Capital structure and corporate reaction to negative stock return shocks

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Abstract

This study investigates firms' capital structure decisions around significant drops in stock price. We present evidence that firms usually repurchase equity to boost stock prices following these shocks, rather than retiring debt to rebalance their capital structures, even though buybacks cause their capital structures to deviate farther from the previous levels. Our results also show that firms that are less exposed to costs related to financial distress (e.g., those with high cash holdings or almost zero leverage) and those whose managers' compensation depends heavily on stock returns are more likely to repurchase shares after stock price shocks than are other firms. These results indicate that managerial incentives and firms' historical financial policies play more important roles in determining how firms react to stock price shocks than do managers' desires to maintain optimal leverage.

I. Introduction

How do firms react to significant drops in their stock prices? When a firm's stock price plummets, its market leverage levels increase significantly. Previous studies of firms' financing behavior find that firms do not often intervene to adjust their capital structures, so capital structures are rebalanced slowly (Fama and French (2002), Welch (2004), and Leary and Roberts (2005)). The studies also indicate that firms' interventions are asymmetric in that they are more responsive to adverse events than to favorable ones. By focusing on an event in response to which firms are likely to take action, we shed light on how and why firms make their financing choices.

We expect firms to react to adverse stock return shocks ("shocks" hereafter) by retiring debt and/or repurchasing shares, reactions that have opposite impacts on capital structure, at least in the short run. If a firm's optimal capital structure is not affected by the price drop, its managers are likely to try to maintain optimal leverage ratios, as traditional trade-off theory suggests, by taking actions that lower the firm's leverage level. The literature that has focused on capital structure adjustments against shocks shows that managers choose leverage-lowering activities (e.g., debt retirement or equity issuance) and that, in the case of stock price drops, managers are more likely to decrease leverage by retiring debt than by issuing equity because equity issuance may further depress the stock price. Leary and Roberts (2005) present evidence that firms gradually adjust their leverage by retiring debt in the long run, possibly because of high adjustment costs.

However, managers are incented to boost stock prices by repurchasing shares when their compensation or even their jobs depend heavily on stock performance. The literature on the

market timing of capital structure and share repurchases argues that a firm should repurchase shares when its stock price is below its normal range (Baker and Wurgler (2002) and Dittmar (2000)), so managers face two conflicting choices: lower leverage to pursue optimal leverage levels or buy back shares to support prices, which will increase leverage and make the firm's capital structure deviate even farther from its optimal level. As Peyer and Vermaelen (2009) show, firms that announce share repurchases following drops in their stock prices tend to experience abnormally high returns in the long run. If a firm's stock price increases significantly following a buyback, its leverage level may return to optimal in the long run. Therefore, the two seemingly conflicting choices may lead to the same result in the end. We also investigate whether firms take additional actions to decrease their leverage levels after share repurchase decisions that raise them. This analysis of capital structure dynamics allows us to compare which theory—trade-off theory or market timing—describes the firms' capital structure decisions better in the event of negative shocks.

Many studies point out that shocks can be persistent or transitory (e.g., Cochrane (1994), Campbell, Polk, and Vuolteenaho (2010), and Gorbenko and Strebulaev (2010)), but few empirical papers distinguish between the effects of short-lived (transitory) price shocks on financial policies and those of long-lasting price shocks. In this paper, we seek to determine whether firms' reactions to negative stock returns depend on whether a shock is transitory or long-lasting. We first define a stock return shock as a daily stock return that falls by more than the annualized standard deviation of daily returns. Then we classify shocks into long-lasting vs. transitory shocks, depending on whether the stock price returns to its level a day before the shock within a month, after adjusting for market movement. According to Leary and Roberts (2005), managers should do nothing in response to short-term shocks if adjustment costs are large

enough to offset the benefits of timely adjustments. We find that managers tend to react to long-lasting negative shocks but do not usually engage in leverage-changing activities following transitory negative shocks.

Our analysis of quarterly data shows that firms increase distribution back to shareholders (buybacks) and creditors (debt retirement) and that buybacks are more likely than debt retirement after stock price collapses. We also observe that firms reduce external financing, of both new debt and equity. On average, firms' market leverage levels increase significantly in the quarter in which a long-lasting negative shock occurs and then partly rebalance downward in the following seven quarters, while book leverage increases throughout the eight quarters after a long-lasting shock. Our analysis of net equity issuance and net debt issuance reveals that firms tend to repurchase shares after negative shocks, while their debt policies do not change significantly. We conclude from our results e that firms that repurchase equity do not rebalance their leverage levels for at least two years, but considering that most leverage-decreasing actions happen within two years after significant leverage increases (Leary and Roberts (2005)), our results are in line with the market timing perspective of capital structure but are less supportive of the prediction of trade-off theory.

Our findings are also consistent with findings of Graham and Harvey (2001) on financial policy that managers care more about supporting stock prices than they do about maintaining optimal capital structure. The financing behavior we observe can be described as an increase in distributions of cash back to shareholders and creditors and a decrease in raising external funds. In other words, firms partly liquidate to preserve their stakeholders' returns in the event of significant decrease in firm value. We see that firms are more likely to compensate for losses in stockholders' returns by means of share repurchases than they are to increase debt-holders'

returns by means of debt retirement. One reason for this result is that most of the loss in firm value comes from equity, rather than from debt, if firms are not in financial distress. Our findings are consistent with the observation that debt policy is used for capital structure adjustment, while equity policy is used to serve other financing motives (Leary and Roberts (2005)).

Which firms are most likely to engage in repurchasing rather than debt retirement after experiencing negative shocks? We came up with three cases in which firms are less exposed to financial distress costs and/or managers have stronger motivations to boost stock prices: firms with abundant cash holdings, firms with almost zero leverage, and firms with high CEO pay-performance sensitivity. Previous studies (e.g., Bates, Kahle, and Stulz (2009)) show that the average US firm has enough cash holdings to retire all of its long-term debt. Firms with high levels of cash are less likely to be financially distressed or to lose investment opportunities than are those with low levels of cash and are likely to have enough capital to buy back shares without raising external capital. The literature on share repurchases also points out that one of the main purposes of share repurchases is to distribute excess cash and alleviate a free-cash-flow problem (Dittmar (2000) and Chan, Ikenberry, and Lee (2004)). Consistent with this conjecture, we find that firms with significant cash holdings are more likely to buy back shares following drops in their stock prices than are firms that do not have such cash holdings.

Strebulaev and Yang (2013) show that a large proportion of firms have almost-zero leverage (below 5%)[3] and that these firms tend to maintain high levels of cash holdings and conservative leverage ratios, indicating that their financial policies significantly affect their

[3] Strebulaev and Yang (2013) show that the percentage of firms with almost-zero leverage (below 5%) increased from 11 percent in 1980 to 34 percent in 2009.

decisions regarding cash holdings and capital structure.[4] Since zero- or almost-zero-levered firms are less likely to face financial distress than are those with more debt, almost-zero-levered firms are more likely to repurchase shares than are other firms following negative shocks. Our empirical results are consistent with this conjecture.

Firms with high CEO pay-performance sensitivity are more motivated to boost their stock prices than are firms without such sensitivity. We find that these firms repurchase significantly more shares up to a year after a stock return shock and continue to repurchase shares afterward, although not at significant levels. We observe no actions to rebalance the increased leverage after a shock. Our result adds to the literature on the relationship between managerial compensation and firms' financial policies (Ortiz-Molina (2007), and Smith and Watts (1992)).

The paper proceeds as follows. Section II introduces our data and methodology, while Section III reports the results regarding whether firms are likely to repurchase their equity following negative shocks. Finally, Section IV summarizes the paper and provides concluding remarks.

II. Data, Variables and Methodology

A. Data

Our sample consists of daily stock return data from 1985 to 2011 listed on NYSE, AMEX and NASDAQ and recorded by the University of Chicago Center for Research in Securities Prices (CRSP). The sample covers all US firms listed in both CRSP and Compustat

[4] After the 2008 financial crisis, firms in many advanced countries accumulated a large amount of internal cash and cash equivalents (Pinkowitz, Stulz, and Williamson (2013)) to use during crisis periods (Opler et al. (1999) and Han and Qiu (2007)). Lins, Servaes, and Tufano (2010) survey of CFOs in twenty-four countries reveals that managers use internal cash during difficult times and lines of credit in good times.

Quarterly between 1985 and 2011. Our sample starts with 1985 because the equity repurchase and issuance measures, our key measures, have been recorded since 1985. All variables used in the paper are measured at fiscal quarter-ends. We exclude firms with a negative book equity value, a market-to-book asset ratio above 10, or total assets below US$10 million. We also exclude utility (SIC 6000-6999) and financial (SIC 4900-4999) companies since their capital structures are regulated.

B. Variables

Long-lasting and transitory shocks

We focus our analysis on negative shocks to excess stock returns. Excess stock returns are defined as a firm's daily stock returns that are in excess of market returns. We use the return on the S&P 500 Index as market return and define negative excess shocks as those that are more than one standard deviation of the daily excess stock returns.[5] We identify stock return shock by comparing the size of the stock return to the short-term historical volatility, as in Barndorff-Nielsen and Shephard (2004), Huang and Tauchen (2005), and Lee and Mykland (2008). The accuracy of the historical volatility measure is an important issue here because it affects the detection of shocks and must be robust to previous shocks to allow detection of the next shock. If previous shocks increase the historical volatility measure, the next shock is less likely to be identified because it has to meet a larger threshold. Studies that deal with shocks typically use high-frequency intraday data and shorten the horizon of stock return data to one minute to increase the estimated historical volatility's accuracy. However, for our purpose of analyzing managers' actions on capital structure, high-frequency intraday data is inappropriate since we

[5] Leary and Roberts(2005) also use one sigma as the cut-off.

believe that managers pay little attention to every intraday stock price movement or make financial decisions based on them. We adopt the methodology of Lee and Mykland (2008) to estimate historical volatility but apply it to daily stock returns in excess of market return to detect a shock to daily excess stock returns.

Let $s_t \equiv \log S_t$ be the logarithmic price at the end of day *t*, and let $m_t \equiv \log M_t$ be the logarithmic market index at the end of day *t*.[6] The daily excess return at the end of day *t* is defined by $r_t \equiv (s_t - s_{t-1}) - (m_t - m_{t-1})$. The standard deviation, σ_j, is defined as:[7]

$$\widehat{\sigma(t_i)}^2 \equiv \frac{1}{21-2}\sum_{j=3}^{21} |r_t||r_{t-1}|.$$

Lee and Mykland (2008) use the realized bipower variation as a measure of stock return volatility because it is a consistent estimator for volatility when jumps in return processes are incorporated, as Barndorff-Nielsen and Shephard (2004) prove. This modified volatility measure is robust to the presence of stock return jumps. The modified volatility measure is less affected by shocks than the traditional stock return volatility is, so the modified measure is better for detecting shocks following earlier stock return jumps. We used an (unreported) simulation to determine whether this volatility measure is sufficiently accurate and robust to detect shocks effectively even if we stretch the estimation period from one minute to one day. The detection rate using daily data is higher than 90 percent, although it is below 9 percent, the rate we achieve if we use intraday data.

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[6] To check the robustness of our results, we test with a stock return shock as a long-lasting shock to determine whether the cumulative log stock returns after shocks have ever been greater than the cumulative log stock industry returns, rather than stock market returns. The 48-industry classification is from Ken French's website, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[7] According to Lee and Mykland, we need more than 16 observations to get converged standard deviations if the daily stock returns are used. Therefore, we use 21 observations (one month) to estimate standard deviations based on the economically meaningful number of observations.

By using excess stock returns, we assume that managers are less reactive to market-wide shocks than they are to firm-specific shocks. If managers care about shocks on raw returns and do not benchmark the overall market's performance when they make decisions, the raw return measure is a better choice and our approach leads to a more conservative conclusion. Our approach to defining shocks excludes the cases in which firms suffer large negative returns while the market also does poorly, which increases the chances of finding nothing in our analysis if these cases also induce managers' actions. In addition, our approach makes it possible to claim a negative shock when the market does exceptionally well while a firm performs poorly but in its normal range of performance[8]. It is not a shock if we define shocks in terms of raw returns, so managers should not take any actions if they make decisions based on raw returns. This again creates a likelihood of finding nothing.

Once we identify negative excess shocks, we classify these shocks into transitory shocks and long-lasting shocks.[9] If a firm experiences a negative excess stock return shock at day *t*, we set a hypothetical path of a stock price that realizes market returns starting from the end of the day *t*-1 price. If the actual stock price fails to recover to this hypothetical level of stock price within a month, we define the shock to be long-lasting, and transitory otherwise. In other words, we track both the cumulative log stock returns and cumulative log market returns after a shock, and if the cumulative log stock returns have never been greater than the cumulative log market returns for one month (or cumulative excess return has been below 0 for one month), we define

[8] This case, however, is unlikely to happen because the market return is the weighted average of a large number of assets and should be more stable than individual stock returns are.

[9] The shocks in the last month of the fiscal quarter need data from the subsequent quarter in order to determine whether they are long-lasting or transitory. Therefore, we construct a last-month dummy that has a value of 1 if the equity shocks occur in the last month of the quarter, and 0 otherwise. To check the robustness of our results, we control the last-month dummy and find that our reported regression results are consistent with unreported results with the last-month dummy.

that shock to be long-lasting. We narrow the set of negative long-lasting shocks further by excluding those that are followed by positive long-lasting shocks in the same fiscal quarter.

We construct the main independent variables that measure the magnitude and the frequency of negative shocks. The |ret / sigma| of long-lasting negative shocks is defined as the absolute value of a stock return on the day that a long-lasting negative excess stock return shock occurs, divided by the standard deviation of the firm's excess stock returns. If there are multiple long-lasting shocks in a quarter, we take the sum of the |ret / sigma| of each shock. The number of a firm's long-lasting negative shocks is the number of the firm's long-lasting shocks in a fiscal quarter. As Table 1 shows, firms seldom experience multiple negative long-lasting shocks in a quarter. We also define the counterparts of these variables for transitory shocks.

Leverage Ratio and Control Variables

The dependent variable of our analysis represents change in capital structure, measured by changes in market leverage ratios, book leverage ratios, net equity issuance, and net debt issuance. The book leverage is defined as the book value of total liabilities (*LTQ*) divided by the book value of total assets (*ATQ)*:

$$Book\ Lev = \frac{Liabilities\ (LTQ)}{Total\ Asset\ (ATQ)}.$$

Market leverage is defined as the book value of total liabilities divided by the market value of total assets:

$$Market\ Lev = \frac{Liabilities\ (LTQ)}{Liabilities\ (LTQ) + Market\ equity(CSHOQ * PRCCQ)}.$$

Therefore, market leverage is sensitive to stock return variations while book leverage is not. Throughout our paper, the market value of total assets is defined as the book value of total liabilities plus the market value of equity. The market value of equity is measured at the fiscal quarter-end, which is end-of-day stock price multiplied by the number of shares outstanding. We exclude firms with book or market leverage ratios that are higher than 100 percent. The variable net equity issuance is defined as the net equity issuance—sales of common and preferred stocks (*SSTKQ*) net of purchases of common and preferred stocks (*PRSTKCQ*)—divided by total assets. Net debt issuance is constructed in a similar manner: net debt issuance—long-term debt issuance (*DLTISQ*) net of long-term debt reduction (*DLTRQ*))—divided by total assets.

Our control variables consist of *stock return net of long-lasting shocks, financial deficits, financial deficits dummy, market-to-book ratio, EBITD, credit rating deficits, changes in target credit rating, leverage deficit, change in target leverage, capital expenditure, and cash holdings.* *The stock return net of long-lasting shocks* is defined as the buy-and-hold stock returns during a fiscal quarter net of the sum of the returns of negative long-lasting shocks during that quarter. Welch (2004) argues for inertia in capital structure since most changes in market leverage ratio are determined by changes in stock price. We expect market leverage to have a negative relationship with buy-and-hold stock returns during a fiscal quarter. The shocks are large by definition, and the quarterly stock returns tend to be driven by these shocks if we do not exclude the sum of the returns of negative long-lasting shocks. Only a few firms experience a shock in any one quarter, and even fewer face multiple shocks in a single quarter. Therefore, by

subtracting the sum of the returns of negative long-lasting shocks from the quarterly stock returns, we construct the variable *stock return net of long-lasting shocks* to control for the effect of "regular" stock price movements that are not negative long-lasting shocks on capital structure.

We construct the *financial deficits* (*FD*) variable, the amount of external financing, to be consistent with Frank and Goyal (2003). The pecking-order theory predicts that firms that need external financing should increase debt, and empirical evidence supports this prediction. *Financial deficits* (*FD*) is calculated as: (*SSTKQ – PRSTKCQ + DLTISQ – DLTRQ*) / *ATQ*, where *SSTKQ* is the sale of common and preferred stocks, *PRSTKCQ* is the purchase of common and preferred stocks, *DLTISQ* is long-term debt issuance, *DLTRQ* is long-term debt reduction, and *ATQ* is the book value of total assets. Sale of common and preferred stocks (*SSTKQ*) of a quarter equals the year-to-date sale of common and preferred stocks (*SSTKY*(t)) if the current quarter is the first quarter (t=1), and is the difference between this quarter and last quarter ((*SSTKY*(t) – *SSTKY*(t-1))) otherwise. Purchase of common and preferred stocks (*PRSTKCQ*), long-term debt issuance (*DLTISQ*), and long-term debt reduction (*DLTRQ*) are derived in the same way as sale of common and preferred stocks (*SSTKQ*). The *financial deficits dummy* (*FDd*) has value of 1 if financial deficits are positive, and 0 otherwise.

We use two control variables regarding a firm's profitability or growth opportunity. *Market to book ratio* (*MB*) is calculated by (*LTQ – TXDITCQ + PSTKQ* + (*CSHOQ* ×*PRCCQ*)) / (*ATQ*), where *TXDITCQ* is deferred taxes and investment credit, *PSTKQ* is preferred stocks, *CSHOQ* × *PRCCQ* is market value of equity, and *ATQ* is book value of total assets. *EBITD*, another measure of profitability, is earnings before interest, tax, and depreciation, divided by total assets. Previous empirical studies find that more profitable firms are likely to have lower levels of leverage, supporting the pecking-order theory.

Trade-off theory and empirical evidence on capital structure suggest that firms have target ranges of leverage ratio and that they adjust their debt ratios if they deviate from the target range (e.g., Hovakimian, Opler, and Titman (2001)). We control the target-leverage-related variables, *LdefM or B* and *dTlevM or B*. *LdefM or B* refers to market or book leverage deficits, which is the difference between the market (book) leverage ratio and the target market (target book) leverage ratio (*LdefM or B* = $Tlev_{t-1} - Lev_{t-1}$) at the beginning of the quarter. *dTlevM or B* is the change in the target market (book) debt ratio at the beginning of the quarter (*dTlevM or B* = $Tlev_t - Tlev_{t-1}$),where the target leverage ratio (*TlevM or B*) is estimated using a Tobit regression model similar to that of Kayhan and Titman (2007). See Appendix B for the target leverage ratio estimation.

We construct *credit rating deficits* and *changes in target credit rating* in a similar manner. Previous studies show that firms have credit rating targets and that they adjust their capital structures to maintain their target credit ratings (Graham and Harvey (2001) and Hovakimian, Kayhan, and Titman (2009)). We estimate the target credit rating using the model of these studies, shown in Appendix C. Our estimates are consistent with Hovakimian, Kayhan, and Titman (2009). The credit rating deficits and changes in target credit ratings are set to 0 for firms with no credit rating.

Capital expenditure is defined as *CAPXQ / PPEQ* at the beginning of the fiscal quarter, where *CAPXQ* is capital expenditure and *PPEQ* is asset tangibility. Quarterly capital expenditure (*CAPXQ*) equals to year-to-date capital expenditure (*CAPXY*) for the first quarters ((*t*=1)), and the difference between *CAPXY* (t) and *CAPXY* (t-1) otherwise. Cash holdings measure the amount of internal capital, which is *CHEQ / ATQ*, where *CHEQ* is cash and short-term investments. Pecking order of financing preferences expects high capital expenditures to increase

the use of debt, the marginal source of external financing, while high cash holdings should decrease external financing and lower leverage levels.

C. Methodology

We analyze the relationship between capital structure and adverse shocks using our control variables:

$$\begin{aligned} \textit{Changes in leverage}_{i,t} = {} & \alpha + \beta_1 \textit{ Stock return Shock measures}_{t-1} + \beta_2 FD_{i,t} + \beta_3 FDd_{i,t-1} \\ & + \beta_4 EBITD_{i,t} + \beta_5 MB_{i,t} + \beta_6 \textit{ (stock return-ret of long lasting shocks)}_{i,t} \\ & + \beta_7 \textit{ LdefM or B}_{i,t} + \beta_8 \textit{ dTlev M or B}_{i,t} + \beta_9 CD_{i,t-1} + \beta_{10} dTRating_{i,t-1} \\ & + \textit{ firm and year dummies} + \varepsilon_{i,t} \end{aligned} \tag{1}$$

$$\begin{aligned} \textit{Net equity (debt) issuance}_{i,t} = {} & \alpha + \beta_1 \textit{ Stock return Shock measures}_{t-1} \\ & + \beta_2 \textit{ Stock return Shock measures}_{t-1} + \beta_3 MB_{i,t} + \beta_4 Capx_{i,t} + \beta_5 \textit{ CashHoldings}_{i,t-1} \\ & + \beta_6 EBITD_{i,t} + \beta_7 \textit{ (stock return-ret of long lasting shocks)}_{i,t} + \beta_8 \textit{ LdefB}_{i,t} + \beta_9 \textit{ dTlevB}_{i,t} \\ & + \beta_{10} CD_{i,t-1} + \beta_{11} dTRating_{i,t-1} + \textit{firm and year dummies} + \varepsilon_{i,t} \end{aligned} \tag{2}$$

where stock return shock measures refer to |ret / sigma| of long-lasting negative shocks or the number of long-lasting negatives shocks for each quarter. We run panel regressions with firm and year dummies to control for fixed effects. All *t*-statistics are based on firm-clustered standard errors, following Petersen (2009).

The dummy variables indicating s firms that are likely to repurchase shares are interacted with shock measures in order to determine whether these firms with strong motivation

or more flexibility in their choices of capital structure purchase more shares when they experience long-lasting negative shocks. One of these variables is the dummy for almost-zero market leverage, which takes the value of 1 if a firm's level of market leverage is 5 percent or less, and 0 otherwise. The second variable is the high abnormal cash holdings dummy, which takes the value of 1 if a firm's abnormal cash holdings are above the median in fiscal quarter *t*, and 0 otherwise. Abnormal cash holdings are defined as a firm's cash holdings minus the industry average cash holdings. The last variable is a high CEO pay-performance sensitivity dummy. We measure the pay-performance sensitivity of CEO compensation as in Core and Guay (2002)—that is, as the log of the change in option grants value for one percent change in stock price—and construct a high-pay-performance-sensitivity (PPS) dummy that takes the value of 1 if PPS is above median, and 0 otherwise. Data are obtained from COMPUSTAT. The panel regression for the analysis is:

$$\begin{aligned} \textit{Net equity(debt) issuance}_{i,t} = {} & \alpha + \beta_1 \textit{ Stock return Shock measures}_{t-1} \\ & + \beta_2 \textit{ Stock return Shock measures}_{t-1} \textit{ *High chance of repurchase Dummy} + \beta_3 MB_{i,t} + \beta_4 \\ & Capx_{i,t} + \beta_5 \textit{ CashHoldings}_{t-1} + \beta_6 EBITD_{i,t} + \beta_7 \textit{ (stock return-ret of long lasting shocks)}_{i,t} \\ & + \beta_8 LdefB_{i,t} + \beta_9 dTlevB_{i,t} + \ + \beta_{10} CD_{i,t-1} + \beta_{11} dTRating_{i,t-1} + \beta_{12} \textit{ High chance of repurchase} \\ & \textit{dummy + firm and year dummies} + \varepsilon_{i,t} \end{aligned} \tag{3}$$

III. Empirical Results

A. Summary Statistics

Table 1 provides summary statistics of our sample during the years from 1984 to 2011. The average quarterly change in market (book) leverage is 0.34 (0.15) percent, and the average net equity (debt) issuance is 0.44 (0.44) percent of total assets. The median of these four variables is zero, suggesting that our sample firms have stable levels of leverage. The average market (book) leverage deficit (*LdefM(B)*[0,4]) is -0.84 (-1.11) percent, and the average change in target market (book) leverage is 0.11 (0.05) percent. As we define only highly significant stock return movements as shocks, most of the shocks that fit our definition are not recovered in a month, so they are categorized as long-lasting. From 245,662 firm-quarter observations, there were 3,022 firm-quarters in which long-lasting shocks occurred and only 337 firm-quarters in which transitory shocks occurred. In quarters in which a long-lasting (transitory) shock did occur, the average number of long-lasting (transitory) negative shocks in a fiscal quarter is 1.03 (1.04), which is close to 1,[10] and the average magnitude, |ret/sigma|, of long-lasting (transitory) negative shocks is 1.50 (1.73). By definition, the |ret/sigma| of stock return shock should be at least 1 to be identified as a shock.

The average of the dummy for almost-zero market leverage (*AZLD*) is 0.31, suggesting that 31 percent of the sample firms had a market leverage level less than 5 percent during our sample period. The average of the dummy for high abnormal cash holdings is 0.5, since it is assigned a value of 1 if the abnormal cash holdings (considering the industry average) are greater than the median of the total average of abnormal cash holdings. The CEO pay-performance sensitivity variable (PPS) is available for only a limited number of the 37,464 observations, and the average

[10] The numbers of long-lasting (transitory) negative shocks are similar to a dummy variable that takes the value of 1 if there are negative long-lasting (transitory) negative shocks in the quarter and 0 otherwise. When we run our regression with these dummy variables to check the robustness of our results, the regression results are similar to the reported results.

of log PPS is 1.37. The average of stock return net of return of long-lasting negative shocks is 4 percent. The average of financial deficits (*FD*) is 0.04 percent of total assets. The mean of the market-to-book ratio is 1.71. The profitability of an average firm is 2.87 percent of total assets. The mean of credit rating deficits (*CD*) is 0.02, and the average of change in target credit ratings is 0. Firms pay an average of 14 percent of fixed assets in capital expenditures. The results also show that US firms have 15 percent of total assets in cash and cash equivalents.

B. Firms' financing behavior

Table 2 reveals that both debt retirement and share repurchase increase after firms experience long-lasting negative shocks. In Table 2 compares the net equity issuance and net debt issuance of the firms that experienced a shock with those that did not. To capture only significant changes in capital structure, we apply a ±3 percent cut-off of issuances from the beginning of quarter *t* (the quarter when a shock occurred) to the end of the following seven quarters. In the groups of the firms that experienced a shock and those did not, half of the firms show no significant debt or equity-issuance activity. The result is consistent with the summary statistics in Table 1 and with previous empirical evidence that firms do not actively adjust their capital structures (Fama and French (2002), Welch (2004), and Leary and Roberts (2005)). We observe that firms that experience long-lasting negative shocks are less likely to raise external financing: 18.2 percent of them issue debt and 13.66 percent issue equity after a long-lasting negative shock. Compare these figures with 20.36 percent of the firms that issue debt and 16.22 percent that issue equity in normal times. We also observe increases in the proportions of firms that retire debt with no significant equity issuance (from 7.48% to 8.52%) and those that repurchase equity with no significant debt issuance (from 11.60% to 12.63%) after experiencing shocks. We see that firms

change their financial behavior after long-lasting negative shocks and that they are more likely to attempt to maintain capital structure or boost stock prices after the shocks, although they do not tend to do both at the same time. We find little change in the proportion of the firms that retire debt and repurchase shares simultaneously. The increase in the proportion of debt retirement and share repurchase is similar (around 1%), but given that debt retirement happens more frequently and in greater magnitude than equity issuance, the increase in net equity issuance is more noticeable.

C. Sub-sample summary statistics

Table 3 presents the difference in the financial behavior and related firm characteristics between firms that experience a negative long-lasting shock and those that do not in the sub-sample of the firms that are more likely to engage in share repurchases in response to negative shocks, that is, firms with high levels of cash holdings, firms with almost-zero leverage, and firms with high CEO pay-performance sensitivity. The results show that in normal times, the equity-financing behavior of these firms is not markedly different from that of the overall sample, but after a shock these firms have significantly lower levels of net equity issuance than the overall sample. Table 3 shows that net debt issuance decreases after shocks in all cases except in the firms with almost-zero leverage, although the decreases are less significant in the sub-samples. In addition, market to book ratios and firm profitability decrease after shocks, while capital expenditures increase. We control for these variables in subsequent regression analyses.

Table 3 shows that, in the overall sample, firms that do not experience long-lasting negative shocks issue around 2.5 percent of equity or debt, while firms that experience long-lasting negative shocks issue 0.87 percent of equity and 1.66 percent of debt. The decrements of equity

and debt issuance are significant at the 1% level. Table 3 also presents the results for firms with high abnormal cash holdings that experience negative long-lasting shocks. The level of net equity issuance of these firms is significantly smaller than that for other firms, consistent with our conjectures. Table 3 also shows the result for firms with almost-zero levels of market leverage. These firms have high market-to-book ratios and are more profitable than average, as Strebulaev and Yang (2013) note. In the case of firms with almost-zero leverage, the amount of net equity issued after negative long-lasting shocks is significantly smaller than the net equity issued in normal times, although the amount of net debt issued is slightly larger than that issued in normal times. Table 3 also shows that firms with high CEO PPS repurchase more shares (though the difference is not significant) and retire more debt when they experience long-lasting negative shocks than when they do not. Firms with high CEO PPS tend to have higher market-to-book ratios and to be more profitable than average firms.

D. Repurchasing firm characteristics

Do firms that repurchase their shares after long-lasting negative shocks and increase their leverage accordingly rebalance their capital structure afterward? To address this question, we follow the leverage change and financing behavior for up seven quarters after the shock for firms that repurchase shares valued at more than 3 percent of book assets in the quarter when a negative shock occurs and for firms that did not repurchase shares in that quarter. The control firms include firms that repurchased their shares later on, which should bias the level of these firms' leverage change after quarter *t* to be increasing. We also track stock return performance and changes in cash holdings. Table 4 shows that share-repurchasing firms have a significantly higher increase in market and book leverage and significantly higher raw stock returns and

abnormal stock returns for the seven quarters following a negative long-lasting shock, which is consistent with findings from the repurchase literature (Ikenberry, Lakonishok, and Vermaelen (1995) and Peyer and Vermaelen (2009)). Firms that repurchase their shares in quarter *t* continue to repurchase equity for the following seven quarters, consistent with empirical findings that financing efforts occur in clusters (Leary and Roberts (2005)). These firms also issue more debt, though not significantly more, than control firms do, indicating that repurchasing firms do not rebalance their increased leverage for up to two years, supporting the market-timing hypothesis. Table 4 also demonstrates that part of the funds used for share repurchases comes from cash holdings.

E. Regression Results

In the panel regressions with firm and year fixed effects, we examine how the magnitude and frequency of negative shocks affect firms' market (book) leverage and net equity (debt) issuance. We calculate the significance of the coefficient estimates based on firm-clustered standard errors. Table 5 shows our panel regression results for the effect of adverse shocks on changes in market leverage and book leverage during quarter *t* (when negative shocks arrive), quarter *t*+1, and from the beginning of quarter *t*+1 to the end of quarter *t*+7.Table 5 indicates that market leverage increases significantly during quarter *t* and then gradually decreases, while book leverage increases significantly throughout quarters *t* to *t*+7. Our empirical results suggest that firms usually repurchase equity after negative long-lasting equity shocks, so both market leverage and book leverage increase in quarter *t*, and as the stock market reacts positively to the share repurchases (as shown in Table 4), market leverage decreases in the following quarters, while book leverage continues to increase. Transitory negative shocks do not change the leverage

levels significantly, with the exception of the market leverage change in quarter *t*. The significant positive coefficient estimate of 2.75 on |ret/sig| of long-lasting negative shocks suggests that a long-lasting negative shock of the magnitude of one sigma, which is the minimum cut-off size for a decrease in stock return to be classified as a shock, leads to a 2.75 percent increase in market leverage over one quarter. The market leverage decreases by 0.82 percent over the next seven quarters. The evidence in the table shows that one long-lasting negative shock increases market leverage by 4.37 percent, which then decreases by -1.15 percent over the following seven quarters. A long-lasting negative shock of one sigma in size increases the book leverage by 0.56 percent during the seven quarters after the shock, and the book leverage increases by 0.82 percent during the following seven quarters in the case of a single long-lasting shock that occurs in quarter *t*.

Other control variables show results consistent with previous empirical findings in the short run, but the relationships of many of the variables differ in the long run. The variable *stock return net of long-lasting shocks* has a negative association with both the changes in market level and the changes in book leverage in general but a significantly positive association with changes in market leverage after quarter *t*. *Financial deficits* increases both book leverage and market leverage in quarter *t*, suggesting that the marginal source of external financing is debt in quarter *t*, consistent with pecking-order theory, but it decreases both book leverage and market leverage afterward, suggesting the possibility of equity issues after quarter *t*. Higher *market to book ratio* also reverses its relationship with leverage changes after quarter *t*, with negative relationships in quarter *t* and positive relationships afterward. Higher profitability is related to lowering leverages in the short run, but in the long run it increases leverage. *Leverage deficit,* and *change in target leverage* have significantly positive relationships with leverage changes, suggesting that firms

rebalance their leverages toward their target leverages. *Credit rating deficits* does not have a significant effect on leverage changes, but *changes in target credit rating* affect changes in market leverage. An increase in target credit rating decreases market leverage levels in quarter *t*, as we expected, but increases market leverage levels afterward.

Table 6 presents the panel regression results for the effects of negative shocks on issues of net equity and net debt. We find that firms are likely to repurchase more equity but that they do not change debt policy significantly after long-lasting negative shocks, suggesting the priority of boosting stock price over rebalancing capital structure. The firms that experience a single long-lasting negative shock in quarter *t* repurchase equity in the amount of 0.36 percent more of their total assets than do the control firms in the corresponding quarter, and they continue to repurchase equity over the next seven quarters in the amount of 1.16 percent more of their total assets than do the control firms over the next seven quarters. The minimum magnitude of long-lasting shocks, one sigma, is related to share repurchases of 0.21 percent more of total firm assets in quarter *t* and 0.75 percent more of total firm assets over the next seven quarters than is the case for firms that do not experience such shocks. Transitory shocks have insignificant or marginally significant effect in all cases, indicating that managers do not react to transitory negative equity shocks. We find no evidence that shocks significantly affect firms' debt policy.

Table 7 shows that firms' historical financial policies and managerial incentives play important roles in firms' financing choices in the event of adverse shocks. We test three cases to determine whether firms are more likely to repurchase shares when they are less exposed to financial distress costs and/or when managers are more motivated to boost stock prices: firms with abundant cash holdings, firms with almost-zero leverage, and firms with high CEO pay-performance sensitivity. We find that these firms repurchase more shares than other firms after

long-lasting shocks, as predicted. Our results are consistent with Leary and Roberts (2005) in finding that the use of equity is driven by motives other than maintaining optimal capital structure. Our results are also consistent with the literature on share repurchase motives in finding that mispricing or undervaluation are the primary reasons for share repurchase and that distribution of excess capital and increasing leverage could be secondary reasons for share repurchase (Dittmar (2000) and Chan, Ikenberry, and Lee (2004)).

Table 7 shows that firms with high levels of abnormal cash holdings repurchase more shares than do other firms after stock return collapses but do not change their debt policies significantly, which is consistent with our conjecture. For quarter t+1 (quarters t+1 to t+7), the coefficient of the interaction term between |ret/sig| of long-lasting negative shocks and the high abnormal cash holdings dummy is -0.13 (-0.43) percent and is significant at the 5% level for net equity issuance. Firms with abnormally high cash holdings repurchase 0.25 (0.92) percent more equity than other firms do when they experience a single negative long-lasting shock. The dummy for high levels of abnormal cash holdings is related to more debt retirement in general, but it does not significantly alter the net amount of debt issued in the event of negative shocks.

Table 7 also reports that firms with almost-zero leverage also repurchase more equity than others do and that some of the fund for share repurchase comes from issuing debt, which further increases leverage. This result suggests that share repurchases are used to increase leverage (Dittmar (2000)). The coefficient of the interaction term between the number of negative long-lasting shocks and the dummy for almost-zero market leverage on negative equity issuance is significantly negative, -0.18 percent of total assets at t+1 and -0.57 percent of total assets during the subsequent seven quarters, indicating that firms with almost-zero market leverage repurchase more equity than others do after experiencing one negative shock. In terms of debt policy, firms

with almost-zero leverage issue significantly more debt in the subsequent seven quarters.

We find that firms with high CEO pay-performance sensitivity repurchase shares to boost stock price while showing no significant changes in debt issuance (Table 7), consistent with our conjecture. The coefficients of the interaction term between |ret/sig| of long-lasting negative shocks and the high-PPS dummy on net equity issuance is -0.23 percent and that of the interaction term between the number of long-lasting negative shocks and the high-PPS dummy is -0.39 percent in quarter t+1 after the shock. The effect of high PPS on share repurchase is significant in the short term—a year at most—after which high PPS continues to decrease net equity issuance, but not significantly. The interaction terms with the high-PPS dummy and long-lasting negative shocks do not have a significant effect in the analysis of net debt issuance.

F. Robustness – Logit Regression

We run a logit regression of the equity-repurchasing dummy on negative shocks as a robustness check. The equity-repurchasing dummy takes a value of 1 if the firm's net equity issue is less than or equal to -3 percent compared to the book value of total assets during a given period, and 0 otherwise. Table 8 shows that, in the quarter following (the following three quarters, the following seven quarters) a shock, a one-sigma magnitude of a long-lasting negative shock increases the probability of share repurchase by 38 (19, 8) percent. One long-lasting negative shock increases the probability by 60 (30, 12) percent in the following quarter (the following three quarters, the following seven quarters), which is consistent with the results of our main regressions.

IV. Conclusion

We study the effect of negative shocks on corporate financing behavior. Previous capital structure literature suggests that stock returns are one of the most important factors in determining capital structure (Welch (2004)). We extend the line of the extant capital structure literature by investigating whether firms whose stock prices plummet take action to lower leverage in order to recover to previous leverage levels or to support stock prices at a cost of further increases in leverage. We find that managers usually choose to buy back shares rather than taking leverage-decreasing actions following negative shocks, especially long-lasting shocks. Our results support the idea that adjusting capital structure is so costly that firms react only to long-lasting shocks but not to transitory shocks. We conclude from our findings that both market timing and rebalancing are ongoing in the event of adverse shocks, but market-timing behavior usually dominates rebalancing behavior. This result indicates that, after a significant drop in stock prices, managers pay more attention to price supports than to possible deviations from optimal capital structures, which is consistent with findings of Graham and Harvey (2001) that maintaining target levels of leverage is not managers' top priority when they make financing decisions. We also show that firms that are less exposed to financial distress cost and that have stronger motives to boost stock prices—such as firms with high cash holdings, those with almost-zero leverage, and those with high CEO pay-performance sensitivity—purchase more shares in the event of adverse shocks. This finding shows that firms' historical financial policies and managerial incentives have significant effects on firms' financial behavior, especially on equity policy, which is consistent with findings of Leary and Roberts (2005) that debt policy is used for capital structure adjustment while equity issuance is primarily driven by other factors.

Appendix A. Variable definitions

COMPUSTAT Quarterly variable names are in parentheses.

Variable	Definitions
Stock Returns and Stock Return Stock Return Shock Related Measures	
|ret / sigma| of long lasting negative shocks	The absolute value of stock return of the day when a long lasting negative excess stock return shock occurs divided by the standard deviation of excess stock returns of a firm. If there are multiple long-lasting shocks in a quarter, we take the sum of the |ret / sigma| of each shock. The definition of long lasting negative excess stock return shocks is in the text.
|ret / sigma| of transitory negative shocks	The absolute value of stock return of the day when a transitory negative excess stock return shock occurs divided by the standard deviation of excess stock returns of a firm. If there are multiple transitory shocks in a quarter, we take the sum of the |ret / sigma| of each shock.
Number of long lasting negative shocks	The number of long lasting negative shocks occurred in a fiscal quarter.
Number of transitory negative shocks	The number of transitory negative shocks occurred in a fiscal quarter.
Dependent Variables	
Book Leverages	Total liabilities (*LTQ*) divided by total assets (*ATQ*)
Market Leverages	Total liabilities (*LTQ*) divided by Total liabilities(*LTQ*) plus market equity(prccQ*cshoQ)
Net equity issuance	The amount of net equity issuance over total assets (Sale of common and preferred stocks (*SSTKQ*) – Purchase of common and preferred stocks (*PRSTKCQ*))
Net debt issuance	The amount of net debt issuance over total assets (Long-term debt issuance (*DLTISQ*)– Long-term debt reduction(*DLTRQ*))
Other Control Variables Used in the Main Regressions	
Stock return – return of long lasting negative shock (*x*)	Buy-and-hold stock returns over the corresponding fiscal quarter minus the return of long lasting negative stocks
Financial deficit (*FD*)	Financial deficit over total assets , where financial deficit is defined as (Sale of common and preferred stocks (*SSTKQ*) – Purchase of common and preferred stocks (*PRSTKCQ*) + Long-term debt issuance (*DLTISQ*)– Long-term debt reduction(*DLTRQ*))
Profitability (*EBITD*)	Earnings before interest, tax, and depreciation (*OIBDPQ*) / total assets at the beginning of the period (*ATQ*).
Capital Expenditure (capx)	Capital Expenditure(*CAPXQ*) divided by Property, Plant and Equipment (*PPEQTQ*) in the previous quarter

Cash Holdings (cashR)	Cash and Short-Term Investments(*CHEQ*) divided by total assets(*ATQ*)
Market-to-book asset ratio (*MB*)	(Total liability (*LTQ*) – deferred taxes and investment credit (*TXDITCQ*) + preferred stocks (*PSTKQ*)) + Market value of equity (*CSHOQ* ×*PRCCQ*)) / Total assets (*AT*).
Research & Development expenditure (*RD*)	Research and development expenditure (*XRDQ*) divided by sales (*SALEQ*). This is set to be zero when missing.
Research & Development dummy (*RDd*)	Research and development dummy is set to 1 when the R&D value (*XRDQ*) is missing.
Selling expense (*SE*)	Selling, general and administration expenses (*XSGAQ*) divided by sales (*SALEQ*)
Firm size (*Size*)	Natural log of (Sales (*SALEQ*))
Asset tangibility (*PPE*)	Property, Plant and Equipment (*ppegtQ*) divided by total assets (*ATQ*)
Leverage deficit (*LdefM or LdefB*)	Difference between the market (or book) leverage (*Lev*) and the target market (or book) leverage ratio (*Tlev*) at the beginning of the quarter ($Ldef_t = Tlev_{t-1} - Lev_{t-1}$)
Change in target leverage (*dTlevM or dTlevB*)	Change in target market (or book) debt ratio (*Tlev*) over the past five years ($dTlev_t = Tlev_t - Tlev_{t-1}$) where the target ratio is calculated using a Tobit regression.

Appendix B. Target Leverages

We use a Tobit regression of book and market leverage ratios on control variables suggested by previous studies. All variables are measured at the fiscal quarter end and the sample period is between 1985 and 2011. The dependent variables are book or market leverage ratios. . A book leverage ratio is the book value of debt divided by total assets whereas a market leverage ratio is the book value of debt divided by the sum of the long-term liability and market value of equity. The book value of debt is defined as long-term liability. The independent variables are market to book asset ratio (*MB*), asset tangibility (*PPE*), profitability (*EBITD*), research and development expenditure (*RD*), R&D cost dummy (*RDd*), selling expense (*SE*), size and industry dummies. These variables are defined as described in Appendix A. *** represent that the coefficients are significantly different from zero at the 1% significance levels. ** represent that the coefficients are significantly different from zero at the 5% significance levels. * represent that the coefficients are significantly different from zero at the 10% significance levels.

Variable	Coefficient	Coefficient
	Market Leverage	**Book Leverage**
Market to book ratio (MB_{t-1})	-4.84***	-1.85***
	(-160.67)	(-68.85)
Asset tangibility (PPE_{t-1})	0.22***	0.25***
	(98.38)	(121.59)
Profitability ($EBITD_{t-1}$)	-1.40***	-0.91***
	(-125.62)	(-89.07)
Selling expense (SE_{t-1})	-0.11***	-0.06***
	(-49.54)	(-29.19)
R&D (RD_{t-1})	-0.15***	-0.13***
	(-24.80)	(-24.70)
R&D dummy (RDd_{t-1})	5.11***	4.98***
	(49.25)	(52.08)
Firm size ($Size_{t-1}$)	1.42***	1.44***
	(58.63)	(64.70)
Intercept	22.58***	12.58***
	(80.09)	(48.41)
Year and industry dummies	Yes	Yes
Number of observations	315,899	315,899

Appendix C. Target Credit Rating

Target credit ratings are estimated using the ordered probit regression in each fiscal quarter similar to Hovakimian, Kayhan, and Titman (2009):

$$Credit\ Rating_{i,t} = \alpha + \beta_1 MB_t + \beta_2 PPE_t + \beta_3 RD_{i,t} + \beta_4 RDd_{i,t} + \beta_5 SE_{i,t} + \beta_6 EBITD_{i,t} + \beta_7 Size_{i,t} + \beta_8 Operating\ risk_{i,t} + \beta_9 Historical\ Credit\ Rating_{i,t} + \varepsilon_{i,t} \quad \text{(A2)}$$

CreditRating is a numerical credit rating value based on the S&P long-term issuer rating (*SPLTCRM*) available from Compustat. The lowest rating (CCC-) is assigned to be 1 and the highest rating (AAA) is assigned to be 19. *MB*, *PPE*, *RD*, *RDd*, *SE*, *EBITD*, and *SIZE* are defined as in Appendix B. *Operating Risk* is calculated by the standard deviation of 20 past quarterly operating cash flows divided by total assets over the past five years. *Historical Credit Rating* is measured as the average credit rating over the past four-year period.

The results from an ordered probit regression of numerical credit rating values on various firm characteristics to estimate target credit ratings are reported below. According to Hovakimian et al (2009), the target credit ratings are estimated using quarterly cross-sectional regressions to address a look-ahead bias issue. We use all NYSE, Amex, and Nasdaq firms from 1984 to 2011 excluding the firms with a negative book equity value, a market-to-book asset ratio above 10, or total assets below $10 million. Utility (SIC 6000-6999) and financial (SIC 4900-4999) companies are excluded from the sample since these two industries are under severe regulation. Firms with book leverage ratios above 100% are also excluded from the sample. We

report only the results from 2011Q4 for brevity. The dependent variable is a numerical credit rating value based on the S&P long-term issuer rating available from Compustat (*SPLTCRM*). All variables are measured at the fiscal quarter end. The other control variables in the regressions are defined in Appendix A.

Variables	Coefficient
Intercept	-7.85***
	(-8.89)
Market to book ratio (*MB*)	0.30***
	(3.10)
Asset tangibility (*PPE*)	-0.02
	(-0.08)
R&D (*RD*)	1.61
	(1.45)
R&D dummy (*RDd*)	0.08
	(0.65)
Selling expense (*SE*)	-0.37
	(-0.75)
Profitability (*EBITD*)	3.53
	(1.36)
Firm size (*Size*)	0.05
	(1.06)
Operating risk (*Oper Risk*)	0.70
	(0.69)
Historical credit rating	2.44***
	(29.17)
Number of observations	711

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Table 1
Summary Statistics

All variables are measured at the fiscal quarter end and the sample period is between 1984 and 2011. A book leverage ratio is the book value of debt divided by total assets whereas a market leverage ratio is the book value of debt divided by the sum of the long-term liability and market value of equity. The book value of debt is defined as long-term liability. Firms with higher than a 100% book or market leverage ratio are excluded from the analysis. Net equity issuance is the amount of equity issuance minus the amount of equity repurchases. Net debt issuance is the amount of debt issuance minus the amount of debt retirement. The independent variables are market to book asset ratio (*MB*), profitability (*EBITD*), research and development expenditure (*RD*), R&D cost dummy (*RDd*), size (log of Sales) and firm dummies. These variables are defined as described in Appendix A. All variables except for stock return shock related variables are winsorized at 1% and 99%.

Variables	**N**	**Mean**	**S.E**	**1%**	**Median**	**99%**
Market Leverage Change (*dMLev*) : %	245,662	0.34	6.15	-30.93	0.00	41.36
Book Leverage Change (*dBLev*) : %	245,662	0.15	4.70	-25.98	0.00	34.16
Net Equity Issuance (*NEI*) : %	245,662	0.44	3.78	-13.81	0.00	77.01
Net Debt Issuance (*NDI*) : %	245,662	0.44	4.64	-18.56	0.00	56.28
Market leverage deficit (*LdefM*[0,1]): %	245,662	-0.84	18.69	-63.61	1.30	40.98
Change in target market leverage (*dTlevM*[0,1]): %	245,662	0.11	4.16	-26.44	0.00	30.12
Book leverage deficit (*LdefB*[0,1]): %	245,662	-1.11	17.33	-61.34	1.54	36.46
Change in target book leverage (*dTlevB*[0,1]): %	245,662	0.05	2.92	-17.15	0.00	18.37
|ret / sigma| of long lasting negative shocks	3,022	1.50	0.73	1.00	1.28	12.92
|ret / sigma| of transitory negative shocks	337	1.73	1.20	1.00	1.26	9.03
The number of long lasting negative shocks	3,022	1.03	0.18	1.00	1.00	3.00
The number of transitory negative shocks	337	1.04	0.20	1.00	1.00	2.00
Almost Zero Market Lev Dummy(*AZLD*)	245,662	0.31	0.46	0.00	0.00	1.00
High Abnormal Cash holdings dummy (*cashHd*)	245,662	0.50	0.50	0.00	0.00	1.00
Log of Performance sensitivity to stock prices (*PPS*)	37,464	1.37	1.06	0.00	1.11	7.90
Stock return – return of long lasting negative shock (*x*)	245,662	0.04	0.32	-0.98	0.01	18.33
Financial deficits (*FD*) : %	245,662	1.02	6.81	-18.96	0.00	106.47
Financial deficits dummy (*FDD*) : %	245,662	0.45	0.50	0.00	0.00	1.00
Market to book ratio (*MB*)	245,662	1.71	1.10	0.37	1.36	8.72
Profitability (*EBITD*) (%)	245,662	2.87	3.91	-24.30	3.13	15.85
Credit rating deficits (CD_{t-1})	245,662	0.02	0.13	0.00	0.00	2.00
Changes in target credit rating (*dTRating*)	245,662	0.00	0.13	-1.00	0.00	1.00
Capital Expenditure (*capx*) : %	245,662	7.27	8.10	-22.01	4.92	98.78
Cash holdings ratio ($cashR_{t-1}$) : %	245,662	14.79	17.70	0.00	7.16	82.35

Table 2 Financing and Long-lasting Negative Shocks

Table 2 categorizes firms by their financing activities and compares the proportion of the firms between two groups, the firms that experienced long lasting shocks and those that did not, in each category. We measure the net equity issuance and net debt issuance from the quarter *t* (shocks occurred) to the following 7 quarters, and use the ±3% cut-off for categorization. The financing activities of the firms that did not experience long lasting negative shocks in quarter *t* are presented in brackets. All variables are measured at the fiscal quarter end and the sample period is between 1984 and 2011. Net equity issuance is the amount of equity issuance minus the amount of equity repurchases. Net debt issuance is the amount of debt issuance minus the amount of debt retirement.

	Net Equity Issue [t,t+7Q] < - 3%	**-3% < NEI [t,t+7Q] < 3%**	**NEI [t,t+7Q] > 3%**	**Total**
	Shocks (No shocks)	**Shocks (No shocks)**	**Shocks (No shocks)**	**Shocks (No shocks)**
Net Debt Issue [t,t+7Q] > 3%	2.46% (2.35%)	13.39% (14.60%)	2.35% (3.41%)	18.20% (20.36%)
-3%<NDI [t,t+7Q] < 3%	8.52% (7.48%)	47.95% (46.54%)	8.85% (10.18%)	65.32% (64.20%)
NDI [t,t+7Q] < - 3%	1.41% (1.21%)	12.63% (11.60%)	2.46% (2.63%)	16.50% (15.44%)
Total	12.39% (11.04%)	73.96% (72.74%)	13.66% (16.22%)	100% (100%)

Table 3 Sub-sample Summary Statistics

Table 3 reports the relation between net equity and debt issuance and adverse stock return shocks. All variables are measured at the fiscal quarter end and the sample period is between 1984 and 2011. Net equity issuance is the amount of equity issuance minus the amount of equity repurchases. Net debt issuance is the amount of debt issuance minus the amount of debt retirement. The negative long lasting stock return shock dummy is assigned 1 if there is more than one negative long lasting stock return dummy. Other variables are defined as described in Appendix A.

Panel A: Total sample

Variables	N	Mean	N	Mean	t-value
		No shock		Shock	
Net Equity Issuance (*NEI[t+1Q,t+7 Q]*) : %	187,564	2.38	2,206	0.87	-6.77***
Net Debt Issuance (*NDI[t+1 Q,t+7 Q]*) : %	187,564	2.75	2,206	1.66	-4.20***
Market to book ratio (*MB*)	185,436	1.74	2,186	1.61	-6.38***
Profitability (*EBITD*) (%)	187,564	3.17	2,206	2.44	-8.79***
Capital Expenditure (*capx*) : %	187,564	7.28	2,206	8.51	6.60***

Panel B: Firms with high abnormal cash holdings

Variables	N	Mean	N	Mean	t-value
		No shock		Shock	
Net Equity Issuance (*NEI[t+1Q,t+7 Q]*) : %	94,268	2.42	1,089	0.48	-5.29***
Net Debt Issuance (*NDI[t+1 Q,t+7 Q]*) : %	94,268	2.59	1,089	1.94	-1.86*
Market to book ratio (*MB*)	93,321	1.95	1,081	1.84	-3.11***
Profitability (*EBITD*) (%)	94,268	3.07	1,089	2.26	-6.13***
Capital Expenditure (*capx*) : %	94,268	8.33	1,089	10.23	6.12***

Panel C: Almost zero market levered firms

Variables	N	Mean	N	Mean	t-value
		No shock		Shock	
Net Equity Issuance (*NEI[t+1Q,t+7 Q]*) : %	57,146	2.48	858	0.11	-5.38***
Net Debt Issuance (*NDI[t+1 Q,t+7 Q]*) : %	57,146	3.12	858	3.28	0.46
Market to book ratio (*MB*)	56,732	2.45	852	2.11	-8.38***
Profitability (*EBITD*) (%)	57,146	3.32	858	2.42	-5.63***
Capital Expenditure (*capx*) : %	57,146	10.24	858	12.01	5.01***

Panel D: Firms with high CEO pay performance sensitivity

Variables	N	Mean	N	Mean	t-value
		No shock		Shock	
Net Equity Issuance (*NEI[t+1Q,t+7 Q]*) : %	18,929	-2.80	235	-3.77	-1.61
Net Debt Issuance (*NDI[t+1 Q,t+7 Q]*) : %	18,929	3.70	235	2.37	-2.06**
Market to book ratio (*MB*)	18,929	2.40	235	2.03	-4.97***
Profitability (*EBITD*) (%)	18,929	4.77	235	3.95	-4.24***
Capital Expenditure (*capx*) : %	18,929	7.39	235	8.30	1.91*

Table 4 Summary Statistics of repurchasing firms and others

Table 4 compares the capital structure of the firms that repurchased shares in the quarter of shocks and those did not. All variables are measured at the fiscal quarter end and the sample period is between 1984 and 2011. Net equity issuance is the amount of equity issuance minus the amount of equity repurchases. Net debt issuance is the amount of debt issuance minus the amount of debt retirement. The negative long lasting stock return shock dummy is assigned 1 if there is more than one negative long lasting stock return dummy. Other variables are defined as described in Appendix A.

	Long Lasting Shock & Equity Repurchase	**Long Lasting Shock & no equity repurchase**	**Diff**
Variable	Mean	Mean	t-value
Market Lev chg[t-1]	-0.04	0.67	2.78***
Market Lev chg[t]	2.64	4.50	4.29***
Market Lev chg[t+1]	-0.08	-0.11	-0.12
Market Lev chg[t+1,t+3]	1.64	0.41	-2.03**
Market Lev chg[t+1,t+7]	2.54	0.35	-2.36**
Book Lev changes [t-1]	-0.56	0.52	3.79***
Book Lev chg[t]	1.67	0.19	-3.41***
Book Lev chg[t+1]	0.29	0.23	-0.18
Book Lev chg[t+1,t+3]	1.58	0.32	-2.28**
Book Lev chg[t+1,t+7]	1.70	0.44	-1.62
stock ret [t-1]	-2.89%	-1.81%	0.68
stock ret [t]	-24.58%	-28.06%	-2.65***
stock ret [t+1]	3.70%	-0.53%	-2.37**
stock ret [t+1,t+3]	1.58%	-4.29%	-1.74*
stock ret [t+1,t+7]	-1.58%	-4.60%	-0.54
Excess stock ret [t-1]	-8.90%	-2.90%	3.60***
Excess stock ret [t]	-30.61%	-38.97%	-3.81***
Excess stock ret [t+1]	5.34%	0.04%	-2.77***
Excess stock ret [t+1,t+3]	8.33%	-2.73%	-3.10***
Excess stock ret [t+1,t+7]	11.78%	-2.16%	-2.55**
Net equity issue[t-1]	-0.98	0.60	4.37***
Net equity issue[t]	-6.08	0.44	32.86***
Net equity issue[t+1]	-2.37	0.03	9.87***
Net equity issue[t+1,t+3]	-5.15	0.34	10.19***
Net equity issue[t+1,t+7]	-8.06	1.50	9.20***
Net debt issue[t-1]	-0.04	0.75	3.17***
Net debt issue[t]	1.56	0.32	-2.47**
Net debt issue[t+1]	0.63	0.33	-1.02
Net debt issue[t+1,t+3]	1.98	0.78	-1.97**
Net debt issue[t+1,t+7]	2.95	1.37	-1.71*
change in cash holdings [t-1]	-1.12	-0.48	0.97
chg in cash holdings [t]	-2.30	-0.29	3.64***
chg in cash holdings[t+1]	-0.82	-0.33	1.08
chg in cash holdings[t+1,t+3]	-1.90	-0.21	2.24**
chg in cash holdings[t+1,t+7]	-0.81	0.41	1.12

Table 5 Panel Regressions of Market and Book Leverage Changes on Adverse Stock Return Shock Measures

This table reports the results of panel regressions of changes in book and market leverage on negative stock return shock measures as well as other control variables. The sample includes all NYSE, Amex, and Nasdaq firms from 1984 to 2011, except for firms with a negative book equity value, a market-to-book asset ratio above 10, or total assets below $10 million, utility (SIC 6000-6999) and financial (SIC 4900-4999) firms, and firms with book leverage above 100%. Net equity issuance (*NEI*) is defined as the amount of equity issuance minus the amount of equity repurchases. Other variables are defined in Appendix A. ***, **, and * indicate that the coefficients are significantly different from zero at the 1%, 5%, and 10% significance levels, respectively. *T*-statistics based on clustered errors (firm) are reported in parentheses.

Dependent Variable	Market Lev Change		MLC[t+1]		MLC [t+1,t+7]		Book Lev Change [t]		BLC[t+1]		BLC[t+1,t+7]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
|ret / sigma| of long lasting negative shocks	2.75***		-0.26***		-0.82***		0.12*		0.17***		0.56***	
	(23.85)		(-3.14)		(-3.97)		(1.95)		(2.84)		(4.22)	
|ret / sigma| of transitory negative shocks	0.49***		-0.08		-0.91*		0.09		0.08		-0.39	
	(2.85)		(-0.29)		(-1.85)		(0.57)		(0.59)		(-1.05)	
The number of long lasting shocks		4.37***		-0.39***		-1.15***		0.21**		0.26***		0.82***
		(33.18)		(-3.23)		(-4.09)		(2.30)		(2.83)		(4.32)
The number of transitory shocks		0.21		-0.77		-1.42		-0.50		0.36		0.23
		(0.51)		(-1.61)		(-1.31)		(-1.52)		(1.08)		(0.27)
Stock return –	-	-					-	-	-	-	-	-
return of long lasting negative shock (*x*)	9.31***	9.30***	0.78***	0.78***	3.66***	3.65***	0.69***	0.69***	0.60***	0.60***	1.26***	1.26***
	(-47.98)	(-47.99)	(15.20)	(15.18)	(27.73)	(27.72)	(-17.65)	(-17.65)	(-15.90)	(-15.89)	(-14.07)	(-14.05)
Financial deficits (*FD*)	0.18***	0.18***	-0.02***	-0.02***	-0.06***	-0.06***	0.17***	0.17***	-0.03***	-0.03***	-0.09***	-0.09***
	(47.86)	(47.86)	(-7.72)	(-7.71)	(-10.39)	(-10.39)	(37.34)	(37.34)	(-14.69)	(-14.69)	(-16.77)	(-16.77)
Financial deficits dummy (*FDD*)	0.78***	0.78***	0.21***	0.21***	0.48***	0.48***	0.86***	0.86***	-0.02	-0.02	-0.10	-0.10
	(27.50)	(27.54)	(6.67)	(6.67)	(5.60)	(5.60)	(31.31)	(31.31)	(-0.69)	(-0.69)	(-1.43)	(-1.43)
Market to book ratio (*MB*)	-0.06**	-0.06**	0.59***	0.59***	2.00***	2.00***	-0.06***	-0.06***	0.19***	0.19***	1.04***	1.04***
	(-2.23)	(-2.20)	(30.47)	(30.47)	(25.08)	(25.09)	(-3.07)	(-3.06)	(10.76)	(10.75)	(15.03)	(15.02)
Profitability (*EBITD*) (%)	-0.06***	-0.06***	-0.18***	-0.18***	0.15***	0.15***	-0.18***	-0.18***	-0.06***	-0.06***	0.14***	0.14***
	(-8.25)	(-8.31)	(-21.55)	(-21.55)	(7.80)	(7.81)	(-23.62)	(-23.62)	(-7.71)	(-7.71)	(8.14)	(8.14)
Credit rating deficits (CD_{t-1})	0.08	0.08	-0.08	-0.08	-0.41	-0.41	0.30***	0.30***	0.11	0.11	-0.11	-0.11
	(0.84)	(0.81)	(-0.69)	(-0.70)	(-1.11)	(-1.10)	(3.58)	(3.58)	(1.30)	(1.30)	(-0.39)	(-0.39)
Changes in target credit rating (*dTRating*)	-0.69***	-0.69***	0.19*	0.19*	0.44*	0.44*	-0.33***	-0.33***	-0.05	-0.05	-0.14	-0.14
	(-8.39)	(-8.35)	(1.89)	(1.89)	(1.90)	(1.90)	(-4.69)	(-4.69)	(-0.73)	(-0.73)	(-0.83)	(-0.83)
Leverage deficit (*LdefB or M*[0,1])	0.10***	0.10***	0.10***	0.10***	0.50***	0.50***	0.11***	0.11***	0.08***	0.08***	0.43***	0.43***
	(58.40)	(58.35)	(63.35)	(63.33)	(71.55)	(71.54)	(59.13)	(59.13)	(60.62)	(60.61)	(69.66)	(69.67)
Change in target leverage (*dTlevB(M)*[0,1])	0.14***	0.14***	0.07***	0.07***	0.29***	0.29***	0.11***	0.11***	0.07***	0.07***	0.26***	0.26***
	(32.00)	(31.93)	(16.97)	(16.97)	(36.77)	(36.78)	(21.32)	(21.32)	(12.83)	(12.83)	(29.29)	(29.31)
Intercept	0.17	0.14	1.17	1.19	-3.25	-3.27	0.32	0.33	1.03	1.02	1.66	1.62
	(0.20)	(0.16)	(0.90)	(0.92)	(-1.06)	(-1.06)	(0.49)	(0.50)	(1.11)	(1.11)	(0.84)	(0.81)
Year & firm dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted *R*-square	0.370	0.370	0.0702	0.0702	0.264	0.264	0.159	0.159	0.0418	0.0418	0.210	0.210
Number of observations	249,940	249,940	240,804	240,804	190,857	190,857	249,940	249,940	240,804	240,804	190,857	190,857

Table 6 Panel Regressions of Net Equity Issuance and Net Debt Issuance on Adverse Stock Return Shocks

This table reports the results of panel regressions of net equity issuance on negative stock return shock measures as well as other control variables. The sample includes all NYSE, Amex, and Nasdaq firms from 1984 to 2011, except for firms with a negative book equity value, a market-to-book asset ratio above 10, or total assets below $10 million, utility (SIC 6000-6999) and financial (SIC 4900-4999) firms, and firms with book leverage above 100%. Net equity issuance (*NEI*) is defined as the amount of equity issuance minus the amount of equity repurchases. Other variables are defined in Appendix A. ***, **, and * indicate that the coefficients are significantly different from zero at the 1%, 5%, and 10% significance levels, respectively. *T*-statistics based on clustered errors (firm) are reported in parentheses.

Panel A: Net equity issuance

Dependent Variable	**Net Equity Issue[t]**		**Net Equity Issue[t+1]**		**Net Equity Issue[t+1,t+3]**		**Net Equity Issue[t+1,t+7]**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
|ret / sigma| of long lasting negative shocks	-0.21***		-0.21***		-0.51***		-0.75***	
	(-5.45)		(-7.64)		(-8.25)		(-6.39)	
|ret / sigma| of transitory negative shocks	-0.11*		-0.09*		-0.11		0.18	
	(-1.92)		(-1.95)		(-0.74)		(0.62)	
The number of long lasting shocks		-0.36***		-0.34***		-0.81***		-1.16***
		(-5.59)		(-7.24)		(-8.19)		(-6.29)
The number of transitory shocks		-0.12		-0.06		-0.30		0.12
		(-0.73)		(-0.44)		(-1.02)		(0.18)
Stock return –	0.35***	0.35***	0.77***	0.77***	1.54***	1.54***	1.88***	1.88***
return of long lasting negative shock (*x*)	(10.16)	(10.15)	(15.82)	(15.82)	(18.22)	(18.22)	(17.46)	(17.44)
Market to book ratio (*MB*)	0.65***	0.65***	0.71***	0.71***	1.15***	1.15***	1.14***	1.14***
	(26.62)	(26.60)	(26.50)	(26.50)	(19.12)	(19.12)	(10.30)	(10.30)
Profitability (*EBITD*) (%)	-0.05***	-0.05***	-0.05***	-0.05***	-0.12***	-0.12***	-0.25***	-0.25***
	(-9.06)	(-9.06)	(-11.47)	(-11.47)	(-10.29)	(-10.29)	(-10.46)	(-10.46)
Credit rating deficits (CD_{t-1})	-0.07	-0.07	-0.06	-0.06	-0.10	-0.10	-0.05	-0.05
	(-1.49)	(-1.48)	(-1.30)	(-1.30)	(-0.87)	(-0.87)	(-0.25)	(-0.25)
Changes in target credit rating (*dTRating*)	-0.07*	-0.07*	-0.14***	-0.14***	-0.31***	-0.31***	-0.50***	-0.50***
	(-1.94)	(-1.95)	(-4.26)	(-4.26)	(-4.75)	(-4.75)	(-4.30)	(-4.30)
Book leverage deficit (*LdefB*[0,1])	-0.02***	-0.02***	-0.02***	-0.02***	-0.04***	-0.04***	-0.08***	-0.08***
	(-18.96)	(-18.96)	(-15.17)	(-15.17)	(-14.82)	(-14.82)	(-13.14)	(-13.14)
Change in target leverage(*dTlevB*[0,1])	-0.05***	-0.05***	-0.02***	-0.02***	-0.05***	-0.05***	-0.08***	-0.08***
	(-13.67)	(-13.65)	(-6.68)	(-6.67)	(-11.40)	(-11.39)	(-12.18)	(-12.19)
Capital Expenditure (*capx*)	0.03***	0.03***	0.00***	0.00***	0.01***	0.01***	0.02***	0.02***
	(15.65)	(15.66)	(3.15)	(3.16)	(3.80)	(3.81)	(4.10)	(4.11)
Cash holdings ($cashR_{t-1}$)	-0.03***	-0.03***	-0.03***	-0.03***	-0.06***	-0.06***	-0.10***	-0.10***
	(-24.94)	(-24.94)	(-20.52)	(-20.53)	(-16.23)	(-16.24)	(-12.47)	(-12.47)
Intercept	0.26	0.27	-0.14	-0.14	1.42*	1.42*	5.28***	5.29***
	(0.60)	(0.60)	(-0.38)	(-0.38)	(1.66)	(1.67)	(3.84)	(3.84)
Year & firm dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted *R*-square	0.0400	0.0401	0.0414	0.0414	0.0579	0.0579	0.0644	0.0644

Number of observations	245,662	245,662	236,713	236,713	219,101	219,101	187,622	187,622

Panel B: Net debt issuance

Dependent Variable	**Net Debt Issue[t]**		**Net Debt Issue[t+1]**		**Net Debt Issue[t+1,t+3]**		**Net Debt Issue[t+1,t+7]**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
|ret / sigma| of long lasting negative shocks	-0.01		0.05		0.08		-0.02	
	(-0.17)		(1.02)		(0.95)		(-0.14)	
|ret / sigma| of transitory negative shocks	-0.01		-0.08		-0.40**		-0.35	
	(-0.09)		(-0.91)		(-2.26)		(-1.01)	
The number of long lasting shocks		-0.04		0.05		0.12		-0.02
		(-0.51)		(0.64)		(0.87)		(-0.10)
The number of transitory shocks		0.26		-0.06		-0.77		-0.07
		(0.86)		(-0.22)		(-1.60)		(-0.07)
Stock return –	0.01	0.01	-0.15***	-0.15***	-0.29***	-0.29***	-0.13	-0.13
return of long lasting negative shock (x)	(0.41)	(0.42)	(-4.49)	(-4.48)	(-5.11)	(-5.11)	(-1.35)	(-1.34)
Market to book ratio (*MB*)	-0.09***	-0.09***	0.32***	0.32***	0.78***	0.78***	1.37***	1.37***
	(-5.09)	(-5.10)	(17.51)	(17.50)	(16.57)	(16.57)	(14.47)	(14.47)
Profitability (*EBITD*) (%)	-0.00	-0.00	-0.02***	-0.02***	0.05***	0.05***	0.17***	0.17***
	(-0.33)	(-0.33)	(-4.51)	(-4.51)	(4.31)	(4.31)	(8.87)	(8.87)
Credit rating deficits (CD_{t-1})	-0.07	-0.07	-0.27***	-0.27***	-0.74***	-0.74***	-1.62***	-1.62***
	(-0.84)	(-0.84)	(-3.07)	(-3.07)	(-3.82)	(-3.82)	(-4.58)	(-4.58)
Changes in target credit rating (*dTRating*)	-0.18**	-0.18**	-0.03	-0.03	0.13	0.13	0.12	0.12
	(-2.27)	(-2.27)	(-0.35)	(-0.35)	(1.04)	(1.04)	(0.57)	(0.58)
Book leverage deficit (*LdefB*[0,1])	0.05***	0.05***	0.05***	0.05***	0.14***	0.14***	0.29***	0.29***
	(37.92)	(37.92)	(37.25)	(37.25)	(37.56)	(37.56)	(35.87)	(35.87)
Change in target leverage(*dTlevB*[0,1])	0.05***	0.05***	0.05***	0.05***	0.11***	0.11***	0.19***	0.19***
	(14.29)	(14.29)	(13.96)	(13.96)	(20.38)	(20.38)	(24.07)	(24.09)
Capital Expenditure (*capx*)	0.09***	0.09***	0.03***	0.03***	0.06***	0.06***	0.08***	0.08***
	(29.55)	(29.56)	(17.32)	(17.32)	(18.14)	(18.14)	(13.69)	(13.69)
Cash holdings ($cashR_{t-1}$)	-0.02***	-0.02***	-0.01***	-0.01***	-0.02***	-0.02***	-0.02**	-0.02**
	(-16.97)	(-16.97)	(-10.04)	(-10.03)	(-6.66)	(-6.65)	(-2.48)	(-2.48)
Intercept	-0.74	-0.75	0.40	0.40	-1.33	-1.33	2.42	2.40
	(-0.93)	(-0.94)	(0.67)	(0.67)	(-0.90)	(-0.90)	(0.90)	(0.89)
Year & firm dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted *R*-square	0.0391	0.0391	0.0248	0.0248	0.0629	0.0629	0.115	0.115
Number of observations	245,662	245,662	236,713	236,713	219,101	219,101	187,622	187,622

Table 7 Panel Regressions of Net Equity and Debt Issuance on Adverse Stock Return Shock Measures With High Abnormal Cash Holdings Dummy and Almost Zero Leverage Dummy

This table reports the results of panel regressions of net equity issuance on negative stock return shock measures as well as other control variables. The sample includes all NYSE, Amex, and Nasdaq firms from 1984 to 2011, except for firms with a negative book equity value, a market-to-book asset ratio above 10, or total assets below $10 million, utility (SIC 6000-6999) and financial (SIC 4900-4999) firms, and firms with book leverage above 100%. Net equity issuance (*NEI*) is defined as the amount of equity issuance minus the amount of equity repurchases. High abnormal cash holdings dummies are 1 if firms have cash holdings minus industry average higher than the median of total sample in the same fiscal quarter. High PPS dummy is assigned 1 if the firms have higher pay performance sensitivity (pps) greater than the median of the fiscal quarter and 0 otherwise. Industries are classified based on 2-digit SIC. Industries are classified based on 2-digit SIC. Other variables are defined in Appendix A. ***, **, and * indicate that the coefficients are significantly different from zero at the 1%, 5%, and 10% significance levels, respectively. *T*-statistics based on clustered errors (firm) are reported in parentheses.

Panel A: High abnormal cash holdings dummy

Dependent Variable	**Net Equity Issue [t+1]**		**Net Equity Issue [t+1,t+3]**		**Net Equity Issue [t+1,t+7]**		**Net Debt Issue [t+1]**		**Net Debt Issue [t+1,t+3]**		**Net Debt Issue [t+1,t+7]**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
|ret / sigma| of long lasting negative shocks	-0.15***		-0.38***		-0.53***		0.07		0.06		-0.20	
	(-4.42)		(-5.35)		(-3.72)		(0.99)		(0.41)		(-0.81)	
|ret / sigma|	-0.13**		-0.28**		-0.43*		-0.04		0.06		0.35	
* High abnormal cash holdings dummy	(-2.36)		(-2.23)		(-1.79)		(-0.49)		(0.35)		(1.17)	
|ret / sigma| of transitory negative shocks	-0.09*		-0.11		0.18		-0.08		-0.40**		-0.35	
	(-1.95)		(-0.74)		(0.61)		(-0.91)		(-2.26)		(-1.00)	
The number of long lasting shocks		-0.22***		-0.59***		-0.71***		0.10		0.06		-0.41
		(-3.53)		(-4.96)		(-3.15)		(0.91)		(0.27)		(-1.23)
The number of long lasting shocks		-0.25***		-0.45**		-0.92**		-0.11		0.13		0.80*
* High abnormal cash holdings dummy		(-2.71)		(-2.27)		(-2.42)		(-0.78)		(0.50)		(1.89)
The number of transitory shocks		-0.06		-0.30		0.12		-0.05		-0.77		-0.07
		(-0.43)		(-1.01)		(0.18)		(-0.22)		(-1.60)		(-0.07)
High abnormal cash holdings dummy	0.01	0.01	-0.03	-0.03	-0.11	-0.10	-0.08**	-0.08**	-0.20***	-0.20***	-0.20	-0.21
	(0.31)	(0.34)	(-0.53)	(-0.52)	(-0.86)	(-0.84)	(-2.27)	(-2.26)	(-2.58)	(-2.58)	(-1.32)	(-1.34)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted *R*-square	0.0414	0.0414	0.0579	0.0579	0.0644	0.0645	0.0249	0.0249	0.0629	0.0629	0.115	0.115
Number of observations	236,713	236,713	219,101	219,101	187,622	187,622	236,713	236,713	219,101	219,101	187,622	187,622

Panel B: Almost Zero Leverage Dummy

Dependent Variable	Net Equity Issue [t+1]		Net Equity Issue [t+1,t+3]		Net Equity Issue [t+1,t+7]		Net Debt Issue [t+1]		Net Debt Issue [t+1,t+3]		Net Debt Issue [t+1,t+7]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
|ret / sigma| of long lasting negative shocks	-0.14***		-0.32***		-0.51***		0.02		-0.02		-0.40*	
	(-5.33)		(-4.86)		(-4.23)		(0.38)		(-0.21)		(-1.86)	
|ret / sigma| of long lasting negative shocks * Almost Zero Market Lev dummy	-0.18***		-0.51***		-0.57**		0.08		0.32*		1.04***	
	(-2.68)		(-3.57)		(-2.16)		(0.87)		(1.91)		(3.47)	
|ret / sigma| of transitory negative shocks	-0.09*		-0.11		0.19		-0.08		-0.40**		-0.35	
	(-1.90)		(-0.71)		(0.66)		(-0.91)		(-2.26)		(-1.03)	
The number of long lasting shocks		-0.20***		-0.49***		-0.67***		-0.02		-0.10		-0.80***
		(-3.88)		(-4.50)		(-3.47)		(-0.17)		(-0.54)		(-2.58)
The number of long lasting shocks * Almost Zero Market Lev dummy		-0.34***		-0.81***		-1.20***		0.17		0.60**		2.04***
		(-3.24)		(-3.64)		(-2.93)		(1.25)		(2.29)		(4.73)
The number of transitory shocks		-0.06		-0.31		0.12		-0.05		-0.77		-0.07
		(-0.46)		(-1.03)		(0.19)		(-0.22)		(-1.60)		(-0.07)
Almost Zero Market Lev dummy	-0.22***	-0.22***	-0.44***	-0.44***	-0.57***	-0.57***	-0.01	-0.01	0.01	0.01	0.03	0.02
	(-6.02)	(-6.00)	(-4.69)	(-4.68)	(-3.01)	(-2.98)	(-0.18)	(-0.20)	(0.11)	(0.09)	(0.13)	(0.09)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted *R*-square	0.0416	0.0416	0.0582	0.0583	0.0647	0.0647	0.0248	0.0248	0.0629	0.0629	0.115	0.115
Number of observations	236,713	236,713	219,101	219,101	187,622	187,622	236,713	236,713	219,101	219,101	187,622	187,622

Panel C : High PPS dummy

Dependent Variable	Net Equity Issue [t+1]		Net Equity Issue [t+1,t+3]		Net Equity Issue [t+1,t+7]		Net Debt Issue [t+1]		Net Debt Issue [t+1,t+3]		Net Debt Issue [t+1,t+7]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
|ret / sigma| of long lasting negative shocks	-0.19**		-0.28**		-0.00		0.16		0.28		0.32	
	(-2.55)		(-1.96)		(-0.01)		(1.53)		(1.30)		(0.84)	
|ret / sigma| of long lasting negative shocks	-0.23**		-0.32		-0.55		0.05		-0.04		0.17	
* High PPS dummy	(-1.99)		(-1.36)		(-1.37)		(0.27)		(-0.13)		(0.33)	
|ret / sigma| of transitory negative shocks	-0.16		0.62		0.26		-0.37		-0.36		2.67**	
	(-0.71)		(1.17)		(0.16)		(-0.72)		(-0.27)		(2.02)	
The number of long lasting shocks		-0.24**		-0.33		-0.01		0.31*		0.38		0.42
		(-2.23)		(-1.51)		(-0.03)		(1.70)		(1.13)		(0.75)
The number of long lasting shocks		-0.39**		-0.57*		-0.86		-0.08		0.01		0.29
* High PPS dummy		(-2.29)		(-1.72)		(-1.45)		(-0.32)		(0.03)		(0.40)
The number of transitory shocks		-0.18		0.71		1.45		0.01		0.06		2.07
		(-0.52)		(1.14)		(1.39)		(0.01)		(0.02)		(0.80)
High PPS dummy	-0.05	-0.05	-0.18	-0.18	-0.75***	-0.75***	0.04	0.05	0.36**	0.36**	0.80**	0.80**
	(-1.36)	(-1.32)	(-1.55)	(-1.53)	(-2.77)	(-2.77)	(0.69)	(0.73)	(1.98)	(1.97)	(2.10)	(2.10)
Other control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted *R*-square	0.0458	0.0458	0.0758	0.0758	0.110	0.110	0.025	0.025	0.068	0.068	0.123	0.123
Number of observations	50,137	50,137	46,192	46,192	38,760	38,760	50,137	50,137	46,192	46,192	38,760	38,760

Table 8 Logit Regressions of Equity Repurchasing Dummy on Adverse Stock Return Shock Measures

This table reports the results of logit regressions of equity repurchasing dummy on negative stock return shock measures as well as other control variables. The sample includes all NYSE, Amex, and Nasdaq firms from 1984 to 2011, except for firms with a negative book equity value, a market-to-book asset ratio above 10, or total assets below $10 million, utility (SIC 6000-6999) and financial (SIC 4900-4999) firms, and firms with book leverage above 100%. Equity Repurchasing dummy is 1 if a firm repurchase equity more than 3% of book asset. Industry dummies are constructed based on 2-digit SIC. Other variables are defined in Appendix A. ***, **, and * indicate that the coefficients are significantly different from zero at the 1%, 5%, and 10% significance levels, respectively. *T*-statistics based on clustered errors (firm) are reported in parentheses.

Dependent Variable	**Equity Repurchasing Dummy[t+1]**		**Equity Repurchasing Dummy[t+1,t+3]**		**Equity Repurchasing Dummy[t+1,t+7]**	
	(1)	(2)	(3)	(4)	(5)	(6)
|ret / sigma| of long lasting negative shocks	0.38***		0.19***		0.08**	
	(7.57)		(4.58)		(2.03)	
|ret / sigma| of transitory negative shocks	0.03		-0.11		-0.31*	
	(0.13)		(-0.63)		(-1.88)	
The number of long lasting negative shocks		0.60***		0.30***		0.12**
		(7.20)		(4.73)		(1.96)
The number of transitory negative shocks		-0.35		-0.15		-0.51*
		(-0.70)		(-0.51)		(-1.93)
Stock return –	-0.66***	-0.66***	-0.54***	-0.54***	-0.45***	-0.45***
return of long lasting negative shock (*x*)	(-12.92)	(-12.89)	(-16.81)	(-16.80)	(-17.23)	(-17.22)
Market to book ratio (*MB*)	0.21***	0.21***	0.17***	0.17***	0.10***	0.10***
	(19.98)	(20.00)	(22.52)	(22.54)	(15.43)	(15.43)
Profitability (*EBITD*) (%)	0.15***	0.15***	0.16***	0.16***	0.16***	0.16***
	(39.83)	(39.78)	(59.69)	(59.68)	(67.46)	(67.46)
Credit rating deficits (CD_{t-1})	0.04	0.04	0.15**	0.15**	0.20***	0.20***
	(0.33)	(0.32)	(2.14)	(2.14)	(3.40)	(3.40)
Changes in target credit rating (*dTRating*)	0.02	0.02	0.27***	0.27***	0.27***	0.27***
	(0.14)	(0.15)	(3.91)	(3.92)	(4.66)	(4.66)
Book leverage deficit (*LdefB*[0,1])	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	(17.44)	(17.41)	(32.69)	(32.69)	(40.89)	(40.90)
Change in target book leverage (*dTlevB*[0,1])	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	(4.50)	(4.48)	(8.05)	(8.04)	(7.81)	(7.82)
Capital Expenditure (*capx*)	-0.02***	-0.02***	-0.03***	-0.03***	-0.03***	-0.03***
	(-11.97)	(-12.00)	(-21.21)	(-21.22)	(-26.35)	(-26.35)
Cash holdings ($cashR_{t-1}$)	0.02***	0.02***	0.01***	0.01***	0.01***	0.01***
	(20.97)	(20.96)	(24.24)	(24.23)	(22.95)	(22.95)
Constant	-5.66***	-5.65***	-5.62***	-5.62***	-3.80***	-3.80***
	(-5.02)	(-5.01)	(-5.25)	(-5.26)	(-5.73)	(-5.74)
Year & Industry dummies	Yes	Yes	Yes	Yes		
Number of observations	236,655	236,655	219,057	219,057	187,598	187,598