Equity Issuance Through Employee Stock Option Exercises *

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This Draft: January 2018

* Chang acknowledges financial support from Academic Research Fund Tier 1 provided by Ministry of Education (Singapore). Wang acknowledges financial support from the Singapore Management University through a research grant (C207MSS14B002) from the Ministry of Education Academic Research Fund Tier 1. We thank Rosita Chang, Jia Chen, Agnes Cheng, Tim Chue, Andy Chui, Jarrad Harford, Gang Hu, Wei Huang, Lei Jiang, Qianqiu Liu, Ghon Rhee, Silvio Vismara, Vijay Yadav, Dong Yan, participants at the 2015 International Conference of the French Finance Association, and seminar participants at Hong Kong Polytechnic University, University of Hawai'i, Peking University, and Tsinghua University for valuable comments. All errors are ours.
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Equity Issuance Through Employee Option Exercises

Abstract

Employee stock option exercises have become an important means through which U.S. firms issue equity. We separate total equity issuance proceeds into two parts: option proceeds generated by employee stock option exercises, and non-option proceeds engendered by all other forms of public and private equity issues. We document that, for a large sample of U.S. firms over the period 1996-2015, the aggregate amount of option proceeds is as much as that of non-option proceeds. We then examine how firms allocate option proceeds across various uses, and find that cash savings constitute the most important use of option proceeds, followed by investment and equity repurchase. Further analysis reveals that more financially constrained firms allocate relatively more option proceeds to cash holdings and investment, and less to equity repurchase. Finally, we show that option proceeds are important in explaining the increasing trend of cash holdings of U.S. firms over time; A one standard deviation increase in option proceeds produces an increase of 0.035 in the average cash-to-assets ratio.

JEL classification: G30; G32; J33
Keywords: Employee stock option; Equity issuance; Cash flow allocation; Cash holdings

I. Introduction

Equity issuance is an important way in which firms raise external capital. Historically, initial public offerings (IPOs), seasoned equity offerings (SEOs), and private placements have been the most traditional approaches of equity issuance. In recent years however, the trend of offering stock options to employees has become so widespread among U.S. firms that employee stock options (ESOs, hereafter) has emerged as an important channel through which firms issue equity.[1] In fact, Fama and French (2005) find that, for a sample of S&P 100 firms over the period 1999-2015, the value of equity issued to employees through compensation plans exceed that issued through SEOs, and private placements. To add on, we document that for a large sample of nonfinancial U.S. firms, mainly consisting of S&P1500 and NASDAQ 100 firms, the amount of equity capital raised from ESOs exercises (GDP deflator adjusted) grew from US$17.1 billion in 1996 to US$72.3 billion in 2007, before dropping to US$27.9 billion in 2015. In other words, proceeds received from the exercise of ESOs sum to a daunting real US$781.3 billion for the period 1996-2015.

Despite the significantly growing use of ESOs, most of the academic research to date has been mainly focused on either the total amount of equity issued, as defined using Compustat cash flow statement, or equity issued in the form of IPOs, SEOs, or private placements, as defined using Thompson Financial SDC Platinum database. In this paper, we study how firms allocate equity issuance proceeds to different uses. To be specific, we examine the allocation of not only the overall equity issuance proceeds, but also the proceeds from the exercise of ESOs i.e., option proceeds, and that from all other equity issues (such as IPOs, SEOs, and private placements). We construe that distinguishing between capital raised from

[1] When employees exercise their stock options, they pay the associated strike price to their employer firms, which issue equity to them in return.

ESOs, and that raised from other equity issues is important because they are of a dissimilar nature, and driven by different motives.

Specifically, option proceeds represent the consequential outcome of firms compensating for their employees' services, and therefore involve no fundraising action on part of their managers. On the other hand, proceeds from other equity issues, which we generally termed as non-option proceeds, involve the conscientious effort made by the firms' managers to raise capital for specific planned uses. Notably, McKeon (2015) posits that equity issues that are employee-initiated differ in important ways from those that are firm-initiated, such that the differences can have significant implications for corporate policies.

It is noteworthy that the amount of option proceeds, and the timing at which, firms can expect to receive these proceeds as a result of granting ESOs to their employees are, to some extent, uncertain because the exercise of ESOs depends on not only the stock market conditions, but also the rationality of employees to exercise their in-the-money ESOs. Option proceeds therefore represent a more ad-hoc inflow of funds to the firms than do non-option proceeds. Given that option proceeds are more unanticipated and discretionary than non-option proceeds[2], we set forth to examine whether firms have a higher tendency to spend option proceeds than non-option proceeds.[3] In addition, we examine the spending pattern of option proceeds in the spirit of the asymmetric information model and the agency model of managerial behavior.

[2] Non-option proceeds are more anticipated than option proceeds because the timing (e.g. IPO listing date) and amount (e.g. IPO issue price) of non-option proceeds are usually pre-determined. How these proceeds are to be spent is also typically specified in the prospectus such that when they are subsequently collected from investors, they are not available for discretionary uses.

[3] Arkes et al. (1994) find that individuals tend to spend "unearned" and "unanticipated" cash flows more readily than regular income. They argue that it is this nature of unexpectedness that led to such cash flows being spent more readily than ordinary income because it takes time to plan for the expenditure of the unexpected wealth. Until a budget is decided upon, these cash flows remain uncommitted and can be discretionarily spent. Like individuals, corporate entities do experience uncertain cash inflows in the course of doing business, in particular, option proceeds. We therefore examine whether firms are more likely to spend option proceeds than non-option proceeds.

We start by examining the contemporaneous spending patterns of option versus non-option proceeds for our sample of nonfinancial U.S. firms during the period 1996-2015. To study all the ways equity issuance proceeds can be spent, we follow Chang et al. (2014) and set up the cash flow identity based on Compustat Statement of Cash Flow (*SCF*, hereafter). That is, we define five main uses of funds, namely investment, cash savings, equity and debt repurchases, and dividends, and equate them with all sources of a firm's funds, including operating cash flow, equity issuance proceeds (i.e., option and non-option proceeds), and debt issuance proceeds. With this identity, we construct an integrated regression framework in which we simultaneously estimate six empirical models, regressing each use of funds on the sources of funds. Coefficients of the different uses of funds on each source of funds therefore indicate the allocation of that source of funds to the said uses. Variables of our interest are the coefficients on options and non-option proceeds.

Such an integrated framework of regressions has the methodological advantage of offering a complete view of the cash flow activities of a firm as it simultaneously tracks all uses of funds, which are interrelated among one another by virtue of the cash flow identity. Specifically, it offers the intuitive interpretation that an increase (decrease) in the allocation of say, option proceeds to investment must be met by a corresponding decrease (increase) in the allocation of option proceeds to other use(s) since all uses of option proceeds must sum to the option proceeds themselves. Like Frank and Goyal (2003) and Chang et al. (2014), we use the *SCF* data to define all variables in the cash flow identity. Using a common data source has the advantage of achieving an almost balanced cash flow identity for our sample firms.[4]

The existing literature documents three main uses of equity issuance proceeds namely, investment, cash savings, and equity repurchase. Babenko, Lemmon, and Tserlukevich (2011)

[4] In fact, Gatchev, Pulvino, and Tarhan (2010) adopt a similar cash flow identity but define its components using data from not only the *SCF*, but also the balance sheet, and income statement. As a result, their cashflow identity generally do not hold for their sample.

find that firms invest 34.0 cents out of every dollar of option proceeds, whereas McLean (2011) observes that firms save as much as 60.0 cents for every dollar of overall equity issuance proceeds. Bens, Nagar, and Wong (2002), and Bens et al. (2003) posit that managers are concerned about the earnings dilution, brought about by significant exercises of ESOs. Consequently, they shift resources towards equity repurchase and away from investment.

We find that our sample firms indeed invest at a similar rate of 32.0 cents per dollar of option proceeds. Furthermore, we show that the rate of investment for non-option proceeds is slightly lower at 27.4 cents. The saving rates for option and non-option proceeds are also different; Firms save an average of 74.3 (62.0) cents out of a dollar of option (non-option) proceeds. Given that the earnings dilution effect and leverage impact of IPOs, SEOs, and private placements are more readily anticipated, and possibly catered for, than those triggered by the exercises of ESOs, it is not surprisingly that we find firms repurchasing equity more extensively after receiving option proceeds than they do with non-option proceeds. They also cut back on debt repurchase only after ESOs are exercised. In sum, firms do not have a relatively higher tendency to spend option proceeds. Rather, option proceeds are so greatly saved that cash savings emerge as the most important use of option proceeds, followed by investment and equity repurchase.

Among the different sources of funds, option proceeds are the most highly saved. That said, these savings are significantly drawn down in the year following the exercise of ESOs, and redirected to investment and equity repurchase, in line with the conjecture of Arkes et al. (1994) that firms take time to plan for the spending of ad-hoc cash inflows. However, contrary to their hypothesis, firms in our sample do not spend the money away before they are committed for specific uses. Rather, they save a large portion of it for future use. On the other hand, consistent with the findings of McLean (2011) that equity issuance proceeds are

increasingly saved due to increasing precautionary motives, we find the savings from non-option proceeds to be more permanent as they are not heavily depleted in subsequent years.

We next evaluate, in light of two alternative theories of corporate financing, the spending pattern of option proceeds for firms facing different degree of financial constraint. In general, our results lend greater support to the asymmetric information model of Myers and Majluf (1984) than to the agency model of managerial behavior.[5] In particular, we find that firms that are less financially constrained do not rely on option proceeds for investment as much as more financially constrained firms do. Instead, financially less constrained firms considerably repurchase equity with their option proceeds; The agency model would have predicted that these firms also spend the option proceeds on investment projects rather than return the cash to shareholders in the form of equity repurchase and/or dividends.

To further examine our results in the spirit of the agency model, we investigate whether firms with varying degree of corporate governance spend their option proceeds differently. On average, we find that firms with high corporate governance do not allocate their option proceeds to investment and cash savings any differently from firms with low corporate governance. Although firms with high corporate governance repurchase relatively more equity, this incremental allocation to equity repurchase is only statistically significant for two out of the seven corporate governance measures. There is therefore little evidence in support of the agency model of managerial behavior in explaining the spending pattern of option proceeds.

Lastly, we examine how equity issuance proceeds (particularly option proceeds), contribute to explaining the cash ratios of nonfinancial U.S. firms during the period 1996-2015. That is, we regress the cash ratios of our sample firms on a set of variables known by Bates et

[5] Specifically, the asymmetric information model conjectures that managers act in the interest of their shareholders but experience capital rationing in the market because investors are worried about the risk of information asymmetry. On the other hand, the agency model assumes that managers have their own interests, and may not always act to the benefit of their shareholders when there is a conflict of interest between managers and shareholders.

al. (2009) as determinants of cash holdings. In addition, we include proceeds from equity and debt issuances as explanatory variables, and find them to be statistically significant in explaining the observed cash ratios. Specifically, both option and non-option proceeds represent sources of cash, and have a positive effect on the cash ratio of an average firm. Economically, our results suggest that a one standard deviation increase in option proceeds leads to an average increase in cash-to-assets ratio of 0.035. For additional perspective, we compute the hypothetical cash ratios that would prevail if firms did not save their option proceeds at the yearly saving rates. We find that the said ratios are consistently lower than the actual ratios, and conclude that the accumulation of option proceeds as cash helps to explain the observed cash ratios of our sample firms.

Our paper contributes to the literature in several ways. First, we provide important insights into how firms spend proceeds arising from the exercise of ESOs, using an integrated regression approach that has the methodological advantage of providing a complete view of how firms allocate the proceeds to different uses, interrelated among one another by virtue of the cash flow identity. Our approach simultaneously examines the corporate policies of investment, cash holdings, and equity repurchase, thereby gauging their relative importance. While prior research has looked at the effect of option proceeds on each of these policies in isolation, to the best of our knowledge, we are the first to provide a comprehensive accounting of the uses of these funds.

Second, we show that distinguishing between capital raised from ESOs, and that raised from other equity issues is important. In fact, we find notable differences in the way firms deploy option and non-option proceeds to various uses; While both types of funds have similar rates of investment, option proceeds are more greatly saved than non-option proceeds. Moreover, firms return a greater amount of option proceeds (15.2 cents per dollar of option proceeds) to shareholders via equity repurchase than they do with non-option proceeds (0.4

cents per dollar of non-option proceeds). That said, cash savings remain the most important use of both sources of funds, with firms saving an average of 74.3 (62.0) cents from a dollar of (non-)option proceeds. By considering the impact of not only total equity issuance proceeds, but also its component amounts (option and non-option proceeds), on the collective policy of investment, cash holdings, and equity repurchase, our analysis is therefore more holistic than those of prior studies, examining the impact of either total equity funds or option proceeds on any one of the corporate policies.

Third, we provide the first large-sample evidence on the allocation of equity issuance proceeds by nonfinancial U.S. firms for the period 1996-2015. Specifically, our sample covers not only S&P1500 and NASDAQ 100 firms, but also non-indexed firms. In contrast, the bulk of existing literature only focuses on a small sample such as the S&P500 firms.[6] Furthermore, by directly collecting data on the exercise of ESOs, we construct our sample in a way that minimizes the potential for any misclassification between option and non-option proceeds. In particular, McKeon (2015) uses the relative sizes of equity issuances to separate employee-initiated equity issuances from firm-initiated ones. We illustrate however that applying such a classification rule to our sample results in many misclassifications between the two types of proceeds, leading to incorrect inferences about the allocation of option and non-option proceeds.

Fourth, we show that the degree to which firms are financially constrained affects the way they deploy equity issuance funds for specific uses. That is, firms that are less financially constrained fund their investments primarily with capital raised in traditional equity issuance events such as IPOs, SEOs, and private placements. They make limited use of option proceeds for investment, and either save the cash or return them to shareholders via equity repurchase. On the other hand, more financially constrained firms make relatively greater use of their

[6] See for example, Kahle (2002), Bens, Nagar, and Wong (2002), Bens et al. (2003), and Babenko, Lemmon, and Tserlukevich (2011).

option proceeds for investment. They also take the opportunity to save the option proceeds to avoid being capital rationed upon in the future. Moreover, since they are financially constrained, they either not return the option proceeds to shareholders in the form of dividends and equity repurchase, or do so if its financial constraint has been eased by the inflow of option proceeds.

Finally, we build on the empirical literature on cash holdings by highlighting the important role of equity issuance proceeds in explaining the cash holding behavior of nonfinancial U.S. firms, and quantifying how much these funds (both option and non-option proceeds) contribute to the recent cash build up, as documented by Bates et al. (2009). In fact, the cash ratios of our sample firms would be significantly lower than the observed ratios if firms did not save their option proceeds at the yearly estimated saving rates.

The remainder of the paper is organized as follows: Section II reviews the literature related to our scope of research, Section III describes the data and variables used in our analysis, Section IV highlights the empirical methodology, Section V presents the summary statistics of our sample, Section VI describes the empirical results, and Section VII concludes.

II. Related Literature

When employees exercise their ESOs, they pay the associated strike price to their employer firms, which consequently experience an inflow of capital for the equity issued to these employees. However, the amount and the timing of these proceeds that firms can expect to receive as a result of granting ESOs to their employees are, to some extent, uncertain because the exercise of ESOs depends on not only the stock market conditions, but also the rationality of employees to exercise in-the-money ESOs. In fact, Huddart and Lang (1996) find that employees typically exercise their ESOs prematurely thereby forgoing as much as half of their

Black-Scholes values, and that the exercise activity is affected by recent stock price movements, the market to strike ratio, time to maturity, volatility and the proximity to vesting dates.

To add on, Heath, Huddart and Lang (1999) show that psychological factors influence the exercise of ESOs. In particular, employees have stock price reference points and exercise their ESOs in response to stock price trends. Huddart and Lang (2003) find that junior and senior employees are both likely to exercise their ESOs when they expect the associated stock return to be low in the next six months. Bettis, Bizjak, and Lemmon (2005) find that ESOs are exercised prematurely following unexpected stock price runups, and that firms with high stock price volatility experience the earliest exercise of ESOs.

Hence, option proceeds represent a more ad-hoc inflow of funds to the firms than do non-option proceeds. To be specific, option proceeds are more unanticipated and discretionary than non-option proceeds. We therefore build upon the literature on ESOs by studying how option and non-option proceeds are spent. In particular, we examine whether firms have a higher tendency to spend option proceeds than non-option proceeds. Moreover, we evaluate the spending pattern of option proceeds in light of the asymmetric information model, as well as the agency model of managerial behavior. In doing so, we adopt the cash flow identity framework of Chang et al. (2014) and identify the main uses of option proceeds as including investment, cash savings, equity and debt repurchases, and dividends.

To date, there has been several studies examining the impact of option proceeds on the corporate policy of investment and/or equity repurchase, but not on the collective policy of investment, cash holdings, security repurchases, and dividends. Specifically, Kahle (2002) finds that firms have a high tendency to repurchase equity when the total amount of exercisable ESOs (i.e., both executive and non-executive), as a percentage of outstanding shares, is high. Bens, Nagar, and Wong (2002), and Bens et al. (2003) find that firms, concerned about the dilution effect of ESOs, cut back on investment to repurchase equity when they are

experiencing significant ESO exercises. Babenko, Lemmon, and Tserlukevich (2011) show that firms invest an average $0.34 per dollar of option proceeds. Moreover, only firms that are not financially constrained use option proceeds to repurchase stocks; Financially constrained firms use these cash flows for investment.

By analyzing how option proceeds are allocated to all the uses of funds, our paper elaborates on the strand of literature that centers on the allocation of option proceeds to any one use. In fact, if investment, cash savings, security repurchases, and dividends are competing uses of the firms' funds, our integrated regression framework enables us to empirically gauge the relative importance of these uses. Particularly, we add that cash savings is the most important use of option proceeds. Although McLean (2011) finds that firms increasingly save their equity capital when they have high precautionary motives, he did not distinguish between option and non-option proceeds. While he finds that the saving rate has increased from 23.0 cents per dollar of equity funds in 1970 to 60.0 cents in recent years, we further show that, on average, option proceeds are saved at a higher rate than do non-option proceeds. That said, cash savings constitute the most fundamental use of both option and non-option proceeds, which is not surprising given that Keynes (1936) long argues that firms hold cash to protect against adverse cash flow shocks that may force them to default on payments or forgo valuable investment opportunities. In fact, Opler et al. (1999), and Bates et al. (2009) find support for this precautionary motive of cash holdings.

Specifically, Bates et al. (2009) report that the average cash ratio for U.S. industrial firms increases significantly from 10.5% in 1980 to 23.2% in 2006, and that the precautionary motive of cash holdings plays an important role in explaining the increase. He and Wintoki (2016) show additionally that research and development investment accounts for a significant portion of this increase. We add to this strand of literature by not only showing that proceeds from both equity and debt issuances contribute to the increase, but also illustrating that the impact on cash

ratio vary depending on the source of the equity funds (i.e., option versus non-option proceeds). Furthermore, we show that the average yearly cash ratios would be consistently lower than those currently observed if firms did not save their option proceeds at the yearly estimated saving rates. For example, we find that in 2015, the average cash ratio would be 23.5% lower than actual if sample firms did not save their option proceeds.

To date, the bulk of the academic research on equity issuance has been focused on examining either the total amount of equity issues or its component amounts (i.e., option or non-option proceeds, but not both). For example, McLean (2011) studies the cash savings of overall equity issuance proceeds. Fama and French (2005) as well as Babenko, Lemmon, and Tserlukevich (2011) examine the implications of option proceeds received by a small sample of U.S. firms. In a separate strand of research, Ritter (1997) and Pontiff and Woodgate (2008) analyze the post-SEO operating performance and long-run stock returns, respectively. By considering the impact of not only equity issuance proceeds, but also its component amounts (option and non-option proceeds), on the collective policy of investment, cash holdings, and equity repurchase, our research on equity issuance is thus more holistic than are these studies.

In particular, we suggest that distinguishing between capital raised from ESOs, and that raised from other equity issues is important because they are driven by different motives. Notably, McKeon (2015) puts forth that equity issuance triggered by the exercise of ESOs is unlikely to reveal managers' motives to issue equity because the grant of ESOs, which is typically made years prior to the issuance of equity, represents the consequential outcome of compensating employees for their service to the firms, and involve no fundraising action on part of their managers. Differentiating firm-initiated equity issues (IPOs, SEOs and private placements) from employee-initiated issues (mainly driven by the exercise of ESOs) based on

the relative size of equity issue, McKeon (2015) argues that the high saving rate of equity capital documented by McLean (2011) is largely driven by employee-initiated equity issues.[7]

By examining the saving rate of overall equity issuance proceeds, as well as those of option and non-option proceeds, we reconcile the works of McLean (2011) and McKeon (2015). We find that firms save an average of 62.3 cents per dollar of total equity issuance proceeds in recent years, consistent with the saving rate of 60.0 cents reported by McLean (2011). Moreover, we show that while option proceeds are saved at a relatively high rate, non-option proceeds are similarly highly saved, thereby producing an overall high saving rate of equity issuance proceeds in general. However, unlike McKeon (2015) who uses an arbitrary rule to impute the amount of employee-initiated equity issues, we explicitly collect data on such issues from various sources. Consequently, we offer a more accurate contrast of the magnitude of employee- versus firm-initiated equity issues. It is also noteworthy that while he examines the relation between market conditions and equity issuance, we focus on the allocation of equity issuance proceeds to different uses.

III. Data and Variables

A. Data

Our sample consists of firms listed in the Compustat Industrial Annual files between 1996 and 2015. Like Babenko, Lemmon, and Tserlukevich (2011), we include in our sample, both firms that grant employee stock options and those that do not. Similarly, our sample is tilted towards large and profitable firms given that more than 60% of our firms are ever listed in the S&P 1500 index and/or NASDAQ 100 index. Following Frank and Goyal (2003) and Chang et al. (2014), we use the flow-of-funds (*SCF*) data to define variables that made up the

[7] Specifically, using quarterly Compustat data and defining the equity issue size as the quarterly proceeds divided by market value of equity, McKeon (2015) defines employee-initiated (firm-initiated) equity issuances as those with issue size lower (higher) than 2% (3%).

cash flow identity. For firms with missing *SCF* data, we manually collect whenever possible, the data from 10-K statements that firms file with the Securities and Exchange Commission. Dollar values are converted into 2009 constant dollars using the GDP deflator. Data on stock prices are retrieved from the Center for Research on Security Prices (CRSP) files, whereas data on broad-based employee stock option programs are obtained from four sources.

First, we manually collect annual data on the weighted average exercise price and the numbers of stock options granted, exercised, and cancelled, from the 10-K statements. Second, we tap on the Investor Responsibility Research Centre (IRRC) Dilution Database, which covers S&P 1500 firms during the period 1998-2010. After IRRC was acquired by Institutional Shareholder Services (ISS) in 2005 however, the number of options exercised become unavailable. Therefore, for the period 2005-2015, we rely on a third source, Compustat, which reports from 2004 onwards, the weighted average exercise price and the numbers of stock options granted, exercised, and cancelled each year. Lastly, for firms with missing number of options exercised, we supplement the data with information from Capital IQ, which offers the number of options exercised for the period 1994-2011. However, given that Capital IQ does not provide the exercise price of these options, we rely on the 10-K statements, IRRC Dilution Database and Compustat as the primary sources of data and Capital IQ as the supplementary source of data. Firms with missing data for option proceeds are excluded from our sample.

Following common practice, we exclude financial institutions (SIC codes 6000–6999), utilities (SIC codes 4900–4999), not-for-profit organizations, and government enterprises (SIC codes greater than 8000). We require firms to provide valid information on their total assets, sales growth, market capitalization, changes in cash holdings, investment, cash dividends, cash flow, changes in working capital, and external financing. To minimize the sampling of financially distressed firms, we follow Almeida, Campello, and Weisbach (2004) and Almeida and Campello (2010), and exclude firm-years for which: (1) the market value of assets (GDP

deflator adjusted) is less than $1 million, (2) the asset growth rate exceeds 100%, and (3) annual sales (GDP deflator adjusted) is lower than $1 million. Furthermore, to ensure that the cash flow identity holds well in our data, we exclude observations for which the absolute value of the difference between the uses of cash flow and the cash flow itself is greater than 1% of the beginning-of-period total assets. These sample filtering rules leave us with an unbalanced panel, consisting of 5,599 firms and 40,421 firm-year observations.

B. The Cash Flow Identity and Variables

Our empirical analysis hinges upon the following cash flow identity, as defined using Compustat flow-of-funds (*SCF*) data:

$$Inv + \Delta C + ER + DR + Div + Oth = CF + EI + DI \quad (1)$$

where the right-hand side of equation (1) depicts the sources of funds, namely operating cash flow net of the change in working capital (*CF*)[8], and proceeds from equity and debt issuances (*EI* and *DI*, respectively). The left-hand side of equation (1) comprises the uses of funds, namely investment (*Inv*), cash savings as measured by the change in cash holdings (ΔC), equity repurchase (*ER*), debt repurchase (*DR*) and cash dividends (*Div*). *Oth* is a residual term for rounding errors and misreported data that might cause the cash flow identity to be unbalanced.

As an aggregate figure reported in the *SCF*, *EI* consists of all forms of equity issuance that give rise to cash inflows to a firm.[9] It includes public equity offerings, private placements

[8] This definition follows previous studies on cash flow sensitivities. See Bushman, Smith, and Zhang (2011), Dasgupta, Noe, and Wang (2011) and Gatchev, Pulvino, and Tarhan (2010).

[9] More specifically, *EI* corresponds to Compustat Data Item Number 108 namely, Sale of Common and Preferred Stock (Statement of Cash Flows). It represents funds received from the issuance of common and preferred stock and includes the following items: (1) conversion of Class A, Class B, or special stock into common stock, (2) conversion of preferred stock and/or debt into common stock, (3) equity offerings, (4) exercise of stock options and/or warrants, (5) increase in capital surplus due to stock issuance, (6) issuance of warrants when combined with common stock, (7) related tax benefits due to issuance of common and/or preferred stock, (8) sale of common stock, (9) sale of preferred stock, (10) sale of redeemable preferred stock and (11) sale of stock. However, this

to outside investors, proceeds from employee stock purchase plans, and proceeds from stock option exercises (*OP*). Specifically, we define *OP*, one of the key variables of our interest, as the number of options exercised times the weighted average exercise price of stock options exercised in a given fiscal year.[10] Non-option proceeds therefore refer to all other equity issuance proceeds besides those arising from employee stock option exercises. Therefore, defining total equity issuance proceeds as the sum of option and non-option proceeds i.e., *EI* = *OP* + (*EI-OP*), and substituting the definition into equation (1), we have the following augmented cash flow identity.

$$Inv + \Delta C + ER + DR + Div + Oth = CF + OP + (EI - OP) + DI \quad (2)$$

According to the Compustat data manual, definitions of the variables in equation (1) vary depending on the format code a firm follows in reporting the *SCF* data. Appendix A details the construction of these variables based on the different format codes. All variables in the cash flow identity are scaled by one-year lagged book value of assets. To control for firm-specific characteristics, we include in our regression analysis, various firm characteristics as control variables. The market-to-book ratio (*MB*) is a proxy for both firm value and growth opportunities, and is defined as (total assets + market value of equity - book value of equity) / total assets. *Sales growth* is the growth rate of net sales, and serves as an alternative proxy for growth opportunities. The log of book value of assets, *Ln*(*Assets*), is included as a proxy for firm size. *Leverage* is the ratio of total debt over total assets. *Tangibility* is a measure of the tangibility of firm assets and is defined as the net property, plant and equipment-to-asset ratio.

data item excludes issuance of warrants, share issuance costs when reported separately and stock of subsidiary company.

[10] Babenko, Lemmon, and Tserlukevich (2011) point out that to the extent that employees are allowed to settle the exercise price using their common shares of the company, rather than cash, *OP* may overestimate the actual amount of cash that firms can receive from option exercises. However, by comparing the IRRC data with their hand-collected data on option proceeds from the Statement of Cash Flows, they find that alternative settlement methods of option exercises are uncommon in practice, and *OP* defined using the IRRC data is quite precise.

These control variables, as well as the variables in equation (2), are winsorized annually at the top and bottom 1% of their distributions to mitigate the effect of outliers.

IV. Empirical Methodology

To examine how firms allocate equity issuance proceeds to different uses, we measure the allocation of equity issuance proceeds using the coefficients on such proceeds within an integrated regression framework. That is, we estimate six empirical models in which we regress each use of funds (i.e., *Inv*, *ΔC*, *ER*, *DR*, *Div,* and *Oth*) on all sources of funds, firm-specific control variables, and year fixed-effects. Variables are demeaned by firm to remove the firm fixed effects. The regression equations are written as follow:

$$Inv_{it} = \beta_0^{Inv} + \beta_1^{Inv} \times CF_{it} + \beta_2^{Inv} \times OP_{it} + \beta_3^{Inv} \times (EI_{it} - OP_{it}) + \beta_4^{Inv} \times DI_{it} + \delta Y_{it-1} + \theta_{it} + \varepsilon_{it} \quad (3)$$

$$\Delta C_{it} = \beta_0^{\Delta C} + \beta_1^{\Delta C} \times CF_{it} + \beta_2^{\Delta C} \times OP_{it} + \beta_3^{\Delta C} \times (EI_{it} - OP_{it}) + \beta_4^{\Delta C} \times DI_{it} + \delta Y_{it-1} + \theta_{it} + \varepsilon_{it} \quad (4)$$

$$ER_{it} = \beta_0^{ER} + \beta_1^{ER} \times CF_{it} + \beta_2^{ER} \times OP_{it} + \beta_3^{ER} \times (EI_{it} - OP_{it}) + \beta_4^{ER} \times DI_{it} + \delta Y_{it-1} + \theta_{it} + \varepsilon_{it} \quad (5)$$

$$DR_{it} = \beta_0^{DR} + \beta_1^{DR} \times CF_{it} + \beta_2^{DR} \times OP_{it} + \beta_3^{DR} \times (EI_{it} - OP_{it}) + \beta_4^{DR} \times DI_{it} + \delta Y_{it-1} + \theta_{it} + \varepsilon_{it} \quad (6)$$

$$Div_{it} = \beta_0^{Div} + \beta_1^{Div} \times CF_{it} + \beta_2^{Div} \times OP_{it} + \beta_3^{Div} \times (EI_{it} - OP_{it}) + \beta_4^{Div} \times DI_{it} + \delta Y_{it-1} + \theta_{it} + \varepsilon_{it} \quad (7)$$

$$Oth_{it} = \beta_0^{Oth} + \beta_1^{Oth} \times CF_{it} + \beta_2^{Oth} \times OP_{it} + \beta_3^{Oth} \times (EI_{it} - OP_{it}) + \beta_4^{Oth} \times DI_{it} + \delta Y_{it-1} + \theta_{it} + \varepsilon_{it} \quad (8)$$

where *Y* represents the vector of firm-specific control variables, which include *MB*, *Sales growth*, *Ln*(*Assets*), *Leverage*, and *Tangibility*. The sensitivity of equity issuance proceeds to a particular use of funds thus reveals how much of an additional dollar of equity issuance proceeds is directed to that use. The allocation of option, and non-option proceeds across the various uses of funds is therefore captured by β_2^i, and β_3^i, respectively.

This integrated framework of regressions has the methodological advantage of offering a complete view of how firms deploy funds for different uses as it simultaneously tracks all

uses of funds, which are interrelated among one another by virtue of the cash flow identity. Specifically, it offers the intuitive interpretation that an increase (decrease) in the allocation of funds to a particular use must be met by a corresponding decrease (increase) in the allocation to some other use(s) since all uses of funds must sum to the sources of funds. Following Frank and Goyal (2003) and Chang et al. (2014), we use the *SCF* data to define all variables in the cash flow identity. Using a common data source has the advantage of achieving an almost balanced cash flow identity for our sample firms. In fact, Gatchev, Pulvino, and Tarhan (2010) rely on a similar cash flow identity but define its components using data from not only the *SCF*, but also the balance sheet, and income statement. As a result, their cashflow identity generally do not hold in their sample.

Chang et al. (2014) show that if the cash flow identity in equation (1) and (2) holds in the data, the coefficients on each source of funds should add up to unity across equations (3) to (8), and the coefficients on each control variable in *Y* should sum to zero. That is,

$$\beta_1^{Inv} + \beta_1^{\Delta C} + \beta_1^{ER} + \beta_1^{DR} + \beta_1^{Div} + \beta_1^{Oth} = 1$$

$$\beta_2^{Inv} + \beta_2^{\Delta C} + \beta_2^{ER} + \beta_2^{DR} + \beta_2^{Div} + \beta_2^{Oth} = 1$$

$$\beta_3^{Inv} + \beta_3^{\Delta C} + \beta_3^{ER} + \beta_3^{DR} + \beta_3^{Div} + \beta_3^{Oth} = 1$$

$$\beta_4^{Inv} + \beta_4^{\Delta C} + \beta_4^{ER} + \beta_4^{DR} + \beta_4^{Div} + \beta_4^{Oth} = 1$$

$$\sum_{i=1}^{5} \delta^i = 0.$$

If any source of funds increases by one dollar while holding other sources unchanged, then the change in all uses of that said source must sum to one dollar. However, if the shock stems from an exogenous or predetermined variable that represents neither a source nor a use of funds in the current period, the total response across different uses of that particular source

of funds must sum to zero.[11] In addition, Chang et al. (2014) demonstrate that estimating equations (3) to (8) in isolation is equivalent to estimating them as simultaneous equations, so long as the six model specifications incorporate the same set of right-hand-side variables.[12]

V. Summary Statistics

Figure 1 illustrates the evolution of equity issuance proceeds (GDP deflator adjusted) for our sample firms. In Panel A, we show that the overall equity issuance proceeds increase from an aggregate amount of US$44.7 billion in 1996 to US$81.4 billion in 2015. In particular, option proceeds increase substantially from US$17.1 billion in 1996 to US$27.9 billion in 2015. Notably, option proceeds and therefore total equity issuance proceeds, peak in 2007, the year before the financial crisis. In fact, option proceeds account for a large fraction of equity issuance proceeds throughout the sample period; The fraction has almost doubled over time, from being only 38.2% in 1996 to 65.4% in 2005, before dropping to 34.3% in 2015.

It is noteworthy that total equity issuance proceeds (*EI*) originates from the Compustat variable, *SSTK*. By definition, it includes the sale of common and preferred stock, as well as the tax benefits associated with the exercise of employee stock options.[13] Therefore, to a certain extent, non-option proceeds include some tax elements of option proceeds. That said, we noticed that after year 2004, these tax benefits are being separately reported as the variable,

[11] For instance, suppose the coefficient on *MB* is 0.1 in equation (3), suggesting that investment increases by 10% of total assets if *MB* increases by one. Since investment is a use of funds and total uses of funds must be equal to the total sources of funds, the net effect of the increase of *MB* on other use(s) must sum to -10% of total assets, holding all source variables constant.

[12] This result is not surprising on account that the simultaneous equations (3) - (7) qualify as seemingly unrelated regressions (SURs). In fact, Kruskal's (1960) theorem implies that SUR estimates turn out to be equivalent to equation-by-equation OLS estimates if the same set of explanatory variables is included in each equation. This is exactly the case in our equations (3) - (7). See Greene (2008) (page 257-258) for a detailed proof.

[13] Specifically, when a firm grants nonqualified stock options to its employees, it effectively receives a tax deduction in the year when such options are exercised. In particular, the amount of tax deduction, which we so-called tax benefits associated with the exercise of ESOs, is calculated as the intrinsic value of the ESOs on the exercise date.

TXBCOF in Compustat. As such, we reclassify these tax benefits as being part of option proceeds, and plot the associated amounts in Panel B of Figure 1. To cater to the possibility that firms may not have completely adjusted to the change in reporting, we omit the initial year in which values of *TXBCOF* becomes available, and report the combined amounts of option proceeds and their associated tax benefits from 2006 onwards. Despite the reclassification between option and non-option proceeds, our inferences remain generally unchanged. The amount of option-plus-tax benefits proceeds peaks in 2007 at US$87.2 billion (GDP deflator adjusted), and throughout the period 2006 to 2015, these proceeds represent a significant portion of overall equity issuance proceeds. In 2015, they sum to a little less than US$ 37.0 billion whereas other equity proceeds (total equity issuance proceeds less option-plus-tax benefits proceeds) amount to US$44.4 billion.

[Insert Table 1 Here]

Table 1 reports the descriptive statistics of our sample. The mean values of *OP* and *EI-OP* are 0.007 and 0.034, respectively, suggesting that the average size of non-option proceeds is greater than that of option proceeds. However, the median values of *OP* and *EI-OP* (0.002 and 0.0004, respectively) indicate that firms receive cash from employee stock option exercises more often than they do from other equity issues. Given that the median value of *EI-OP* is only 0.0004 while the 75th percentile is 0.005, we infer that the high mean value of *EI-OP* is driven by other equity issues, which are infrequent and lumpy. The mean, 25th percentile, median, and 75th percentile values of the residual term, *Oth*, are all zero, suggesting that the cash flow identity holds well in our data. Firms in our sample are generally profitable; On average, only 16.4% of them report negative income during the sample period 1996-2015. In addition, the average values of Tobin's Q, and market-to-book ratio (1.927 and 1.953, respectively) imply that our sample firms do have investment opportunities to pursue throughout the said period.

[Insert Table 2 Here]

Table 2 lists the annual amounts of equity issuance proceeds (GDP deflator adjusted) for our sample firms. For each sample year, it depicts the total number of firms, as well as the number and percentage of equity issuers and non-issuers. For all years, non-issuers are dominated by equity issuers; The percentage of equity issuers has been increasing steadily, from 78% in 1996 to 89% in 2006. However, following the change in disclosure requirements of stock option grants, this percentage gradually decreases to 76% in 2015. Column 6 to 10 of Table 2 depict the amounts and relative proportions of option, and non-option proceeds. In total, firms in our sample receive a daunting US$1,553.0 billion worth of equity issuance proceeds for the period 1996-2015, of which 50% arises from the exercise of employee stock options (US$781.3 billion), while the remaining 50% represents non-option proceeds amounting to US$771.7 billion. This implies that employee stock options have become an important means through which firms issue equity.

VI. Empirical Results

A. Contemporaneous Allocation of Equity Issuance Proceeds

We start by examining how firms allocate to different uses, equity issuance proceeds, along with operating cash flow and debt issuance proceeds. That is, we estimate equations (3) to (8) as part of an integrated set of regressions, and report the results in Table 3. The *t*-statistics are computed using standard errors robust to both heteroskedasticity and clustering at the firm level. Panel A presents the results for our full sample period. Column (1) to (5) depict the allocations of overall equity issuance proceeds to investment, cash savings, equity repurchases, debt repurchases, and dividends, respectively. The coefficient of each use on *EI* reflects the amount of overall equity issuance proceeds spent on that use, and are all statistically significant

at the 1% level. For brevity, coefficients of *Oth* are not reported as they are not significantly different from zero. By virtue of the cash flow identity, all the coefficients on *EI* sum to unity.

[Insert Table 3 Here]

In a nutshell, a dollar of capital raised from all equity issues is spent as follows. 27.5 cents are set aside for investment, 62.3 cents are saved as cash, 0.7 cents are used to repurchase equity, 9.4 cents are allocated to debt reduction, and 0.3 cents are paid as dividends. Importantly, cash savings constitutes the most prominent use of equity issuance proceeds, and the rate of saving complements that of McLean (2011), who posits that firms issue equity for cash accumulation purpose, saving 60 cents out of every dollar of equity capital raised. On a side note, operating cash flow is also mainly used for cash savings and investment. That said, it is not as greatly saved as equity issuance proceeds; Only 42.4 cents per dollar of operating cash flow are saved. Debt issuance proceeds on the other hand, is mainly used to roll over debt given that almost 60.0 cents out of a dollar of debt capital is used to retire debt, while most of the remainder (29.2 cents) are invested. Only a minimum of 9.7 cents per dollar of debt issuance proceeds is saved as cash. As an additional analysis, we run regression equations (3) to (8) on an annual basis and plot the yearly rates of allocation in Figure 2. We show that consistently across all years, cash savings is the most important use of equity capital, with firms saving more than 50.0 cents per dollar of proceeds, on average. The next major use of the proceeds is investment, followed by debt repurchase.

[Insert Figure 2 Here]

Next, we separate equity issuance proceeds into funds raised from ESOs, and those raised from other equity issues, and re-estimate equations (3) to (8). Column (6) to (10) of Table 3 report the resulting estimates, and contrast the spending patterns of option and non-option proceeds. On average, firms save as much as 74.3 cents per dollar of option proceeds,

and allocate 32.0 cents to investment, consistent with Babenko, Lemmon, and Tserlukevich (2011), which show that firms invest an average 34.0 cents per dollar of option proceeds received. The remaining 15.2 cents is returned to shareholders via equity repurchase, in line with the conjecture that firms, concerned about the earnings dilution brought about by the exercise of ESOs, shift resources towards equity repurchase. In addition, firms reduce their debt repurchase activities by 23.5 cents per dollar of option proceeds, and pay out a trivial 2.0 cents as dividends.

In contrast, a typical dollar of non-option proceeds is spent as follows. 27.4 cents are invested, 62.0 cents are parked as cash, 0.4 cents are used to buy back equity, 10.0 cents are dedicated to debt reduction, and only 0.2 cents are paid out as dividends. Importantly, we find that although option and non-option proceeds entail different saving rates, cash savings emerge as the most fundamental use of both types of proceeds. Hence, we conclude that although option proceeds are relatively more ad-hoc and discretionary, firms do not have a greater tendency to spend them away. Rather, they save the monies more greatly than they do with non-option proceeds. In comparing these two types of proceeds, we construe that there are likely differences in the allocation of option versus non-option proceeds to equity and debt repurchases because the dilution effect and leverage impact of IPOs, SEOs, and private placements are more readily anticipated, and possibly catered for, than that of ESO exercises. We indeed find that firms repurchase equity more extensively after the exercises of ESOs (15.2 cents) than they do after other equity issuances (0.4 cents). They also cut back on debt repurchases only after ESOs are exercised.

As discussed previously, the amounts of non-option proceeds computed before year 2004 include some tax elements of option proceeds because the tax benefits associated with the exercise of ESOs are not separately reported during those prior years. To address the implication that this classification issue may have on our results, we re-run equations (3) to (8)

but replace option proceeds with the sum of option proceeds and tax benefits (i.e., option-plus-tax benefits proceeds), and non-option proceeds with the difference between total equity issuance proceeds and option-plus-tax benefits proceeds. Since tax benefits are separately reported only after 2004, we perform a subperiod analysis for the years 2006-2015. Column (1) to (5) in Panel B of Table 3 presents the results. As a comparison, we run the regressions in terms of option and non-option proceeds for the same subperiod and depict them in column (6) to (10) of the same panel. Our inferences are generally unaffected by the subtlety in the classification of proceeds. Cash savings remains as the most prominent use of option-plus-tax benefits proceeds, followed by investment and equity repurchase. That said, the rate of saving is somewhat reduced from 71.3 cents per dollar of option proceeds to 61.3 cents per dollar of option-plus-tax benefits proceeds.

B. Dynamic Allocation of Equity Issuance Proceeds

Next, we examine the dynamic allocation of equity issuance proceeds by adding to equations (3) to (8), lagged values (from *t*-2 to *t*-1) of all sources of funds, including option and non-option proceeds. For ease of interpretation, we scale all the lagged variables by total assets at *t*-1 i.e., the same deflator for all contemporaneous sources-of-funds variables. Since we require firms to have at least two years of history for these variables, the number of observations now reduces from 40,421 to 26,145. To make our results comparative, we estimate for our reduced sample, regression equations (3) to (8) both with and without the lagged sources-of-funds variables. Column (1) to (5) in Panel A of Table 4 depict the results without lagged values, whereas column (6) to (10) present the results with lagged values.

[Insert Table 4 Here]

We find that the coefficient estimates of all sources-of-funds variables does not fluctuate very much from those in Panel A of Table 3, suggesting that reducing the sample size does not vastly alter our results. Particularly, the coefficient of cash savings on concurrent *OP* remains both economically and statistically significant after controlling for lagged variables. In fact, the magnitude of the coefficient is stable both with (0.685) or without (0.616) lagged variables. Importantly, the coefficient on OP_{t-1} is negative and statistically significant (coefficient = -0.357; *t*-statistic = -4.4). That is, while firms save 68.5 cents per dollar of option proceeds in the year of ESO exercises, they reduce their cash holdings by 35.7 cents in the following year, and redirect them mainly to investment (19.6 cents) and equity repurchase (17.8 cents). This is consistent with the conjecture of Arkes et al. (1994) that firms take time to plan for the spending of ad-hoc funds. However, we find that firms do not spend the money away before they are committed for specific uses. Rather, they save a large portion of it. The statistically insignificant coefficient of cash savings on OP_{t-2} implies that firms do not further adjust their cash holdings two years after the exercise of ESOs. Taken together, the coefficients of cash savings on option proceeds from *t*-2 to *t* suggest that firms receiving a dollar of option proceeds this year, will still have 32.8 cents (= 68.5 – 35.7) as cash two years later. Hence, cash saving is the most important use of option proceeds.

In contrast, the cash savings from non-option proceeds are more permanent given that they are not heavily drawn down in subsequent years; The magnitude of the coefficients of cash savings on EI_{t-1}-OP_{t-1} and EI_{t-2}-OP_{t-2} is minimal i.e., -0.055 and -0.033, respectively. That is, consistent with the hypothesis of McLean (2011) that firms largely save equity capital for precautionary motives, our sample firms save as much as 61.1 cents of non-option proceeds in the year of equity issuance. Furthermore, two years after the equity issuance, firms still retain more than 85% of the 61.1 cents saved. Cash savings is therefore the most prominent use of not only option proceeds but also non-option proceeds. In fact, overall equity issuance proceeds

entail the highest saving rate among all sources of funds; Over the three-year window, firms only save an average of 29.7 cents out of a dollar of operating cash flow, and 5.0 cents per dollar of debt issuance proceeds.

For additional perspective, we show that on a per dollar basis, firms invest 48.1 cents of operating cash flow, 56.6 cents of option proceeds, 37.1 cents of non-option proceeds, and 23.9 cents of debt issuance proceeds during the three-year period. Moreover, among all sources of funds, option proceeds are the most greatly used to repurchase equity; Over the three-year window, 34.9 cents per dollar of option proceeds are collectively used for equity repurchase. Panel B of Table 4 presents the corresponding subperiod regression results when we adjust option proceeds to include the related tax benefits. Our inferences generally remain unchanged despite the change in proceeds classification and the resulting sample size reduction.

As a robustness check, we re-estimate the regressions within column (6) to (10) of Table 4 Panel A and B using the "event-year" Fama-MacBeth (1973) approach i.e., we run Fama-MacBeth regressions by event year *t*, i.e., the number of years a firm is in our sample, rather than by calendar year. This ensures that in measuring the lagged amounts of option and non-option proceeds, we have sample firms with the same length of history for each cross-sectional regression at event year *t*. In unreported results, we show that the Fama-MacBeth regressions are qualitatively similar to those in column (6) to (10) in Table 4 Panel A and B.

C. Financial Constraint and the Allocation of Equity Issuance Proceeds

To examine the spending pattern of option proceeds in light of the two alternative theories of corporate financing, namely the asymmetric information model and the agency model, we identify firms with different degree of financial constraint, and evaluate their allocations of option proceeds to various uses. That is, we use five different measures to gauge

the degree of financial constraint faced by our sample firms. They include firm size, as proxied by the natural logarithm of total assets, *Ln*(*Assets*), the financial constraint index of Hadlock and Piece (2010) (*HP*), the financial constraint index of Whited and Wu (2006) (*WW*), the dividend paying status, and the availability of a credit rating.[14] In other words, a firm is classified as being more (less) financially constrained in a given year if its *Ln*(*Assets*) is below (above) the 30th percentile, its *HP index* or *WW index* is above (below) the 70th percentile, it pays (no) dividends, or it is not assigned (is assigned) a credit rating.

The asymmetric information model assumes that managers act in the interest of their shareholders but experience capital rationing in the market because investors are worried about adverse selection due to information asymmetry. Accordingly, we would expect the availability of option proceeds to ease the financial woes of constrained firms. That is, these firms would tap on their option proceeds for investment, and take the opportunity to save the proceeds to avoid being capital rationed upon in the future. Moreover, since they are financially constrained, they would either not return the monies to shareholders in the form of dividends, and equity repurchase or do so only if its financial constraint has been eased by the inflow of option proceeds. We would also expect them to cut back on debt repurchase in face of the dilutive effect of exercised ESOs.

On the other hand, the agency model assumes that managers may not always act to the benefit of their shareholders when there is a conflict of interest between managers and shareholders. In the spirit of this model, we would expect managers to spend their option proceeds on investment projects they like, rather than return the cash to shareholders. Moreover,

[14] The *HP* index measures the degree of financial constraint faced by a firm as a function of its age and size. That is, $HP = -0.737 \times Ln(Assets) + 0.043 \times (Ln(Assets))^2 - 0.040 \times Age$. Hadlock and Pierce (2010) argue that in many contexts, their index is a more reasonable measure of a firm's degree of financial constraint than are other types of constraint measures, such as the index of constraints by Kaplan and Zingales (1997). The *WW* index is based on a structural model that avoids the measurement errors associated with Tobin's *Q* in traditional tests. Specifically, *WW* = -0.091×*Cash Flows/Assets* - 0.062×*Dividend Payer* + 0.021×long-term debt/*Assets* - 0.044×*Ln*(*Assets*) + 0.102×industry median *Sale Growth* - 0.035×*Sale Growth*. By construction, the higher the scores of the *HP* or *WW* indices, the more financially constrained are the firms.

they would not significantly accumulate the cash on their balance sheets, since doing so will make their firms attractive to potential acquirers. The direction on debt is however, unclear because the model is consistent with managers either repurchasing debt with option proceeds to mitigate the disciplinary effect of debt or increasing borrowing for empire-building purposes, given that cash inflows from the exercise of ESOs increase their debt capacity.

[Insert Table 5 Here]

Regression equations (3) to (8) are then re-estimated for the more financially constrained (*Con.*) and less financially constrained (*UCon.*) firms combined. An interaction term for each explanatory variable with the respective financial constraint measure is added to the regressions to identify any allocation differences between the two groups of firms. The results are reported in Table 5. For brevity, we only tabulate the coefficients on *OP* and *EI-OP*; The coefficients on other sources of funds are omitted as they are similar to those reported in Table 3. In general, our empirical results lend greater support to the asymmetric information model than to the agency model. Specifically, only the investment of more financially constrained firms is sensitive to the availability of option proceeds. For firms that are less financially constrained, the allocation of option proceeds to investment is either marginally significant or not at all statistically significant across the different measures of financial constraint; These firms rely mainly on non-option proceeds for their investment needs, which is not surprisingly given that by definition, they are relatively less cash strapped, and most likely have little difficulty raising external capital.

As predicted by the asymmetric information model, we find that more financially constrained firms save more in terms of both option and non-option proceeds than do less financially constrained firms. The incremental savings of option proceeds are however, not statistically significant for all measures of financial constraint. In other words, firms with different degree of financial constraint save option proceeds at similar high rates. This is

inconsistent with the agency model, which would predict less financially constrained firms to also spend their option proceeds away on investment projects, and not keep the cash on their balance sheet at high levels. Contrastingly, less financially constrained firms repurchase equity in substantially greater amounts than do more constrained firms, and this difference is statistically significant across all alternative measures of financial constraint. For example, large firms buy back 53.8 cents worth of equity with every dollar of option proceeds, whereas small firms only devote 5.4 cents of option proceeds to equity repurchase. This is somewhat not surprising given that option proceeds represent a discretionary source of funds to less financially constrained firms. By virtue of their financial abundance, these firms are likely to have little use of the option proceeds for investment or other uses. Therefore, to the extent that their managers act in the interest of shareholders, the cash is likely to be returned to their shareholders via either equity repurchase or cash dividends. Moreover, given that more financially constrained firms are likely to consider equity repurchase only after their financial constraints are eased by the inflow of option proceeds, it is reasonable to expect a relatively smaller coefficient of equity repurchase on *OP* for these firms.

On a side note, there is only weak evidence for differences in the allocation of option and non-option proceeds to debt repurchases and dividends, by firms with different degree of financial constraint. In particular, we find that although less financially constrained firms pay out relatively more option proceeds as dividends, this is only evident for one of the five measures of financial constraint i.e., the dividend payer status. We therefore conclude that firms, which are more likely to have no immediate use of their option proceeds (i.e., less financially constrained firms), save a relatively large portion of the proceeds as cash, and return most of the remaining option proceeds to their shareholders via equity repurchase. In other words, there is some empirical support for the asymmetric information model, but limited evidence on the

agency model of managerial behavior in explaining how U.S. firms allocate their option proceeds to different uses during the period 1996-2015.

D. Corporate Governance and the Allocation of Equity Issuance Proceeds

To further examine our results in the spirit of the agency model, we investigate whether firms with varying degree of corporate governance spend their option proceeds any differently. In doing so, we employ seven measures of corporate governance to classify firms based on the strength of their corporate governance. They include dedicated institutional ownership, institutional ownership, board independence, director representation in the board, the governance index of Gompers, Ishii, and Metrick (2003) (*GINDEX*), the entrenchment index of Bebchuk, Cohen, and Ferrell (2009) (*EINDEX*), and CEO duality. Each year, a firm is said to have low (high) corporate governance if its dedicated institutional ownership, institutional ownership, proportion of independent directors, or log number of directors is below the 30th (above the 70th) percentile, its *GINDEX* is above the 70th (below the 30th) percentile, its *EINDEX* is more (less) than or equal to 4 (2) or when its chief executive officer (CEO) is (not) the chairperson of its board.

Dedicated institutional ownership refers to the proportion of shares held by dedicated institutional investors with long investment horizons and large stock holdings (Bushee 1998, 2001). Institutional ownership is defined using data from Thomson Financial and the associated institutional investor classification is from Brian Bushee.[15] Board independence refers to the proportion of independent directors in the board, whereas director representation refers to the log number of directors in the board. *GINDEX* is constructed using 24 anti-takeover provisions that measure the ability of managers to restrict shareholder activism. Specifically, *GINDEX*

[15] We thank Brian Bushee for his data, made available at the following URL link. http://accounting.wharton.upenn.edu/faculty/bushee/IIclass.html.

adds one point to a firm for each of its anti-takeover provisions, which restrict shareholder rights, thereby increasing managerial entrenchment. Unlike *GINDEX*, *EINDEX* is constructed based on only six provisions, and firms are given a score (from 0 and 6), depending on the number of provisions that they have in a specific year.[16] Data for board independence, *GINDEX*, and *EINDEX* are obtained from Risk Metrics. CEO duality refers to the situation in which the CEO of a firm serves concurrently as the chairman of the board.

[Insert Table 6 Here]

Regression equations (3) to (8) are re-estimated for firms with low corporate governance (*Low*) and firms with high corporate governance (*High*) combined. To identify any allocation differences between the two groups of firms, we add to the regressions, an interaction term for each explanatory variable with the respective corporate governance measure. Table 6 presents the associated regression outputs. In analyzing these results, we note that according to Jensen (1986), even when firms have poor investment opportunities, entrenched managers would retain the corporate cash to serve their personal interests, rather than return the cash to shareholders via equity repurchase or dividends. Therefore, if the agency model explains the allocation behavior of option proceeds, then ceteris paribus, we would expect firms with low corporate governance to hoard more cash, or spend more of it on investment projects than do firms with high corporate governance. Moreover, firms with low corporate governance would be expected to allocate relatively less option proceeds to equity repurchase and dividends.

We find that firms with varying degree of corporate governance do not allocate option proceeds to investment and cash savings differently; Across the seven corporate governance measures, differences in the allocation to investment and cash savings are all statistically insignificant. While firms with high corporate governance repurchase relatively more equity,

[16] The six provisions are staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments.

this is only so for five out of the seven measures. Moreover, among these five measures, the incremental equity repurchase is only statistically significant for two measures i.e. board independence (coefficient = -0.208; *t*-statistic = -1.8) and director representation (coefficient = -0.526; *t*-statistic = -3.8). For example, firms with high corporate governance, measured as having high board independence, repurchase an additional 20.8 cents worth of equity per dollar of option proceeds received. This increment is however, only significant at the 10% level. As a side note, there is no statistically significant difference in the allocation of option proceeds to debt repurchase and only weak evidence for a difference in the allocation to dividends.

In sum, we find that the agency model cannot explain how firms put option proceeds to various uses. In fact, firms that are said to have more entrenched managers invest and save their option proceeds just as do firms with less entrenched managers. While firms with high corporate governance return relatively more of their option proceeds to shareholders via equity repurchase, this increment is neither consistent nor statistically significant across all measures of corporate governance. To add on, the results for dividends are mixed in that, depending on the corporate governance measure used, firms with high corporate governance do not necessary return relatively more option proceeds to shareholders in the form of dividends.

E. Employee Stock Option Proceeds and Cash Holdings

To recapitulate, we find that firms save a large portion of the overall proceeds raised from equity issuance during the period 1996-2015. The liquidity improvement brought about by the exercise of ESOs enables these firms to save significant amounts of option proceeds in the year of receipt. Moreover, this short-term effect on cash savings does not completely reverse as firms do not spend all the savings in subsequent years. In this section, we examine how equity issuance proceeds (particularly option proceeds) contribute to corporate cash

holdings. Following Bates et al. (2009), we regress the cash-to-assets ratios of our sample firms on a set of variables, which they deemed as determinants of cash holdings. Like the authors, we allow the intercept of the regressions to change in the 2000s by incorporating the necessary indicator variable into the regressions. In addition, we include equity and debt issuance proceeds as explanatory variables of cash holdings. Table 7 depicts the associated results.

In column (1) of the table, we replicate the results of Bates et al. (2009), depicted in column (1) of their Table 3 Panel B. It is noteworthy that the magnitude of our coefficients does not exactly match those of Bates at el. (2009) because the latter construct their sample for the period 1980-2006. Limited by the data availability of ESOs, we can only examine firms during the years 1996-2015. That said, our coefficients have the same signs as theirs. Furthermore, in unreported results, we construct a comparable sample by closely following their data rules, and are able to replicate their results with similar coefficient estimates.

[Insert Table 7 Here]

Column (2) of Table 7 presents the results with equity and debt issuance proceeds as additional explanatory variables. Given the high saving rate of equity issuance proceeds documented by McLean (2011) as well as our analysis, it is not surprising that the coefficient on *EI* is positive and statistically significant (coefficient = 0.168; *t*-statistic = 4.1). In contrast, the availability of debt issuance proceeds reduces the firms' needs to hold cash; The coefficient on *DI* is negative but nevertheless significant at the 1% level (coefficient = -0.034; *t*-statistic = -4.4). Economically, these results imply that after controlling for the various determinants of cash holdings, firms in our sample hold, on average, 16.8 cents of cash for every dollar of equity issuance proceeds received. On the other hand, they reduce their cash holdings by an average of 3.4 cents with every dollar of debt issuance proceeds made available to them.

To disentangle the effects of option and non-option proceeds on cash holdings, we include the two types of funds as separate regressors, and re-run the associated regressions. Column (3) of Table 7 shows that both types of proceeds have an important impact on corporate cash holdings. However, the magnitude differs depending on whether the proceeds are generated by the exercise of ESOs or other equity issues. Ceteris paribus, a one standard deviation increase in option proceeds predicts an average increase in cash ratio of 0.035 whereas a similar increase in non-option proceeds produces an increase of 0.013, on average. In contrast, a one standard deviation increase in debt issuance proceeds reduces the average cash ratio by only 0.007.

In a less subtle analysis, we repeat our cash ratio analysis in light of an alternative cash flow measure i.e. $Cash\ flow_{SCF}$. We posit that $Cash\ flow_{SCF}$ is a more realistic measure of cash flow because it is based on the *SCF*, which is designed to record all cash transactions of a firm. On other hand, the cash flow measure used by Bates et al. (2009) is defined as earnings after interest expenses, dividends, and taxes but before depreciation, and is therefore based on the income statement, which is almost certain to include non-cash items such as accruals, impairment charges and non-cash staff compensation expenses. In fact, Lewellen and Lewellen (2016) find that such a measure has become noisy over time because it erroneously incorporates non-cash expenses such as asset write-downs, restructuring charges, employee stock compensation, and deferred taxes, that have become increasingly important in recent years.

Column (4) to (6) of Table 7 depict the regression results based on our alternative cash flow measure. In particular, we find that replacing the cash flow variable with a comprehensive measure significantly increases its explanatory power and statistical significance. In the baseline regression as depicted in column (4), the cash flow coefficient estimate increases from 0.037 to 0.085, and the value of its *t*-statistics increases from 1.7 to 3.4. The impact of using different cash flow measures is further amplified when we augment the regression to include

equity and debt issuance proceeds; In column (5), the cash flow coefficient estimate increases from 0.064 to as much as 0.124 and the associated t-statistics increases from 2.4 to 5.0, whereas in column (6), it increases from 0.042 (t-statistic = 1.8) to 0.095 (t-statistic = 4.1).

To further evaluate the impact of option proceeds on cash holdings, we compute the hypothetical cash ratios that would prevail if firms did not save their option proceeds. In doing so, we note that the amounts of cash holdings and total assets of sample firms evolve as follow.

$$Cash_t = Cash_{t-1} + \Delta Cash_{[t-1,t]}$$

$$Assets_t = Assets_{t-1} + \Delta Assets_{[t-1,t]}$$

In each time t, the change in cash ($\Delta Cash_{[t-1,t]}$) is then decomposed into two components i.e., the option proceeds allocated to cash ($Cash^{OP}$), and all other cash additions ($Cash^{Oth}$) such that $\Delta Cash_{[t-1,t]} = \Delta Cash^{OP}_{[t-1,t]} + \Delta Cash^{Oth}_{[t-1,t]}$, whereby $\Delta Cash^{OP}_{[t-1,t]}$ is computed by first running regression equation (4) on an annual basis to obtain the average yearly saving rates of option proceeds i.e., $\beta_2^{\Delta C}$. The amount of option proceeds allocated to cash in a specific year is therefore given by multiplying the option proceeds received for that year by the associated saving rate. At any time t, the hypothetical cash ratio is therefore:

$$Cash\ Ratio_i^{Hypo} = \frac{Cash_1 + \sum_{i=2}^{t} \Delta Cash_i^{Oth}}{Assets_t - \sum_{i=2}^{t} \Delta Cash_i^{OP}}$$

where $Cash_1$ is the starting amount of cash i.e., the cash holdings of a specific firm for the first year it is in the sample.

[Insert Figure 3 Here]

Panel A (B) of Figure 3 plot the annual mean and median values of the actual and hypothetical cash ratios for our sample firms, thereby contrasting the differences caused by the saving of option proceeds, and illustrating the time trend of cash holdings. Since savings from

option proceeds made up a part of cash holdings, the hypothetical cash ratio is therefore lower than the actual cash ratio. That said, the hypothetical mean cash ratio is only marginally lower than the actual ratio during the early sample years, suggesting that the saving of option proceeds does not contribute much to the time trend of cash holdings during these years. However, with the increasing use of ESOs by our sample firms, the gap between actual and hypothetical cash ratios widens over time, so much so that in 2015, the hypothetical mean ratio would be as much as 23.5% lower than the actual mean ratio if firms did not save their option proceeds. We therefore conclude that, to a large extent, the accumulation of option proceeds as cash helps to explain the observed cash ratios of our sample of U.S. firms.

F. Alternative Classification of Equity Issuance Proceeds by McKeon (2015)

In this section, we examine how accurate the classification rule of McKeon (2015) is in imputing the amounts of option and non-option proceeds for our sample firms. Specifically, McKeon (2015) uses the relative size of equity issues to separate employee-initiated issues from firm-initiated ones. He defines employee-(firm-) initiated equity issues as those with issue size lower (higher) than 2% (3%) of market equity, the so-called *ISSUE%* rule.[17] Implicit in this rule is the assumption that a firm can only be classified as having issued in a specific year, either employee- or firm-initiated equity, but not both. For example, a firm receiving an annual amount of option proceeds exceeding 3% of its market equity is mistakenly deemed by the rule as having issued only firm-initiated equity. Given that equity issues with a size between 2% to

[17] McKeon (2015) uses the Compustat Fundamentals Quarterly file to compute the quarterly equity issuance proceeds of a firm by substracting from the current year-to-date value, the previous quarter value of the proceeds from the sale of common and preferred stock, as reported in Compustat variable, *SSTKY*. To isolate the amount of proceeds from common equity issuance, he subtracts preferred equity issuance proceeds from the overall equity issuance proceeds, whereby preferred equity issuance proceeds are calculated as increases in the Compustat variable, *PSTKQ* (or *PSTKRQ* where missing). He then computes the ratio of common equity issuance proceeds to end-of-period market equity for each firm-quarter observation, and refers to this variable as *ISSUE%*.

3% of market equity are deemed as ambiguous and disregarded by McKeon (2015), the rule also misses out on firms with moderate amounts of option and/or non-option proceeds.

Unlike McKeon (2015), we explicitly collect data on ESOs from various sources, including the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. We therefore offer a relatively more accurate estimate of the proceeds raised from employee-initiated equity issues by our sample firms. We illustrate that applying the *ISSUE%* rule to our data results in misclassifications between the two types of proceeds, leading to inaccurate inferences about the allocation of option and non-option proceeds. That said, in defining non-option proceeds as the difference between total equity issuance proceeds and proceeds from the exercise of ESOs, we could also be potentially classifying proceeds from other employee-initiated issues (such as stock incentive and profit sharing plans) as non-option proceeds. However, we believe that such a loophole, if any, will lead to an underestimation of the amount of option proceeds and bias us against documenting the importance of option proceeds. Moreover, stock issued to employees under such plans are solely at the discretion of managers, and may therefore be more appropriately classified as other equity issues, what McKeon (2015) deems as firm-initiated issues.

[Insert Table 8 Here]

Panel A of Table 8 evaluates the *ISSUE%* rule with respect to our data. Column (1) to (3) of the table list the annual amounts of option and non-option proceeds based on actual data. Column (4) and (5) depict the proceeds imputed from employee- and firm-initiated equity issues, respectively. In sum, the *ISSUE%* rule estimates an overall US$800.9 billion (GDP deflator adjusted) raised from employee-initiated equity issues, as opposed to the US$781.3 billion of option proceeds actually received by our sample firms.[18] Notably, firm-initiated

[18] Given that the *ISSUE%* rule of McKeon (2015) requires firms to have market value of equity, we dropped 41 missing observations in computing the amounts of employee- and firm-initiated equity issues. These observations

issues sum to US$548.6 billion, in contrast to the US$771.7 billion of non-option proceeds. The difference is due to several reasons; First, equity issues with size between 2% and 3% of market equity are deemed as ambiguous by McKeon (2015), and disregarded. The annual amounts of these issues are tabulated in column (6), and aggregates to as much as US$106.5 billion for the entire sample period. Second, McKeon (2015) did not explicitly consider the tax benefits associated with option proceeds; These tax grants are separately reported in Compustat since 2005. Lastly, applying the *ISSUE%* rule to our data entails, to a certain extent, misclassifications between employee- and firm-initiated issues, depicted in column (8) and (9).

To facilitate comparison, we show in column (1) to (4) of Table 8 Panel B, the actual amounts of option and non-option proceeds corresponding to the respective imputed amounts of employee- and firm-initiated issues. In view that the *ISSUE%* rule necessitates firms to be classified as having issued in a specific year, either employee- or firm-initiated equity but not both, we further evaluate the magnitude of misclassification arising from this implicit assumption. In doing so, we distinguish between dual and non-dual equity issues; A firm is regarded as a dual issuer if it receives both option and non-option proceeds in a specific year. A firm is said to be a non-dual issuer if it receives either option or non-option proceeds.

Column (5) to (8) of Table 8 Panel B illustrates the accuracy of the *ISSUE%* rule in terms of non-dual issues. In total, only 29% of the US$800.9 billion of employee-initiated issuance proceeds are indeed option proceeds received by non-dual issuers (US$229.9 billion). Less than 10% of firm-initiated issuance proceeds relate to non-option proceeds (US$47.7 billion). For dual issuers, column (9) shows the amounts of option proceeds misclassified as firm-initiated issuance proceeds, and column (10) lists the amounts of non-option proceeds reported as employee-initiated issuance proceeds. Column (11) and (12) aggregate the

involve US$4.7 million of option proceeds, and US$81.4 million of non-option proceeds, both GDP deflator adjusted.

misclassifications for dual and non-dual issuers; The *ISSUE%* rule produces a net misclassification between employee- and firm-initiated issuance proceeds, amounting to a daunting US$100.3 billion.

Panel C of Table 8 examines the accuracy of *ISSUE%* rule in terms of the quantity of issues. Column (1) to (5) of the panel present the actual split between non-issuers and equity issuers, as well as dual and non-dual issuers in our sample. Column (6) and (7) tabulate respectively, the number of employee- and firm-initiated equity issuers based on the rule. Column (8) shows that there are as many as 1,392 equity issues falling between 2% and 3% of market equity, deemed as ambiguous issues according to the rule. Importantly, column (9) shows that only 9,912 of the 25,417 employee-initiated issues are correctly classified. In contrast, a little more than 25% of the firm-initiated issues are accurate (1,268 issues). Overall, among the 30,399 issues identified by the *ISSUE%* rule as being either employee- or firm-initiated, only 36.8% of them (9,912+1,268 issues) are accurately categorized. 12.2% (3,714 issues) are misclassified as firm-initiated issues, while the remaining 51.0% are wrongly identified as employee-initiated issues. This implies that there are many moderately sized firm-initiated issues in our sample, to which the *ISSUE%* rule is unable to identify them accurately.

To assess the implication these misclassifications have on our inferences, we replace option and non-option proceeds with the corresponding employee- and firm-initiated issuance proceeds in equation (3) to (8), and re-run the regressions. For comparative purposes, we report the results in Table 9, along with regressions involving the original option and non-option proceeds. In general, the coefficients on employee- and firm-initiated issuance proceeds are vastly different from those on the respective option and non-option proceeds. Particularly, the cash flow identity does not hold very well in terms of the imputed amounts of equity issuance proceeds, mostly because the tax grants associated with option proceeds are not considered. As

a result, while all coefficients on *Oth* are zero for the regressions in terms of option and non-option proceeds, those with respect to employee- and firm-initiated issuance proceeds are not.

[Insert Table 9 Here]

We show that investment increases by 59.1 cents per dollar of employee-initiated issuance proceeds as opposed to 27.5 cents per dollar of option proceeds, more than a twofold difference. Importantly, firms save 102.4 cents from each dollar raised in employee-initiated issues whereas the saving rate of option proceeds is only 80.6 cents. Given that a significant amount of non-option proceeds is classified as being employee-initiated, the resulting proceeds from employee-initiated issues therefore significantly overstate the saving rate of option proceeds. Similarly, there are remarkable differences in the allocation of firm-initiated issuance proceeds and non-option proceeds; Firms invest 41.3 (27.3) cents and save 71.0 (62.8) cents per dollar of firm-initiated issuance proceeds (non-option proceeds). In sum, we find that applying the *ISSUE%* rule to our data results in inaccurate inferences about the allocation of option and non-option proceeds for our sample firms during the period 1996-2015.

VII. Conclusion

Employee stock options (ESOs) has become an important channel through which firms issue equity in the new millennium. Funds raised from the exercise of these options constitute a more ad-hoc source of capital for the firms than funds raised from formal equity issuance events such as IPOs, SEOs and private placements because it is uncertain when such options will become in-the-money, and whether employees will exercise them when it is profitable to do so. We construe that distinguishing between these two types of proceeds is important because they are driven by different motives. Specifically, option proceeds result from the initiative of firms to compensate employees for their service to the firms, and involve no active

fundraising action on part of their managers. On the other hand, proceeds from other equity issues involve the conscientious effort made by managers to raise capital for specific uses.

In view of the relatively discretionary nature of option proceeds, we examine whether firms have a greater tendency to spend option proceeds than they do with non-option proceeds, and whether the agency model of managerial behavior helps to explain how option proceeds are typically spent. In doing so, we identify the main ways in which option proceeds can be spent based on the cash flow identity. To be specific, we examine the impact of both option and non-option proceeds on the firms' collective policy of investment, cash holdings, security repurchases, and dividends. As such, we are not only able to simultaneously examine all uses of equity issuance proceeds but also gauge the relative importance of these uses.

We find that firms do not have a relatively higher tendency to spend option proceeds. In fact, option proceeds are so highly saved that cash savings emerge as the most important use of option proceeds, followed by investment and equity repurchase. In comparison, non-option proceeds are invested at a slightly lower rate (27.4 cents per dollar of non-option proceeds as opposed to 32.0 cents per dollar of option proceeds). The saving rates are also different; Firms save an average of 74.3 (62.0) cents out of a dollar of option (non-option) proceeds. Moreover, they repurchase equity more extensively after receiving option proceeds than they do with non-option proceeds, and cut back on debt repurchase only after ESOs are exercised.

Among the different sources of funds, option proceeds are the most highly saved. That said, these savings are significantly drawn down in the year following the exercise of ESOs, and redirected to investment and equity repurchase. Savings from non-option proceeds, on the other hand, are more permanent as they are not heavily depleted in subsequent years. Our results also do not conform to the predictions of the agency model in that less financially constrained firms return a significant amount of option proceeds to shareholders via equity

repurchase, rather than spend them away on investment projects. There is also no evidence that firms with different degree of corporate governance spend their option proceeds differently.

Lastly, we find that equity issuance proceeds (particularly option proceeds) contribute to explaining the cash ratios of nonfinancial U.S. firms during the period 1996-2015. We show that proceeds from both equity and debt issuances help to explain the observed cash ratios. Specifically, equity capital represents a source of cash, and have a positive effect on the cash ratio of an average firm. The availability of debt issuance proceeds however, reduces the need for corporate cash holdings, and therefore negatively affects the average cash ratio. For additional perspective, we compute the hypothetical cash ratios that would prevail if firms did not save their option proceeds at the yearly estimated saving rates, and find that the said ratios are consistently lower than the actual cash ratios. We therefore conclude that, to a certain extent, the accumulation of option proceeds as cash helps to explain the observed cash ratios of our sample firms.

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Figure 1. Evolution of Equity Issuance Proceeds

This figure presents by calendar year, the aggregate amounts of equity issuance proceeds for nonfinancial U.S. firms in Compustat for the years 1996 to 2015. Panel A depicts for the full sample period, the total equity issuance proceeds, as well as the option and non-option proceeds received by our sample firms. Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. Non-option proceeds refer to total equity issuance proceeds less option proceeds and therefore, include tax benefits associated with the exercise of employee stock options (*TB*). Panel B reclassify the tax benefits as being part of option-related proceeds (*OP+TB*) and excludes firm-years for which the tax benefits are not separately reported in Compustat. Amounts are in billions of 2009 constant U.S. dollars.

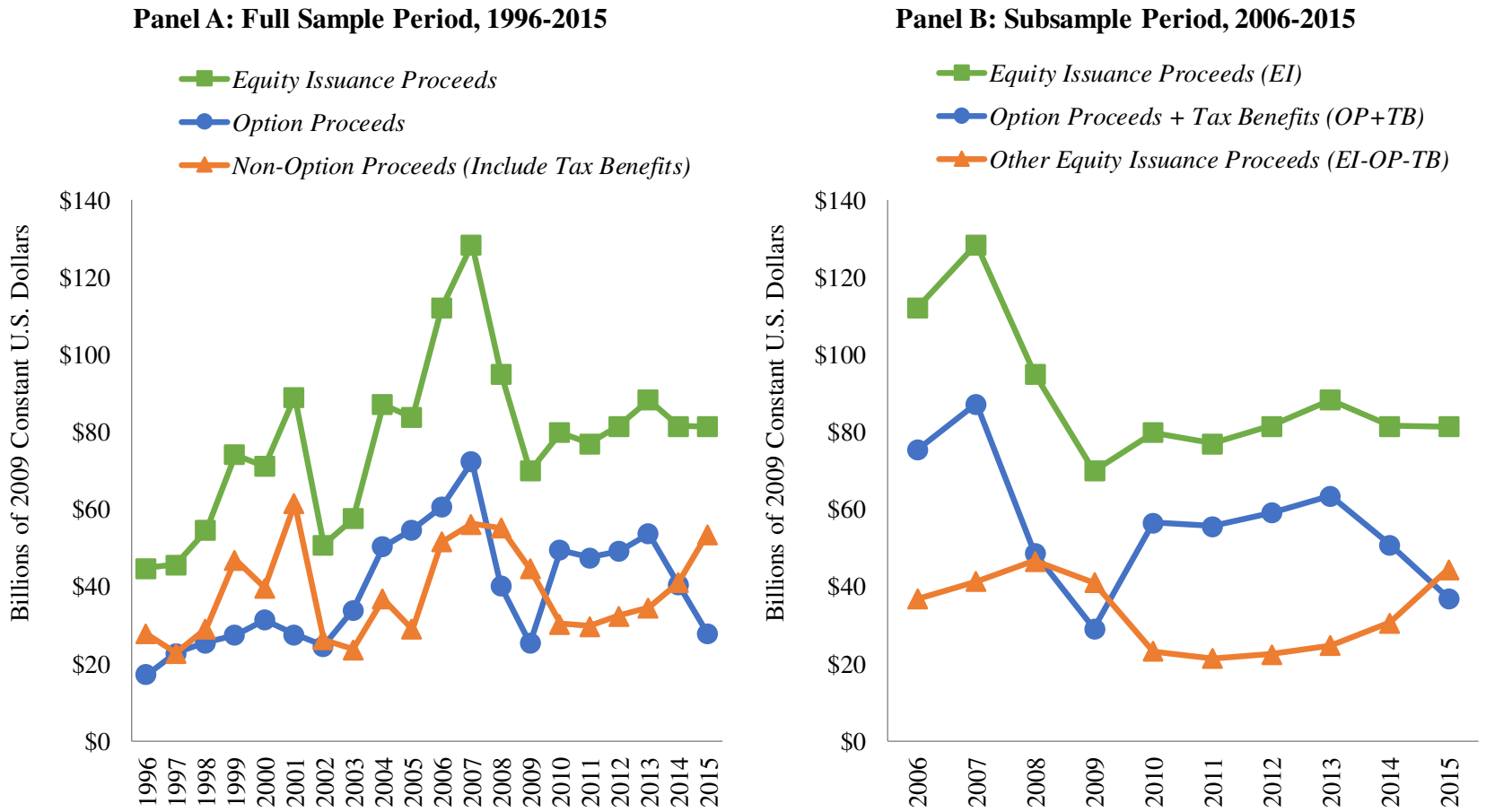

Figure 2. Allocation of Total Equity Issuance Proceeds

This figure depicts the annual amounts allocated to each use of funds for every dollar of equity issuance proceeds received by an average firm in the sample. The sample covers nonfinancial U.S. firms in Compustat for the years 1996 to 2015. Uses of funds include investment, cash savings, equity and debt repurchases, dividends, and other uses of funds. The rates of allocation to other uses of funds are not reported because they are not significantly different from zero.

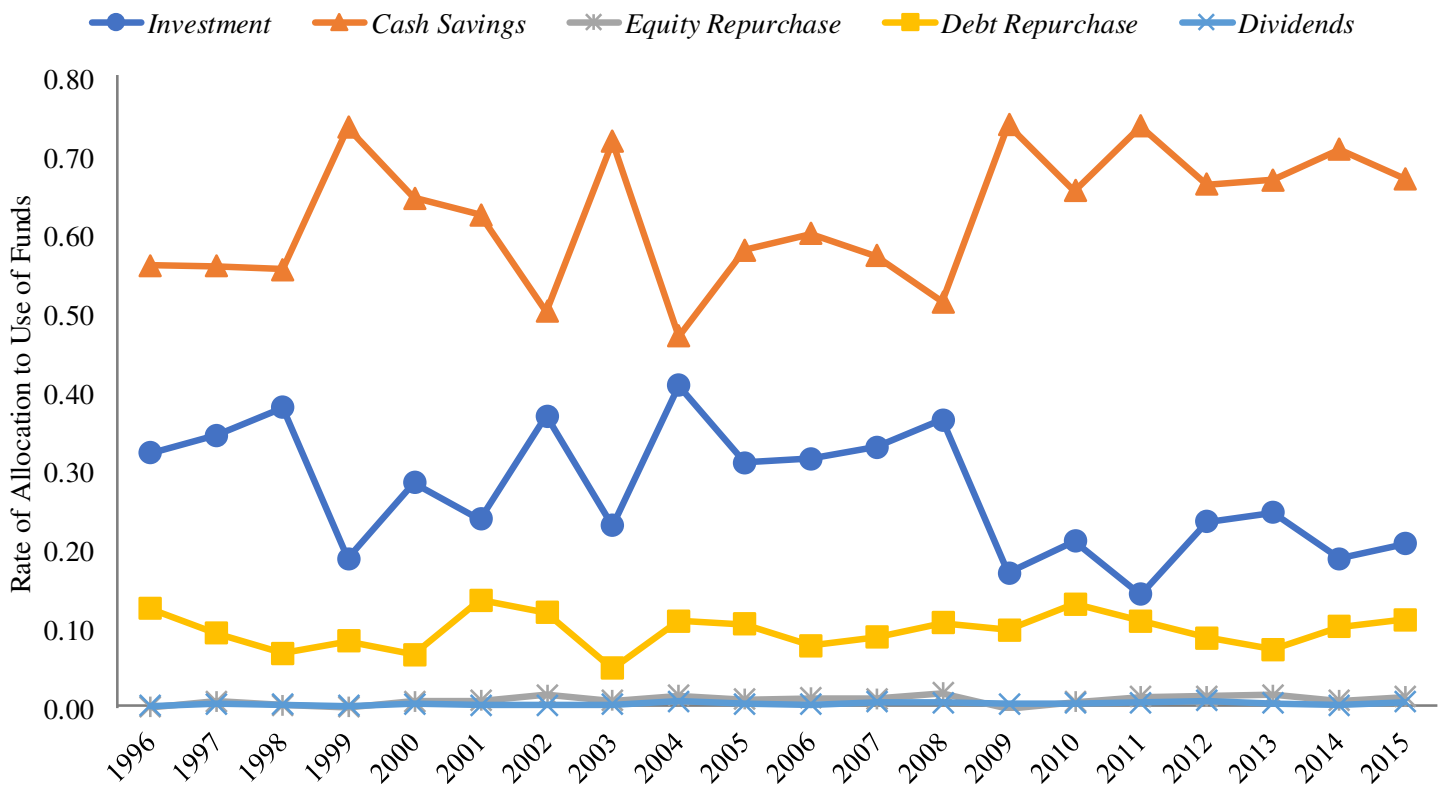

Figure 3. The Time Trend of Cash Ratio

This figure presents the yearly mean and median values of cash ratio of nonfinancial U.S. firms in Compustat for the years 1996 to 2015. Cash ratio is defined as the ratio of cash and short-term investments to book value of assets. Actual ratios refer to cash ratios computed based on actual data available in Compustat whereas hypothetical ratios refer to the cash ratios that would have prevailed if firms did not save part of their option proceeds as cash. Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings.

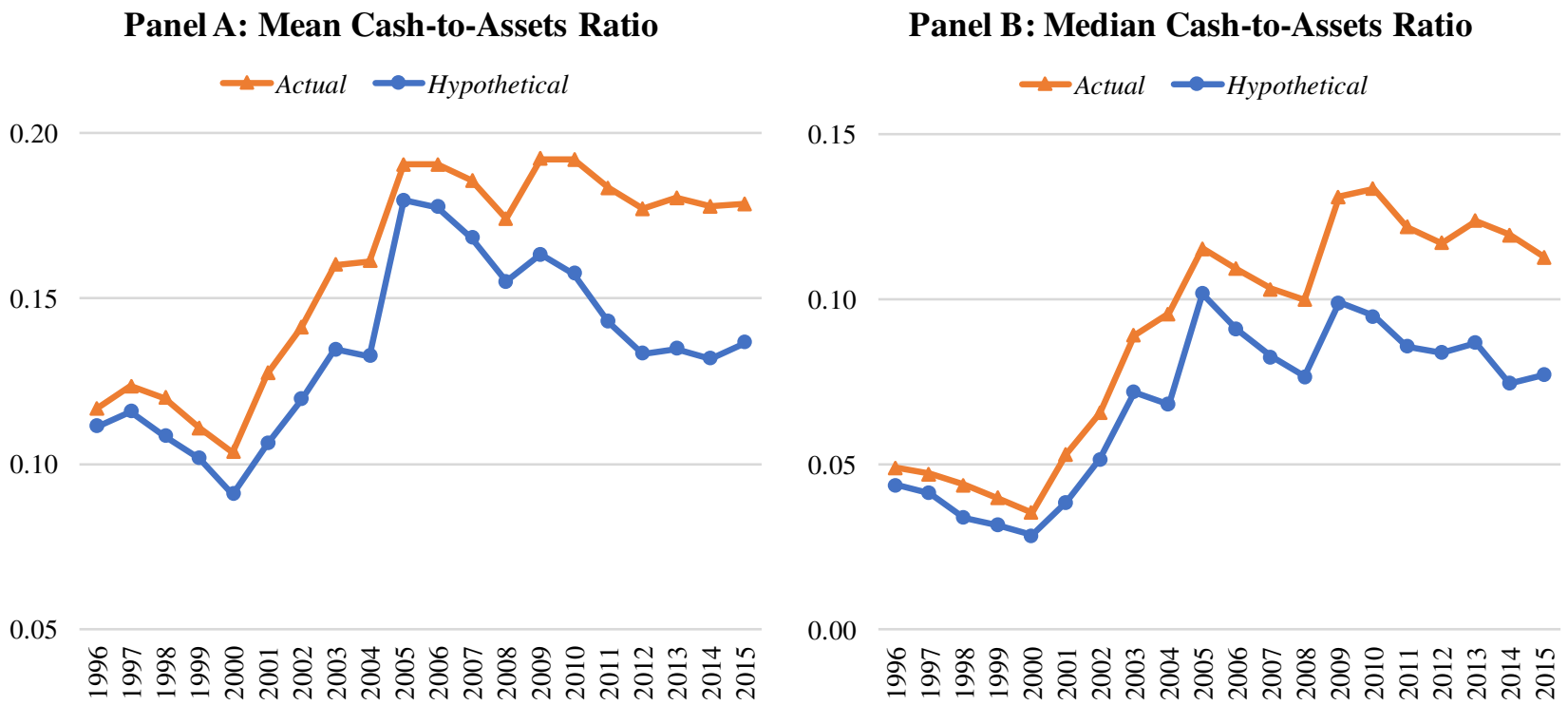

Table 1. Summary Statistics, 1996-2015

This table presents for our sample of nonfinancial U.S. firms in Compustat, the descriptive statistics of our main regression variables for the period 1996 to 2015. That is, sources of funds include operating cash flow net of changes in working capital (*CF*), as well as debt and equity issuance proceeds (*DI* and *EI*, respectively). *OP* is employee stock option proceeds, collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. *EI-OP* is equity issuance proceeds 1less option proceeds and therefore, include tax benefits associated with the exercise of stock options. Uses of funds include investment (*Inv*), cash savings (Δ*Cash*), equity repurchase (*ER*), debt repurchase (*DR*), and dividends (*Div*). *Oth* refers to the plug that balances the cash flow identity in the event of reporting errors and/ or rounding adjustments. All variables that made up the cash flow identity are deflated by the respective firm's beginning-of-period total assets. Appendix A depicts the definitions of these variables. Control variables include the ratio of market assets to book assets (*MB*), annual sales growth rate (*Sales growth*), log of book assets (*Ln*(*Assets*)), ratio of total debt to book assets (*Leverage*), and ratio of fixed assets to book assets (*Tangibility*). Negative income dummy is an indicator that equals one if a firm suffers an operating loss (*EBITDA*) in a given year, zero otherwise. Tobin's Q is the sum of book value of assets and market value of common equity less book value of common equity and deferred taxes, normalized by book value of assets.

Variable	Description	Mean	S.D.	Min.	25th	Median	75th	Max.
Sources of Funds (Normalized by Total Assets):								
CF	Operating cash flow	0.067	0.167	-3.211	0.023	0.085	0.144	0.736
EI	Equity issuance proceeds	0.041	0.162	0.000	0.0003	0.005	0.018	7.050
OP	Option proceeds	0.007	0.014	0.000	0.000	0.002	0.008	0.194
EI-OP	Non-option proceeds (*EI-OP*)	0.034	0.159	-0.007	0.000	0.0004	0.005	7.039
DI	Debt issuance proceeds	0.100	0.206	-0.192	0.000	0.008	0.112	3.316
Uses of Funds (Normalized by Total Assets):								
Inv	Investment	0.083	0.140	-0.694	0.017	0.053	0.121	1.812
Δ*Cash*	Change in cash	0.013	0.129	-0.603	-0.021	0.002	0.035	3.549
ER	Equity repurchase	0.019	0.040	0.000	0.000	0.000	0.016	0.352
DR	Debt retirement	0.084	0.170	0.000	0.000	0.017	0.083	2.170
Div	Dividends	0.009	0.020	0.000	0.000	0.000	0.011	0.321
Oth	Cash flow identity plug	0.000	0.000	-0.010	0.000	0.000	0.000	0.010
Firm characteristics:								
NegInc	Negative income dummy	0.164	0.371	0.000	0.000	0.000	0.000	1.000
Q	Tobin's Q	1.927	1.665	0.250	1.091	1.466	2.161	46.644
MB	Market-to-Book ratio	1.953	1.658	0.271	1.125	1.499	2.187	42.673
SaleG	Sales growth	0.075	0.239	-0.986	-0.037	0.062	0.176	1.000
Ln(Assets)	Log of book value of assets	6.131	2.160	-1.972	4.680	6.215	7.594	11.897
Leverage	Ratio of total debt to total assets	0.216	0.202	0.000	0.023	0.183	0.337	0.910
Tangibility	Ratio of net PPE to total assets	0.261	0.226	0.000	0.084	0.190	0.372	0.981

Table 2. Annual Amounts of Equity Issuance Proceeds

This table depicts the annual amounts of equity issuance proceeds for nonfinancial U.S. firms in Compustat during the years 1996 to 2015. Column (1) reports the total number of firms in our sample, which is made up of non-issuing and equity issuing firms, as tabulated in column (2) and (3) of this table respectively. Column (4) and (5) report these respective firms as a percentage of the total number of sample firms. Column (6) and (7) show that equity issuance proceeds is the sum of option and non-option proceeds. Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. Non-option proceeds (*EI-OP*) refer to equity issuance proceeds (*EI*) less option proceeds (*OP*). The relative proportions of option and non-option proceeds are given in column (9) and (10), respectively. Amounts are in billions of 2009 constant U.S. dollars.

Year	(1) Total Firms (#)	(2) Non-Issuers (#)	(3) Equity Issuers (#)	(4)=(2)÷(1) Non-Issuers (%)	(5)=(3)÷(1) Equity Issuers (%)	(6) *OP* ($)	(7) *EI-OP* ($)	(8)=(6)+(7) *EI* ($)	(9)=(6)÷(8) *OP* (%)	(10)=(7)÷(8) *EI-OP* (%)
1996	1,429	313	1,116	22%	78%	$17.1	$27.6	$44.7	38%	62%
1997	1,582	318	1,264	20%	80%	$22.8	$22.8	$45.6	50%	50%
1998	1,793	462	1,331	26%	74%	$25.4	$29.1	$54.6	47%	53%
1999	1,813	547	1,266	30%	70%	$27.4	$46.8	$74.1	37%	63%
2000	1,742	561	1,181	32%	68%	$31.3	$39.7	$71.0	44%	56%
2001	1,763	546	1,217	31%	69%	$27.6	$61.5	$89.0	31%	69%
2002	1,833	505	1,328	28%	72%	$24.6	$26.2	$50.8	48%	52%
2003	1,722	398	1,324	23%	77%	$33.9	$23.6	$57.5	59%	41%
2004	1,711	252	1,459	15%	85%	$50.3	$36.8	$87.1	58%	42%
2005	2,609	283	2,326	11%	89%	$54.7	$29.0	$83.7	65%	35%
2006	2,716	286	2,430	11%	89%	$60.6	$51.5	$112.0	54%	46%
2007	2,624	322	2,302	12%	88%	$72.3	$56.2	$128.5	56%	44%
2008	2,543	520	2,023	20%	80%	$40.0	$55.1	$95.1	42%	58%
2009	2,438	630	1,808	26%	74%	$25.3	$44.6	$69.9	36%	64%
2010	2,272	511	1,761	22%	78%	$49.5	$30.3	$79.8	62%	38%
2011	2,175	449	1,726	21%	79%	$47.4	$29.6	$77.0	62%	38%
2012	2,055	493	1,562	24%	76%	$49.1	$32.5	$81.5	60%	40%
2013	1,948	409	1,539	21%	79%	$53.7	$34.6	$88.2	61%	39%
2014	1,866	380	1,486	20%	80%	$40.6	$40.9	$81.5	50%	50%
2015	1,787	434	1,353	24%	76%	$27.9	$53.5	$81.4	34%	66%
Total	40,421	8,619	31,802	21%	79%	$781.3	$771.7	$1,553.0	50%	50%

Table 3. Allocation of Funds

This table reports the results of regressing each use of funds on the sources of funds. Uses include investment (*Inv*), cash savings ($\Delta Cash$), equity repurchase (*ER*), debt repurchase (*DR*), dividends (*Div*), and *Oth*, which is the plug that balances the cash flow identity in the event of reporting errors and/ or rounding adjustments. Sources include operating cash flow net of changes in working capital (*CF*), option proceeds (*OP*), non-option proceeds (*EI-OP*), and debt proceeds (*DI*). Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. *EI-OP* is equity issuance proceeds less option proceeds. Variables are demeaned by firm and scaled by book assets. Control variables include the ratio of market assets to book assets (*MB*), annual sales growth rate (*Sales growth)*, log of book assets (*Ln(Assets)*), ratio of total debt to book assets (*Leverage*), and ratio of fixed assets to book assets (*Tangibility)*. For brevity, coefficients of *Oth* are not reported as they are not significantly different from zero. Panel A depicts the results for nonfinancial U.S. firms in Compustat during the period 1996 to 2015. Panel B reclassify tax benefits of options (*TB*) as being part of option-related proceeds (*OP+TB*) and excludes firm-years for which *TB* are not separately reported in Compustat. Regressions are run by ordinary least squares with year fixed effects. *T*-statistics are in parentheses and computed using standard errors robust to both heteroskedasticity and clustering at firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Full sample period (1996-2015)

Dependent Variable:	(1) Inv_{it}	(2) $\Delta Cash_{it}$	(3) ER_{it}	(4) DR_{it}	(5) Div_{it}	(6) Inv_{it}	(7) $\Delta Cash_{it}$	(8) ER_{it}	(9) DR_{it}	(10) Div_{it}
CF_{it}	0.357***	0.424***	0.028***	0.184***	0.007***	0.356***	0.422***	0.025***	0.191***	0.007***
	(41.0)	(39.4)	(17.3)	(21.6)	(12.3)	(39.5)	(37.6)	(15.2)	(21.8)	(11.4)
EI_{it}	0.275***	0.623***	0.007***	0.094***	0.003***					
	(19.3)	(37.5)	(5.6)	(14.9)	(6.5)					
OP_{it}						0.320***	0.743***	0.152***	-0.235***	0.020***
						(4.2)	(9.3)	(6.8)	(-5.1)	(2.7)
EI_{it}-OP_{it}						0.274***	0.620***	0.004***	0.100***	0.002***
						(18.6)	(35.9)	(2.9)	(15.2)	(5.4)
DI_{it}	0.292***	0.097***	0.010***	0.599***	0.002***	0.291***	0.097***	0.010***	0.600***	0.002***
	(40.7)	(13.8)	(8.8)	(70.2)	(4.8)	(40.6)	(13.7)	(8.6)	(70.5)	(4.7)
MB_{it-1}	0.007***	-0.004***	0.001***	-0.005***	0.000***	0.007***	-0.004***	0.001***	-0.005***	0.000***
	(9.2)	(-3.9)	(5.1)	(-9.3)	(7.7)	(8.9)	(-4.1)	(3.7)	(-8.3)	(7.1)
$Sales\ growth_{it-1}$	0.011***	-0.003**	-0.003***	-0.004***	-0.001***	0.011***	-0.003**	-0.003***	-0.004***	-0.001***
	(7.3)	(-2.3)	(-9.7)	(-3.6)	(-6.6)	(7.3)	(-2.3)	(-9.6)	(-3.7)	(-6.6)
$Ln(Assets)_{it-1}$	-0.016***	-0.001	0.007***	0.009***	0.001***	-0.016***	-0.001	0.007***	0.009***	0.001***
	(-11.8)	(-1.1)	(19.2)	(8.7)	(10.4)	(-11.7)	(-1.0)	(19.7)	(8.2)	(10.5)
$Leverage_{it-1}$	-0.155***	-0.011**	-0.036***	0.212***	-0.010***	-0.154***	-0.011*	-0.035***	0.211***	-0.010***
	(-27.0)	(-2.0)	(-22.3)	(34.5)	(-15.3)	(-26.8)	(-1.9)	(-21.9)	(34.3)	(-15.2)
$Tangibility_{it-1}$	-0.015	0.074***	-0.009***	-0.046***	-0.004***	-0.015	0.074***	-0.009***	-0.046***	-0.004***
	(-1.6)	(9.1)	(-3.9)	(-6.4)	(-3.4)	(-1.6)	(9.1)	(-4.0)	(-6.4)	(-3.4)
Year FE	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Obs	40,421	40,421	40,421	40,421	40,421	40,421	40,421	40,421	40,421	40,421
R^2	0.33	0.45	0.07	0.62	0.04	0.33	0.45	0.07	0.62	0.04

Table 3. Allocation of Funds (continue)

Panel B: Subsample period (2006-2015)

Dependent Variable:	(1) Inv_{it}	(2) $\Delta Cash_{it}$	(3) ER_{it}	(4) DR_{it}	(5) Div_{it}	(6) Inv_{it}	(7) $\Delta Cash_{it}$	(8) ER_{it}	(9) DR_{it}	(10) Div_{it}
CF_{it}	0.317***	0.460***	0.025***	0.190***	0.008***	0.318***	0.458***	0.027***	0.188***	0.009***
	(30.4)	(32.8)	(11.4)	(15.6)	(8.9)	(30.6)	(32.8)	(12.1)	(15.6)	(9.6)
$OP_{it}+TB_{it}$	0.389***	0.613***	0.225***	-0.255***	0.042***					
	(4.5)	(7.1)	(7.4)	(-5.1)	(3.4)					
$EI_{it}-(OP_{it}+TB_{it})$	0.247***	0.645***	0.003**	0.102***	0.002***					
	(15.7)	(37.3)	(2.5)	(12.0)	(4.4)					
OP_{it}						0.346***	0.713***	0.197***	-0.243***	0.026**
						(3.6)	(7.3)	(5.6)	(-4.5)	(2.0)
$EI_{it}-OP_{it}$						0.248***	0.643***	0.004***	0.100***	0.003***
						(15.8)	(37.1)	(3.4)	(11.9)	(5.2)
DI_{it}	0.258***	0.117***	0.014***	0.606***	0.003***	0.259***	0.117***	0.015***	0.606***	0.003***
	(34.0)	(12.4)	(8.8)	(60.2)	(4.6)	(34.0)	(12.3)	(8.9)	(60.0)	(4.7)
MB_{it-1}	0.006***	-0.004***	0.001***	-0.004***	0.000***	0.006***	-0.004***	0.001***	-0.004***	0.001***
	(5.6)	(-3.2)	(4.9)	(-5.4)	(4.7)	(5.8)	(-3.4)	(5.4)	(-5.7)	(5.1)
$Sales\ growth_{it-1}$	0.010***	-0.003	-0.002***	-0.004***	-0.001***	0.010***	-0.003	-0.002***	-0.004***	-0.001***
	(5.1)	(-1.6)	(-5.6)	(-3.1)	(-4.5)	(5.1)	(-1.6)	(-5.6)	(-3.0)	(-4.6)
$Ln(Assets)_{it-1}$	-0.016***	-0.003*	0.007***	0.010***	0.002***	-0.016***	-0.003	0.007***	0.010***	0.002***
	(-9.7)	(-1.7)	(13.3)	(7.7)	(7.4)	(-9.6)	(-1.6)	(13.6)	(7.4)	(7.4)
$Leverage_{it-1}$	-0.136***	-0.010	-0.039***	0.195***	-0.010***	-0.136***	-0.010	-0.039***	0.195***	-0.010***
	(-18.3)	(-1.3)	(-17.5)	(24.0)	(-9.5)	(-18.4)	(-1.2)	(-17.6)	(24.0)	(-9.6)
$Tangibility_{it-1}$	-0.018	0.083***	-0.009***	-0.048***	-0.008***	-0.018	0.083***	-0.009***	-0.048***	-0.008***
	(-1.4)	(7.4)	(-2.7)	(-5.2)	(-4.8)	(-1.5)	(7.4)	(-2.8)	(-5.2)	(-4.8)
Year FE	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Obs	22,424	22,424	22,424	22,424	22,424	22,424	22,424	22,424	22,424	22,424
R^2	0.27	0.46	0.07	0.63	0.03	0.27	0.46	0.07	0.63	0.03

Table 4. The Effects of Past Option Exercises on Funds Allocation

This table reports the results of regressing each use of funds on the sources of funds. Uses include investment (*Inv*), cash savings (Δ*Cash*), equity repurchase (*ER*), debt repurchase (*DR*), dividends (*Div*), and *Oth*, which is the plug that balances the cash flow identity in the event of reporting errors and/ or rounding adjustments. Sources include operating cash flow net of changes in working capital (*CF*), option proceeds (*OP*), non-option proceeds (*EI-OP*), and debt proceeds (*DI*). Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. *EI-OP* is equity issuance proceeds less option proceeds. Variables are demeaned by firm and scaled by book assets. Control variables include the ratio of market assets to book assets (*MB*), annual sales growth rate (*Sales growth)*, log of book assets (*Ln(Assets)*), ratio of total debt to book assets (*Leverage*), and ratio of fixed assets to book assets (*Tangibility)*. Coefficients on control variables are not reported as they are similar to those in Table 3. Coefficients of *Oth* are also omitted since they are not significantly different from zero. Panel A depicts the results for nonfinancial U.S. firms in Compustat during the period 1996 to 2015. Panel B reclassify tax benefits of options (*TB*) as being part of option-related proceeds (*OP+TB*) and excludes firm-years for which *TB* are not separately reported in Compustat. Regressions are run by ordinary least squares with year fixed effects. *T*-statistics are in parentheses and computed using standard errors robust to both heteroskedasticity and clustering at firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Panel A: Full sample period (1996-2015)

Dependent Variable:	(1) Inv_{it}	(2) $\Delta Cash_{it}$	(3) ER_{it}	(4) DR_{it}	(5) Div_{it}	(6) Inv_{it}	(7) $\Delta Cash_{it}$	(8) ER_{it}	(9) DR_{it}	(10) Div_{it}
CF_{it}	0.359***	0.410***	0.031***	0.192***	0.008***	0.352***	0.420***	0.027***	0.194***	0.007***
	(34.0)	(31.2)	(13.2)	(17.1)	(9.4)	(33.2)	(30.5)	(11.3)	(17.6)	(8.6)
CF_{it-1}						0.087***	-0.086***	0.019***	-0.024***	0.004***
						(10.0)	(-8.9)	(8.2)	(-3.1)	(4.1)
CF_{it-2}						0.042***	-0.037***	0.004*	-0.012	0.003***
						(5.2)	(-3.8)	(1.8)	(-1.6)	(4.1)
OP_{it}	0.412***	0.616***	0.130***	-0.173***	0.029***	0.357***	0.685***	0.100***	-0.157***	0.028***
	(4.7)	(6.8)	(4.7)	(-3.2)	(3.2)	(4.0)	(7.4)	(3.6)	(-3.0)	(3.1)
OP_{it-1}						0.196**	-0.357***	0.178***	-0.017	0.000
						(2.3)	(-4.4)	(5.7)	(-0.4)	(0.0)
OP_{it-2}						0.013	0.003	0.071***	-0.102**	0.013**
						(0.2)	(0.0)	(2.7)	(-2.6)	(2.0)
EI_{it}-OP_{it}	0.267***	0.620***	0.004**	0.107***	0.002***	0.277***	0.611***	0.005**	0.104***	0.002***
	(12.4)	(24.9)	(2.1)	(10.6)	(4.0)	(12.9)	(24.4)	(2.6)	(10.5)	(4.4)
EI_{it-1}-OP_{it-1}						0.057***	-0.055***	-0.005***	0.003	-0.001*
						(5.0)	(-4.6)	(-2.6)	(0.5)	(-1.9)
EI_{it-2}-OP_{it-2}						0.037***	-0.033***	-0.003**	-0.002	0.001
						(4.2)	(-3.1)	(-2.1)	(-0.3)	(1.4)

Table 4. The Effects of Past Option Exercises on Funds Allocation (continue)

Panel A: Full sample period (1996-2015)

Dependent Variable:	(1) Inv_{it}	(2) $\Delta Cash_{it}$	(3) ER_{it}	(4) DR_{it}	(5) Div_{it}	(6) Inv_{it}	(7) $\Delta Cash_{it}$	(8) ER_{it}	(9) DR_{it}	(10) Div_{it}
Continue:										
DI_{it}	0.288***	0.066***	0.011***	0.633***	0.002***	0.292***	0.069***	0.012***	0.625***	0.002***
	(31.9)	(9.7)	(7.2)	(66.8)	(3.5)	(32.2)	(9.8)	(7.6)	(66.2)	(3.8)
DI_{it-1}						-0.031***	-0.019***	-0.007***	0.059***	-0.002***
						(-5.9)	(-4.5)	(-6.0)	(10.8)	(-3.8)
DI_{it-2}						-0.022***	0.001	-0.005***	0.028***	-0.002***
						(-5.0)	(0.2)	(-4.5)	(6.1)	(-3.9)
Controls	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year FE	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Obs	26,145	26,145	26,145	26,145	26,145	26,145	26,145	26,145	26,145	26,145
R^2	0.33	0.39	0.08	0.65	0.04	0.34	0.40	0.09	0.66	0.05

Panel B: Subsample period (2006-2015)

Dependent Variable:	(1) Inv_{it}	(2) $\Delta Cash_{it}$	(3) ER_{it}	(4) DR_{it}	(5) Div_{it}	(6) Inv_{it}	(7) $\Delta Cash_{it}$	(8) ER_{it}	(9) DR_{it}	(10) Div_{it}
CF_{it}	0.310***	0.470***	0.029***	0.181***	0.009***	0.305***	0.480***	0.025***	0.181***	0.008***
	(27.3)	(31.4)	(9.7)	(14.1)	(7.9)	(27.0)	(31.9)	(8.3)	(14.2)	(7.3)
CF_{it-1}						0.075***	-0.083***	0.017***	-0.012	0.004***
						(7.5)	(-7.0)	(5.9)	(-1.3)	(3.0)
CF_{it-2}						0.043***	-0.044***	0.001	-0.001	0.003***
						(4.4)	(-3.9)	(0.2)	(-0.1)	(2.9)
$OP_{it}+TB_{it}$	0.494***	0.472***	0.236***	-0.255***	0.054***	0.444***	0.548***	0.186***	-0.223***	0.054***
	(5.1)	(4.8)	(6.5)	(-4.4)	(3.7)	(4.3)	(5.3)	(5.0)	(-3.8)	(3.5)
$OP_{it-1}+TB_{it-1}$						0.066	-0.236***	0.202***	-0.051	-0.007
						(0.6)	(-2.6)	(5.1)	(-1.0)	(-0.7)
$OP_{it-2}+TB_{it-2}$						0.001	-0.046	0.079**	-0.089**	0.018**
						(0.0)	(-0.6)	(2.6)	(-2.0)	(2.2)

Table 4. The Effects of Past Option Exercises on Funds Allocation (continue)

Panel B: Subsample period (2006-2015)

Dependent Variable:	(1) Inv_{it}	(2) $\Delta Cash_{it}$	(3) ER_{it}	(4) DR_{it}	(5) Div_{it}	(6) Inv_{it}	(7) $\Delta Cash_{it}$	(8) ER_{it}	(9) DR_{it}	(10) Div_{it}
Continue:										
EI_{it}-(OP_{it}+TB_{it})	0.227***	0.658***	0.002	0.110***	0.002***	0.239***	0.648***	0.003	0.106***	0.003***
	(14.0)	(32.8)	(1.1)	(9.7)	(2.9)	(15.1)	(33.3)	(1.5)	(9.9)	(3.4)
EI_{it-1}-(OP_{it-1}+TB_{it-1})						0.072***	-0.077***	-0.007***	0.013*	-0.001
						(5.8)	(-5.7)	(-3.0)	(1.8)	(-1.5)
EI_{it-2}-(OP_{it-2}+TB_{it-2})						0.035***	-0.022*	-0.004*	-0.010	0.001
						(3.6)	(-1.8)	(-1.9)	(-1.1)	(1.6)
DI_{it}	0.250***	0.080***	0.017***	0.650***	0.003***	0.254***	0.083***	0.017***	0.643***	0.003***
	(28.5)	(11.7)	(7.8)	(67.0)	(3.1)	(28.7)	(11.7)	(8.1)	(66.4)	(3.4)
DI_{it-1}						-0.026***	-0.020***	-0.007***	0.056***	-0.002***
						(-4.3)	(-4.3)	(-4.5)	(9.2)	(-3.6)
DI_{it-2}						-0.015***	-0.003	-0.006***	0.027***	-0.003***
						(-2.6)	(-0.6)	(-4.0)	(4.8)	(-4.3)
Controls	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year FE	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Obs	16,714	16,714	16,714	16,714	16,714	16,714	16,714	16,714	16,714	16,714
R^2	0.25	0.41	0.08	0.67	0.03	0.26	0.42	0.09	0.68	0.04

Table 5. Financial Constraint and Allocation of Equity Issuance Proceeds

This table depicts the rates of allocation of option and non-option proceeds to different uses of funds, computed by regressing each use of funds on the sources of funds for the period 1996-2015. Uses include investment (*Inv*), cash savings (Δ*Cash*), equity repurchase (*ER*), debt repurchase (*DR*), dividends (*Div*), and *Oth*, which is the plug that balances the cash flow identity in the event of reporting errors and/ or rounding adjustments. Sources include operating cash flow net of changes in working capital (*CF*), option proceeds (*OP*), non-option proceeds (*EI-OP*), and debt proceeds (*DI*). Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. *EI-OP* is equity issuance proceeds less option proceeds. Variables are demeaned by firm and scaled by book assets. Control variables include the ratio of market assets to book assets (*MB*), annual sales growth rate (*Sales growth)*, log of book assets (*Ln(Assets)*), ratio of total debt to book assets (*Leverage*), and ratio of fixed assets to book assets (*Tangibility)*. Each year, a firm is classified as being financially less constrained if its *Ln(Assets)* is above the 70th percentile, its HP or WW index is below the 30th percentile, it pays dividends, or has a credit rating. A firm is classified as being financially more constrained if its *Ln(Assets)* is below the 30th percentile, its HP or WW index is above the 70th percentile, it pays no dividends, or has no credit rating. Regressions are estimated for the two groups of firms combined i.e. more constrained (*Con.*) and less constrained firms (*UCon.*), but with an interaction term for each explanatory variable with the respective financial constraint measure. *Diff.* collectively refers to the interaction terms with either *OP* or *EI-OP*. For brevity, only the coefficients on *OP,* and *EI–OP* are reported. The coefficients of *Oth* are also omitted as they are not significantly different from zero. Regressions are run by ordinary least squares with year fixed effects. T-statistics are in parentheses and computed using standard errors robust to both heteroskedasticity, and clustering at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Financial Constraint		(1) *Inv*			(2) *ΔCash*			(3) *ER*			(4) *DR*			(5) *Div*		
Measure:		*Con.*	*UCon.*	*Diff.*	*Con.*	*UCon.*	*Diff.*	*Con.*	*UCon.*	*Diff.*	*Con.*	*UCon.*	*Diff.*	*Con.*	*UCon.*	*Diff.*
Ln(Assets)	*OP*	0.331***	-0.055	0.386**	0.776***	0.658***	0.119	0.054**	0.538***	-0.484***	-0.185***	-0.149*	-0.036	0.024**	0.007	0.017
		(2.6)	(-0.4)	(2.1)	(5.7)	(4.9)	(0.6)	(2.1)	(7.9)	(-6.6)	(-2.9)	(-1.7)	(-0.3)	(2.1)	(0.3)	(0.7)
	EI-OP	0.244***	0.504***	-0.260***	0.665***	0.399***	0.266***	0.002**	-0.010	0.012	0.087***	0.108**	-0.021	0.002***	-0.000	0.002
		(14.6)	(8.6)	(-4.3)	(35.0)	(6.7)	(4.3)	(2.1)	(-0.7)	(0.8)	(12.3)	(2.4)	(-0.5)	(3.9)	(-0.1)	(0.6)
	Obs	12,134	12,114		12,134	12,114		12,134	12,114		12,134	12,114		12,134	12,114	
	R^2	0.28	0.41		0.60	0.14		0.04	0.15		0.50	0.68		0.02	0.07	
HP Index	*OP*	0.384***	-0.145	0.529***	0.859***	0.643***	0.216	0.027	0.609***	-0.582***	-0.295***	-0.130	-0.166	0.025***	0.023	0.003
		(3.0)	(-1.1)	(2.8)	(6.3)	(4.3)	(1.1)	(1.1)	(7.7)	(-7.1)	(-4.3)	(-1.2)	(-1.3)	(2.8)	(1.2)	(0.1)
	EI-OP	0.255***	0.396***	-0.141**	0.662***	0.414***	0.248***	0.004***	-0.026*	0.030*	0.077***	0.220***	-0.143***	0.002***	-0.004	0.005*
		(14.7)	(5.8)	(-2.0)	(33.4)	(6.1)	(3.5)	(3.3)	(-1.7)	(2.0)	(10.4)	(4.7)	(-3.0)	(4.4)	(-1.2)	(1.8)
	Obs	11,094	11,113		11,094	11,113		11,094	11,113		11,094	11,113		11,094	11,113	
	R^2	0.29	0.37		0.58	0.14		0.04	0.15		0.47	0.69		0.02	0.08	
WW Index	*OP*	0.390***	0.013	0.378**	0.781***	0.498***	0.283	0.015	0.635***	-0.620***	-0.206***	-0.181**	-0.025	0.020***	0.036	-0.016
		(2.9)	(0.1)	(2.0)	(5.4)	(4.1)	(1.5)	(0.7)	(9.3)	(-8.6)	(-3.2)	(-2.1)	(-0.2)	(2.6)	(1.4)	(-0.6)
	EI-OP	0.240***	0.530***	-0.290***	0.672***	0.345***	0.327***	0.002**	0.006	-0.004	0.085***	0.117***	-0.032	0.001***	0.002	-0.001
		(14.6)	(10.9)	(-5.6)	(36.1)	(7.3)	(6.4)	(2.1)	(0.6)	(-0.4)	(11.4)	(3.6)	(-1.0)	(3.3)	(0.6)	(-0.3)
	Obs	12,108	12,124		12,108	12,124		12,108	12,124		12,108	12,124		12,108	12,124	
	R^2	0.28	0.42		0.60	0.13		0.03	0.15		0.51	0.68		0.02	0.08	

Table 5. Financial Constraint and Allocation of Equity Issuance Proceeds (continue)

Financial Constraint		(1) *Inv*			(2) *ΔCash*			(3) *ER*			(4) *DR*			(5) *Div*		
Measure:		*Con.*	*UCon.*	*Diff.*	*Con.*	*UCon.*	*Diff.*	*Con.*	*UCon.*	*Diff.*	*Con.*	*UCon.*	*Diff.*	*Con.*	*UCon.*	*Diff.*
Continue:																
Dividend	*OP*	0.459***	-0.206*	0.665***	0.720***	0.641***	0.079	0.078***	0.580***	-0.502***	-0.267***	-0.120	-0.147	0.010**	0.105***	-0.094***
Payer		(5.2)	(-1.8)	(4.5)	(7.8)	(5.4)	(0.5)	(3.4)	(9.3)	(-7.5)	(-5.2)	(-1.3)	(-1.4)	(2.4)	(3.3)	(-2.9)
Dummy	*EI-OP*	0.262***	0.572***	-0.310***	0.634***	0.347***	0.288***	0.004***	-0.016*	0.020**	0.098***	0.101***	-0.004	0.001***	-0.004	0.005
		(17.5)	(10.4)	(-5.4)	(36.3)	(8.1)	(6.2)	(3.8)	(-1.7)	(2.1)	(14.3)	(3.5)	(-0.1)	(4.5)	(-0.8)	(1.1)
	Obs	26,424	13,997		26,424	13,997		26,424	13,997		26,424	13,997		26,424	13,997	
	R^2	0.31	0.41		0.50	0.15		0.06	0.13		0.59	0.70		0.02	0.11	
Credit	*OP*	0.420***	-0.231*	0.651***	0.739***	0.725***	0.014	0.077***	0.538***	-0.460***	-0.264***	-0.030	-0.234**	0.027***	-0.004	0.031
Rating		(4.9)	(-1.8)	(4.2)	(8.1)	(5.2)	(0.1)	(3.4)	(8.7)	(-7.0)	(-5.3)	(-0.3)	(-2.0)	(3.5)	(-0.2)	(1.4)
Dummy	*EI-OP*	0.263***	0.479***	-0.216***	0.639***	0.374***	0.265***	0.004***	-0.014*	0.019**	0.091***	0.164***	-0.073**	0.002***	-0.003	0.006***
		(17.4)	(11.5)	(-4.9)	(36.4)	(9.9)	(6.3)	(4.0)	(-1.8)	(2.4)	(13.9)	(4.7)	(-2.1)	(5.9)	(-1.6)	(2.7)
	Obs	26,084	14,337		26,084	14,337		26,084	14,337		26,084	14,337		26,084	14,337	
	R^2	0.32	0.39		0.50	0.16		0.06	0.14		0.58	0.70		0.03	0.07	

Table 6. Corporate Governance and Allocation of Equity Issuance Proceeds

This table depicts the rates of allocation of option and non-option proceeds to different uses of funds, computed by regressing each use of funds on the sources of funds for the period 1996-2015. Uses include investment (*Inv*), cash savings (Δ*Cash*), equity repurchase (*ER*), debt repurchase (*DR*), dividends (*Div*), and *Oth*, which is the plug that balances the cash flow identity in the event of reporting errors and/ or rounding adjustments. Sources include operating cash flow net of changes in working capital (*CF*), option proceeds (*OP*), non-option proceeds (*EI-OP*), and debt proceeds (*DI*). Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. *EI-OP* is equity issuance proceeds less option proceeds. Variables are demeaned by firm and scaled by book assets. Control variables include the ratio of market assets to book assets (*MB*), annual sales growth rate (*Sales growth)*, log of book assets (*Ln(Assets)*), ratio of total debt to book assets (*Leverage*), and ratio of fixed assets to book assets (*Tangibility)*. Each year, a firm is said to have low corporate governance if its dedicated institutional ownership, institutional ownership, proportion of independent directors, or log number of directors is below the 30th percentile, its *GINDEX* is above the 70th percentile, its *EINDEX* is greater than or equal to 4 or when its chief executive officer (CEO) is the chairperson of its board (*CEO duality*). A firm is said to have high corporate governance if its dedicated institutional ownership, institutional ownership, proportion of independent directors, or log number of directors is above the 70th percentile, its *GINDEX* is below the 30th percentile, its *EINDEX* is less than or equal to 2 or when its CEO is not the chairperson of its board. Regressions are estimated for the two groups of firms combined i.e. firms with low corporate governance (*Low*) and firms with high corporate governance (*High*), but with an interaction term for each explanatory variable with the respective corporate governance measure. *Diff.* collectively refers to the interaction terms with either *OP* or *EI-OP*. For brevity, only the coefficients on *OP,* and *EI–OP* are reported. Coefficients of *Oth* are also omitted as they are not significantly different from zero. Regressions are run by ordinary least squares with year fixed effects. T-statistics are in parentheses and computed using standard errors robust to both heteroskedasticity, and clustering at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Corporate Governance		(1) *Inv*			(2) *ΔCash*			(3) *ER*			(4) *DR*			(5) *Div*		
Measure:		*Low*	*High*	*Diff.*	*Low*	*High*	*Diff.*	*Low*	*High*	*Diff.*	*Low*	*High*	*Diff.*	*Low*	*High*	*Diff.*
Dedicated	*OP*	0.365**	0.146	0.219	0.816***	0.788***	0.029	0.131***	0.174***	-0.043	-0.320***	-0.130*	-0.189	0.008	0.022	-0.015
Institutional		(2.1)	(1.3)	(1.1)	(4.3)	(6.5)	(0.1)	(3.3)	(3.7)	(-0.7)	(-3.1)	(-1.8)	(-1.5)	(0.5)	(1.6)	(-0.7)
Ownership	*EI-OP*	0.244***	0.313***	-0.068	0.636***	0.576***	0.060	0.003**	0.004	-0.002	0.115***	0.107***	0.007	0.003***	0.000	0.003***
		(11.3)	(7.6)	(-1.5)	(24.3)	(12.7)	(1.2)	(2.0)	(1.4)	(-0.5)	(10.4)	(8.7)	(0.4)	(4.3)	(0.1)	(2.7)
	Obs	12,127	12,126		12,127	12,126		12,127	12,126		12,127	12,126		12,127	12,126	
	R^2	0.31	0.34		0.53	0.35		0.06	0.09		0.55	0.67		0.03	0.04	
Institutional	*OP*	0.439**	0.182	0.258	0.711***	0.735***	-0.023	0.149***	0.203***	-0.054	-0.295***	-0.142**	-0.153	-0.004	0.021*	-0.026
Ownership		(2.5)	(1.5)	(1.2)	(3.6)	(6.2)	(-0.1)	(3.9)	(4.4)	(-0.9)	(-2.6)	(-2.1)	(-1.2)	(-0.4)	(1.7)	(-1.4)
	EI-OP	0.222***	0.390***	-0.168***	0.660***	0.527***	0.133**	0.003*	0.003	-0.000	0.113***	0.079***	0.034*	0.003***	0.001	0.001
		(11.0)	(8.2)	(-3.3)	(25.5)	(10.5)	(2.3)	(1.9)	(0.5)	(-0.0)	(10.2)	(5.7)	(1.9)	(4.6)	(1.5)	(1.1)
	Obs	12,127	12,126		12,127	12,126		12,127	12,126		12,127	12,126		12,127	12,126	
	R^2	0.30	0.37		0.56	0.27		0.05	0.11		0.54	0.68		0.03	0.05	
Proportion of	*OP*	0.206	0.352*	-0.146	0.715***	0.415**	0.300	0.152**	0.359***	-0.208*	-0.112	-0.108	-0.004	0.038*	-0.020	0.058
Independent		(1.2)	(1.9)	(-0.6)	(4.1)	(2.3)	(1.2)	(2.1)	(4.0)	(-1.8)	(-1.0)	(-1.0)	(-0.0)	(1.7)	(-0.7)	(1.6)
Directors	*EI-OP*	0.320***	0.436***	-0.116	0.605***	0.555***	0.050	0.001	-0.027	0.028	0.074	0.037	0.037	0.000	-0.001	0.001
		(5.4)	(4.8)	(-1.1)	(5.0)	(6.0)	(0.3)	(0.1)	(-1.6)	(1.4)	(1.0)	(0.7)	(0.4)	(0.1)	(-0.2)	(0.2)
	Obs	4,618	4,618		4,618	4,618		4,618	4,618		4,618	4,618		4,618	4,618	
	R^2	0.40	0.33		0.29	0.18		0.11	0.17		0.68	0.67		0.10	0.08	

Table 6. Corporate Governance and Allocation of Equity Issuance Proceeds (continue)

Corporate Governance		(1) *Inv*			(2) *ΔCash*			(3) *ER*			(4) *DR*			(5) *Div*		
Measure:		*Low*	*High*	*Diff.*	*Low*	*High*	*Diff.*	*Low*	*High*	*Diff.*	*Low*	*High*	*Diff.*	*Low*	*High*	*Diff.*
Continue:																
Log Number of Directors	*OP*	0.249*	0.041	0.208	0.674***	0.505***	0.169	0.095	0.621***	-0.526***	-0.050	-0.138	0.088	0.032	-0.030	0.062*
		(1.7)	(0.2)	(0.9)	(4.7)	(3.0)	(0.8)	(1.6)	(5.0)	(-3.8)	(-0.6)	(-1.1)	(0.5)	(1.6)	(-1.0)	(1.7)
	EI-OP	0.296***	0.654***	-0.358***	0.615***	0.287***	0.328***	0.000	0.024	-0.024	0.087	0.059	0.028	0.002	-0.023***	0.025***
		(6.2)	(6.6)	(-3.3)	(6.4)	(3.7)	(2.7)	(0.0)	(0.6)	(-0.6)	(1.4)	(0.9)	(0.3)	(0.8)	(-2.9)	(3.0)
	Obs	4,618	4,618		4,618	4,618		4,618	4,618		4,618	4,618		4,618	4,618	
	R^2	0.36	0.43		0.29	0.12		0.10	0.19		0.61	0.68		0.06	0.13	
GINDEX	*OP*	0.018	0.275*	-0.257	0.856***	0.825***	0.031	0.279***	0.222***	0.057	-0.195	-0.316**	0.121	0.044**	-0.005	0.048**
		(0.1)	(1.7)	(-1.1)	(4.7)	(4.8)	(0.1)	(3.5)	(4.2)	(0.6)	(-1.3)	(-2.4)	(0.6)	(2.4)	(-0.4)	(2.2)
	EI-OP	0.472***	0.331***	0.141*	0.369***	0.545***	-0.176**	0.004	0.000	0.004	0.163***	0.121***	0.041	-0.007***	0.003***	-0.010***
		(7.2)	(7.0)	(1.7)	(6.0)	(9.5)	(-2.1)	(0.2)	(0.0)	(0.2)	(4.1)	(5.4)	(0.9)	(-3.5)	(3.3)	(-4.4)
	Obs	5,892	5,892		5,892	5,892		5,892	5,892		5,892	5,892		5,892	5,892	
	R^2	0.42	0.39		0.19	0.37		0.15	0.10		0.67	0.67		0.07	0.05	
EINDEX	*OP*	-0.118	0.323***	-0.441	1.157***	0.695***	0.462	0.350***	0.200***	0.150	-0.376**	-0.228***	-0.148	-0.014	0.010	-0.024
		(-0.4)	(2.9)	(-1.4)	(3.9)	(5.9)	(1.4)	(3.4)	(5.0)	(1.4)	(-2.3)	(-2.6)	(-0.8)	(-0.7)	(1.0)	(-1.0)
	EI-OP	0.566***	0.343***	0.223**	0.257***	0.521***	-0.264***	-0.015	-0.001	-0.014	0.187***	0.135***	0.052	0.005	0.002**	0.003
		(7.1)	(9.6)	(2.6)	(4.8)	(12.3)	(-3.9)	(-1.2)	(-0.1)	(-1.1)	(3.2)	(7.3)	(0.9)	(1.4)	(2.2)	(0.9)
	Obs	2,857	11,858		2,857	11,858		2,857	11,858		2,857	11,858		2,857	11,858	
	R^2	0.44	0.39		0.19	0.31		0.16	0.11		0.69	0.65		0.09	0.06	
CEO Duality	*OP*	0.241**	0.070	0.171	0.641***	0.738***	-0.097	0.217***	0.243***	-0.026	-0.124	-0.061	-0.064	0.025	0.008	0.017
		(2.1)	(0.5)	(0.9)	(5.2)	(5.3)	(-0.5)	(4.3)	(3.2)	(-0.3)	(-1.6)	(-0.6)	(-0.5)	(1.6)	(0.3)	(0.6)
	EI-OP	0.385***	0.371***	0.014	0.530***	0.540***	-0.010	-0.006	-0.008	0.003	0.096*	0.093***	0.003	-0.006***	0.004**	-0.010***
		(7.3)	(7.3)	(0.2)	(5.2)	(9.8)	(-0.1)	(-0.5)	(-0.8)	(0.2)	(1.7)	(3.5)	(0.1)	(-2.8)	(2.0)	(-3.4)
	Obs	10,413	4,981		10,413	4,981		10,413	4,981		10,413	4,981		10,413	4,981	
	R^2	0.39	0.34		0.22	0.23		0.13	0.12		0.66	0.69		0.07	0.06	

Table 7. Equity Issuance Proceeds and Cash Holdings

This table depicts the results of ordinary least squares regressions estimating the determinants of cash holdings for nonfinancial U.S. firms in Compustat during the period 1996 to 2015. The dependent variable is the ratio of cash and short-term investments to book value of assets (*Cash/Assets*). Explanatory variables include equity and debt issuance proceeds (*EI* and *DI*, respectively), options proceeds (*OP*), non-option proceeds (*EI-OP*), cash flow risk (*Industry sigma*), market to book ratio, the natural log of book value of total assets in 2009 dollars (*Real size*), the ratio of cash flow to assets, the ratio of capital expenditure to book value of total assets (*Capex*), the ratio of total debt to book value of total assets (*Leverage*), the ratio of research and development expense to sales (R&D/sales), an indicator variable that equal one if the firm paid a common dividend in that year, and zero otherwise (*Dividend dummy*), the ratio of expenditures on acquisitions to book value of total assets (*Acquisition activity*), and a dummy variable for the 2000s along with their corresponding interaction terms. *Industry sigma* is defined as the mean of standard deviations of the cash ratio over 10 years for firms in the same industry, as defined by the two-digit Standard Industry Classification (SIC) code. Cash flow is defined either as EBITDA less the sum of interest expense, taxes, and common dividends (*Cash flow/assets*) or as the operating cash flow based on Compustat Statement of Cash Flow (*Cash flow$_{SCF}$/assets*). Total debt is the sum of long-term debt and current liabilities. T-statistics are in parentheses and computed using standard errors robust to both heteroskedasticity, and clustering at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1) *Cash/Assets*		(2) *Cash/Assets*		(3) *Cash/Assets*		(4) *Cash/Assets*		(5) *Cash/Assets*		(6) *Cash/Assets*	
Dependent Variable:	Estimate	Interaction 2000s	Estimate	Interaction 2000s	Estimate	Interaction 2000s	Estimate	Interaction 2000s	Estimate	Interaction 2000s	Estimate	Interaction 2000s
EI			0.168***	-0.030					0.188***	-0.037		
			(4.1)	(-0.6)					(4.9)	(-0.9)		
OP					3.195***	-0.501*					3.138***	-0.460
					(11.7)	(-1.7)					(11.4)	(-1.5)
EI-OP					0.120***	-0.011					0.141***	-0.024
					(3.0)	(-0.3)					(3.6)	(-0.6)
DI			-0.034***	-0.041***	-0.035***	-0.038***			-0.032***	-0.043***	-0.033***	-0.040***
			(-4.4)	(-4.4)	(-4.9)	(-4.4)			(-4.2)	(-4.6)	(-4.7)	(-4.5)
Intercept	0.194***	0.038***	0.191***	0.039***	0.199***	0.031**	0.197***	0.035***	0.193***	0.037***	0.201***	0.029**
	(16.3)	(2.8)	(16.2)	(2.9)	(18.4)	(2.5)	(16.4)	(2.6)	(16.3)	(2.8)	(18.4)	(2.4)
Industry sigma	0.372***	-0.262***	0.366***	-0.256***	0.298***	-0.189***	0.368***	-0.259***	0.360***	-0.251***	0.294***	-0.186***
	(9.7)	(-6.8)	(9.6)	(-6.6)	(8.4)	(-5.3)	(9.5)	(-6.6)	(9.3)	(-6.5)	(8.2)	(-5.1)
Market to book	0.014***	0.008***	0.012***	0.007***	0.006***	0.006**	0.013***	0.008***	0.011***	0.007***	0.006***	0.006**
	(7.0)	(3.1)	(6.3)	(3.0)	(3.7)	(2.6)	(6.9)	(3.0)	(6.1)	(3.0)	(3.5)	(2.6)
Real size	-0.006***	0.001	-0.006***	0.002	-0.008***	0.002	-0.007***	0.002	-0.007***	0.002*	-0.009***	0.002*
	(-5.6)	(0.9)	(-5.6)	(1.2)	(-7.4)	(1.3)	(-6.3)	(1.6)	(-6.4)	(1.8)	(-8.1)	(1.9)
Cash flow/assets	0.037*	-0.004	0.064**	-0.021	0.042*	-0.019						
	(1.7)	(-0.2)	(2.4)	(-0.7)	(1.8)	(-0.7)						
Cash flow $_{SCF}$/assets							0.085***	-0.043	0.124***	-0.059**	0.095***	-0.059**
							(3.4)	(-1.6)	(5.0)	(-2.1)	(4.1)	(-2.2)

Table 7. Equity Issuance Proceeds and Cash Holdings (continue)

	(1) *Cash/Assets*		(2) *Cash/Assets*		(3) *Cash/Assets*		(4) *Cash/Assets*		(5) *Cash/Assets*		(6) *Cash/Assets*	
Dependent Variable:	Estimate	Interaction 2000s	Estimate	Interaction 2000s	Estimate	Interaction 2000s	Estimate	Interaction 2000s	Estimate	Interaction 2000s	Estimate	Interaction 2000s
Continue:												
NWC/assets	-0.100***	0.039	-0.099***	0.036	-0.106***	0.041	-0.106***	0.047	-0.106***	0.043	-0.112***	0.047*
	(-4.5)	(1.3)	(-4.6)	(1.3)	(-5.8)	(1.6)	(-4.6)	(1.6)	(-4.9)	(1.5)	(-6.0)	(1.9)
Capex	-0.269***	-0.204***	-0.269***	-0.185***	-0.270***	-0.167***	-0.292***	-0.190***	-0.304***	-0.169***	-0.299***	-0.150***
	(-8.8)	(-5.8)	(-8.7)	(-5.1)	(-9.5)	(-5.0)	(-9.0)	(-5.1)	(-9.5)	(-4.6)	(-10.1)	(-4.3)
Leverage	-0.265***	-0.029**	-0.244***	-0.026*	-0.224***	-0.023*	-0.259***	-0.035***	-0.237***	-0.032**	-0.218***	-0.029**
	(-22.6)	(-2.1)	(-19.7)	(-1.8)	(-18.9)	(-1.7)	(-22.4)	(-2.6)	(-19.7)	(-2.3)	(-18.7)	(-2.1)
R&D/sales	0.172***	-0.091***	0.164***	-0.089***	0.157***	-0.083***	0.179***	-0.098***	0.171***	-0.095***	0.164***	-0.089***
	(6.7)	(-3.5)	(6.5)	(-3.5)	(6.5)	(-3.4)	(6.9)	(-3.7)	(6.6)	(-3.6)	(6.6)	(-3.5)
Dividend dummy	-0.058***	0.001	-0.055***	0.000	-0.050***	-0.001	-0.059***	0.001	-0.057***	0.001	-0.051***	-0.000
	(-16.4)	(0.2)	(-15.6)	(0.1)	(-14.5)	(-0.3)	(-17.0)	(0.3)	(-16.3)	(0.2)	(-15.0)	(-0.1)
Acquisition activity	-0.172***	-0.126***	-0.166***	-0.093***	-0.154***	-0.121***	-0.176***	-0.121***	-0.175***	-0.085***	-0.163***	-0.113***
	(-9.4)	(-5.6)	(-8.5)	(-3.9)	(-8.1)	(-5.2)	(-9.7)	(-5.4)	(-9.1)	(-3.6)	(-8.7)	(-4.9)
Obs	36,483		36,483		36,483		36,483		36,483		36,483	
Adjusted R^2	0.396		0.405		0.423		0.396		0.406		0.424	

Table 8. The Accuracy of *ISSUE%* Rule by McKeon (2015)

This table compares the amounts of equity issuance proceeds with those imputed based on the *ISSUE%* rule of McKeon (2015) for nonfinancial U.S. firms in Compustat during the years 1996 to 2015. Column (1) shows that equity issuance proceeds is the sum of option and non-option proceeds, depicted in column (2) and (3) respectively. Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. Non-option proceeds (*EI-OP*) refer to equity issuance proceeds (*EI*) less option proceeds (*OP*). Column (4) and (5) list the proceeds from employee- and firm-initiated equity issues (*EMI* and *FI*, respectively). Employee-(firm-) initiated issues are equity issues with size lower (higher) than 2% (3%) of market equity, the so-called *ISSUE%* rule. Column (6) refers to issues with *ISSUE%* between 2% and 3%, and are disregarded by McKeon (2015). In addition, he did not consider tax benefits associated with employee stock options (*TB*), which started to be separately reported in Compustat since 2005. Amounts are in billions of 2009 constant U.S. dollars.

Panel A: Comparison of Actual Data with those imputed by *ISSUE%* Rule

	Based on Actual Data			Based on *ISSUE%* Rule		Omitted by McKeon (2015)		Misclassification	
	(1)=(2)+(3)	(2)	(3)	(4)	(5)	(6)	(7)	(8)=(2)-(4)	(9)=(3)-(5)
Year	*EI*	*OP*	*EI-OP*	*EMI*	*FI*	*2%≥*ISSUE%*≤3%*	*TB*	*OP-EMI*	*(EI-OP)-FI*
1996	$44.7	$17.1	$27.6	$20.4	$22.3	$2.1	-	-$3.3	$5.4
1997	$45.6	$22.8	$22.8	$27.8	$15.6	$2.2	-	-$5.0	$7.2
1998	$54.6	$25.4	$29.1	$34.8	$16.9	$2.9	-	-$9.4	$12.2
1999	$74.1	$27.4	$46.8	$36.4	$33.5	$4.2	-	-$9.0	$13.3
2000	$71.0	$31.3	$39.7	$33.1	$33.3	$4.6	-	-$1.8	$6.4
2001	$89.0	$27.6	$61.5	$31.7	$53.9	$3.5	-	-$4.1	$7.6
2002	$50.8	$24.6	$26.2	$27.2	$20.5	$3.0	-	-$2.7	$5.7
2003	$57.5	$33.9	$23.6	$36.9	$17.1	$3.5	-	-$3.0	$6.5
2004	$87.0	$50.3	$36.8	$51.4	$30.2	$5.4	-	-$1.1	$6.6
2005	$83.7	$54.7	$29.0	$54.8	$23.0	$5.2	$0.7	-$0.1	$5.9
2006	$112.0	$60.6	$51.5	$54.5	$31.7	$11.1	$14.7	$6.1	$19.7
2007	$128.5	$72.3	$56.2	$58.4	$43.4	$11.8	$14.9	$13.9	$12.8
2008	$95.1	$40.0	$55.1	$34.3	$45.0	$7.2	$8.6	$5.7	$10.0
2009	$69.9	$25.3	$44.6	$29.4	$34.6	$2.1	$3.7	-$4.1	$9.9
2010	$79.8	$49.5	$30.3	$40.3	$19.9	$12.5	$7.1	$9.2	$10.4
2011	$77.0	$47.4	$29.6	$42.8	$18.5	$7.5	$8.2	$4.6	$11.1
2012	$81.5	$49.1	$32.5	$52.9	$11.5	$7.1	$10.0	-$3.8	$20.9
2013	$88.2	$53.7	$34.6	$52.1	$17.5	$8.9	$9.8	$1.6	$17.1
2014	$81.5	$40.6	$40.9	$48.1	$21.9	$1.2	$10.3	-$7.6	$19.0
2015	$81.4	$27.9	$53.5	$33.7	$38.2	$0.5	$9.0	-$5.7	$15.2
Omitted by McKeon (2015) due to missing market equity:									
	$0.086	$0.005	$0.081						
Total	$1,553.0	$781.3	$771.7	$800.9	$548.6	$106.5	$96.9	-$19.6	$223.0

Table 8. The Accuracy of *ISSUE%* Rule by McKeon (2015) (continue)

Panel B: Option and Non-Option Proceeds versus Employee- and Firm-Initiated Proceeds ($)

	Based on Actual Data		Based on *ISSUE%* Rule		Non-Dual Issues				Dual Issues		Total Issues	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)=(7)+(9)	(12)=(8)+(10)
Year	*OP*	*EI-OP*	*EMI*	*FI*	*OP reported as EMI*	*EI-OP reported as FI*	*OP reported as FI*	*EI-OP reported as EMI*	*OP reported as FI*	*EI-OP reported as EMI*	*OP reported as FI*	*EI-OP reported as EMI*
1996	$16.1	$26.6	$20.4	$22.3	$4.4	$0.4	$0.1	$0.0	$1.4	$5.9	$1.5	$5.9
1997	$21.5	$21.9	$27.8	$15.6	$7.8	$0.8	$0.0	$0.1	$1.1	$7.3	$1.1	$7.4
1998	$24.3	$27.4	$34.8	$16.9	$8.9	$1.7	$0.2	$0.1	$1.0	$11.7	$1.2	$11.7
1999	$24.9	$45.0	$36.4	$33.5	$5.2	$0.6	$0.0	$0.1	$2.3	$13.8	$2.4	$13.9
2000	$28.1	$38.3	$33.1	$33.3	$6.4	$0.5	$0.6	$0.1	$2.6	$8.2	$3.3	$8.3
2001	$25.9	$59.7	$31.7	$53.9	$6.2	$0.7	$0.4	$0.0	$2.7	$8.8	$3.0	$8.9
2002	$23.0	$24.7	$27.2	$20.5	$9.4	$1.1	$0.2	$0.0	$1.5	$5.9	$1.7	$5.9
2003	$31.6	$22.4	$36.9	$17.1	$10.5	$1.5	$0.3	$0.1	$1.7	$7.3	$2.0	$7.3
2004	$45.9	$35.7	$51.4	$30.2	$15.6	$0.6	$0.9	$0.0	$4.6	$11.1	$5.6	$11.1
2005	$50.2	$27.6	$54.8	$23.0	$17.8	$1.0	$0.3	$0.0	$3.5	$8.4	$3.8	$8.4
2006	$52.5	$33.7	$54.5	$31.7	$18.1	$3.3	$1.6	$0.0	$4.2	$7.7	$5.8	$7.7
2007	$62.3	$39.5	$58.4	$43.4	$19.4	$2.0	$0.6	$0.0	$10.6	$7.2	$11.1	$7.2
2008	$34.1	$45.2	$34.3	$45.0	$10.3	$3.7	$0.3	$0.0	$5.0	$5.4	$5.3	$5.5
2009	$24.5	$39.6	$29.4	$34.6	$11.9	$5.5	$0.0	$0.1	$0.8	$5.7	$0.8	$5.7
2010	$37.8	$22.4	$40.3	$19.9	$15.2	$3.1	$0.2	$0.0	$3.0	$5.7	$3.2	$5.7
2011	$41.0	$20.4	$42.8	$18.5	$11.6	$2.5	$0.0	$0.5	$3.9	$5.3	$4.0	$5.8
2012	$43.5	$20.8	$52.9	$11.5	$15.9	$3.0	$0.3	$0.5	$0.9	$9.9	$1.2	$10.5
2013	$46.2	$23.3	$52.1	$17.5	$14.6	$4.0	$0.6	$0.2	$0.9	$7.2	$1.5	$7.4
2014	$39.7	$30.4	$48.1	$21.9	$10.8	$5.9	$0.0	$0.0	$1.1	$9.5	$1.1	$9.5
2015	$27.6	$44.3	$33.7	$38.2	$9.7	$6.0	$0.2	$0.0	$0.9	$7.2	$1.1	$7.2
Total	$700.6	$648.9	$800.9	$548.6	$229.9	$47.7	$7.1	$2.0	$53.7	$159.1	$60.8	$161.1

Table 8. The Accuracy of *ISSUE%* Rule by McKeon (2015) (continue)

Panel C: Option and Non-Option Proceeds versus Employee- and Firm-Initiated Proceeds (Number of Issues)

	Based on Actual Data					Based on *ISSUE%* Rule			Non-Dual Issuers (#)				Dual Issuers (#)		All Issuers (#)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)=(11)+(13)	(16)=(12)+(14)
Year	Total Firms (#)	Non-Issuers (#)	Dual Issuers (#)	*Receive only OP*	*Receive only EI-OP*	*EMI (#)*	*FI (#)*	*2%≥ ISSUE% ≤3%*	*OP reported as EMI*	*EI-OP reported as FI*	*OP reported as FI*	*EI-OP reported as EMI*	*OP reported as FI*	*EI-OP reported as EMI*	*OP reported as FI*	*EI-OP reported as EMI*
1996	1,428	312	742	321	53	893	163	60	307	19	3	31	141	555	144	586
1997	1,582	318	839	376	49	1,055	153	56	364	19	1	28	133	663	134	691
1998	1,791	461	873	349	108	1,083	179	68	339	46	3	59	130	685	133	744
1999	1,811	547	812	305	147	1,001	208	55	298	73	2	67	133	636	135	703
2000	1,739	561	704	324	150	902	221	55	305	68	12	73	141	524	153	597
2001	1,762	545	772	323	122	963	197	57	303	54	12	62	131	598	143	660
2002	1,831	503	806	371	151	1,037	223	68	351	82	10	66	131	620	141	686
2003	1,721	397	808	402	114	1,086	189	49	389	70	7	41	112	656	119	697
2004	1,709	251	919	460	79	1,124	241	93	408	50	38	29	153	687	191	716
2005	2,607	281	1,529	707	90	1,787	390	149	658	58	37	30	295	1,099	332	1,129
2006	2,710	280	1,975	360	95	1,850	433	147	746	61	52	31	320	1,073	372	1,104
2007	2,621	321	1,874	329	97	1,778	392	130	724	60	46	36	286	1,018	332	1,054
2008	2,538	516	1,554	303	165	1,592	331	99	639	77	42	83	212	870	254	953
2009	2,436	628	1,303	278	227	1,459	318	31	615	114	12	112	192	732	204	844
2010	2,272	511	1,322	311	128	1,460	249	52	653	74	18	52	157	755	175	807
2011	2,170	444	1,305	304	117	1,399	267	60	641	76	21	37	170	721	191	758
2012	2,054	492	1,178	264	120	1,324	193	45	606	61	18	55	114	663	132	718
2013	1,946	408	1,195	247	96	1,271	216	51	560	59	18	33	139	678	157	711
2014	1,866	380	1,141	238	107	1,227	226	33	535	74	19	31	133	661	152	692
2015	1,786	433	1,017	212	124	1,126	193	34	471	73	19	49	101	606	120	655
Omitted by McKeon (2015) due to missing market equity:																
	41	30	2	2	7											
Total	40,421	8,619	22,670	6,786	2,346	25,417	4,982	1,392	9,912	1,268	390	1,005	3,324	14,500	3,714	15,505

Table 9. Allocation of Funds with *ISSUE%* Rule

This table reports the results of regressing each use of funds on the sources of funds for nonfinancial U.S. firms in Compustat during the period 1996 to 2015. Uses include investment (*Inv*), cash savings ($\Delta Cash$), equity repurchase (*ER*), debt repurchase (*DR*), dividends (*Div*), and *Oth*, which is the plug that balances the cash flow identity in the event of reporting errors and/ or rounding adjustments. Sources include operating cash flow net of changes in working capital (*CF*), option proceeds (*OP*), non-option proceeds (*EI-OP*), proceeds from employee- and firm-initiated equity issues (*EMI* and *FI*, respectively), and debt proceeds (*DI*). Employee stock option data are collected from the IRRC dilution database, Compustat, Capital IQ, and SEC 10-K filings. *EI-OP* is equity issuance proceeds less option proceeds. Employee-(firm-) initiated issues are equity issues with size lower (higher) than 2% (3%) of market equity, the so-called *ISSUE%* rule. Variables are demeaned by firm and scaled by book assets. Control variables include the ratio of market assets to book assets (*MB*), annual sales growth rate (*Sales growth)*, log of book assets (*Ln(Assets)*), ratio of total debt to book assets (*Leverage*), and ratio of fixed assets to book assets (*Tangibility)*. Regressions are run by ordinary least squares with year fixed effects. *T*-statistics are in parentheses and computed using standard errors robust to both heteroskedasticity and clustering at firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Dependent Variable:	(1) Inv_{it}	(2) $\Delta Cash_{it}$	(3) ER_{it}	(4) DR_{it}	(5) Div_{it}	(6) Oth_{it}	(7) Inv_{it}	(8) $\Delta Cash_{it}$	(9) ER_{it}	(10) DR_{it}	(11) Div_{it}	(12) Oth_{it}
CF_{it}	0.334***	0.331***	0.026***	0.162***	0.006***	0.142***	0.361***	0.435***	0.025***	0.173***	0.006***	0.000***
	(24.7)	(18.6)	(13.6)	(16.7)	(8.6)	(5.3)	(33.0)	(33.0)	(13.0)	(18.1)	(8.8)	(2.9)
EMI_{it}	0.591***	1.024***	0.079***	-0.219***	0.016*	-0.491***						
	(6.5)	(9.2)	(2.7)	(-3.4)	(1.6)	(-5.5)						
FI_{it}	0.413***	0.710***	0.010***	0.120***	0.004***	-0.257***						
	(27.5)	(32.5)	(5.2)	(13.7)	(5.9)	(-14.9)						
OP_{it}							0.275***	0.806***	0.129***	-0.231***	0.021***	0.000
							(3.2)	(8.7)	(5.4)	(-4.6)	(2.7)	(1.4)
EI_{it}-OP_{it}							0.273***	0.628***	0.005***	0.093***	0.002***	0.000*
							(17.3)	(34.4)	(3.7)	(13.8)	(4.9)	(1.9)
DI_{it}	0.290***	0.089***	0.009***	0.590***	0.001***	0.020***	0.294***	0.103***	0.009***	0.592***	0.001***	0.000***
	(36.3)	(9.6)	(7.0)	(60.5)	(3.2)	(3.8)	(36.5)	(11.9)	(7.0)	(60.6)	(3.2)	(4.2)
MB_{it-1}	0.009***	0.002	0.001***	-0.004***	0.000***	-0.008***	0.007***	-0.004***	0.001***	-0.004***	0.000***	0.000
	(9.0)	(1.2)	(4.1)	(-6.4)	(6.0)	(-5.5)	(8.0)	(-4.0)	(3.2)	(-7.1)	(5.6)	(0.2)
Sales growth$_{it-1}$	0.012***	-0.002	-0.003***	-0.004***	-0.001***	-0.002	0.011***	-0.004**	-0.003***	-0.004***	-0.001***	-0.000**
	(6.5)	(-1.1)	(-8.9)	(-3.2)	(-5.2)	(-0.9)	(6.6)	(-2.1)	(-8.9)	(-3.3)	(-5.2)	(-2.3)
Ln(Assets)$_{it-1}$	-0.013***	-0.005***	0.007***	0.006***	0.001***	0.004***	-0.015***	0.000	0.008***	0.006***	0.001***	0.000
	(-8.3)	(-3.2)	(17.6)	(5.2)	(8.8)	(3.2)	(-9.4)	(0.2)	(17.9)	(5.1)	(8.9)	(1.0)
$Leverage_{it-1}$	-0.163***	-0.016*	-0.040***	0.230***	-0.010***	-0.001	-0.160***	-0.022***	-0.040***	0.231***	-0.010***	-0.000
	(-23.1)	(-2.0)	(-19.5)	(32.0)	(-12.7)	(-0.2)	(-22.8)	(-3.1)	(-19.4)	(32.4)	(-12.7)	(-1.2)
Tangibility$_{it-1}$	-0.015	0.088***	-0.009***	-0.044***	-0.002	-0.018*	-0.017	0.072***	-0.010***	-0.045***	-0.002	0.000**
	(-1.3)	(7.0)	(-3.1)	(-5.1)	(-1.5)	(-1.8)	(-1.4)	(6.9)	(-3.2)	(-5.2)	(-1.5)	(2.2)
Year FE	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Obs	30,399	30,399	30,399	30,399	30,399	30,399	30,399	30,399	30,399	30,399	30,399	30,399
R^2	0.34	0.29	0.07	0.62	0.04	0.18	0.34	0.48	0.07	0.62	0.04	0.00

Appendix A. Variables defined using the flow-of-funds data

Variables are defined using flow-of-funds data of Compustat. The variable definitions vary according to the format code (*scf*) a firm follows in reporting flow-of-funds data. Effective for fiscal years ending July 15, 1988, SFAS #95 requires U.S. companies to report the Statement of Cash Flows (*scf* = 7). Prior to adoption of SFAS #95, companies may have reported one of the following statements: Working Capital Statement (*scf* = 1), Cash Statement by Source and Use of Funds (*scf* = 2), and Cash Statement by Activity (*scf* = 3). Variables include investment (*Inv*), the change in cash holdings (Δ*Cash*), the change in working capital (Δ*WC*), cash dividends (*Div*), cash flows (*CF*), net debt issued (Δ*D*=*DI*-*DR*), and net equity issued (Δ*E*=*EI*-*ER*). PPE denotes property, plant, and equipment. We include in parentheses the Compustat XPF variable names in italics.

Variables	*scf* = 1	*scf* = 2	*scf* = 3	*scf* = 7
Inv	capital expenditure(*capx*) + increase in investment(*ivch*) + acquisition(*aqc*) + other uses of funds(*fuseo*) - sale of PPE(*sppe*) - sale of investment(*siv*)	same as *scf* = 1	same as *scf* = 1	capital expenditure (*capx*) + increase in investment(*ivch*) + acquisition(*aqc*) - sale of PPE(*sppe*) - sale of investment(*siv*) - change in short-term investment(*ivstch*) - other investing activities(*ivaco*)
Δ*Cash*	cash and cash equivalents increase/decrease (*chech*)	same as *scf* = 1	same as *scf* = 1	same as *scf* = 1
Div	cash dividends (*dv*)	same as *scf* = 1	same as *scf* =1	same as *scf* = 1
DI	long-term debt issuance(*dltis*) - changes in current debt(*dlcch*)	long-term debt issuance(*dltis*) + changes in current debt(*dlcch*)	same as *scf* = 2	same as *scf* = 2
DR	long-term debt reduction(*dltr*)	long-term debt reduction(*dltr*)	same as *scf* = 2	same as *scf* = 2
EI	sale of common and preferred stock (*sstk*)	same as *scf* = 1	same as *scf* = 1	same as *scf* = 1
ER	purchase of common and preferred stock(*prstkc*)	same as *scf* = 1	same as *scf* = 1	same as *scf* = 1
Δ*WC*	change in working capital(*wcapc*)	- change in working capital(*wcapc*)	same as *scf* = 2	-change in account receivable(*recch*) - change in inventory(*invch*) - change in account payable(*apalch*) - accrued income taxes(*txach*) - other changes in assets and liabilities (*aoloch*) - other financing activities(*fiao*)
CF	income before extra items(*ibc*) + extra items & discontinued operation(*xidoc*) + depreciation & amortization(*dpc*) + deferred taxes(*txdc*) + equity in net loss(*esubc*) + gains in sale of PPE & investment(*sppiv*) + other funds from operation(*fopo*) + other sources of funds(*fsrco*)	same as *scf* = 1	same as *scf* = 1	income before extra items(*ibc*) + extra items & discontinued operation(*xidoc*) + depreciation & amortization(*dpc*) + deferred taxes(*txdc*) + equity in net loss(*esubc*) + gains in sale of PPE & investment(*sppiv*) + other funds from operation(*fopo*) + exchange rate effect(*exre*)