Finding market timing patterns when they are unlikely to exist*

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March, 2018

Abstract

We show that periods during which firms issue equity and simultaneously retire debt reflect market timing patterns: such leverage decreasing recapitalizations (LDRs) occur during periods of high equity valuation which subsequently decrease. Nevertheless, market timing is unlikely to explain those issues as the documented pattern also persists in case creditors likely have substantial control rights - such as firms with high leverage or those violating financial covenants. Instead, we show that the subsequent decrease in valuation ratios is driven by physical investment which is consistent with an ex-post exercise of growth options. This interpretation is further supported by asset pricing tests.

Keywords: equity issue; recapitalization; market timing; covenants; earnings management

*We have benefitted from the comments and suggestions of Leonidas Barbopoulos, Paul Borochin, Ettore Croci, Amil Dasgupta, Ran Duchin, Halit Gonenc, Gerard Hoberg, Tim Jenkinson, Minna Martikainen, Francisco Santos, Sebastian Stoeckl and Kate Suslava. We also thank seminar participants at the 2017 European Financial Management Association (doctoral seminar) and the Norwegian School of Economics.

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1 Introduction

It is a well known fact that firms tend to issue equity when share valuations are high (Asquith and Mullins, 1986; Masulis and Korwar, 1986). Moreover, these firms experience pre-issue stock price run-ups that are large and positive, whereas (abnormal) returns following a seasoned equity offering (SEO) are often negative (Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995). However, there is little agreement as to the underlying explanation for these empirical findings.

For example, Baker and Wurgler (2002) suggest that market timing efforts drive equity issues and thereby capital structure choices. Leary and Roberts (2005), on the other hand, conclude that the high valuations reflect growth opportunities and that the corresponding effect on capital structures can be rationalized with the existence of leverage adjustment costs. Kim and Weisbach (2008) observe that firms stockpile cash following periods of equity issues and argue this behavior is consistent with market timing efforts. DeAngelo, DeAngelo, and Stulz (2010) instead argue that the increase in cash reflects asset growth effects and that - without the SEO - firms would have quickly run out of funds.

Turning to the estimation of abnormal returns, Butler, Cornaggia, Grullon, and Weston (2011) find that investment based factor models explain the negative stock return of firms doing seasoned equity offerings. However, Lewis and Tan (2016) show that managers are more likely to issue equity when analysts are optimistic about long-term growth prospects. Further controlling for research and development ($R\&D$) expenses in cross-sectional return regressions, they suggest that abnormal returns of equity issuers are negative and interpret this as consistent with a managerial attempt to time the market. Finally, Huang and Ritter (2017) show that the frequency and size of equity (and debt) issues is negatively correlated with future abnormal stock returns.

In this paper, we take a different route and investigate the potential impact of market timing efforts by focusing on an over-looked subsample of equity issuers: firms that perform a leverage decreasing recapitalization (LDR) by issuing equity and using a significant amount of the proceeds to actively retire debt. The focus on LDRs is interesting for several reasons. First, it attempts to isolate periods of neutral asset growth and could therefore help in identifying the impact of market timing efforts. Second, because shareholders would never find it optimal to recapitalize to a lower leverage outside of bankruptcy or strategic debt renegotiation (Fischer et al., 1989; Leland, 1994; Goldstein et al., 2001; Strebulaev, 2007; Admati et al., 2017), their existence likely reflects the exercise of creditor control rights. As a consequence, it becomes less likely that market timing efforts drive these equity issues.

Using a large Compustat sample of 13,651 firms (137,688 firm-years) over the period from 1971 to 2015, we define LDRs by employing information from a company's cash flow statement and requiring that both net equity issues (NEIs) and net debt retirements (NDRs) exceed at least 5% of the book value of assets. While the size threshold is standard (Hovakimian, Opler, and Titman, 2001; Leary and Roberts, 2005), the definition also includes private equity issues and we therefore supplement all results for a subsample of LDRs which issue public equity (information obtained from SDC, henceforth referred to as public LDRs).[1] We find that LDRs account for 20 percent of all observed NEIs. Moreover, the latter become more frequent during boom periods whereas this is not the case for LDRs. To the extent that market timing is more prevalent during hot markets, this raises the possibility that LDRs are driven by other factors than the average NEI.

Turning to firm characteristics, we find that firms performing LDRs have higher leverage and lower cash holdings than the full sample of net equity issuers. Interestingly, both groups of issuers are on average unprofitable, invest substantial amounts into both *Capex* and *R&D* and are valued at high valuation ratios (Q). Contrary to the findings in Teoh, Welch, and Wong (1998) and Rangan (1998), we find no evidence that firms issuing net equity or undertaking a LDR are likely to inflate earnings upwards by opportunistically altering discretionary accounting accruals (Dechow, Sloan, and Sweeney, 1995). This finding is may reflect the evidence in Givoly and Hayn (2000) who report a general tendency among U.S. public corporates to report financial statements more conservatively.[2]

[1] As will be shown through-out the paper, our results are not sensitive to this difference in the LDR definition.

[2] We also find that losses of equity issuers (LDR firms) continue to increase in magnitude after the 2005 Securities Offering Reform (SOR). Our descriptive evidence is thus consistent with Clinton, White, and Woidtke (2014) and Shroff, Sun, White, and Zhang (2013) who show that firms did not opportunistically use the relaxed reporting guidelines ahead of the security issues.

We then investigate whether the equity valuation dynamics of LDR firms exhibit patterns which are consistent with a market timing interpretation. We first show that LDR firms are subject to stock price run-ups and that (ex-post) market adjusted returns of LDR firms are flat or slightly negative. The pattern is similar when using the market-to-book ratio. We then control for several fundamental factors by adjusting the valuation framework of Fama and French (1998) to specifically account for LDRs. This framework relates a scaled version of the market-to-book ratio (precisely its excess value over one) to various fundamental factors and an indicator variable indicating the presence of a LDR. Our findings suggest that LDRs take place during periods of high valuation which are followed by a decrease in valuation ratios. This result is robust and obtains for both small and large firms. While the pattern is thus similar to the sample of net equity issuers, we argue that it is only a necessary (though not necessarily sufficient) condition for the presence of successful market timing abilities.

In fact, as evidenced by the documented disagreement in the literature, it is very difficult to disentangle market timing efforts from rational behavior in the context of growth opportunities. In other words, equity values could be high because the company faces substantial (yet unexercised) growth opportunities and the LDR solely occurs in an attempt to mitigate the debt overhang problem (Myers, 1977). Because the market-to-book ratio (or variants of it) identify both periods of high equity valuations (market timing) and the presence of growth opportunities, it is hard to distinguish between the two forces - even in the context of a valuation model that controls for research and development expenses (among its fundamental factors) in an attempt to isolate growth opportunities.

We address this problem using capital structure theory to guide our test design. Dynamic trade-off theory of capital structure implies that LDRs should not exist outside of bankruptcty or strategic debt renegotitation (Fischer, Heinkel, and Zechner, 1989; Leland, 1994; Goldstein, Ju, and Leland, 2001; Strebulaev, 2007; Admati, DeMarzo, Hellwig, and Pfleiderer, 2017; Abel, 2017). Our descriptive evidence shows that close to half of all LDRs occur among firms placed in the highest two quintiles of the market leverage distribution for the full sample of firms.[3] We further hypothesize that for those firms, market timing efforts are (even more) unlikely to be the main driver of the recapitalization. The underlying intuition is that those firms are likely in financial distress and there is evidence showing that those firms have low (as opposed to high) stock returns (Campbell, Hilscher, and Szilagyi, 2008).

Relatedly, contracting theory rationalizes the existence of debt covenants to mitigate the ex-post suboptimality of LDRs (Smith and Warner, 1979; Aghion and Bolton, 1992; Dewatripont and Tirole, 1994). That is, shareholders and creditors can agree ex-ante on a set of (financial) covenants which the company must meet. If breached, creditors typically gain substantial control rights which can force the company to issue equity. Focusing on a subsample of firms that can be merged with the data on covenant violations in Nini, Smith, and Sufi (2009), we find that LDR firms are indeed more likely to violate covenants than the average firm. We hypothesize that for those firms, market timing efforts are again unlikely to be the main driver of the recapitalization.

However, our findings show that the positive relation between LDR and equity value (as well as the subsequent decrease in valuation ratios) also exists among firms with high leverage (absolute and industry-adjusted), for those that are over-levered or among firms that violated financial covenants. We therefore argue that market timing considerations are unlikely to be the driving force as - by construction - creditors have substantial influence over the firm in these cases.

In other words, we find market timing patterns where they are unlikely to exist. Our findings thus cast doubt over the use of equity value dynamics (which drive valuation ratios) in the attempt to identify market timing efforts and we thereby complement the critique of DeAngelo, DeAngelo, and Stulz (2010) who argue that a successful market timing theory also needs to explain why many firms with high valuation ratios choose not to issue equity.

An alternative interpretation of these patterns is that the existence of growth opportunities has an important impact on the decision of firms to undertake a leverage decreasing recapiatlization

[3]Findings are similar if we sort based on lagged excess industry leverage or in case we first estimate leverage targets and then focus on firms that are over-levered. Those results will be supplemented below, but are not discussed separately in the introduction.

(Myers, 1977). Accordingly, we show that investment rates increase substantially in periods following recapitalizations which is consistent with a subsequent exercise of growth options. Moreover, the simultaneous decrease in valuation ratios could reflect a decrease in the firm's risk (Carlson, Fisher, and Giammarino, 2004). Relatedly, we show that abnormal returns following periods of LDRs are statistically indistinguishable from zero and load negatively on the value factor (Fama and French, 1992, 2015). Taken together, our findings are difficult to square with the market timing hypothesis but are consistent with a rational decrease in valuation ratios of LDR firms due to the exercise of growth opportunities.

Our paper is most closely related to Autore, Bray, and Peterson (2009) and Hertzel and Li (2010). Autore, Bray, and Peterson (2009) investigate the relation between the stated use of proceeds and the subsequent stock and operating performance of the issuer. While they find significant negative performance if the SEO finances a recapitalization, the analysis is based on a relatively small sample of 257 issuers over the period from 1997 to 2003. Hertzel and Li (2010) decompose a firm's market-to-book ratio into components reflecting over-valuation and growth opportunities and find that debt reductions are more likely to follow SEOs in case the firm was estimated to be overvalued.

Our study is instead based on a large sample of approximately 3,000 LDRs which take place over a period of four decades and are therefore not specific to a special period such as the burst of the dot-com bubble. We contribute to the literature by expanding beyond pure debt reductions as we condition our analysis on situations where creditors are likely to exercise control rights in conjunction with those issues. Examples include the direct violation of bond covenants, but also situations where creditor control is likely such as firms with high (excess) leverage. Moreover, we show that abnormal stock returns - as opposed to gross returns or valuation ratios - are not low relative to several asset pricing models.

The paper proceeds as follows. Section 2 presents the sample and provides descriptive evidence on LDR. Section 4 estimates the impact of LDR on shareholder value, while Section 5 attempts to provide explanations for the observed valuation effect of LDR. Section 6 concludes the paper.

2 Data and descriptive evidence

2.1 Sample Construction

The sample consists of U.S. public industrial corporations listed on Crisp/Compustat (CCM) over the period from 1971 to 2015. As usual, we exclude financial firms, utilities and government entities. In addition, we require the availability of one-year lagged information on our main variables (to be introduced below). Finally, we merge the CCM sample with Crsp (and SDC) and require the availability of trailing twelve months stock returns. All other sample selection criteria are standard and are listed in Table 1. The final sample consists of 13,651 firms and 137,688 firm-years.

We focus on leverage decreasing recapitalizations (LDR) which we define as periods during which firms issue equity and use the proceeds to retire debt. This definition is consistent with dynamic trade-off of capital structure (Fischer, Heinkel, and Zechner, 1989) in which cash holdings are absent and, moreover, any period of capital structure inactivity is driven by security issuance costs. We define LDRs using information obtained from a company's cash flow statement which includes public as well as private equity issues:

$$LDR_t = 1 \;\; if \;\; NEI_t = 1 \;\; and \;\; NDR_t = 1 \tag{1}$$

$$NEI_t = 1 \;\; if \;\; \frac{nei_t}{a_t} > th \tag{2}$$

$$NDR_t = 1 \;\; if \;\; \frac{ndi_t}{a_t} < -th \tag{3}$$

where nei are common and preferred stock issues net of dividends and share repurchases, a is the book value of assets) and ndi are short and long-term debt issues net of debt retirement. The variable th is a size threshold which is set equal to 5%. While the size of the threshold is standard (Hovakimian, Opler, and Titman, 2001; Leary and Roberts, 2005), the LDR definition includes private equity issues which is why we also provide results separately for LDRs that happen in periods when the firm issues public equity (information obtained from SDC, referred to as public LDRs).

The focus on LDRs is driven by the objective to identify a financial transaction for which market timing is ex-ante relatively unlikely. The above definition is therefore based on net (as opposed to gross) equity issues and it requires a significant retirement of net debt. The latter part is crucial because dynamic trade-off models of capital structure imply that LDRs should not exist outside bankruptcy or strategic debt renegotiation as the recapitalization involves a transfer of wealth from shareholders to bondholders (Danis, Rettl, and Whited, 2014; Eckbo and Kisser, 2017).

Table 2 displays annual values for the numbers of U.S. publicly listed firms (column 1), net equity issues (NEIs) and LDRs. Column 2 shows that the number of NEIs exhibits substantial variation over time and peaks in the late 1990s. The dynamics are similar if one conditions on public $NEIs$ (column 3), though the absolute frequency is reduced by approximately 60 percent. Columns 4 and 5 show frequencies of LDRs (all and public) and columns 6 and 7 further display the fraction of LDRs relative to NEIs. On average, every fifth NEI finances a major debt retirement (irrespective of whether the equity issue involves public or private equity). Finally, columns 4 to 7 further suggest that LDRs become relatively less (more) frequent in periods of high (low) net issue activity. To the extent that market timing is more prevalent during hot markets, the descriptive information raises the possibility that LDRs are driven by other factors than the average net equity issue.

Table 3 compares selected characteristics for firms performing NEIs and LDRs. The table confirms that capital structure differs across the two groups as leverage (market and book) is substantially lower for the full sample of net equity issuers. For example, column 1 shows that market leverage equals 15% in the year preceding the NEI and subsequently decreases to 14%. For LDR firms, on the other hand, the effect of the LDR on leverage is substantial as market leverage decreases from 29% to 18% (column 3). Furthermore, the LDR leads 8% of all firms to become all-equity financed and 35% almost all-equity financed (which we define as those with a market leverage of less than 5% (Strebulaev and Yang, 2013)), suggesting an active decision to abstain from debt financing.[4]

Interestingly, firms performing either a NEI or a LDR are highly unprofitable. The average ratio of operating profits to assets is -8% for LDR firms, -16% for NEI firms but +7% for the average sample firm (untabulated). Publicly financed LDRs tend to be more profitable (-1%). The large operating losses of firms performing NEIs differ starkly from the earnings management patterns documented in Teoh, Welch, and Wong (1998) and Rangan (1998). These papers find that - surrounding SEOs - firms report positive earnings which are further inflated by opportunistically altering discretionary accounting accruals.

Table 4 show that while we find a similar pattern until 1989, this trend has not continued. From 1990 onwards, average earnings of public NEIs are consistently negative and - most of the time - even lower than operating cash flow. In other words, total accounting accruals are negative in the post 1989 period (and estimated discretionary accruals are close to zero). While losses of firms undertaking public LDRs are less severe, accruals (total and estimated discretionary) are non-positive, reducing the overall likelihood of earnings management activities.

Returning to Table 3, the significant operating losses reflect heavy investment into $R\&D$ which equals 9% (LDR) and 12% (NEIs). Furthermore, both groups also invest heavily into capital expenditures (8% on average). Notwithstanding the low current profitability, market-to-book ratios (Q) are high for firms performing either a NEI or a LDR. Absolute values exceed two and continue to be positive when adjusting for industry effects (untabulated).[5]

2.2 LDRs, financial distress and covenant violations

Trade-off theory of capital structure implies that firms recapitalize only when close to bankruptcy as such a transaction transfers wealth from shareholders to bondholders (Danis, Rettl, and Whited,

[4]While LDR firms have substantial cash holdings (18%), they are - nevertheless - dwarfed by those of net equity issuers (30%).

[5]To be precise, we compute yearly values of industry median Q using the three-digit SIC code and then subtract these values from Q for each firm. In this case, average values of excess Q are 1.35 (all net equity issuers), 1.01 (public net equity issuers), 0.89 (all LDR firms) and 0.65 (public LDRs).

2014; Admati, DeMarzo, Hellwig, and Pfleiderer, 2017). While early recapitalizations are thus viewed as suboptimal in standard trade-off models, their existence may nevertheless be rationalized by bond covenants or (for researchers unobserved) agreements with private creditors which can induce shareholders to credibly commit to pro-active leverage reductions (Nini, Smith, and Sufi, 2009).

To shed light on the timing of LDRs, Table 5 categorizes LDR firms based on two alternative measures of leverage. In Panel A, we first compute the distribution of lagged market leverage using the full sample of 137,688 firm-years and then employ the corresponding quintile cutoff values to categorize LDR firms into five different leverage groups (ranging from low to high). In Panel B, the classification is done using quintile cutoff values from the distribution of market leverage relative to the industry median leverage ratio in that year (henceforth referred to as excess industry leverage).[6]

Panel A confirms that LDR firms on average have relatively high leverage as only 2% are placed in the lowest leverage quintile. Nearly half of all LDR firms place in the two highest leverage quintiles with an average leverage ratio of 49% (column 3) in the year prior to the LDR. For those LDRs, the average size of the net equity issue (column 8) and net debt retirement (column 9) are similar, economically significant (22% and 19% of assets, respectively) and they reduce average leverage to 31% (column 5). This is reassuring and suggests that the recapitalization is likely to be the main driver of the financing decision.

Focusing on the LDR firms in the highest two leverage quintiles, we find that average profitability (column 7) is positive, Q is lower and closer to one (column 13) and the high absolute levels of leverage likely reflect distress. Column 14 shows that the fraction of LDR firms with an implied junk credit rating equals 79%.[7] Relatedly, column 15 presents the deviation from an

[6] While not tabulated, we have also computed excess leverage relative to an estimated target leverage ratio. The findings are similar to those in Panel B, yet the number of observations is reduced from 3,533 to 2,315 LDRs.

[7] The estimation maps the interest coverage ratio (ICR) onto credit ratings. The ICR is a measure of the firm's ability to make payments to creditors and it compares a firm's earnings before interest and taxes (EBIT) to the level of interest payments. Using Damodaran's mapping table (displayed in Appendix Table 2), we then assign a synthetic credit rating for each sample firm. The notation is based on Standard and Poor's (S&P): AAA ratings denote the safest assets, ratings below BBB are referred to as non-investment grade and D identifies bankruptcy.

estimated leverage target and shows that the deviation is positive and equal to 9%, on average.[8]

Turning to lower levels of initial leverage, we instead find that the size of net equity issues and net debt retirements differ and simultaneously observed asset growth (column 12) increases significantly. This raises the possibility that those LDRs might arise as a by-product of mergers and acquisitions. Our analysis below will account for those differences.

Panel B displays the same variables as in Panel A, but now assigns LDR firms into groups using the distribution of the excess industry leverage in the year preceding the transaction. This alternative assignment increases the fraction of LDR firms in the two highest quintiles to 62%, but decreases average market leverage for those firms to 38% in the year preceding the LDR. Relative to Panel A, the average size of net equity issue and net debt retirement deviates more for those firms (32% and 20%, respectively).[9]

Taken together, the descriptive evidence suggests that sorting LDR firms based on absolute market leverage is helpful in identifying firms which undertake the LDR primarily for reasons of restructuring. The superiority of absolute (as opposed to excess industry) leverage may reflect the documented descriptive evidence showing that within-industry variation in leverage is substantially larger than across-industry variation (Graham and Leary, 2011).

Finally, we stress that the existence of LDRs among firms with relatively low leverage may also reflect the exercise of creditor control as the violation of bond covenants (or agreements with private creditors) might force the firm to restructure relatively early. To test whether this is the case, we also merge our sample with data on covenant violations obtained from Nini, Smith, and Sufi (2009). This dataset is based on quarterly SEC filings for public U.S. corporations over the period from 1996 to 2008. For those firms, the authors identify whether a (at least one) financial covenant was violated or not.

The successful merge results in a subsample of 43,268 firm years out of which financial covenants are violated in 13% (or 5,814 cases). Moreover, we find that the frequency of covenant violations

[8]The leverage target is estimated on a rolling basis to avoid capturing a mechanical mean-reversion due to the recapitalization. See Eckbo and Kisser (2017) for details.

[9]This is likely explained by the fact that LDR firms placed in the fourth excess industry leverage quintile still experience substantial asset growth.

is relatively larger during periods of LDRs (20%, or 256 cases). Consistent with the intuition that those recapitalizations occur early, average leverage in the year preceding the LDR is only 33% (which is significantly lower than the average leverage of 49% for the LDR firms placing in the highest two leverage quintiles).

2.3 LDRs and univariate market timing patterns

Table 6 displays descriptive evidence on stock returns and market-to-book ratios surrounding the year of the equity issue for all LDRs (Panel A) and a subsample of distressed LDRs (Panel B). Motivated by the evidence above, the latter are defined as LDR firms which are placed upper two absolute leverage quintiles of Table 5. In both cases, LDR firms experience significant stock price run-ups and Q peaks in the year of the LDR. Moreover, subsequent market-adjusted stock returns are flat (or negative), valuation ratios decrease. Similar findings also obtain when focusing only on public LDRs.

These patterns are consistent with previously documented evidence on stock returns surrounding stock issues (Asquith and Mullins, 1986; Masulis and Korwar, 1986; Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995). However, the surprising aspect of our results is that they reflect cases where creditor control is likely substantial. Of course, as discussed in the introduction, there is an ongoing debate whether those patterns constitute a sufficient (and not only necessary) condition as other factors might explain the univariate variation. We turn to this issue next.

3 Valuation framework and hypothesis development

This section presents a valuation framework relating several fundamental factors to a measure of firm value. We then derive corresponding market timing hypotheses which are tested empirically in Section 4. Finally, we return to an analysis of stock returns in a multivariate asset pricing framework in Section 5 .

3.1 Valuation framework

The approach below is based on an extension to Fama and French (1998) who estimate the value impact of debt and dividend payments.[10] To arrive at our regression specification, we start from the well-known fact that levered firm value (V^L) can be decomposed into the value of the firm's unlevered assets (V_U) and the tax shield associated with debt financing (τD):[11]

$$V^L = V_U + \tau D$$

Assuming that unlevered firm value consists of both assets in place (V_A) and growth options (V_G), we can further write that

$$V^L = V_A + V_G + \tau D$$

Using the book value of assets (A) as an approximation for the value of assets in place, leads to the following regression specification

$$V^L - A = \alpha + \beta V_G + \gamma D + \epsilon$$

In order to estimate the valuation model, one needs to control for the value of growth opportunities. Therefore (levels and changes of) operating profits ($prof$), R&D expenses (rd) and capital expenditures ($capex$) are included as additional control variables. Standardizing all variables by assets to both deal with heteroskedasticity and to also make sure that the largest firms do not drive results, implies that

[10] The Fama-French valuation framework has been used extensively in the empirical cash literature which attempts to estimate the shadow value of cash holdings (Pinkowitz and Williamson, 2004; Pinkowitz et al., 2006; Kisser, 2013).

[11] If the financial markets are competitive and corporations are taxed then, ceteris paribus, the value of the levered firm equals that of the unlevered firm plus the value of the debt tax shield, i.e., $V_L = V_U + \tau D$, where the L and U denote levered and unlevered, respectively, and (τD) denotes the value of the debt tax shield (Modigliani and Miller, 1958).

$$Q_t^E = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+v}}{A_t} + \gamma BL_t + \epsilon_t$$

where Q_t^E is $(V_t^L - A_t)/A_t$ and can be interpreted as the the excess of Q over one. The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to assets and the compact notation dX_t (dX_{t+v}) denotes the lagged one year (future v-year) change in the variable of interest ($prof$, rd or $capex$).[12] Using a two-year future change is in line with evidence that two years is as far ahead as the market can predict (Fama, 1990; Fama and French, 1998). Finally, BL is the book leverage ratio.

3.2 Hypotheses development

The valuation framework of the previous section allows us to investigate whether LDRs systematically reflect market timing patterns. We first test whether LDR firms have a systematically higher valuation ratio and estimate

$$Q_t^E = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+v}}{A_t} + \gamma BL_{t-1} + \delta^1 I_t^* + \epsilon_t \tag{4}$$

Note that the regression employs the lagged book leverage ratio in order to disentangle the effect of the LDR (captured by the indicator variable I_t^*) from the level of leverage. Second, we investigate whether the period of the LDR is followed by a decrease in valuation ratios

$$\Delta Q_t^E = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta \frac{dX_t}{A_t} + \phi \frac{dX_{t+v}}{A_t} + \gamma BL_{t-1} + \delta^2 I_t^* + \epsilon_t \tag{5}$$

where $\Delta Q_t^E = Q_t^E - Q_{t-1}^E$. Taken together, the analysis of the coefficient estimates δ and ϕ allows us to specify the following hypothesis for LDR firms

[12] Specifically, $dX_t = (X_t - X_{t-v})/A_t$ and $dX_{t+v} = (X_{t+v} - X_t)/A_t$.

(H1) LDR firms are unlikely to be driven by market timing and therefore should <u>not</u> exhibit dynamics in valuation ratios that are consistent with a market timing interpretation (H1: $\delta^1 \leq 0$ **and** $\delta^2 \geq 0$**)**

The evidence in Section 2 has revealed significant heterogeneity in terms of firm characteristics among the sample of LDR firms. We therefore also propose the following two modified hypotheses:

(H2) LDR firms which are in financial distress are unlikely to be driven by market timing and therefore should <u>not</u> exhibit dynamics in valuation ratios that are consistent with a market timing interpretation (H2: $\delta^1 \leq 0$ **and** $\delta^2 \geq 0$**)**

(H3) LDR firms violating financial covenants are unlikely to be driven by market timing and therefore should <u>not</u> exhibit dynamics in valuation ratios that are consistent with a market timing interpretation (H3: $\delta^1 \leq 0$ **and** $\delta^2 \geq 0$**)**

The test of H2 assumes that market timing considerations should be even more unlikely as those firms are in financial distress and there is evidence showing that those firms have low (as opposed to high) stock returns (Campbell, Hilscher, and Szilagyi, 2008). H3 assumes that the exercise of creditor control rights is unrelated to market timing efforts

4 Do LDRs exhibit market timing patterns?

4.1 (H1) LDRs and market timing patterns

Table 7 displays the correlation between LDRs and shareholder value. Specifically, columns (1) to (3) test whether LDRs occur during periods of high valuations and present estimates of equation 4. Next, columns (4) to (6) investigate whether valuations decrease following the LDR and correspond to equation 5. To maximize sample size, we focus on one year future changes in the control variables ($v = 1$). Results are provided using OLS regression (columns 1 and 4), accounting for firm-fixed effects (columns 2 and 5) as well as cross-sectional regressions in columns 3 and 6 (Fama and

MacBeth, 1973). Note that Fama-MacBeth regressions have the advantage that they identify the average cross-sectional effect, but come with the drawback of relatively little test power when applied to yearly data.

Focusing on the coefficient of the LDR indicator variable in column 1, we can see that the existence of a LDR increases excess Q by 0.44 units. In other words, this suggests that firms undertaking a leverage decreasing recapitalization have a market-to-book ratio that is approximately 0.4 units higher than for the average sample firm. Moreover, the coefficient is highly statistically significant and robust to alternative estimation methods including the presence of firm fixed effects (column 2) or FMB regressions (column 3). Investigating the period after the LDR, columns 4 to 6 provide strong evidence that the LDR is followed by a decrease in valuation ratios. Independent of the estimation method (OLS, FE, FMB) we find that that excess Q decreases by approximately 0.13 units.[13]

Also interesting, the coefficient estimate of operating profitability ($Prof$) shows that more profitable firms have lower excess market-to-book ratios. In other words, the negative correlation implies that low profitability firms on average have higher valuations, which is consistent with characteristics of high market-to-book firms (Fama and French, 1992; Novy-Marx, 2013). In addition, the correlation with lagged leverage is negative. Both coefficient estimates reflect the descriptive evidence above (Table 5) showing that LDR firms with low initial leverage are unprofitable but valued highly (whereas those with high leverage are more profitable and have lower market-to-book ratios). In untabulated results we find that firm size to a large part explains the negative impact of profitability (for large firms the correlation with excess Q becomes positive).[14]

Table 8 shows that similar findings also obtain for the subsample of public LDRs. Taken together, these patterns reject H1 as valuations peak in the year of the LDR and decrease subsequently. The documented pattern for LDRs is thus consistent with previously documented evidence on stock returns surrounding stock issues (Asquith and Mullins, 1986; Masulis and Ko-

[13]Appendix Table 4 shows that the the pattern is similar when investigating when investigating the subsequent two-year (instead of one year) period.

[14]Irrespective of size, LDRs are always associated with high valuation periods that are followed by decreasing subsequent valuations.

rwar, 1986; Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995). Before attempting to interpret results, we focus on financially distressed firms or those that violate financial covenants.

4.2 (H2) Financially distressed LDRs and market timing patterns

We now test H2 which states that LDRs undertaken by financially distressed firms are even more unlikely to reflect market timing patterns. Table 9 displays corresponding results when defining distressed LDR firms as those for which the lagged market leverage ratio is placed in the upper two quintiles of the leverage ratio distribution for the entire sample of firms (Panel A, Table 5).

Panel A investigates the correlation between the LDR indicator variable and excess Q and robustly confirms the previously found positive relation. Columns (1) to (3) contain results for the full sample of high leverage LDR firms and show that - irrespective of the estimation method - the LDR raises Q^E by 0.18 to 0.28 relative to the average Q^E of all firms (that are in the two upper quintiles of the leverage distribution). Columns (4) to (6) focus on the subset of public LDR firms with high leverage and reveal quantitatively similar findings.

Panel B tests whether LDRs of financially distressed firms are followed by a decrease in valuation ratios. Using the same samples as in Panel A, we find that all coefficient estimates γ_2 of the LDR indicator variable are negative, with five out of six being statistically different from zero. The table further shows that Q^E decreases by 0.05 and 0.12 relative to the year of the LDR.

In Appendix Tables 5 and 6, we further verify that these findings are robust to changing the financial distress classification to excess industry leverage (Panel B, Table 5) or those that are over-levered relative to an estimated time-varying target leverage ratio. Taken together, our findings suggest that financially distressed LDR firms exhibit dynamics in valuation ratios that are consistent with a theory of market timing.

4.3 (H3) LDRs and market timing patterns

Table 10 is based on the subsample of firms covering the period from 1996 to 2008 which are sucessfully merged with the data documenting the existence of covenant violations obtained from

Nini, Smith, and Sufi (2009). Columns (1) to (3) employ Q^E as the dependent variable and show that the cross-sectional correlation between LDRs and valuation also persists among firms that violate financial covenants. These findings are robust to using OLS, FE or FMB regressions. Columns (4) to (6) investigate the impact of the LDR on the subsequent change in excess Q. All three coefficient estimates are negative and statistically significant.

Taken together, the findings in this paper reject hypotheses H1, H2 and H3. In other words, we find that LDR firms exhibit valuation dynamics that are consistent with a market timing interpretation. Valuation ratios peak in the year of the LDR and decrease subsequently. These findings also obtain for LDR firms with high absolute leverage, positive excess leverage or those violating financial covenants.

However, we argue that our sample firms are unlikely to be in a position to time the market in the first place. After all, they have been selected with the idea that creditor control is likely. Our results thus cast doubt over the unconditional use of equity value dynamics in the attempt to identify market timing efforts and we thereby complement the critique of DeAngelo, DeAngelo, and Stulz (2010) who argue that a successful market timing theory also needs to explain why many firms with high valuation ratios choose not to issue equity. For our case, a successful market timing theory needs to explain why the valuation pattern is similar even when creditor control is likely.

Finding market timing patterns when they are unlikely to exist reinforces concerns that variation in growth opportunities affect stock returns and valuation ratios (Leary and Roberts, 2005) - even in the context of a multivariate fundamental valuation model. We turn to this issue next.

5 LDRs, the exercise of growth options and abnormal returns

The findings above show that a LDR significantly reduces leverage and is further correlated with a substantial decrease in valuation ratios. Even though the valuation framework above controls for $R\&D$, $Prof$ and $Capex$, it is possible that the LDR signals a credible attempt to mitgate the debt overhang problem (Myers, 1977).

To investigate this possibility, we perform two main tests. The first one explores whether the presence of LDRs leads to an increased exercise of growth options. The second one investigates the value and asset pricing implications of LDRs. Specifically, we hypothesize that while the exercise of growth options leads to a decrease in subsequent valuations ratios, abnormal stock returns of LDR firms should indistinguishable zero.

5.1 The exercise of growth options following periods of LDRs

It is possible that the positive relation between LDRs and excess Q is explained by the presence of substantial growth opportunities among LDR firms. If this is indeed the case, we would expect that - ceteris paribus - the LDR allows firms to invest in a less constrained way. Put differently, the LDR should be followed by an increase in the physical investment activity of firms which is conceptually equivalent to the exercise of growth options.

Figure 1 illustrates the investment dynamics in event time for firms undertaking a LDR in event year 0. The figure tracks, over the next three years, the evolution of three different measures of investment into fixed assets (all of which are scaled by the lagged value of book assets in order to accurately measure the resulting asset growth). The solid blue line shows capital expenditures (I_{CX}) which equal 9% of lagged book assets in the year of the LDR. The red dashed line also includes cash outlays for patent purchases and acquisitions, as well as net reductions resulting from asset sales, decreasing the total cash investment (I_{CF}) to 7% in year 0. Comparing the two measures suggests that LDR firms were selling assets in order to help finance capital expenditures. Finally, the long-dashed green line is based on the broadest measure of fixed asset investment (I_{FA}) and is computed from yearly changes in fixed assets in the firm's balance sheet (Lewellen and Lewellen, 2016).[15]

What happens following the LDR is interesting. All three measures of investment increase

[15] The yearly changes in fixed assets are adjusted for non-cash charges that affect fixed assets such as depreciation and write-downs.

substantially. Investment into capital expenditures and total cash financed investment are now similar and equal to 10% and 11% of assets, respectively. Finally, we can see that total fixed asset investment (as measured by I_{FA}) increases by 50% from 17% to 24% of lagged book assets.

To investigate whether the illustrated effects also hold in a multivariate context, we further estimate

$$\frac{dInv_{t+v}}{A_t} = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \eta \frac{dX_t}{A_t} + \phi \frac{dX_{t+v}}{A_t} + \gamma BL_{t-1} + \delta LDR_t + \epsilon_t \tag{6}$$

where $dInv_{t+v} = Inv_{t+v} - Inv_t$ and dX_{t+v} now only includes subsequent changes in profits ($prof$) and R&D outlays (rd).

Table 11 again employs three different measures of fixed asset investment: capital expenditures, total cash financed investment and total fixed assets investment. Note, however, that the regression scales by current assets (and not lagged assets as in the Figure). For each investment measure, results are shown using OLS, FE and FMB regressions. Panel A of the table uses a one year horizon suggests that capital expenditures increase by 1.8-2.1 percentage points (pp), total cash financed investment by 3.4-3.9 pp. and total investment into fixed assets by 7.4-7.6. These effects are not only statistically significant but are also economically large (as visualised by Figure 1). Panel B uses a two year horizon and reports similar magnitudes. Finally, Appendix Table 7 shows that the effect also persists for public LDRs.

5.2 Value and return implications of LDRs

The descriptive evidence in Section 2 has shown that LDR firms experience slightly negative market adjusted returns ($r_i - r_m$) in the year following the LDR. In this section, we further investigate the stock performance of firms performing LDRs by implementing empirical asset pricing tests.

To this end, we merge our annual sample of 137,688 firm-years again with the CRSP database. This time, following Huang and Ritter (2017), the merge imposes a four month lag between the date of the fiscal year-end (reported in Compustat) and the first monthly stock return (used from

Crsp). This choice is somewhat more restrictive than market timing papers relying on security issue announcement returns and it is driven by the fact that we use the broader Compustat database (instead of SDC) to identify net equity issues and leverage decreasing recapitalizations.[16] Finally, monthly market returns, risk-free rates and returns of the book-to-market, size and momentum factors are obtained from Ken French's data library.[17] The merge with CRSP reduces the overall sample somewhat to 13,457 firms and 1,516,918 firm-months.

To disentangle the effect of market timing from a reduction in systematic risk, we turn to an estimation of abnormal returns implied by different empirical asset pricing models (Sharpe, 1964; Fama and French, 1992, 2015). Table 12 presents monthly excess returns of a trading strategy investing in firms that performed a LDR (Panel A is based on value-weighted returns, Panel B equally weights LDR firms). Excess returns are computed relative to three competing asset pricing models: the market-model, the Fama and French three-factor model and the five factor model which also accounts for profitability and investment.

The value-weighted results in Panel A suggest that estimating the capital asset pricing model (CAPM) is already sufficient to generate a statistically insignificant estimate of the abnormal return (α). These findings are difficult to square with successful market timing efforts of management. Moreover, accounting for size and value as additional risk factors further increases abnormal returns (from 6 basis points p.m. to 19 basis points, with a corresponding increase in t-statistics from 0.26 to 0.87). The inclusion of investment and profitability decreases abnormal return to -11 basis points, though the estimate remains statistically insignificant (t-statistics of -0.21). Under the three and five factor model, LDR firms load negatively on HML which is due to their high valuation ratios relative to the average firm.

Turning to equally weighted returns in Panel B generates slightly negative, yet statistically insignificant, abnormal returns for the CAPM, the three-factor model and the five factor model. Similar findings also obtain when we focus on public LDRs only (see Appendix Table 8).

[16]Results are robust to changing the lag to zero, seven months or if we merge with Crsp based on the filing date of the security issue obtained from SDC.

[17]Consistent with Fama and French (1993), we compute the book-to-market ratio using the seven month lagged value of market equity and we drop negative book-equity firms from the sample.

Finally, in Table 13 we present results for the two previously used subsamples of financially distressed LDR firms. Panel A is based on a portfolio of LDR firms with high market leverage in the year preceding the LDR. All point estimates of α are negative and statistically insignificant. Panel B is based on a similar portfolio assignment using excess market leverage and shows similar results. Summing up, investing into distressed LDR firms generates a negative though statistically insignificant excess return relative to both single and multi-factor asset pricing models.

6 Conclusion

This paper investigates whether valuation dynamics surrounding leverage decreasing recapitalizations (LDRs) exhibit market timing patterns. The underlying and novel idea is that the focus on LDRs likely identifies cases where creditors have substantial influence over the firm. Consistent with this intuition, we show that a substantial fraction of LDRs are undertaken by firms with high (excess) leverage. For these firms, the LDR signifiantly reduces market leverage from 49% in the year preceding the LDR to close to 30%. In addition, we show that covenant violations frequently occur among LDR firms.

We then demonstrate that LDRs reflect many valuation patterns that are frequently interpreted as being consistent with market timing efforts: they occur during periods of high equity valuations, and are followed by subsequent decreases in valuation ratios. These findings obtain in a multivariate setting and are particularly surprising as they prevail even among the subset of LDR firms with high (excess) leverage or those violating financial covenants.

However, given the likely influence of creditors, we argue that market timing is nevertheless unlikely to explain those patterns and suggest that they are more likely driven by the existence (and subsequent exercise) of growth options. Indeed, we find that firms significantly increase investment rates in periods following the LDR. This interpretation gets further reinforced by the fact that abnormal stock returns are statistically indifferent from zero and as LDR firms negatively load on the value factor.

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Figure 1: **Investment dynamics of firms performing LDRs**

The figure displays three measures of investment for firms performing leverage decreasing recapitalizations (LDRs). LDRs consists of a net equity issue and a simultaneous debt retirement, both of which are measured relative to a size threshold which is set to 5% of book assets. The three investment measures are all scaled by the lagged value of book assets and include capital expenditures (I_{CX}), total cash financed investment (I_{CF}) and total investment into fixed assets (I_{FA}). The figure plots the subsequent values in event time of I_{CX}, I_{CF} and I_{CFA}. Exact variable definitions are given in Appendix Table 1. Total sample of 13,651 firms and 137,688 firm-years.

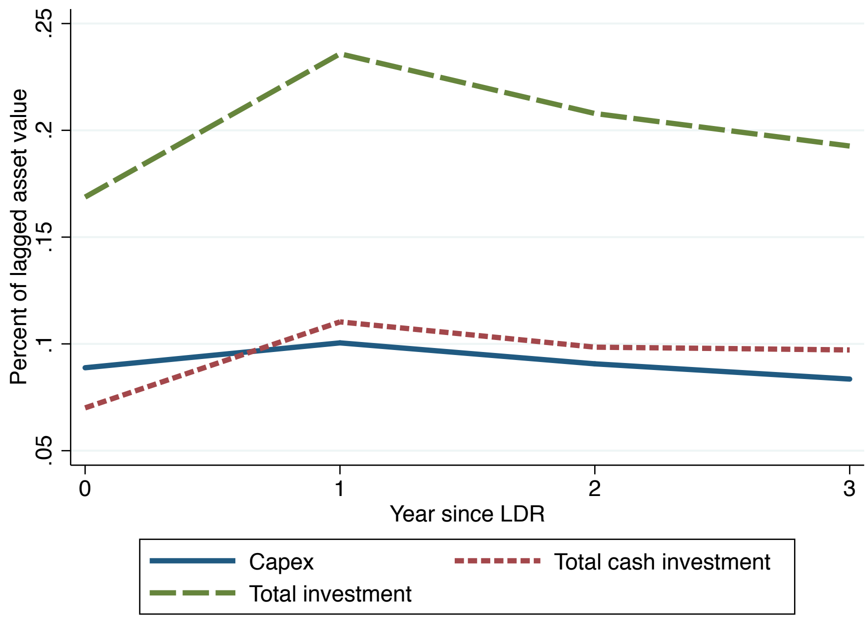

Table 1: **Sample selection**

Sample restriction	Observations	Firms
Annual CRSP/Compustat (CCM) sample, 1971-2015		
Initial CCM sample	267,054	24,201
U.S. domiciled firms only	-23,376	-2,374
Nongovernmental, industrial firms only[a]	-70,839	-5,895
No multiple annual observations	-479	-18
No missing information on book value of assets	-1,697	0
Consistent cash-flow statement data[b]	-1,465	-288
Consistent other financial statement data[c]	-3,439	-94
Lagged information	-16,725	-1,150
Merge CRSP and SDC[d]	-8,603	-602
Twelve months trailing stock returns	-2,743	-129
Final Sample	137,688	13,651

[a] Eliminates utilities (SIC codes 4899-5000), financial firms (SIC codes 5999-7000), and government entities (SIC codes greater than 8999).

[b] For cash-flow data consistency, we first set missing entries for items in the cash flow statement to zero and then drop observations in case total sources or uses of funds equal zero or deviate by more than 1% from each other.

[c] For balance sheet data consistency, we require non-missing data for the market value of the firm's equity, Tobin's Q, total debt, cash holdings, property plant and equipment, operating profits and book equity.

[d] We require availability on stock return data, that the firm is listed on the NYSE, AMEX or Nasdaq (requiring that exchange codes equal either 1, 2 or 3) or dropping firms for which the share code does not equal 10 or 11.

Table 2: **Yearly frequency of net equity issues and leverage decreasing recapitalizations**

The table summarizes the frequency of net equity issues (NEIs) and leverage decreasing recapitalizations (LDRs) which are defined using information from a firm's cash flow statement. NEIs are periods when common and preferred stock issues net of dividends and repurchases exceed 5% of book assets. LDRs further require a simultaneous net debt retirement (short and long term retirement net of issues, also in excess of 5% of assets). Public NEIs or LDRs additionally impose a simultaneous public equity issue (identified through SDC). Columns 1 to 5 display the number of firms, NEIs, public NEIs, LDRs and public LDRs. Columns 6 and 7 show the fraction of LDRs relative to NEIs. Exact variable definitions are given in Appendix Table 1. Total sample of 13,651 firms and 137,688 firm-years.

		NEI		*LDR*		*LDR/NEI*	
Year	Firms	All	Public	All	Public	All	Public
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1972	1,600	88	52	18	7	0.20	0.13
1973	1,893	39	16	10	3	0.26	0.19
1974	2,661	39	10	7	1	0.18	0.10
1975	2,703	60	23	19	6	0.32	0.26
1976	2,521	81	44	22	14	0.27	0.32
1977	2,644	78	14	17	2	0.22	0.14
1978	2,578	107	40	20	8	0.19	0.20
1979	2,702	130	44	31	12	0.24	0.27
1980	2,852	274	128	58	29	0.21	0.23
1981	2,871	311	159	62	30	0.20	0.19
1982	3,070	280	110	46	18	0.16	0.16
1983	3,132	624	346	132	78	0.21	0.23
1984	3,338	331	78	90	19	0.27	0.24
1985	3,367	414	135	93	22	0.22	0.16
1986	3,318	530	157	142	31	0.27	0.20
1987	3,469	478	131	141	38	0.29	0.29
1988	3,525	275	53	73	12	0.27	0.23
1989	3,407	325	84	83	27	0.26	0.32
1990	3,370	318	74	84	21	0.26	0.28
1991	3,368	461	189	148	77	0.32	0.41
1992	3,360	503	192	137	60	0.27	0.31
1993	3,600	645	241	163	66	0.25	0.27
1994	3,900	580	195	115	34	0.20	0.17
1995	4,123	730	242	113	46	0.15	0.19
1996	4,302	872	334	159	67	0.18	0.20
1997	4,606	808	280	139	53	0.17	0.19
1998	4,478	689	172	118	36	0.17	0.21
1999	4,153	719	181	110	34	0.15	0.19
2000	3,983	856	250	143	31	0.17	0.12
2001	3,841	581	303	112	62	0.19	0.20
2002	3,546	444	281	122	77	0.27	0.27
2003	3,295	537	344	107	69	0.20	0.20
2004	3,147	553	391	97	63	0.18	0.16
2005	3,050	461	268	68	45	0.15	0.17
2006	2,976	430	268	56	34	0.13	0.13
2007	2,855	395	245	57	31	0.14	0.13
2008	2,810	228	140	45	29	0.20	0.21
2009	2,691	347	255	106	87	0.31	0.34
2010	2,538	303	218	52	41	0.17	0.19
2011	2,470	300	194	53	33	0.18	0.17
2012	2,410	263	195	27	20	0.10	0.10
2013	2,358	323	231	43	34	0.13	0.15
2014	2,372	333	238	41	28	0.12	0.12
2015	2,433	400	275	54	38	0.14	0.14
Avg.	3,269	437	186	88	38	0.21	0.21

Table 3: **Selected firm characteristics**

The table displays firm characteristics for firms performing a net equity issue (columns 1 and 2) or a leverage decreasing recapitalization (LDR, columns 3 and 4). NEIs are periods when common and preferred stock issues net of dividends and repurchases exceed 5% of book assets. LDRs further require a simultaneous net debt retirement (short and long term retirement net of issues, also in excess of 5% of assets). Public NEIs or LDRs additionally impose a simultaneous public equity issue (identified through SDC). The table displays average values of the following variables: the market leverage ratio (L), the book leverage ratio (BL), the fraction of all-equity financed firms (AE), the fraction of almost all-equity financed firms (AAE), the cash ratio (CR), the ratio of operating profits to assets ($Prof$), the ratio of R&D expenditures to assets (*R&D*), the ratio of capital expenditures to assets (*Capex*), the market-to-book ratio (Q) and the logarithm of assets ($Size$). Exact variable definitions are given in Appendix Table 1. Total sample of 13,651 firms and 137,688 firm-years.

	NEIs		LDRs		LDR - NEI	
	All	Public	All	Public	All	Public
	(1)	(2)	(3)	(4)	(5)	(6)
L (lagged)	0.15	0.15	0.29	0.28	0.13	0.13
L	0.14	0.13	0.18	0.15	0.04	0.03
BL (lagged)	0.22	0.21	0.37	0.36	0.15	0.15
BL	0.20	0.18	0.23	0.20	0.03	0.02
AE	0.18	0.19	0.08	0.10	-0.10	-0.09
AAE	0.48	0.50	0.35	0.38	-0.13	-0.12
CR	0.30	0.34	0.18	0.20	-0.12	-0.14
$Prof$	-0.16	-0.11	-0.08	-0.01	0.08	0.10
R&D	0.12	0.12	0.09	0.08	-0.04	-0.04
Capex	0.07	0.08	0.07	0.07	-0.01	0.00
Q	3.01	2.71	2.36	2.14	-0.66	-0.58
$Size$	3.88	4.59	3.89	4.71	0.01	0.12
N	17,543	7,820	3,533	1,573		

Table 4: **Net income, operating cash flow and the use of accounting accruals**

The table displays yearly average values of net income, operating cash flow, total and (estimated) discretionary accounting accruals in the year of a public net equity issue (NEI, columns 1 to 4) or a public leverage decreasing recapitalization (LDR, columns 5 to 8). NEIs are periods when common and preferred stock issues net of dividends and repurchases exceed 5% of book assets. LDRs further require a simultaneous net debt retirement (short and long term retirement net of issues, also in excess of 5% of assets). Public NEIs or LDRs additionally impose a simultaneous public equity issue (identified through SDC). Net income, operating cash flow and total cash accruals are all scaled by the lagged book value of assets, discretionary accruals are estimated using the modified Jones model. All four variables are defined as in Dechow et al. (1995) and the exact variable definitions are given in Appendix Table 1. Total sample of 13,651 firms and 137,688 firm-years.

	Public NEIs				Public LDRs			
Year	NI (1)	OFF (2)	TACC (3)	DACC (4)	NI (5)	OFF (6)	TACC (7)	DACC (8)
1972	0.10	0.01	0.10	0.06	0.14	0.09	0.05	0.03
1973	0.11	0.03	0.08	0.07	0.10	0.08	0.02	0.00
1974	0.09	-0.05	0.14	0.11	0.04	0.03	0.01	-0.02
1975	0.13	0.12	0.00	0.03	0.12	0.21	-0.10	-0.05
1976	0.15	0.10	0.05	0.04	0.16	0.18	-0.03	-0.02
1977	0.13	0.02	0.11	0.08	0.13	0.08	0.06	0.00
1978	0.13	0.06	0.07	0.06	0.17	0.10	0.07	0.04
1979	0.11	0.05	0.06	0.04	0.10	0.05	0.05	0.01
1980	0.10	0.05	0.05	0.05	0.07	0.07	0.00	0.00
1981	0.08	0.04	0.04	0.06	0.10	0.08	0.02	0.02
1982	0.08	0.04	0.04	0.05	0.07	0.05	0.01	-0.01
1983	0.05	0.03	0.03	0.03	0.04	0.05	-0.01	-0.01
1984	0.02	-0.04	0.06	0.04	-0.05	-0.13	0.08	0.06
1985	0.05	-0.01	0.07	0.07	0.00	-0.03	0.03	0.01
1986	0.04	-0.01	0.05	0.05	0.02	0.00	0.03	0.03
1987	0.01	-0.02	0.04	0.04	0.07	0.08	-0.02	0.00
1988	0.03	-0.04	0.07	0.05	-0.02	-0.08	0.07	0.04
1989	0.02	-0.05	0.07	0.07	0.08	0.03	0.04	0.04
1990	-0.06	-0.05	-0.01	0.03	-0.04	-0.04	0.00	0.02
1991	-0.03	-0.03	0.02	0.03	0.02	0.03	0.02	0.04
1992	-0.12	-0.11	0.01	0.03	0.02	0.04	0.00	0.01
1993	-0.11	-0.09	0.00	0.02	0.00	0.03	-0.03	0.01
1994	-0.10	-0.13	0.04	0.04	-0.10	-0.07	-0.01	0.01
1995	-0.04	-0.07	0.03	0.02	-0.02	-0.08	0.06	0.06
1996	-0.08	-0.09	0.03	0.03	0.01	0.01	0.02	0.02
1997	-0.05	-0.04	0.01	0.02	-0.01	0.02	0.00	0.01
1998	-0.07	-0.07	0.02	0.02	0.03	0.00	0.04	0.03
1999	-0.15	-0.09	-0.04	0.00	0.00	0.06	-0.05	-0.01
2000	-0.34	-0.25	-0.07	-0.03	-0.11	-0.08	-0.03	0.00
2001	-0.37	-0.27	-0.08	-0.02	-0.19	-0.10	-0.06	-0.01
2002	-0.31	-0.24	-0.05	-0.01	-0.12	-0.06	-0.06	-0.01
2003	-0.31	-0.25	-0.04	-0.01	-0.20	-0.15	-0.05	0.00
2004	-0.31	-0.25	-0.04	-0.01	-0.12	-0.08	-0.02	0.01
2005	-0.35	-0.30	-0.04	-0.01	-0.16	-0.11	-0.04	-0.01
2006	-0.34	-0.29	-0.03	-0.01	-0.26	-0.21	-0.02	0.00
2007	-0.39	-0.33	-0.05	-0.01	-0.35	-0.28	-0.05	-0.02
2008	-0.42	-0.36	-0.03	0.00	-0.34	-0.25	-0.03	0.00
2009	-0.36	-0.29	-0.05	-0.01	-0.21	-0.14	-0.06	-0.01
2010	-0.39	-0.34	-0.02	0.01	-0.34	-0.26	-0.05	-0.02
2011	-0.38	-0.32	-0.04	-0.02	-0.15	-0.11	-0.04	-0.02
2012	-0.45	-0.40	-0.03	0.01	-0.47	-0.40	-0.06	-0.02
2013	-0.46	-0.37	-0.06	-0.01	-0.30	-0.21	-0.08	-0.02
2014	-0.44	-0.38	-0.04	-0.01	-0.35	-0.32	-0.01	0.01
2015	-0.50	-0.44	-0.04	-0.01	-0.48	-0.39	-0.06	0.00
Avg.	-0.21	-0.18	-0.01	0.01	-0.09	-0.07	-0.02	0.01
Avg. (pre 1990)	0.06	0.01	0.05	0.05	0.06	0.04	0.01	0.01
Avg. (post 1989)	-0.28	-0.23	-0.03	0.00	-0.14	-0.10	-0.03	0.00

Table 5: **Leverage decreasing recapitalizations, leverage and financial distress**

The table categorizes firms performing leverage decreasing recapitalizations (LDRs) into different leverage groups. In Panel A, the assignment is made using the quintile cutoff values of the lagged market leverage ratio distribution for the full sample of firms. In Panel B, cutoff values are chosen using the distribution of lagged market leverage relative to the industry median leverage ratio in the year preceding the issue (henceforth referred to as excess industry leverage). LDRs are defined as periods of simultaneous net equity issues (NEIs) and net debt retirements (NDRs). NEIs are common and preferred stock issues net of dividends and repurchases, NDRs are short and long term debt retirement net of debt issues, both measured in excess of 5% of book assets. The table displays average values of the following variables: the market leverage ratio (L), the book leverage ratio (BL), the ratio of operating profits to assets ($Prof$), the ratio of net equity issues (nei) and net debt retirements (ndi) relative to book assets (at), the ratio of capital expenditures to assets ($Capex$), the ratio of R&D expenditures to assets ($R\&D$), the percentage growth in total assets (g_a), the market-to-book ratio (Q), the fraction of firms with an implied $Junk$ credit rating and the estimated deviation from target leverage ($L - L^*$). Implied junk credit ratings (less than BBB+) are obtained by mapping a firm's interest coverage ratio onto credit ratings, see Appendix Table 2. The leverage target L^* is estimated using a rolling window regression of market leverage on lagged values of size, $Prof$, Q, the ratio of cash-to-assets, asset tangibility, $R\&D$, $Capex$, industry median leverage, time and firm fixed effects.. Exact variable definitions are given in Appendix Table 1. Total sample of 13,651 firms and 137,688 firm-years.

Quintiles (Y)	Obs	Fraction	Period $t-1$		Period t										
			L	BL	L	BL	$Prof$	nei/at	ndi/at	$Capex$	$R\&D$	g_a	Q	$Junk$	$L-L^*$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Panel A: Y is based on market leverage															
1 (= low)	84	0.02	0.00	0.03	0.06	0.12	-0.36	0.45	-0.12	0.08	0.18	0.70	4.24	0.58	-0.06
2	843	0.24	0.06	0.22	0.04	0.11	-0.27	0.60	-0.15	0.07	0.17	0.29	3.89	0.64	-0.05
3	921	0.26	0.17	0.34	0.10	0.18	-0.08	0.39	-0.19	0.07	0.10	0.20	2.49	0.56	-0.03
4	863	0.24	0.34	0.42	0.20	0.26	0.02	0.24	-0.17	0.07	0.05	0.10	1.63	0.69	0.03
5 (= high)	822	0.23	0.63	0.56	0.42	0.41	0.05	0.19	-0.22	0.06	0.02	-0.03	1.19	0.90	0.15
Panel B: Y is based on excess industry leverage															
1 (= low)	389	0.11	0.11	0.24	0.07	0.13	-0.05	0.35	-0.14	0.10	0.04	0.39	2.99	0.50	-0.08
2	406	0.11	0.13	0.28	0.09	0.16	-0.09	0.39	-0.14	0.09	0.08	0.33	3.16	0.57	-0.04
3	558	0.16	0.14	0.27	0.10	0.15	-0.18	0.54	-0.15	0.07	0.15	0.21	3.02	0.61	-0.03
4	1023	0.29	0.23	0.36	0.14	0.21	-0.11	0.39	-0.18	0.06	0.11	0.15	2.41	0.69	0.00
5 (= high)	1157	0.33	0.52	0.52	0.33	0.36	0.00	0.24	-0.22	0.05	0.06	0.00	1.50	0.84	0.13

Table 6: **Total stock returns and dynamics of Q**

The table displays total stock returns and market-to-book (Q) surrounding the year of the leverage decreasing recapitalization (LDR, $t = 0$). LDRs are defined as periods of simultaneous net equity issues (NEIs) and net debt retirements (NDRs). NEIs are common and preferred stock issues net of dividends and repurchases, NDRs are short and long term debt retirement net of debt issues, both measured in excess of 5% of book assets. Public LDRs additionally impose a simultaneous public equity issue (obtained from SDC). Distressed LDRs are defined as LDRs for which the lagged market leverage ratio is placed in the upper two quintiles of the leverage ratio distribution for the entire sample of firms (see Panel A, Table 5). Stock returns include capital gains and dividends, are in excess of the market return and are measured on a trailing basis relative to the year of the LDR. For example, the documented excess return ($r_i - r_m$) for year -2 is the total excess return measured over the corresponding 36 months period (from the beginning of year $t = -2$ to the end of year $t = 0$). Values of Q are annual values which are measured at the end of the year. Exact variable definitions are given in Appendix Table 1. Total sample of 13,651 firms and 137,688 firm-years.

	-2	-1	0	1	2
Panel A: LDRs					
All LDRs					
$r_i - r_m$	0.83	0.19	0.14	-0.03	-0.05
N	2,665	3,103	3,533	3,159	2,761
Q	2.11	2.26	2.36	2.15	1.97
	3,025	3,533	3,533	3,008	2,650
Public LDRs					
$r_i - r_m$	1.37	0.48	0.27	-0.02	-0.07
N	1,198	1,369	1,573	1,482	1,323
Q	1.87	2.06	2.14	1.93	1.76
N	1,347	1,573	1,573	1,418	1,269
Panel B: Distressed LDRs					
All LDRs					
$r_i - r_m$	0.71	0.13	0.22	-0.01	0.02
N	1,384	1,548	1,685	1,511	1,315
Q	1.26	1.11	1.42	1.42	1.37
N	1,508	1,685	1,685	1,445	1,272
Public LDRs					
$r_i - r_m$	1.31	0.47	0.39	0.03	0.04
N	628	689	753	717	645
Q	1.18	1.10	1.40	1.39	1.35
N	679	753	753	692	626

Table 7: **(H1) LDRs and market timing patterns**

The table presents estimates of the correlation between leverage decreasing recapitalizations (LDRs) and equity valuations and is based on

$$Y_t^j = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+1}}{A_t} + \gamma BL_{t-1} + \delta^j I_t^* + \epsilon$$

where the superscript j distinguishes between the level regression ($Y_t^1 = Q_t^E$ in columns 1 to 3) and the changes regression ($Y_t^2 = \Delta Q_t^E$ in columns 4 to 6). Hypothesis H1 predicts that $\delta_1 \leq 0$ and $\delta_2 \geq 0$. The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t (dX_{t+1}) denotes the one year lag (lead) change for the three variables $prof$, rd and $capex$. Finally, BL is the book leverage ratio and I^* is an indicator variable denoting the presence of a LDR (it equals one in case the firm simultaneously issues net equity and retires net debt for at least 5% of assets). Estimation is based on OLS regression (columns 1 and 4), firm fixed effects (columns 2 and 5) and cross-sectional Fama-MacBeth regressions (column 4 and 6). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	$Y_t^1 = Q_t^E$			$Y_t^2 = \Delta Q_t^E$		
	OLS (1)	FE (2)	FMB (3)	OLS (4)	FE (5)	FMB (6)
$Prof$	-1.134**	-0.457**	-0.710*	0.271**	0.277**	0.142
	(0.056)	(0.097)	(0.306)	(0.033)	(0.032)	(0.111)
$R\&D$	4.709**	4.720**	5.627**	0.198**	0.174**	-0.087
	(0.101)	(0.205)	(0.234)	(0.066)	(0.067)	(0.188)
$Capex$	2.165**	2.692**	2.081**	-0.621**	-0.915**	-0.599**
	(0.072)	(0.135)	(0.181)	(0.045)	(0.052)	(0.097)
BL	-0.633**	-0.283**	-0.567**	0.189**	0.191**	0.174**
	(0.024)	(0.047)	(0.058)	(0.014)	(0.016)	(0.033)
LDR	0.444**	0.318**	0.447**	-0.144**	-0.139**	-0.122**
	(0.035)	(0.028)	(0.050)	(0.023)	(0.024)	(0.028)
ΔX_t	yes	yes	yes	yes	yes	yes
ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	3,008	3,008	3,008	3,008	3,008	3,008
R^2	0.30	0.14	0.26	0.09	0.09	0.03
N	122,188	122,188	122,188	122,188	122,188	122,188

Table 8: **(H1) Public LDRs and market timing patterns**

The table presents estimates of the correlation between public LDRs and equity valuations and is based on

$$Y_t^j = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+1}}{A_t} + \gamma BL_{t-1} + \delta^j I_t^* + \epsilon$$

where the superscript j distinguishes between the level regression ($Y_t^1 = Q_t^E$ in columns 1 to 3) and the changes regression ($Y_t^2 = \Delta Q_t^E$ in columns 4 to 6). Hypothesis H1 predicts that $\delta_1 \leq 0$ and $\delta_2 \geq 0$. The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t (dX_{t+1}) denotes the one year lag (lead) change for the three variables $prof$, rd and $capex$. Finally, BL is the book leverage ratio and I^* and I^* is an indicator variable denoting the presence of a public LDR (it equals one in case the firm simultaneously issues net equity, retires net debt for at least 5% of assets and the equity issue is public). Estimation is based on OLS regression (columns 1 and 4), firm fixed effects (columns 2 and 5) and cross-sectional Fama-MacBeth regressions (column 4 and 6). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	$Y_t^1 = Q_t^E$			$Y_t^2 = \Delta Q_t^E$		
	OLS	FE	FMB	OLS	FE	FMB
	(1)	(2)	(3)	(4)	(5)	(6)
$Prof$	-1.162**	-0.468**	-0.733*	0.279**	0.284**	0.151
	(0.056)	(0.097)	(0.308)	(0.033)	(0.032)	(0.111)
$R\&D$	4.726**	4.739**	5.677**	0.194**	0.169*	-0.098
	(0.101)	(0.205)	(0.239)	(0.066)	(0.067)	(0.189)
$Capex$	2.180**	2.695**	2.102**	-0.624**	-0.917**	-0.603**
	(0.072)	(0.135)	(0.183)	(0.045)	(0.052)	(0.097)
BL	-0.596**	-0.245**	-0.536**	0.179**	0.179**	0.166**
	(0.024)	(0.047)	(0.056)	(0.014)	(0.016)	(0.033)
LDR	0.200**	0.231**	0.290**	-0.114**	-0.122**	-0.095*
	(0.040)	(0.033)	(0.051)	(0.028)	(0.029)	(0.038)
ΔX_t	yes	yes	yes	yes	yes	yes
ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	1,418	1,418	1,418	1,418	1,418	1,418
R^2	0.30	0.14	0.26	0.09	0.09	0.03
N	122,188	122,188	122,188	122,188	122,188	122,188

Table 9: **(H2) LDRs and market timing patterns for firms with high leverage**

The table presents estimates of the correlation between LDRs and equity valuations and is based on

$$Y_t^j = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+1}}{A_t} + \gamma BL_{t-1} + \delta^j I_t^* + \epsilon$$

where the superscript j distinguishes between the level regression ($Y_t^1 = Q_t^E$ in Panel A) and the changes regression ($Y_t^2 = \Delta Q_t^E$ in Panel B). Hypothesis H2 predicts that $\delta_1 \leq 0$ and $\delta_2 \geq 0$ for financially distressed firms which we define as those for which the lagged market leverage ratio is placed in the upper two quintiles of the leverage ratio distribution for the entire sample of firms (Panel A, Table 5). The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t (dX_{t+1}) denotes the one year lag (lead) change for the three variables $prof$, rd and $capex$. BL is the book leverage ratio and I^* is an indicator variable denoting the presence of a LDR (it equals one in case the firm simultaneously issues net equity, retires net debt for at least 5% of assets, Panel A) or a public LDR (additionally requires the equity issue to be public, Panel B). Estimation is based on OLS regression (columns 1, 4), firm fixed effects (columns 2, 5) and cross-sectional Fama-MacBeth regressions (column 3, 6). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	All LDRs			Public LDRs		
	OLS	FE	FMB	OLS	FE	FMB
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Contemporaneous valuation level ($Y_t^1 = Q_t^E$)						
$Prof$	-0.372**	0.155**	-0.040	-0.402**	0.145**	-0.068
	(0.098)	(0.032)	(0.123)	(0.097)	(0.032)	(0.124)
$R\&D$	3.369**	3.027**	3.015**	3.397**	3.056**	3.059**
	(0.172)	(0.133)	(0.237)	(0.171)	(0.133)	(0.238)
$Capex$	0.910**	1.482**	0.831**	0.914**	1.478**	0.835**
	(0.049)	(0.053)	(0.086)	(0.049)	(0.053)	(0.086)
BL	1.133**	0.759**	1.097**	1.147**	0.775**	1.112**
	(0.023)	(0.018)	(0.040)	(0.023)	(0.018)	(0.040)
LDR	0.251**	0.175**	0.256**	0.224**	0.184**	0.220**
	(0.026)	(0.011)	(0.035)	(0.029)	(0.016)	(0.035)
ΔX_t, ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	1,445	1,445	1,445	692	692	692
R^2	0.32	0.16	0.27	0.32	0.16	0.26
N	48,346	48,346	48,346	48,346	48,346	48,346
Panel B: Subsequent valuation change ($Y_t^2 = \Delta Q_t^E$)						
$Prof$	0.064	0.180**	-0.044	0.072	0.187**	-0.039
	(0.065)	(0.033)	(0.060)	(0.065)	(0.033)	(0.061)
$R\&D$	0.480**	0.601**	0.305	0.476**	0.581**	0.301
	(0.141)	(0.138)	(0.188)	(0.141)	(0.138)	(0.190)
$Capex$	-0.137**	-0.539**	-0.138*	-0.138**	-0.536**	-0.140*
	(0.042)	(0.055)	(0.068)	(0.042)	(0.055)	(0.068)
BL	-0.081**	-0.190**	-0.063**	-0.084**	-0.201**	-0.067**
	(0.016)	(0.018)	(0.017)	(0.016)	(0.018)	(0.018)
LDR	-0.064**	-0.117**	-0.061**	-0.080**	-0.122**	-0.050
	(0.022)	(0.012)	(0.017)	(0.026)	(0.016)	(0.032)
ΔX_t, ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	1,445	1,445	1,445	692	692	692
R^2	0.07	0.07	0.02	0.07	0.07	0.02
N	48,346	48,346	48,346	48,346	48,346	48,346

Table 10: **(H3) LDRs and market timing patterns for firms violating financial covenants**

The table presents estimates of the correlation between LDRs and equity valuations and is based on

$$Y_t^j = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+1}}{A_t} + \gamma BL_{t-1} + \delta^j I_t^* + \epsilon$$

where the superscript j distinguishes between the level regression ($Y_t^1 = Q_t^E$ in columns 1 to 3) and the changes regression ($Y_t^2 = \Delta Q_t^E$ in columns 4 to 6). Hypothesis H3 predicts that $\delta_1 \leq 0$ and $\delta_2 \geq 0$ for firms violating financial coventants. The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t (dX_{t+1}) denotes the one year lag (lead) change for the three variables $prof$, rd and $capex$. Finally, BL is the book leverage ratio and I^* is an indicator variable denoting the presence of a LDR (it equals one in case the firm simultaneously issues net equity and retires net debt for at least 5% of assets). The identification of financial covenant violations is obtained from Nini et al. (2009). Results are displayed for the full sample of firms that violated covenants using OLS regression (columns 1 and 4), firm fixed effects (columns 2 and 5) and cross-sectional Fama-MacBeth regressions (column 4 and 6). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	$Y_t^1 = Q_t^E$			$Y_t^2 = \Delta Q_t^E$		
	OLS	FE	FMB	OLS	FE	FMB
	(1)	(2)	(3)	(4)	(5)	(6)
$Prof$	-1.441**	-1.143**	-0.972	0.593**	0.613**	0.552**
	(0.267)	(0.305)	(0.449)	(0.161)	(0.163)	(0.135)
$R\&D$	4.551**	4.489**	4.550**	0.471	0.514	0.157
	(0.406)	(0.478)	(0.463)	(0.319)	(0.308)	(0.641)
$Capex$	2.601**	2.628**	2.507**	-0.489*	-0.530*	-0.584
	(0.301)	(0.400)	(0.549)	(0.229)	(0.238)	(0.379)
BL	0.047	-0.014	-0.045	0.009	0.008	0.010
	(0.096)	(0.117)	(0.075)	(0.062)	(0.063)	(0.091)
LDR	0.377**	0.393**	0.394*	-0.232**	-0.253**	-0.217*
	(0.122)	(0.109)	(0.131)	(0.084)	(0.087)	(0.099)
ΔX_t	yes	yes	yes	yes	yes	yes
ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	202	202	202	202	202	202
R^2	0.27	0.00	0.25	0.13	0.13	0.07
N	4,627	4,627	4,627	4,627	4,627	4,627

Table 11: **LDRs and the exercise of growth options**

The table presents estimates of the correlation between LDRs and subsequent investment into fixed assets and is based on

$$\frac{dInvx_{t+v}}{A_t} = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \eta\frac{dX_t}{A_t} + \phi\frac{dX_{t+v}}{A_t} + \gamma BL_{t-1} + \delta I_t^* + \epsilon_t$$

where $dInv_{t+v}$ denotes the change in investment (Inv) over the subsequent $v-$year period (v is one year in Panel A, two in Panel B). The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t denote the one year lag change for the three variables $prof$, rd and $capex$. The variable dX_{t+v} denotes the v year lead change for the two variables $prof$, rd. BL is the book leverage ratio and I^* is a is an indicator variable denoting the presence of a LDR (it equals one in case the firm simultaneously issues net equity and retires net debt for at least 5% of assets). The table distinguishes between three measures of investment. In columns 1 - 3, Inv is based on capital expenditures ($Capex$). In columns 4 - 6, Inv is based on total cash financed investment obtained from the cash flow statement (Inv_{CF}). In columns 7 - 8, Inv is based on total investment into fixed assets obtained from the balance sheet (Inv_{FA}). Estimation is based on OLS regression (columns 1, 4, 7), firm fixed effects (columns 2, 5, 8) and cross-sectional Fama-MacBeth regressions (column 3, 6, 9). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	Capex			Total cash investment			Total investment		
	OLS	FE	FMB	OLS	FE	FMB	OLS	FE	FMB
	(1)	(2)	(3)	(4)	(5)	(6)	(4)	(5)	(6)
Panel A: Subsequent one year period ($v = 1$)									
$Prof$	0.024**	0.036**	0.033**	0.023**	0.032**	0.021**	0.01	0.062**	0.035*
	(0.002)	(0.001)	(0.006)	(0.004)	(0.003)	(0.006)	(0.008)	(0.006)	(0.015)
$R\&D$	0.007*	0.027**	-0.009	0.045**	0.066**	0.032**	0.082**	0.214**	0.077**
	(0.003)	(0.003)	(0.008)	(0.008)	(0.006)	(0.011)	(0.015)	(0.012)	(0.027)
BL	-0.003**	-0.011**	-0.001	0.007**	0.004	0.005*	0.019**	0	0.019**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.004)
LDR	0.018**	0.018**	0.021**	0.039**	0.039**	0.034**	0.076**	0.074**	0.076**
	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)	(0.005)	(0.006)
ΔX_t	yes	yes	yes	yes	yes	yes	yes	yes	yes
ΔX_{t+1}	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes	no	yes	yes
LDR	3,008	3,008	3,008	3,008	3,008	3,008	3,008	3,008	3,008
R^2	0.08	0.10	0.07	0.04	0.04	0.03	0.05	0.06	0.05
N	122,188	122,188	122,188	122,188	122,188	122,188	122,188	122,188	122,188
Panel B: Subsequent one year period ($v = 2$)									
$Prof$	0.024**	0.059**	0.039**	0.015*	0.051**	0.017	-0.017	0.114**	0.022
	(0.003)	(0.002)	(0.009)	(0.006)	(0.004)	(0.010)	(0.011)	(0.008)	(0.022)
$R\&D$	-0.007	0.071**	-0.031*	0.037**	0.127**	0.026	0.060**	0.395**	0.037
	(0.005)	(0.005)	(0.013)	(0.011)	(0.009)	(0.018)	(0.021)	(0.018)	(0.036)
BL	0.003*	-0.015**	0.006	0.016**	0.011**	0.014**	0.050**	0.027**	0.051**
	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)	(0.004)	(0.006)	(0.006)	(0.006)
LDR	0.023**	0.020**	0.027**	0.038**	0.034**	0.031**	0.077**	0.066**	0.075**
	(0.002)	(0.002)	(0.004)	(0.004)	(0.003)	(0.005)	(0.008)	(0.006)	(0.009)
ΔX_t	yes	yes	yes	yes	yes	yes	yes	yes	yes
ΔX_{t+1}	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes	no	yes	yes
LDR	2,650	2,650	2,650	2,650	2,650	2,650	2,650	2,650	2,650
R^2	0.13	0.00	0.11	0.09	0.00	0.07	0.10	0.00	0.09
N	109,634	109,634	109,634	109,634	109,634	109,634	109,634	109,634	109,634

Table 12: **LDRs and subsequent abnormal returns**

The table presents monthly abnormal returns (α) of a strategy investing into firms performing leverage decreasing recapitalizations (LDRs). LDRs are defined as periods of simultaneous net equity issues (NEIs) and net debt retirements (NDRs). NEIs are common and preferred stock issues net of dividends and repurchases, NDRs are short and long term debt retirement net of debt issues, both measured in excess of 5% of book assets. Abnormal returns are estimated relative to the CAPM [includes the market excess return (r_m)], the Fama and French three factor model [includes r_m, the the size factor (SMB) and the value factor (HML)] and the five factor model [includes the 3 FF factors plus investment (INV) and profitability (PROF)]. The sample is based on merging the annual sample of Compustat data with monthly stock returns using the CRSP database and imposing a four month lag between the date of the fiscal year-end (reported in Compustat) and the first monthly stock return (used from Crsp). Monthly market returns, risk-free rates and returns of the size, value, investment and profitability factors are obtained from Ken French's data library.

	CAPM		3 Factor Model		5 Factor Model	
	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.
Panel A: Value weighted portfolios						
α	0.06	0.26	0.19	0.87	-0.11	-0.21
r_m	1.23***	17.46	1.09***	13.54	1.08***	14.00
SMB			0.45***	3.42	0.45***	3.41
HML			-0.39**	-3.03	-0.37*	-1.97
INV					-0.06	-0.31
PROF					0.02	0.64
N	530		530		530	
R^2	0.54		0.59		0.59	
Panel B: Equal weighted portfolios						
α	-0.02	-0.10	-0.13	-0.66	-0.31	-0.66
r_m	1.46***	24.06	1.25***	21.29	1.25***	20.48
SMB			1.20***	13.95	1.20***	13.75
HML			-0.11	-1.12	-0.12	-0.92
INV					0.01	0.04
PROF					0.01	0.41
N	530		530		530	
R^2	0.57		0.73		0.73	

Table 13: **Distressed LDRs and subsequent abnormal returns**

The table presents value-weighted monthly abnormal returns (α) of a strategy investing into financially distressed firms performing leverage decreasing recapitalizations (LDRs). LDRs are defined as periods of simultaneous net equity issues (NEIs) and net debt retirements (NDRs). NEIs are common and preferred stock issues net of dividends and repurchases, NDRs are short and long term debt retirement net of debt issues, both measured in excess of 5% of book assets. In Panel A, distressed LDRs are defined as LDRs for which the lagged market leverage ratio is placed in the upper two quintiles of the leverage ratio distribution for the entire sample of firms (see Panel A, Table 5). In Panel B, the assignment is made using the lagged excess industry market leverage ratio (Panel B, Table 5). Abnormal returns are estimated relative to the CAPM [includes the market excess return (r_m)], the Fama and French three factor model [includes r_m, the the size factor (SMB) and the value factor (HML)] and the five factor model [includes the 3 FF factors plus investment (INV) and profitability (PROF)]. The sample is based on merging the annual sample of Compustat data with monthly stock returns using the CRSP database and imposing a four month lag between the date of the fiscal year-end (reported in Compustat) and the first monthly stock return (used from Crsp). Monthly market returns, risk-free rates and returns of the size, value, investment and profitability factors are obtained from Ken French's data library.

	CAPM		3 Factor Model		5 Factor Model	
	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.
Panel A: High market leverage LDR firms						
α	-0.16	-0.63	-0.36	-1.46	-0.11	-0.23
r_m	1.25***	17.87	1.16***	15.45	1.18***	15.39
SMB			0.75***	7.40	0.74***	7.32
HML			0.19	1.59	0.15	0.89
INV					0.10	0.54
PROF					-0.01	-0.66
N	530		530		530	
R^2	0.49		0.57		0.57	
Panel B: High excess industry leverage LDR firms						
α	-0.16	-0.58	-0.24	-0.93	-0.61	-0.93
r_m	1.28***	15.56	1.14***	12.54	1.10***	13.09
SMB			0.81***	5.35	0.82***	5.50
HML			-0.07	-0.50	0.07	0.35
INV					-0.33	-1.40
PROF					0.02	0.75
N	528		528		528	
R^2	0.47		0.55		0.55	

Appendix Table 1: Variable construction using database mnemonics

The table displays the definition of the variables employed in this paper using the original database mnemonics. Panel A refers to the Crisp/Compusted merged database (CCM), Panel B to the data library of Kenneth French and Panel C to CRSP.

Variable Name	Description
A: Compustat variables	
L	*Market leverage*: (dlcc + dlt)/(prcc$_f * csho + dlcc + dlt$)
BL	*Book leverage*: (dlcc + dlt)/at
C	*Cash ratio*: che/at
$Size$	log(at)
$Prof$	*Profitability*: (oibdp)/at
Tan	*Tangibility*: ppent/at
Q	*Tobin's Q*: (prcc$_f * csho + dlcc + dlt)/at$
Q^E	*Excess Q*: $Q - 1$
$R\&D$	xrd/at
$Capex$	capx/at
I_{CX}	capx/lag(at)
I_{CF}	(inv_total + ivstch)/lag(at)
I_{FA}	(fa - lag(fa) + dpc + esubc + sppiv + fopo + (xidoc - xido))/lag(at)
g_a	(at - lag(at))/lag(at)
EI	*Equity Issues*: sstk
ER	*Distributions to equity-holders*: dv + prstkc
ndi	dltis + dlcch - dltr
nei	*Equity issue minus equity distributions*: EI - ER
B: Ken French data library	
r_f	*risk-free rate*: rf
r_m	*market factor*: mktrf
SMB	*size factor*: smb
HML	*value factor*: hml
INV	*investment factor*: inv
$PROF$	*profitability factor*: prof
B: CRSP variables	
r_i	*Stock return*: ret - rf

Appendix Table 2: Mapping of interest coverage ratios to credit ratings

For each firm, the implied credit rating is computed by mapping the firm-specific interest coverage ratio (ICR, defined as the ratio of earnings before interest and taxes (EBIT) to the level of interest payments) onto credit ratings. The mapping is based on Damodaran (2017) and distinguishes between large firms (defined as those for which the market value of assets exceeds 5 billion U.S. dollars) and small firms (with a market value of less than 5 billion).

Large firms			**Small firms**		
ICR		Rating	ICR		Rating
$>$	$\leq$		$>$	$\leq$	
-100000	0,20	D	-100000	0,50	D
0,2	0,65	C	0,5	0,80	C
0,65	0,80	CC	0,8	1,25	CC
0,8	1,25	CCC	1,25	1,50	CCC
1,25	1,50	B-	1,5	2,00	B-
1,5	1,75	B	2	2,50	B
1,75	2,00	B+	2,5	3,00	B+
2	2,50	BB	3	3,50	BB
2,5	3,00	BBB	3,5	4,50	BBB
3	4,25	A-	4,5	6,00	A-
4,25	5,50	A	6	7,50	A
5,5	6,50	A+	7,5	9,50	A+
6,5	8,50	AA	9,5	12,50	AA
8,5	100000	AAA	12,5	100000	AAA

Appendix Table 3: Synthetic credit ratings

The table displays the number and fraction of credit ratings for the full sample of firms, net equity issuers and those performing leverage decreasing recapitalizations (LDRs). NEIs are periods when common and preferred stock issues net of dividends and repurchases exceed 5% of book assets. LDRs further require a simultaneous net debt retirement (short and long term retirement net of issues, also in excess of 5% of assets). The implied credit rating is based on the firm-specific interest coverage ratio (ICR, defined as the ratio of earnings before interest and taxes (EBIT) to the level of interest payments) which is mapped into credit ratings using Damodaran's mapping table (see Appendix Table 2). Exact variable definitions are given in Appendix Table 1. Total sample of 13,651 firms and 137,688 firm-years.

	Full Sample		NEIs		LDRs		
Rating	Obs.	Fraction	Obs.	Fraction	Obs.	Fraction	height
D	31,452	0.23	8,133	0.46	1,646		0.47
C	2,568	0.02	195	0.01	57		0.02
CC	4,677	0.03	365	0.02	117		0.03
CCC	2,995	0.02	220	0.01	63		0.02
B-	5,326	0.04	414	0.02	141		0.04
B-	5,024	0.04	349	0.02	118		0.03
B+	4,859	0.04	359	0.02	106		0.03
BB	4,124	0.03	320	0.02	97		0.03
BB+	3,815	0.03	275	0.02	96		0.03
BBB	3,494	0.03	245	0.01	67		0.02
A-	8,573	0.06	579	0.03	166		0.05
A	6,231	0.05	411	0.02	128		0.04
A+	5,678	0.04	359	0.02	107		0.03
AA	5,870	0.04	376	0.02	125		0.04
AAA	43,002	0.31	4,943	0.28	499		0.14
N	137,688	1	17,543	1	3,533		1

Appendix Table 4: **(H1) LDRs and market timing patterns: two-year horizon**

The table presents estimates of the correlation between LDRs and equity valuations and is based on

$$Y_t^j = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+1}}{A_t} + \gamma BL_{t-1} + \delta^j I_t^* + \epsilon$$

where the superscript j distinguishes between the level regression ($Y_t^1 = Q_t^E$ in columns 1 to 3) and the changes regression ($Y_t^2 = \Delta Q_t^E$ in columns 4 to 6). Hypothesis H1 predicts that $\delta_1 \leq 0$ and $\delta_2 \geq 0$. The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t (dX_{t+2}) denotes the two year lag (lead) change for the three variables $prof$, rd and $capex$. Finally, BL is the book leverage ratio and I^* is an indicator variable denoting the presence of a LDR (it equals one in case the firm simultaneously issues net equity and retires net debt for at least 5% of assets). Estimation is based on OLS regression (columns 1 and 4), firm fixed effects (columns 2 and 5) and cross-sectional Fama-MacBeth regressions (column 4 and 6). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	$Y_t^1 = Q_t^E$			$Y_t^2 = \Delta Q_t^E$		
	OLS	FE	FMB	OLS	FE	FMB
	(1)	(2)	(3)	(4)	(5)	(6)
$Prof$	-1.032**	-0.335**	-0.624	0.343**	0.324**	0.223
	(0.061)	(0.104)	(0.313)	(0.044)	(0.056)	(0.162)
$R\&D$	4.457**	4.438**	5.211**	0.322**	0.239*	-0.177
	(0.111)	(0.219)	(0.255)	(0.088)	(0.120)	(0.265)
$Capex$	1.952**	2.369**	1.916**	-0.826**	-1.272**	-0.826**
	(0.077)	(0.138)	(0.186)	(0.060)	(0.085)	(0.139)
BL	-0.691**	-0.327**	-0.624**	0.315**	0.323**	0.297**
	(0.026)	(0.049)	(0.060)	(0.019)	(0.028)	(0.043)
LDR	0.448**	0.331**	0.458**	-0.276**	-0.270**	-0.229**
	(0.037)	(0.031)	(0.054)	(0.029)	(0.030)	(0.042)
ΔX_t	yes	yes	yes	yes	yes	yes
ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	2,650	2,650	2,650	2,650	2,650	2,650
R^2	0.30	0.14	0.26	0.10	0.10	0.05
N	109,634	109,634	109,634	109,634	109,634	109,634

Appendix Table 5: (H2) LDRs and market timing patterns for firms with excess industry leverage

The table presents estimates of the correlation between LDRs and equity valuations and is based on

$$Y_t^j = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+1}}{A_t} + \gamma BL_{t-1} + \delta^j I_t^* + \epsilon$$

where the superscript j distinguishes between the level regression ($Y_t^1 = Q_t^E$ in Panel A) and the changes regression ($Y_t^2 = \Delta Q_t^E$ in Panel B). Hypothesis H2 predicts that $\delta_1 \leq 0$ and $\delta_2 \geq 0$ for financially distressed firms which we define as those for which the lagged excess industry leverage ratio is placed in the upper two quintiles of the leverage ratio distribution for the entire sample of firms (Panel B, Table 5). The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t (dX_{t+1}) denotes the one year lag (lead) change for the three variables $prof$, rd and $capex$. BL is the book leverage ratio and I^* is an indicator variable denoting the presence of a LDR (it equals one in case the firm simultaneously issues net equity, retires net debt for at least 5% of assets, Panel A) or a public LDR (additionally requires the equity issue to be public, Panel B). Estimation is based on OLS regression (columns 1, 4), firm fixed effects (columns 2, 5) and cross-sectional Fama-MacBeth regressions (column 3, 6). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	All LDRs			Public LDRs		
	OLS	FE	FMB	OLS	FE	FMB
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Contemporaneous valuation level ($Y_t^1 = Q_t^E$)						
$Prof$	-0.676**	0.021	-0.357**	-0.724**	-0.001	-0.397**
	(0.090)	(0.043)	(0.126)	(0.090)	(0.043)	(0.129)
$R\&D$	5.029**	3.961**	4.461**	5.058**	3.997**	4.502**
	(0.143)	(0.117)	(0.268)	(0.144)	(0.117)	(0.268)
$Capex$	0.982**	1.944**	0.890**	0.991**	1.948**	0.895**
	(0.070)	(0.091)	(0.131)	(0.071)	(0.091)	(0.133)
BL	0.927**	0.769**	0.887**	0.951**	0.806**	0.911**
	(0.031)	(0.027)	(0.036)	(0.031)	(0.027)	(0.036)
LDR	0.373**	0.263**	0.330**	0.251**	0.199**	0.245**
	(0.035)	(0.016)	(0.037)	(0.044)	(0.023)	(0.039)
ΔX_t, ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	1,840	1,840	1,840	852	852	852
R^2	0.36	0.16	0.30	0.36	0.15	0.30
N	47,842	47,842	47,842	47,842	47,842	47,842
Panel B: Subsequent valuation change ($Y_t^2 = \Delta Q_t^E$)						
$Prof$	0.09	0.118**	0.049	0.104	0.131**	0.059
	(0.060)	(0.042)	(0.069)	(0.060)	(0.042)	(0.070)
$R\&D$	0.235*	-0.121	0.136	0.233*	-0.136	0.128
	(0.105)	(0.114)	(0.182)	(0.105)	(0.114)	(0.184)
$Capex$	-0.297**	-0.863**	-0.270**	-0.297**	-0.863**	-0.266**
	(0.056)	(0.089)	(0.088)	(0.056)	(0.089)	(0.089)
BL	-0.074**	-0.160**	-0.057**	-0.079**	-0.175**	-0.061**
	(0.021)	(0.026)	(0.020)	(0.021)	(0.026)	(0.020)
LDR	-0.123**	-0.147**	-0.095**	-0.151**	-0.170**	-0.060
	(0.026)	(0.016)	(0.029)	(0.033)	(0.023)	(0.049)
ΔX_t, ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	1,840	1,840	1,840	692	692	692
R^2	0.08	0.08	0.02	0.08	0.08	0.02
N	47,842	47,842	47,842	47,842	47,842	47,842

Appendix Table 6: **(H2) LDRs and market timing patterns for firms with excess target leverage**

The table presents estimates of the correlation between LDRs and equity valuations and is based on

$$Y_t^j = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \beta_3 Capex_t + \eta_L \frac{dX_t}{A_t} + \eta_F \frac{dX_{t+1}}{A_t} + \gamma BL_{t-1} + \delta^j I_t^* + \epsilon$$

where the superscript j distinguishes between the level regression ($Y_t^1 = Q_t^E$ in Panel A) and the changes regression ($Y_t^2 = \Delta Q_t^E$ in Panel B). Hypothesis H2 predicts that $\delta_1 \leq 0$ and $\delta_2 \geq 0$ for financially distressed firms which we define as those for which the deviation from a leverage target L^* is positive. The target L^* is estimated using a rolling window regression of market leverage on lagged values of size, $Prof$, Q, the ratio of cash-to-assets, asset tangibility, $R\&D$, $Capex$, industry median leverage, time and firm fixed effects.The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t (dX_{t+1}) denotes the one year lag (lead) change for the three variables $prof$, rd and $capex$. BL is the book leverage ratio and I^* is an indicator variable denoting the presence of a LDR (it equals one in case the firm simultaneously issues net equity, retires net debt for at least 5% of assets, Panel A) or a public LDR (additionally requires the equity issue to be public, Panel B). Estimation is based on OLS regression (columns 1, 4), firm fixed effects (columns 2, 5) and cross-sectional Fama-MacBeth regressions (column 3, 6). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	All LDRs			Public LDRs		
	OLS	FE	FMB	OLS	FE	FMB
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Contemporaneous valuation level ($Y_t^1 = Q_t^E$)						
Prof	-0.926**	-0.034	-0.708**	-0.948**	-0.041	-0.732**
	(0.090)	(0.051)	(0.187)	(0.090)	(0.051)	(0.187)
R&D	5.200**	4.702**	5.696**	5.222**	4.718**	5.780**
	(0.152)	(0.127)	(0.280)	(0.152)	(0.127)	(0.293)
Capex	1.762**	2.439**	1.718**	1.777**	2.448**	1.731**
	(0.099)	(0.131)	(0.168)	(0.099)	(0.131)	(0.169)
BL	-0.409**	0.214**	-0.355**	-0.383**	0.243**	-0.331**
	(0.036)	(0.038)	(0.074)	(0.036)	(0.037)	(0.073)
LDR	0.288**	0.205**	0.315**	0.07	0.123**	0.110
	(0.044)	(0.027)	(0.062)	(0.049)	(0.038)	(0.060)
ΔX_t, ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	1,471	1,471	1,471	675	675	675
R^2	0.32	0.14	0.28	0.32	0.13	0.28
N	49,933	49,933	49,933	49,933	49,933	49,933
Panel B: Subsequent valuation change ($Y_t^2 = \Delta Q_t^E$)						
Prof	0.09	0.118**	0.049	0.104	0.131**	0.059
	(0.060)	(0.042)	(0.069)	(0.060)	(0.042)	(0.070)
R&D	0.235*	-0.121	0.136	0.233*	-0.136	0.128
	(0.105)	(0.114)	(0.182)	(0.105)	(0.114)	(0.184)
Capex	-0.297**	-0.863**	-0.270**	-0.297**	-0.863**	-0.266**
	(0.056)	(0.089)	(0.088)	(0.056)	(0.089)	(0.089)
BL	-0.074**	-0.160**	-0.057**	-0.079**	-0.175**	-0.061**
	(0.021)	(0.026)	(0.020)	(0.021)	(0.026)	(0.020)
LDR	-0.123**	-0.147**	-0.095**	-0.151**	-0.170**	-0.060
	(0.026)	(0.016)	(0.029)	(0.033)	(0.023)	(0.049)
ΔX_t, ΔX_{t+1}	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	yes	no	yes	yes
LDR	1,840	1,840	1,840	692	692	692
R^2	0.08	0.08	0.02	0.08	0.08	0.02
N	47,842	47,842	47,842	47,842	47,842	47,842

Appendix Table 7: Public LDRs and the exercise of growth options

The table presents estimates of the correlation between LDRs and subsequent investment into fixed assets and is based on

$$\frac{dInvx_{t+v}}{A_t} = \alpha + \beta_1 Prof_t + \beta_2 RD_t + \eta \frac{dX_t}{A_t} + \phi \frac{dX_{t+v}}{A_t} + \gamma BL_{t-1} + \delta I_t^* + \epsilon_t$$

where $dInv_{t+v}$ denotes the change in investment (Inv) over the subsequent $v-$year period (v is one year in Panel A, two in Panel B). The variables $Prof$, RD, $Capex$ denote the ratios of $prof$, rd and $capex$ to book assets (A). The compact notation dX_t denote the one year lag change for the three variables $prof$, rd and $capex$. The variable dX_{t+v} denotes the v year lead change for the two variables $prof$, rd. BL is the book leverage ratio and I^* is an indicator variable denoting the presence of a public LDR (it equals one in case the firm simultaneously issues net equity, retires net debt for at least 5% of assets and the equity issue is public). The table distinguishes between three measures of investment. In columns 1 - 3, Inv is based on capital expenditures ($Capex$). In columns 4 - 6, Inv is based on total cash financed investment obtained from the cash flow statement (Inv_{CF}). In columns 7 - 8, Inv is based on total investment into fixed assets obtained from the balance sheet (Inv_{FA}). Estimation is based on OLS regression (columns 1, 4, 7), firm fixed effects (columns 2, 5, 8) and cross-sectional Fama-MacBeth regressions (column 3, 6, 9). All variables are winsorized at the 1(99) percent level or must lie between zero and one (leverage). Variable definitions are in Appendix table 1 in the paper. *, ** indicate significance at the 5% and 1% level, respectively. Total sample of 13,651 firms and 137,688 firm-years.

	Capex			Total cash investment			Total investment		
	OLS	FE	FMB	OLS	FE	FMB	OLS	FE	FMB
	(1)	(2)	(3)	(4)	(5)	(6)	(4)	(5)	(6)
Panel A: Subsequent one year period ($v = 1$)									
$Prof$	0.023**	0.035**	0.032**	0.021**	0.030**	0.019**	0.006	0.058**	0.031*
	(0.002)	(0.001)	(0.006)	(0.004)	(0.003)	(0.006)	(0.008)	(0.006)	(0.015)
$R\&D$	0.007*	0.028**	-0.006	0.046**	0.067**	0.033**	0.084**	0.217**	0.084**
	(0.003)	(0.003)	(0.008)	(0.008)	(0.006)	(0.011)	(0.015)	(0.012)	(0.028)
BL	-0.002*	-0.010**	-0	0.009**	0.007**	0.007**	0.023**	0.006	0.024**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)
LDR	0.024**	0.024**	0.026**	0.039**	0.038**	0.030**	0.069**	0.067**	0.069**
	(0.002)	(0.002)	(0.004)	(0.005)	(0.004)	(0.004)	(0.008)	(0.006)	(0.008)
ΔX_t	yes	yes	yes	yes	yes	yes	yes	yes	yes
ΔX_{t+1}	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	no	no	no	no	no	no	no	no	no
LDR	1,418	1,418	1,418	1,418	1,418	1,418	1,418	1,418	1,418
R^2	0.08	0.00	0.07	0.04	0.00	0.03	0.05	0.00	0.05
N	122,188	122,188	122,188	122,188	122,188	122,188	122,188	122,188	122,188
Panel B: Subsequent one year period ($v = 2$)									
$Prof$	0.023**	0.058**	0.038**	0.013*	0.049**	0.015	-0.022	0.112**	0.018
	(0.003)	(0.002)	(0.009)	(0.006)	(0.004)	(0.009)	(0.011)	(0.008)	(0.022)
$R\&D$	-0.007	0.072**	-0.027*	0.038**	0.128**	0.027	0.063**	0.400**	0.045
	(0.005)	(0.005)	(0.013)	(0.011)	(0.009)	(0.018)	(0.021)	(0.018)	(0.036)
BL	0.005**	-0.014**	0.007	0.019**	0.014**	0.016**	0.056**	0.034**	0.056**
	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)	(0.004)	(0.006)	(0.006)	(0.006)
LDR	0.024**	0.021**	0.027**	0.029**	0.025**	0.022**	0.049**	0.037**	0.048**
	(0.003)	(0.002)	(0.005)	(0.006)	(0.005)	(0.004)	(0.010)	(0.008)	(0.009)
ΔX_t	yes	yes	yes	yes	yes	yes	yes	yes	yes
ΔX_{t+1}	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects	no	no	no	no	no	no	no	no	no
LDR	1,269	1,269	1,269	1,418	1,418	1,418	1,418	1,418	1,418
R^2	0.13	0.00	0.11	0.09	0.00	0.06	0.10	0.00	0.09
N	109,634	109,634	109,634	109,634	109,634	109,634	109,634	109,634	109,634

Appendix Table 8: Public LDRs and subsequent abnormal returns

The table presents monthly abnormal returns (α) of a strategy investing into firms performing leverage decreasing recapitalizations (LDRs). LDRs are defined as periods of simultaneous net equity issues (NEIs) and net debt retirements (NDRs). NEIs are common and preferred stock issues net of dividends and repurchases, NDRs are short and long term debt retirement net of debt issues, both measured in excess of 5% of book assets. Public LDRs additionally impose a simultaneous public equity issue (identified through SDC). Abnormal returns are estimated relative to the CAPM [includes the market excess return (r_m)], the Fama and French three factor model [includes r_m, the the size factor (SMB) and the value factor (HML)] and the five factor model [includes the 3 FF factors plus investment (INV) and profitability (PROF)]. The sample is based on merging the annual sample of Compustat data with monthly stock returns using the CRSP database and imposing a four month lag between the date of the fiscal year-end (reported in Compustat) and the first monthly stock return (used from Crsp). Monthly market returns, risk-free rates and returns of the size, value, investment and profitability factors are obtained from Ken French's data library.

	CAPM		3 Factor Model		5 Factor Model	
	Coeff.	T-stat.	Coeff.	T-stat.	Coeff.	T-stat.
Panel A: Value weighted portfolios						
α	0.11	0.38	0.13	0.46	-0.31	-0.43
r_m	1.40***	18.14	1.26***	14.75	1.26***	14.91
SMB			0.58***	4.67	0.58***	4.53
HML			-0.22	-1.62	-0.24	-1.19
INV					0.04	0.16
PROF					0.02	0.55
N	527		527		527	
R^2	0.47		0.51		0.51	
Panel B: Equal weighted portfolios						
α	0.05	0.17	-0.05	-0.20	-0.40	-0.59
r_m	1.55***	23.10	1.35***	18.45	1.36***	17.28
SMB			1.06***	9.55	1.06***	9.42
HML			-0.12	-1.11	-0.14	-0.89
INV					0.04	0.17
PROF					0.02	0.47
N	527		527		527	
R^2	0.50		0.60		0.60	