Cash/TA)_{t-1}$) (Panel B) and sales growth ($Sales\ growth_t$) (Panel C), respectively. $Sales\ growth_t$ is one-year sales growth rate ($\Delta Sales_t / Sales_{t-1}$). The sample spans the period 1971-2016. Cell values are the mean and median of selected firm characteristics.

Panel A.		Quintile subgroups sorted by market-to-book (MB_{t-1})				
		Q1	Q2	Q3	Q4	Q5
$\Delta Cash_t/SSTK_t$	Mean	0.199	0.218	0.249	0.263	0.308
	Median	[0.100]	[0.167]	[0.253]	[0.266]	[0.321]
$SSTK_t/TA_{t-1}$	Mean	0.295	0.391	0.537	0.707	1.109
	Median	[0.191]	[0.240]	[0.353]	[0.475]	[0.712]
MB_{t-1}	Mean	1.103	1.750	2.652	4.261	10.657
	Median	[1.101]	[1.688]	[2.552]	[3.999]	[8.185]
$(Cash/TA)_{t-1}$	Mean	0.139	0.209	0.312	0.405	0.456
	Median	[0.063]	[0.115]	[0.223]	[0.369]	[0.457]
$Sales\ growth_t$	Mean	0.359	0.463	0.540	0.667	0.996
	Median	[0.170]	[0.220]	[0.252]	[0.312]	[0.450]
Panel B.		Quintile subgroups sorted by cash holdings ($(Cash/TA)_{t-1}$)				
		Q1	Q2	Q3	Q4	Q5
$\Delta Cash_t/SSTK_t$	Mean	0.245	0.335	0.306	0.300	0.068
	Median	[0.080]	[0.243]	[0.287]	[0.347]	[0.252]
$SSTK_t/TA_{t-1}$	Mean	0.360	0.469	0.590	0.740	0.921
	Median	[0.216]	[0.266]	[0.334]	[0.432]	[0.595]
MB_{t-1}	Mean	2.341	2.986	3.893	5.159	5.986
	Median	[1.539]	[1.898]	[2.527]	[3.492]	[4.212]
$(Cash/TA)_{t-1}$	Mean	0.018	0.096	0.231	0.433	0.725
	Median	[0.013]	[0.086]	[0.231]	[0.449]	[0.758]
$Sales\ growth_t$	Mean	0.404	0.494	0.499	0.649	0.983
	Median	[0.202]	[0.207]	[0.246]	[0.329]	[0.388]
Panel C.		Quintile subgroups sorted by sales growth ($Sales\ growth_t$)				
		Q1	Q2	Q3	Q4	Q5
$\Delta Cash_t/SSTK_t$	Mean	0.041	0.241	0.381	0.397	0.195
	Median	[0.090]	[0.180]	[0.311]	[0.334]	[0.222]
$SSTK_t/TA_{t-1}$	Mean	0.652	0.454	0.461	0.612	0.905
	Median	[0.357]	[0.250]	[0.265]	[0.363]	[0.544]
MB_{t-1}	Mean	4.159	3.069	3.349	4.213	5.635
	Median	[2.657]	[1.969]	[2.172]	[2.711]	[3.543]
$(Cash/TA)_{t-1}$	Mean	0.338	0.237	0.239	0.292	0.398
	Median	[0.238]	[0.134]	[0.147]	[0.222]	[0.363]
$Sales\ growth_t$	Mean	-0.359	0.048	0.266	0.583	2.493
	Median	[-0.332]	[0.054]	[0.257]	[0.546]	[1.774]

Table 5: Regressions of the average cash-savings rate from equity issues

The table reports regression results in which the average cash-savings rate from equity issuance (denoted by $\Delta Cash_t/SSTK_t$) is the dependent variable. The sample consists of pure equity issues, as defined in Table 1's caption, over the period 1971-2016. The key explanatory variables are market-to-book (MB_{t-1}), the level of cash holdings ($(Cash/TA)_{t-1}$), sales growth ($Sales\ growth_t$) and its square ($Sales\ growth_t^2$). $Sales\ growth_t$ is one-year sales growth rate ($\Delta Sales_t/Sales_{t-1}$). In Columns (4) and (5) the regressions control for issue size ($SSTK_t/TA_{t-1}$) along with CPI-adjusted sales ($log(CPI\ adj.\ Sales)_{t-1}$), operating profitability ($(EBITDA/TA)_{t-1}$) and book leverage ($(Debt/TA)_{t-1}$) as well as year-fixed effects. The numbers in parentheses are t-values based on industry-clustered standard errors at the Fama-French 48 industries. *, ** and *** indicate two-tailed significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
MB_{t-1}	0.005*			0.000	0.010**
	(1.95)			(0.01)	(2.12)
$(Cash/TA)_{t-1}$		-0.281***		-0.406***	-0.369***
		(-3.71)		(-5.07)	(-4.74)
$Sales\ growth_t$			0.155***	0.147***	0.080***
			(5.44)	(5.29)	(4.33)
$Sales\ growth_t^2$			-0.036***	-0.035***	-0.012***
			(-5.19)	(-4.96)	(-4.74)
$SSTK_t/TA_{t-1}$				0.197***	0.290***
				(4.84)	(8.60)
$Log(CPI\ adj.\ Sales)_{t-1}$					0.060***
					(6.88)
$(EBITDA/TA)_{t-1}$					0.434***
					(9.60)
$(PPENT/TA)_{t-1}$					-0.194**
					(-2.32)
$(Debt/TA)_{t-1}$					-0.556***
					(-6.90)
Intercept	0.270***	0.308***	0.238***	0.243***	-0.003
	(4.30)	(5.13)	(3.80)	(3.75)	(-0.03)
N	14,216	14,626	14,626	14,216	14,169
Adj. R^2	0.0150	0.0228	0.0245	0.0656	0.1700

Table 6: Regressions with institutional ownership as an additional explanatory variable
The table reports regression results in which the average cash-savings rate from equity issuance (denoted by $\Delta Cash_t/SSTK_t$) is the dependent variable. The key explanatory variables are institutional ownership ($InsOwn_{t-1}$) and long-term institutional ownership ($LT\ InsOwn_{t-1}$). The sample consists of pure equity issues, as defined in Table 1's caption, over the period 1980-2016. The regressions control for market-to-book (MB_{t-1}), the level of cash holdings ($(Cash/TA)_{t-1}$), sales growth ($Sales\ growth_t$), its square ($Sales\ growth_t^2$), issue size ($SSTK_t/TA_{t-1}$), CPI-adjusted sales ($log(CPI\ adj.\ Sales)_{t-1}$), operating profitability ($(EBITDA/TA)_{t-1}$) and book leverage ($(Debt/TA)_{t-1}$) as well as year-fixed effects. The numbers in parentheses are t-values based on industry-clustered standard errors at the Fama-French 48 industries. *, ** and *** indicate two-tailed significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
$InsOwn_{t-1}$	0.482***	0.521***	0.244***			
	(6.56)	(7.01)	(5.85)			
$LT\ InsOwn_{t-1}$				0.788***	0.864***	0.391***
				(6.14)	(6.93)	(4.91)
MB_{t-1}		0.001	0.008*		-0.001	0.008*
		(0.13)	(1.87)		(-0.10)	(1.73)
$(Cash/TA)_{t-1}$		-0.430***	-0.366***		-0.423***	-0.357***
		(-3.38)	(-3.94)		(-3.35)	(-3.81)
$Sales\ growth_t$		0.124***	0.080***		0.132***	0.084***
		(4.50)	(2.92)		(4.76)	(3.15)
$Sales\ growth_t^2$		-0.026***	-0.010***		-0.028***	-0.010***
		(-4.55)	(-3.33)		(-4.52)	(-3.55)
$SSTK_t/TA_{t-1}$		0.208***	0.290***		0.212***	0.293***
		(4.29)	(6.24)		(4.50)	(6.45)
$Log(CPI\ adj.\ Sales)_{t-1}$			0.051***			0.052***
			(3.80)			(3.88)
$(EBITDA/TA)_{t-1}$			0.433***			0.436***
			(7.45)			(7.41)
$(PPENT/TA)_{t-1}$			-0.249**			-0.249**
			(-2.55)			(-2.54)
$(Debt/TA)_{t-1}$			-0.604***			-0.609***
			(-5.46)			(-5.52)
Intercept	0.046	-0.046	-0.036	0.137	0.048	0.003
	(0.56)	(-0.57)	(-0.39)	(1.54)	(0.55)	(0.03)
N	5,363	5,264	5,244	5,360	5,261	5,241
Adj. R^2	0.0548	0.1091	0.1895	0.0506	0.1057	0.1888

Table 7: Average and marginal cash-savings rates from equity issues for each decade
The table reports the means (as well as the medians in square brackets) of the average cash-savings rate ($\Delta Cash_t/SSTK_t$) and the marginal cash-savings rate of pure equity issues for individual decades from 1970s through 2010s. Pure equity issues are defined in Table 1's caption. "All issues" denotes all pure equity issues and "Q5" denotes the top quintile issues by issue size ($SSTK_t/TA_{t-1}$). The 1970s spans the period 1971-1980; The 1980s spans the period 1981-1990; and so on. The 2010s include issue-years that belong to the period 2011-2016. N is the number of issue-years.

		All issues		Q5 issues only		All issues
		$\Delta Cash_t/SSTK_t$	$SSTK_t/TA_{t-1}$	$\Delta Cash_t/SSTK_t$	$SSTK_t/TA_{t-1}$	Marginal cash-savings rate
1970s	N	708	708	139	139	706
	Mean	0.268	0.299	0.432	0.724	0.634
	Median	[0.142]	[0.203]	[0.392]	[0.525]	
1980s	N	2,434	2,434	486	486	2,378
	Mean	0.25	0.516	0.446	1.483	0.651
	Median	[0.202]	[0.288]	[0.452]	[1.140]	
1990s	N	5,425	5,425	1,084	1,084	5,277
	Mean	0.277	0.708	0.534	2.051	0.689
	Median	[0.238]	[0.382]	[0.541]	[1.662]	
2000s	N	4,406	4,406	880	880	4,344
	Mean	0.255	0.61	0.47	1.741	0.681
	Median	[0.247]	[0.343]	[0.482]	[1.361]	
2010s	N	1,901	1,901	379	379	1,891
	Mean	0.165	0.616	0.433	1.747	0.683
	Median	[0.168]	[0.355]	[0.454]	[1.364]	

Table 8: Cash savings behavior of pure, dual and debt-retiring issues in their issue size quintiles

The table reports the mean and median of issue size (Panel A), change in the cash ratio (Panel B), average cash-savings rate (Panel C) and average spending rate on operating expenses (Panel D) for three groups of equity issues: pure issues, dual issues and debt-retiring issues. The sample spans the period 1971-2016. The mean and median values are reported for each issue-size quintile as well as for all observations. Quintile subgroups (Q1 through Q5) are formed in the following procedure: we first identify pure issues, dual issues and debt-retiring issues each year and then merge those issues into a single dataset. We then split the dataset into quintile subgroups by issue size. Issue size is defined as the size of equity issues ($SSTK_t/TA_{t-1}$) for pure issues and debt-retiring issues but as the size of total issues (($SSTK_t$ + $DebtIssue_t$)/TA_{t-1}) for dual issues, where total issues are the sum of equity issue proceeds and the increase in total debt. All three types of issues are firm-years in which issue proceeds ([SSTK]) are greater than 10% of lagged book assets. Among them, pure issues are firm-years in which total debt does not increase or decrease by more than 10% of lagged book assets; dual issuers are those in which total debt increases by more than 10% of lagged book assets; and debt-retiring issues are those in which total debt decreases by more than 10% of lagged book assets. N is the number of issue-years.

Panel A. Issue size ($SSTK_t/TA_{t-1}$ *or* ($SSTK_t$ + $DebtIssue_t$)/TA_{t-1})

		Quintiles by issue size					
		Q1	Q2	Q3	Q4	Q5	All obs.
Pure issues	Mean	0.137	0.248	0.426	0.738	1.975	0.617
	Median	[0.132]	[0.241]	[0.416]	[0.708]	[1.609]	[0.332]
	N	3,872	3,336	2,673	2,568	2,425	14,874
Dual issues	Mean	0.213	0.292	0.438	0.731	1.983	1.029
	Median	[0.212]	[0.287]	[0.428]	[0.719]	[1.521]	[0.682]
	N	3	527	1,283	1,520	1,679	5,012
Debt-retiring issues	Mean	0.138	0.246	0.418	0.715	2.085	0.628
	Median	[0.134]	[0.239]	[0.413]	[0.700]	[1.704]	[0.341]
	N	729	767	674	542	510	3,222

Panel B. Change in the cash-to-assets ratio from t-1 to t ($\Delta(Cash/TA)_t$)

		Quintiles by issue size					
		Q1	Q2	Q3	Q4	Q5	All obs.
Pure issues	Mean	-0.014	-0.004	0.023	0.042	0.106	0.024
	Median	[-0.000]	[0.001]	[0.020]	[0.036]	[0.103]	[0.012]
Dual issues	Mean	0.000	-0.015	-0.013	-0.003	0.003	-0.005
	Median	[0.001]	[-0.001]	[-0.000]	[-0.000]	[-0.001]	[-0.001]
Debt-retiring issues	Mean	0.005	0.014	0.033	0.065	0.137	0.044
	Median	[0.002]	[0.008]	[0.023]	[0.063]	[0.145]	[0.018]

Panel C. Average cash-savings rate ($\Delta Cash_t/SSTK_t$)

		Quintiles by issue size					
		Q1	Q2	Q3	Q4	Q5	All obs.
Pure issues	Mean	0.125	0.120	0.258	0.365	0.498	0.250
	Median	[0.043]	[0.069]	[0.178]	[0.347]	[0.499]	[0.221]
Dual issues	Mean	0.268	0.036	0.082	0.129	0.203	0.132
	Median	[0.031]	[0.010]	[0.025]	[0.043]	[0.095]	[0.047]
Debt-retiring issues	Mean	0.092	0.107	0.171	0.266	0.377	0.186
	Median	[0.025]	[0.056]	[0.109]	[0.231]	[0.395]	[0.122]

Panel D. Average spending rate on operating expenses ($\Delta Expense_t/SSTK_t$)

		Quintiles by issue size					
		Q1	Q2	Q3	Q4	Q5	All obs.
Pure issues	Mean	1.164	0.755	0.551	0.428	0.299	0.694

	Median	[0.705]	[0.467]	[0.324]	[0.279]	[0.186]	[0.341]
Dual issues	Mean	2.971	0.831	0.800	0.611	0.513	0.651
	Median	[0.555]	[0.503]	[0.416]	[0.316]	[0.241]	[0.315]
Debt-retiring issues	Mean	0.970	0.731	0.684	0.617	0.554	0.728
	Median	[0.547]	[0.386]	[0.428]	[0.349]	[0.274]	[0.374]

Table 9: Stock-return effect of cash increases before and after removing equity issues

In Panel A, we split non-financial and non-utility Compustat firms over the period 1971-2001 into quintile subgroups (from Q1 to Q5) by the change in cash holdings scaled by lagged market value of equity ($(\Delta Cash/MVE_{t-1})$). Cell values are the mean and median (in square brackets) of selected variables. *Excess return*$_t$ is the annual stock return in excess of the return to the benchmark portfolio that matches the stock's size and book-to-market, as defined in Faulkender and Wang (2006). $SSTK_t/TA_{t-1}$ is equity issue proceeds scaled by lagged book assets. CF_t/TA_{t-1} is cash flow scaled by lagged book assets. *Sales growth*$_t$ is one-year sales growth from year *t-1* to *t* ($\Delta Sales_t/Sales_{t-1}$). In Panel B, we retabulate the mean and median after removing firms that issue equity at year *t* from each quintile of Panel A. Equity-issuers are defined as firm-years in which equity issue proceeds ([SSTK]) is greater than 10% of lagged book assets. Similarly, in Panel C, we retabulate the mean and median after removing fastest growing firms from each quintile of Panel A, where fastest growing firms are firm-years in which *Sales growth*$_t$ belongs to the top twenty percent of all observations in a given year.

Panel A. Before removing equity issues

		Quintiles by cash increase ($\Delta Cash_t/MVE_{t-1}$)					
		Q1	Q2	Q3	Q4	Q5	All obs.
$\Delta Cash_t/MVE_{t-1}$	Mean	-0.168	-0.025	0.003	0.034	0.226	0.014
	Median	[-0.116]	[-0.022]	[0.001]	[0.029]	[0.150]	[0.001]
Excess return$_t$	Mean	-0.117	-0.067	-0.027	0.010	0.072	-0.025
	Median	[-0.185]	[-0.124]	[-0.088]	[-0.063]	[-0.031]	[-0.097]
$SSTK_t/TA_{t-1}$	Mean	0.027	0.038	0.040	0.065	0.184	0.071
	Median	[0.000]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
CF_t/TA_{t-1}	Mean	-0.007	0.047	0.083	0.089	0.071	0.057
	Median	[0.051]	[0.087]	[0.103]	[0.108]	[0.100]	[0.090]
Sales growth$_t$	Mean	0.242	0.202	0.188	0.224	0.305	0.232
	Median	[0.079]	[0.098]	[0.107]	[0.118]	[0.129]	[0.107]

Panel B. After removing equity issues

		Quintiles by cash increase ($\Delta Cash_t/MVE_{t-1}$)					
		Q1	Q2	Q3	Q4	Q5	All obs.
$\Delta Cash_t/MVE_{t-1}$	Mean	-0.169	-0.025	0.003	0.034	0.218	0.005
	Median	[-0.117]	[-0.022]	[0.001]	[0.028]	[0.143]	[0.000]
Excess return$_t$	Mean	-0.121	-0.073	-0.038	-0.010	0.012	-0.047
	Median	[-0.185]	[-0.127]	[-0.094]	[-0.072]	[-0.070]	[-0.109]
$SSTK_t/TA_{t-1}$	Mean	0.006	0.008	0.008	0.009	0.008	0.008
	Median	[0.000]	[0.001]	[0.001]	[0.001]	[0.000]	[0.001]
CF_t/TA_{t-1}	Mean	0.006	0.068	0.097	0.108	0.100	0.075
	Median	[0.053]	[0.090]	[0.105]	[0.109]	[0.100]	[0.092]
Sales growth$_t$	Mean	0.202	0.159	0.150	0.166	0.189	0.173
	Median	[0.075]	[0.093]	[0.101]	[0.106]	[0.100]	[0.096]

Panel C. After removing fastest growing firms

		Quintiles by cash increase ($\Delta Cash_t/MVE_{t-1}$)					
		Q1	Q2	Q3	Q4	Q5	All obs.
$\Delta Cash_t/MVE_{t-1}$	Mean	-0.166	-0.024	0.003	0.034	0.219	0.010
	Median	[-0.115]	[-0.022]	[0.001]	[0.028]	[0.146]	[0.000]
Excess return$_t$	Mean	-0.139	-0.094	-0.056	-0.031	0.008	-0.063
	Median	[-0.200]	[-0.140]	[-0.104]	[-0.085]	[-0.080]	[-0.121]
$SSTK_t/TA_{t-1}$	Mean	0.018	0.024	0.026	0.038	0.108	0.042
	Median	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
CF_t/TA_{t-1}	Mean	0.001	0.053	0.083	0.088	0.067	0.058
	Median	[0.051]	[0.085]	[0.100]	[0.104]	[0.092]	[0.087]
Sales growth$_t$	Mean	-0.010	0.037	0.061	0.067	0.037	0.039
	Median	[0.031]	[0.066]	[0.080]	[0.083]	[0.067]	[0.067]

Table 10: The market-share-growth effect of cash holdings before and after removing equity issues
In Panel A, we split non-financial and non-utility Compustat firms over the period 1973-2006 into quintile subgroups (Q1 through Q5) by the standardized cash-to-assets ratio ($(zCash_{t-1})$, as defined (X – industry-year mean of X)/(industry-year standard deviation of X), where X is the cash-to-assets ratio. Cell values are mean and median (in square brackets) of selected variables. $\Delta MarketShare_{t-1+i}$ is market share growth, as measured by sales growth less its industry-year average for i = 0, 1, 2 and 3, where sales growth is one-year sales growth ($\Delta Sales_{t+i}/Sale_{t-1+i}$). Industry-year is defined at the Fama-French 48 industry level. $SSTK_{t+i}/TA_{t-1+i}$'s are equity issue proceeds scaled by lagged book assets for i = -1, 0, 1, 2 and 3. In Panel B, we retabulate the mean and median after removing firms that issue equity any year over (t, $t+1$) from each quintile of Panel A. Similarly, in Panel C we retabulate the mean and median after removing firms that issue equity any year over ($t-1$, $t+3$). Equity-issuers are defined as firm-years in which equity issue proceeds ([SSTK]) is greater than 10% of lagged book assets.

Panel A. Before removing equity issuers

		Quintiles by standardized cash ratio $(zCash_{t-1})$					
		Q1	Q2	Q3	Q4	Q5	All obs.
$zCash_{t-1}$	Mean	-0.962	-0.619	-0.308	0.285	1.570	-0.007
	Median	[-0.916]	[-0.617]	[-0.327]	[0.260]	[1.363]	[-0.327]
$(Cash/TA)_{t-1}$	Mean	0.037	0.049	0.113	0.252	0.500	0.190
	Median	[0.018]	[0.023]	[0.067]	[0.185]	[0.480]	[0.088]
$SSTK_{t-1}/TA_{t-2}$	Mean	0.058	0.050	0.069	0.162	0.479	0.161
	Median	[0.003]	[0.001]	[0.002]	[0.004]	[0.007]	[0.003]
$SSTK_t/TA_{t-1}$	Mean	0.091	0.055	0.068	0.109	0.164	0.098
	Median	[0.003]	[0.002]	[0.002]	[0.004]	[0.005]	[0.003]
$SSTK_{t+1}/TA_t$	Mean	0.060	0.040	0.051	0.081	0.147	0.076
	Median	[0.003]	[0.002]	[0.002]	[0.004]	[0.005]	[0.003]
$SSTK_{t+2}/TA_{t+1}$	Mean	0.050	0.033	0.043	0.066	0.120	0.062
	Median	[0.003]	[0.002]	[0.002]	[0.003]	[0.004]	[0.003]
$SSTK_{t+3}/TA_{t+2}$	Mean	0.043	0.030	0.039	0.055	0.100	0.053
	Median	[0.003]	[0.002]	[0.002]	[0.003]	[0.004]	[0.003]
$\Delta MarketShare_{t-1}$	Mean	-0.081	-0.036	-0.020	0.010	0.131	-0.001
	Median	[-0.113]	[-0.060]	[-0.060]	[-0.059]	[-0.034]	[-0.065]
$\Delta MarketShare_t$	Mean	-0.092	-0.047	-0.035	-0.021	0.095	-0.021
	Median	[-0.108]	[-0.061]	[-0.058]	[-0.055]	[-0.028]	[-0.062]
$\Delta MarketShare_{t+1}$	Mean	-0.053	-0.026	-0.022	-0.004	0.058	-0.010
	Median	[-0.072]	[-0.042]	[-0.037]	[-0.035]	[-0.019]	[-0.041]
$\Delta MarketShare_{t+2}$	Mean	-0.036	-0.015	-0.014	-0.005	0.042	-0.006
	Median	[-0.053]	[-0.031]	[-0.033]	[-0.028]	[-0.014]	[-0.032]

Panel B. After removing equity issuers (i.e., firms that issue equity in year t or year t-1 or both)

		Quintiles by standardized cash ratio $(zCash_{t-1})$					
		Q1	Q2	Q3	Q4	Q5	All obs.
$zCash_{t-1}$	Mean	-0.950	-0.618	-0.313	0.260	1.586	-0.080
	Median	[-0.903]	[-0.616]	[-0.332]	[0.233]	[1.382]	[-0.383]
$(Cash/TA)_{t-1}$	Mean	0.034	0.044	0.098	0.207	0.408	0.146
	Median	[0.017]	[0.022]	[0.061]	[0.151]	[0.340]	[0.070]
$SSTK_{t-1}/TA_{t-2}$	Mean	0.008	0.007	0.008	0.009	0.008	0.008
	Median	[0.002]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
$SSTK_t/TA_{t-1}$	Mean	0.008	0.007	0.008	0.009	0.008	0.008
	Median	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
$SSTK_{t+1}/TA_t$	Mean	0.039	0.025	0.028	0.036	0.059	0.036
	Median	[0.002]	[0.001]	[0.001]	[0.002]	[0.001]	[0.001]
$SSTK_{t+2}/TA_{t+1}$	Mean	0.033	0.021	0.027	0.033	0.052	0.032
	Median	[0.002]	[0.001]	[0.001]	[0.002]	[0.001]	[0.002]
$SSTK_{t+3}/TA_{t+2}$	Mean	0.031	0.023	0.025	0.028	0.046	0.030
	Median	[0.003]	[0.001]	[0.002]	[0.002]	[0.001]	[0.002]
$\Delta MarketShare_{t-1}$	Mean	-0.115	-0.062	-0.052	-0.044	0.011	-0.055
	Median	[-0.123]	[-0.068]	[-0.066]	[-0.066]	[-0.053]	[-0.074]

$\Delta MarketShare_t$	Mean	-0.107	-0.062	-0.051	-0.046	0.024	-0.051
	Median	[-0.111]	[-0.063]	[-0.061]	[-0.057]	[-0.036]	[-0.066]
$\Delta MarketShare_{t+1}$	Mean	-0.063	-0.033	-0.028	-0.018	0.015	-0.027
	Median	[-0.075]	[-0.045]	[-0.038]	[-0.036]	[-0.026]	[-0.044]
$\Delta MarketShare_{t+2}$	Mean	-0.043	-0.021	-0.020	-0.017	0.013	-0.019
	Median	[-0.055]	[-0.033]	[-0.036]	[-0.030]	[-0.020]	[-0.035]

Panel C. After removing equity issuers (i.e., firms that issue equity any year (t-1, t+3))

		Quintiles by standardized cash ratio *($zCash_{t-1}$)*					
		Q1	Q2	Q3	Q4	Q5	All obs.
$zCash_{t-1}$	Mean	-0.948	-0.617	-0.312	0.256	1.593	-0.082
	Median	[-0.902]	[-0.616]	[-0.330]	[0.229]	[1.387]	[-0.382]
$(Cash/TA)_{t-1}$	Mean	0.035	0.043	0.095	0.197	0.382	0.139
	Median	[0.017]	[0.022]	[0.060]	[0.145]	[0.316]	[0.068]
$SSTK_{t-1}/TA_{t-2}$	Mean	0.008	0.007	0.007	0.008	0.007	0.007
	Median	[0.001]	[0.001]	[0.001]	[0.001]	[0.000]	[0.001]
$SSTK_t/TA_{t-1}$	Mean	0.008	0.007	0.007	0.008	0.007	0.007
	Median	[0.001]	[0.001]	[0.001]	[0.001]	[0.000]	[0.001]
$SSTK_{t+1}/TA_t$	Mean	0.008	0.007	0.007	0.008	0.007	0.007
	Median	[0.001]	[0.001]	[0.001]	[0.001]	[0.000]	[0.001]
$SSTK_{t+2}/TA_{t+1}$	Mean	0.008	0.007	0.007	0.007	0.007	0.007
	Median	[0.001]	[0.001]	[0.001]	[0.001]	[0.000]	[0.001]
$SSTK_{t+3}/TA_{t+2}$	Mean	0.008	0.007	0.007	0.007	0.007	0.007
	Median	[0.002]	[0.001]	[0.001]	[0.001]	[0.000]	[0.001]
$\Delta MarketShare_{t-1}$	Mean	-0.121	-0.068	-0.061	-0.054	-0.008	-0.065
	Median	[-0.126]	[-0.071]	[-0.069]	[-0.069]	[-0.053]	[-0.076]
$\Delta MarketShare_t$	Mean	-0.120	-0.072	-0.061	-0.052	-0.014	-0.066
	Median	[-0.117]	[-0.068]	[-0.065]	[-0.060]	[-0.043]	[-0.070]
$\Delta MarketShare_{t+1}$	Mean	-0.078	-0.046	-0.043	-0.035	-0.009	-0.043
	Median	[-0.082]	[-0.051]	[-0.044]	[-0.042]	[-0.033]	[-0.050]
$\Delta MarketShare_{t+2}$	Mean	-0.055	-0.032	-0.034	-0.028	-0.005	-0.032
	Median	[-0.060]	[-0.040]	[-0.040]	[-0.033]	[-0.025]	[-0.040]

Table 11: Fama-MacBeth regressions of post-issue monthly returns

The table reports the results of Fama-McBeth regressions of month stock returns of year *t+1* (i.e., the year immediately following equity issues). The regressions control for the lagged values of firm size, market-to-book and momentum. $Size_{t-1}$ is the natural logarithm of market equity measured at the end of the previous June; MB_{t-1} is the natural logarithm of the market-to-book equity ratio measured at the end of the previous June; and $Momentum_{t-1}$ is the past 6 months stock return. In Columns (2), (3) and (4), the regressions include either the average cash-savings rate from equity issuance ($\Delta Cash_t/SSTK_t$) or the size of equity issuance ($SSTK_t/TA_{t-1}$) or both. The sample consists of non-financial and non-utility Compustat and CRSP firms for the period 1971-2016. In constructing $\Delta Cash_t/\Delta SSTK_t$ and $SSTK_t/TA_{t-1}$, we use actual values of these variables for pure equity issues, but set those values to zero for dual equity-and-debt issues and debt-retiring equity issues. Pure equity issues are defined in Table 1's caption. The regressions in the table are estimated for the 552 months from January 1971 to December 2016, with a total of 1,172,843 firm-observations. The numbers in parentheses are t-values. *, ** and *** indicate two-tailed significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)
$Size_{t-1}$	-0.001*	-0.001***	-0.001***	-0.001***
	(-1.68)	(-4.29)	(-2.64)	(-3.79)
MB_{t-1}	-0.004***	-0.004***	-0.004***	-0.004***
	(-5.28)	(-5.32)	(-5.18)	(-4.28)
$Momentum_{t-1}$	0.004**	0.003	0.002	0.003
	(2.32)	(1.59)	(1.04)	(1.39)
$\Delta Cash_t/SSTK_t$		0.000***		0.000***
		(18.10)		(18.10)
$SSTK_t/TA_{t-1}$			0.008***	0.006***
			(3.55)	(3.08)
Intercept	0.009***	0.015***	0.011***	0.014***
	(3.11)	(4.78)	(3.90)	(4.63)
Adj. R^2	0.0315	0.0364	0.0351	0.0397

Table 12: Investor sentiment and issue cost

The table reports results of regressions in which the average cash-savings rate from equity issuance (denoted by $\Delta Cash_t/\Delta PaidInCap_t$) is the dependent variable. The sample includes pure equity issues over the period 1971-2016. We use two sets of proxy variables as explanatory variables: (i) investor sentiment and (ii) issue cost. In Columns (1)-(3), proxies for investment sentiment include the first day's return on IPOs (RIPO), the number of IPOs (NIPO) and the first principal component of RIPO, NIPO and four other investor components according to Baker and Wurgler (2006) (SENTIMENT). In Columns (4)-(8), proxies for issue cost include three firm-level measures: Amihud's (2002) illiquidity, Amivest's price impact measure and Gibb's spread estimate and two economy-level indicator variables: Contraction and Decline. Contraction (Decline) is equal to one if six or more of the previous 12 months had declining GDP (industry production) and zero otherwise. These proxies are defined in Appendix A.1. All regressions also include the same set of control variables along with year-fixed effect. *, ** and *** indicate two-tailed significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Investment sentiment			Issue cost				
RIPO	-0.012**							
	(-2.27)							
NIPO		-0.005**						
		(-2.34)						
SENTIMENT			0.301**					
			(2.34)					
Amihud				0.001				
				(1.53)				
Amvest					0.000*			
					(1.84)			
Gibb						-0.959		
						(-0.84)		
Contraction							0.107	
							(1.35)	
Decline								0.165*
								(2.00)
$SSTK_t/TA_{t-1}$	0.291***	0.295***	0.295***	0.282***	0.282***	0.279***	0.295***	0.295***
	(8.60)	(8.80)	(8.80)	(11.28)	(11.03)	(11.90)	(8.80)	(8.80)
MB_{t-1}	0.011**	0.011**	0.011**	0.015**	0.014**	0.015**	0.011**	0.011**
	(2.38)	(2.38)	(2.38)	(2.65)	(2.50)	(2.47)	(2.38)	(2.38)
$(Cash/TA)_{t-1}$	-0.354***	-0.363***	-0.363***	-0.321***	-0.333***	-0.342***	-0.363***	-0.363***

	(-4.90)	(-4.79)	(-4.79)	(-3.53)	(-3.69)	(-3.76)	(-4.79)	(-4.79)
(EBITDA/TA)$_{t-1}$	0.447***	0.448***	0.448***	0.534***	0.532***	0.528***	0.448***	0.448***
	(9.38)	(9.85)	(9.85)	(9.69)	(9.70)	(9.03)	(9.85)	(9.85)
Log(CPI adj. Sales)$_{t-1}$	0.059***	0.058***	0.058***	0.058***	0.055***	0.054***	0.058***	0.058***
	(7.25)	(7.20)	(7.20)	(4.34)	(4.15)	(3.95)	(7.20)	(7.20)
(PPENT/TA)$_{t-1}$	-0.189**	-0.189**	-0.189**	-0.064	-0.063	-0.064	-0.189**	-0.189**
	(-2.29)	(-2.34)	(-2.34)	(-1.16)	(-1.16)	(-1.18)	(-2.34)	(-2.34)
(Debt/TA)$_{t-1}$	-0.566***	-0.554***	-0.554***	-0.646***	-0.645***	-0.646***	-0.554***	-0.554***
	(-7.23)	(-6.74)	(-6.74)	(-7.40)	(-7.30)	(-7.34)	(-6.74)	(-6.74)
Intercept	0.318***	0.233***	0.272***	0.028	0.050	0.059	0.016	0.016
	(3.82)	(3.71)	(3.93)	(0.23)	(0.42)	(0.49)	(0.16)	(0.16)
N	13,641	13,966	13,966	6,326	6,326	6,326	13,966	13,966
Adj. R^2	0.167	0.168	0.168	0.172	0.172	0.172	0.168	0.168