

# Are all leverage decreasing recapitalizations the same?

Loreta Rapushi

November 2015

## Abstract

This paper studies stock price reactions of US public corporations to announcements of leverage decreasing recapitalizations (LDRs) over the period 1984–2014. Dynamic models of capital structure typically predict that leverage reductions are uncommon outside of default or strategic renegotiation. Our empirical analysis of LDRs includes exchange offers, equity issues with simultaneous debt retirements and equity issues that serve to increase cash holdings and suggests that - contrary to dynamic theories - leverage decreasing recapitalizations happen in financially safe firms. However, corresponding announcement returns are typically negative. We find that the magnitude of the market reaction is different across the different strategies implemented to reduce the leverage: in a three-day event window, it is considerably negative for cash hoarding and debt retirement while highly negative for exchange offers. For a larger event window, cumulative abnormal returns turn significantly positive for cash hoarding but remain negative for both the other groups. These results are consistent with an option value of cash holdings.

**Keywords:** LDR - leverage decreasing recapitalization; debt retirement; cash hoarding; exchange offer; cumulative abnormal return.

# 1 Introduction

Leverage decreasing recapitalizations, theoretically regarded as highly unusual operations, in reality happen, both across firms and more importantly repetitively in a firm.<sup>1</sup> Yet, in recent years, the empirical capital structure literature focused on the leverage increasing strategies. One reason might be that an important class of models in capital structure, the dynamic inaction models, suggests that it is never optimal to reduce indebtedness outside of default or strategic renegotiation.<sup>2</sup>

As a consequence, most of the latest dynamic capital structure models assume that no debt reductions are possible [Goldstein et al. (2001), Morellec et al. (2012)].<sup>3</sup> Others show that firms will never optimally modify their capital structure when reducing their level of leverage unless they are close to bankruptcy [Fan and Sundaresan (2000)]. Also, Danis et al (2014) argue that the reason why it is difficult to generate predictions and explanations for debt reductions is that it is usually impossible to observe the leverage of firms under bankruptcy. Therefore, they again relate the debt reductions with the bankruptcy. Thus, by the existing evidence, debt reducing recapitalization is a subject that is present at most where the ‘Classical capital structure’ literature and ‘Financial distress and bankruptcy’ literature encounter each other.

In this paper, we empirically show that debt reductions and more broadly leverage reductions do happen, also, when the firm is considered financially safe as measured by the standard measures of financial soundness used in the literature. Using the Altman Z-score as an indicator and predictor of financial distress, we check whether the firms that undertake leverage decreasing recapitalizations are more likely to have higher credit risk.<sup>4</sup>

There are other plausible theories about why leverage decreasing recapitalizations (LDR) might not occur. Recently, several papers have modeled the optimal capital structure problem in a principal-agent setting and the agency costs that arise in that setting. Notable in this context is the paper by Admati et al.(2013) in which they show that once debt is in place, shareholders may inefficiently increase leverage but avoid reducing it no matter how beneficial leverage reduction might be to total firm value.<sup>5</sup> These theories suggest that generally among

---

<sup>1</sup>In Fischer et al. (1989), Anderson and Sundaresan (1996), Mella-Barral and Perraudin (1997), Fan and Sundaresan (2000), Titman and Tsyplakov (2007), Bhamra et al. (2010a) it is never optimal to reduce debt outside of default or strategic renegotiation.

<sup>2</sup>The dynamic capital structure models are an important class of models because they tell which way the firms have to go if they want to optimize their capital structure decision at each instant. This is an important question, as the ability to modify the capital structure later may serve to inform on the capital structure decision now.

<sup>3</sup>The assumption of no downward adjustments in debt levels, is common also in the static structural models of capital structure. In Merton (1974), Black and Cox (1976) and Leland (1994) firms cannot reduce debt by assumption. Strebulaev (2007) allows for debt reductions but considers these events as exogenous.

<sup>4</sup>Robert Altman (2010) - Predicting financial distress of companies: Revisiting the Z-Score and Zeta® Models. The Z-Score below the lower cutoff of 1.81 indicates a high probability of distress within two years of operations.

<sup>5</sup>A paper similar to this one in spirit, but with a different setting, is Titman and Tsyplakov (2007). The

the various stakeholders of a firm, the shareholders are the ones who have no interest in lowering the indebtedness through ‘early’ recapitalizations. One would therefore ask: are stockholders harmed by the management’s decision to recapitalize?

This paper aims to answer this question through an examination of firms’ stock price reactions to LDR announcements of US firms in the period from 1984 to 2014. Then, we focus on the different techniques firms practice in realizing an LDR, on how the market reaction differs across those practices and finally, on the relation between the stock price reaction and various firm characteristics.

If the recapitalization costs are less than the present value of the expected cash flows resulted from the LDR decision, the decision should in principle increase the firm’s equity value. However, the stock price reaction would depend also on the information content of the recapitalization decision. It is possible that the stock price reacts still unfavorably to a positive net present value recapitalization if this decision conveys negative information of the firm’s future performance. Indeed, the firm must also consider the potential signaling effect and the adverse selection implications analysed in Myers and Majluf (1984).

Strebulaev (2007) shows that in presence of frictions, firms adjust their capital structure infrequently. Because altering a firm’s capital structure entails transaction costs, firms are likely to behave passively most of the time, changing their capital structures actively only if they significantly depart from “optimum” leverage.<sup>6</sup>

Of all the possible capital structure changes that a firm might undergo, the ones of interest herein are the leverage-reducing strategies, which firms may implement in different ways. They may use their internal funds to buy back bonds in order to lower their debt-to-equity ratio. The firm may conduct a debt tender offering before going close to maturity, and so without renewing the old debt. Doing so the company will have a greater margin of safety against bankruptcy because the company will be paying less interest in the future. Myers (1984) suggests through the pecking order hypothesis, that the firm’s managers will prefer to use retained earnings first, and will issue equity only as a latter option. Nevertheless, Leary and Roberts (2010) bring substantial evidence that firms do not follow a strict pecking order. Therefore, in line with this last evidence, firms may issue equity to retire old debt, even though this might be less common when they already have available cash.

In this last scenario, firms may lower their indebtedness in three ways: equity issuance and subsequent liquidity buffer increase; equity issuance for cash debt tender offer and equity for debt exchange offers.

To the extent that the leverage decreasing recapitalizations are not publicly announced op-

---

authors focus on the debtholder/equityholder agency problems. They find that an equity maximizing firm will never reduce its debt, because the transaction costs and the wealth transfer to debtholders exceed the added value associated with a movement towards the target. Of course, this result depends on a number of fixed parameters.

<sup>6</sup>Strebulaev, I. (2007), Do Tests of Capital Structure Theory Mean What They Say?. *The Journal of Finance*, 62: 1747–1787.

erations, it is difficult to measure the effect on stock prices of those. Thus, we identify the LDR announcements starting from the equity issues or equity for debt exchange offers, matching these announcements with the debt retirement/cash hoarding in the balance sheet items of those companies around the time of the announcements. We do not consider the cases in which firms buyback debt using their cash or retained earnings because these events are not associated to any public announcement.

Briefly, three results stand out from our event study. First, the immediate reaction of the market after leverage decreasing recapitalization announcements is at best zero. Second, we show that the equity for debt swap strategy is usually undertaken when firms are close to financial distress and hence cause a more negative reaction after announcements compared to the other LDRs. Finally, by looking at the comparison between the remaining two strategies, the retirement of debt after equity issues is perceived worse by the markets compared to the equity issuance and subsequent liquidity buffer increase. Our result is consistent with a value creation from cash holdings as in Gamba and Triantis (2009, JF). This result is also consistent with a financial flexibility objective, according to which the decision of the firm to increase liquidity and diminish the leverage is a voluntary effort of the managers to improve the capital structure. De Angelo & De Angelo (2006) explain that moderate flexibility benefits are sufficient to explain why profitable firms carry low leverage, since the annual tax-related opportunity cost of preserving one dollar of debt capacity is relatively small. While the flexibility argument might also apply for buybacks of debt, someone may as well relate the firm's decision with a possible running out of cash, or a level of leverage which is much higher than the target.

## 2 The empirical literature

Several empirical studies have estimated the market reactions to security issues.<sup>7</sup> For example, Masulis and Korwar (1986) show that announcements of equity issues result in significant negative stock price reactions. In addition, according to Eckbo and Masulis (1995), the announcements of security issues typically generate a non-positive stock price reaction. The valuation effects are the most negative for common stock issues, slightly less negative for convertible debt issues, and zero for straight debt issues. The larger the issue, the more negative the effects.

The negative market reaction to equity issues and the lack of a market reaction to debt issues are consistent with adverse selection arguments. Indeed, the pecking order theory predicts that securities which suffer more adverse selection (equity) will result in more negative market reactions. This result is well established in the empirical literature, and still, the impact of equity issues appears to differ conditional on a firm's choice of flotation method. For U.S. firms, Eckbo and Masulis (1992) find that the average announcement-period abnormal returns are insignificant for uninsured rights offerings and negative for firm-commitment underwritten

---

<sup>7</sup>See Eckbo and Masulis (1992), Eckbo and Masulis (1995), Jung et al. (1996), Antweiler and Frank (2006).

offerings. Estimating the response of the markets to equity issuances on the OSE, Eckbo and Norli (2004) find that uninsured rights offerings and private placements result in positive stock price reactions, while standby rights offerings generate negative market reactions. These papers interpret the effect of the flotation method as reflecting different degrees of adverse selection problems.

As we move from the event studies related to pure equity issues, to the market reactions to recapitalizations (with equity issues or exchange offers) the contribution becomes less ample. Relatively few papers to date have attempted to provide an explanation for the market's reaction to leverage decreasing recapitalizations. Masulis (1983), for example, documents a response of the stock prices to leverage altering capital structure changes. Evidence is obtained indicating that changes in stock prices are positively related to leverage changes. In addition, Chatterjee et al. (1995) show that on average the leverage-reducing strategies are expected to cause a negative reaction in the stock market returns.

More recently, Eckbo (2011) argues that these studies do not consider the starting level of leverage of the company that goes through the leverage decreasing recapitalizations. They implicitly assume that the firm is under levered. While these works remain focal, because no recent work overcomes the problems of these studies, they do not provide us with predictions about the debt reducing strategies that bring the firm closer to the target leverage. Because the equity for debt swaps are easier to identify, different papers focused on the market reaction to these swap announcements [Kalra et al (1996), Graham et al (1999)]. Special attention has been paid to the effects of these swaps across industries and years, with special considerations to the Deficit Reduction Act of 1984.<sup>8</sup> The empirical literature shows that the average stock price reaction at these exchanges announcements is negative before and after the Deficit Reduction Act.<sup>9</sup> Shah (1997) concludes that firms undertaking Debt reducing exchange offers (DREOs) are typically distressed.

There is an extensive empirical evidence on capital structure issues, including here security issues and security repurchase evidence, leverage changes evidence and numerous tests of the pecking order theory and the tradeoff theory.<sup>10</sup> Most of them focus on the debt changes rather than equity changes. For example, recent empirical tests of target adjustments suggest

---

<sup>8</sup>The Deficit Reduction Act of 1984 (Pub.L. 98-369), also known as the DEFRA, was a federal law enacted in the United States in 1984. Originally part of the Tax Reform Act of 1983, it was adjusted and reintroduced as the Tax Reform Act of 1984. Under this law if a creditor forgives or reduces debt and there is no transfer of property, the debt reduction is generally included in gross income. An issuer that exchanges a new security for old debt in an exchange offer will recognize ordinary cancellation of indebtedness income (CODI) to the extent the adjusted issue price of the old debt exceeds the issue price of the new security.

<sup>9</sup>Rajiv Kalra, Kam C. Chan and Gary A. Raines in 'The Effect Of Equity-For-Debt Swaps On Security Returns: Some New Evidence (1996).

<sup>10</sup>Regarding equity issues there is contrasting evidence between different countries. Several studies find positive market reaction to equity issues around the world (see Eckbo et al., 2007, for a summary). To understand this evidence, Eckbo and Masulis (1992) and, more recently, Eckbo and Norli (2004) have examined stock price reactions to equity issues conditional on a firm's choice of flotation method.

that firms adjust toward target debt ratios issuing debt when actual leverage is below the target, and reducing debt when leverage is above the target.<sup>11</sup> Hovakimian et al. (2001) show that adjustments are stronger and more significant for debt reductions than they are for debt issuances. It is not clear why firms adjust more quickly when they are overlevered and what is the market reaction when leverage decreasing operations are announced. We do not have a clear indication on the frequency of leverage decreasing recaps either. This paper aims to bring new evidence regarding the frequency and the market reaction to the debt reducing strategies that bring the firm closer to the target.

### 3 Hypothesis

Dynamic contingent claims models of capital structure imply that leverage decreasing recapitalizations do not occur outside of bankruptcy. For example, Fischer et al. (1989) show that firms have a range of capital structure values within optimally chosen boundaries and they will recapitalize only if they hit the barriers. If equity holders could call the debt earlier without any extra costs, they would transfer wealth from the debtholders to themselves. The debtholders anticipate this incentive and ask for higher bond coupon rate, call premium or issue discounts, which make it convenient for equity holders to pre-commit. For the reason that these instruments mitigate the agency problems between equity holders and debtholders, early recapitalizations do not happen. Similar findings can be found in Fan and Sundaresan (2000), Goldstein et al. (2001) or Morellec et al. (2012).<sup>12</sup>

Reassuring, intuitively what these studies tell us is that equity holders have no incentive in recapitalizing too early because they would redistribute the wealth in favor of debtholders. The intuition is easily understood if we think about the “cashing out” effect of debt overhang or oppositely, to the asset substitution effect especially in firms with high financial distress risk. Once a firm has debt already in place, managers (with interests aligned with shareholders) may take action that disburse the proceeds to shareholders but discharge the downside risk to debtholders. In this case, they would have no interest in decreasing leverage by buying back debt, even if it will increase the value of the firm. If they did, the remaining debtholders gain in a higher priced debt because of the lower financial distress risk of the recapitalized firm.

Hypothesis 1 summarizes the above view.

- Hypothesis 1 (Leverage decreasing recapitalizations and bankruptcy menace):
  - Leverage decreasing recapitalizations do not happen outside of financial distress.

---

<sup>11</sup>Hovakimian et al. (2001), Fama and French (2002), Korajczyk and Levy (2003) and Kayhan and Titman (2007).

<sup>12</sup>Moving away from pure recapitalizations, debt decreasing operations are shown to be frequent [Hovakimian, H & Tehranian (2004); DeAngelo, D & Whited (2011)] and there is ample evidence that most of the long-term debt contracts are renegotiated prior to maturity [Roberts & Sufi (2009)].

Given that LDRs are not optimal from a theoretical perspective, their expected announcement return is negative. Similarly, a pecking order interpretation of equity issues and simultaneous cash hoarding implies a negative expected return.<sup>13</sup> In a dynamic setting, issuing equity and/or holding cash is typically less efficient than the usage of transitory debt or loan commitment.<sup>14</sup> From the considerations above, we lead at our second hypothesis.

- Hypothesis 2 (Leverage decreasing recapitalizations and stock market reaction):
  - The announcement return of Leverage decreasing recapitalizations is negative across all strategies.

The leverage reductions in LDRs may occur through debt retirements or simultaneous cash hoarding or both. Gamba and Triantis (2009, JF) present a dynamic financing and investment model in which firms choose optimal investment policies, debt and cash holdings. The model implies that while firms may optimally change their net leverage policy in response to changes in the investment opportunities, such changes should affect cash holdings instead of debt levels.<sup>15</sup> As a consequence, because both transactions (debt retirement *versus* cash hoarding) decrease net leverage by the same amount, we hypothesize that the announcement return involving cash hoarding is less negative due to the additional option value embedded in the cash holdings.

- Hypothesis 3 (Issue equity to retire debt vs Issue equity to hold/invest the cash):
  - The announcement return of LDRs in which you do not retire debt is less negative compared to the case in which you retire debt.

## 4 The data

### 4.1 Sample Construction

We start with the quarterly data from merged Crisp Compustat (CCM) database from January 1984 to December 2014 and impose the following sample selection criteria: public nongovernmental industrial firms only (eliminate firm-years for utilities (SIC codes 4899-5000), financial

---

<sup>13</sup>Myers (1984) states that a firm is following a pecking order if it prefers internal to external financing and debt to equity if external financing is used.

<sup>14</sup>Asvanunt, Broadie & Sundaresan (2010) and De Angelo, De Angelo & Whited (2011).

<sup>15</sup>Bates, Kahle, and Stulz (2009) demonstrate that the average cash-to-assets ratio for US industrial firms has more than doubled since the mid-1980s. Lyandres and Palazzo (2012) show that the increase in average cash holdings is driven almost solely by firms which invest heavily in R&D. Falato, Kadyrzhanova, and Sim (2013) provide theoretical and empirical evidence that the rise in intangibles is a fundamental driver of the secular trend of cash holdings. Others have focused on the precautionary motive of cash holdings (Keynes (1936), Almeida et al. (2004) and Han and Qiu (2007)) that arises as constrained firms proactively save more to safeguard future investment needs.

**Table 1:** The sample construction

Panel A: Crisp Compustat merged (CCM)				
Selection type	Total	M.Lev < 0.4	0.4 < M.Lev < 0.6	0.6 < M.Lev
All Industry observations in Crisp-Compustat	522,388	301,228	98,864	122,294
Net leverage decreases (5%)	66,973	43,126	11,557	12,290
Panel B: Security data company (SDC)				
Selection type	Total	M.Lev < 0.4	0.4 < M.Lev < 0.6	0.6 < M.Lev
Equity issues	8,785	6,088	1,431	1,259
Equity for debt swaps	107	9	15	83
Panel C: SDC_CCM merged				
Selection type	Total	M.Lev < 0.4	0.4 < M.Lev < 0.6	0.6 < M.Lev
All matched	6,301	4,375	989	807
All leverage decreasing recapitalizations related to an equity issue or an exchange offer	Debt Retirement			
	1,165	658	278	229
	Cash Hoarding			
	2,524	2,167	195	162
	Exchange offer			
	91	9	13	69

firms (SIC 5999-7000), and government entities (SIC above 8999)). We require non-missing data for assets, debt, cash and other covariates (to be defined in Table 2).

We then merge the CCM data with SDC- global issues- data and SDC- restructuring- data, respectively. Because SDC has limited information about equity for debt exchange offers, the merge is based mainly on equity issues. Initially, we have approximately 9000 equity issue events (no IPO) of public U.S firms. When merging CCM and SDC 6301 event-firms are matched. Using the information from companies' balance sheet, we identify the frequency of leverage reducing recapitalizations and describe the corresponding firm characteristics. We define a leverage decreasing recapitalization (LDR) as a decrease in net book leverage by at least 5 percentage points and simultaneous increase in book equity by more than 5 percentage points.<sup>16</sup>

Further, we want to define whether the decrease in leverage is attributable to a debt retire-

<sup>16</sup>Net book leverage is defined as total debt minus cash, divided by the total assets.

ment or a cash hoarding situation so the next step consists in sorting the observations in three subsamples, following another criterion. We classify the transaction a debt retirement if in the next period the change in debt over the assets is lower than a given negative threshold. In this case, the cash outflows from the firm to buyback part of the debt or all of it.

$$\frac{(D_{t+1}-D_{t-1})}{A_{t+1}} \leq -threshold$$

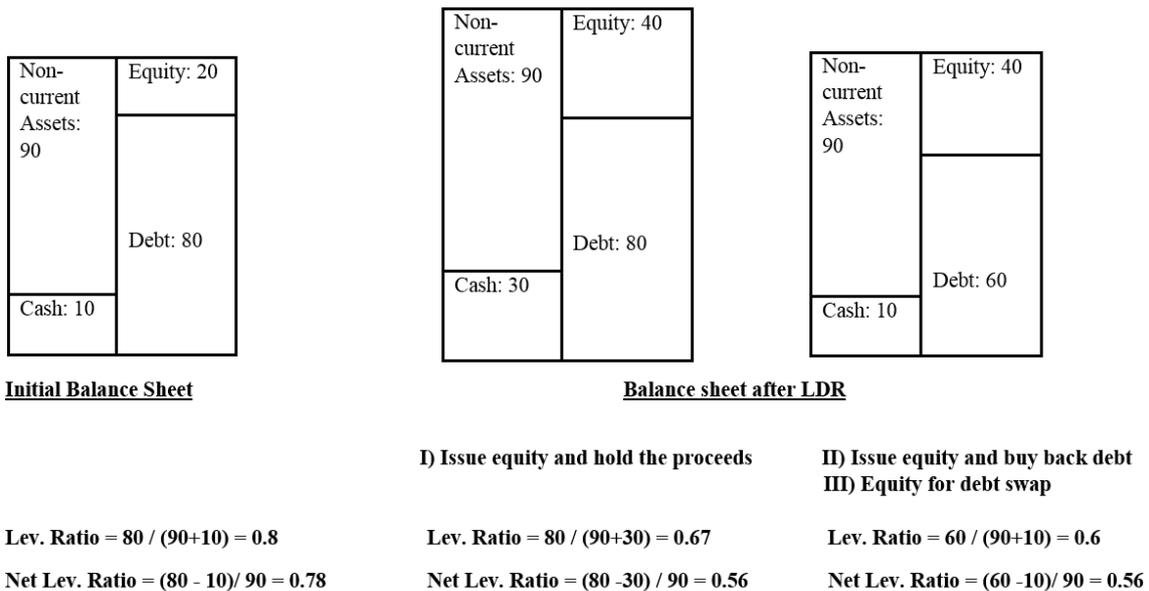
On the other side, the transaction is categorized as a cash hoarding if in the next period the cash increase over assets is higher than a given positive threshold.

$$\frac{(C_{t+1}-C_{t-1})}{A_{t+1}} \geq threshold$$

We also check if the change is still there in the next quarter and in the one that follows, to make sure that the change is not only temporary. If this cash amount is increasing in the next quarter and it remains there for at least two quarters we call this case, one in which the proceeds are hoarded into the firm. As for the equity for debt swaps, we already have a well-defined subsample because we find the information on SDC or in the publicly available filings. In the empirical analysis, we try two different thresholds: 5% and 2.5%. We exclude the observations for which we have missing data for the cash change or the debt change in the next two quarters.

The three different alternatives to reduce leverage are illustrated in Figure 1. The figure exhibits how the firm's balance sheet changes under each of the alternatives, when the firm issues 20 units of new equity. All alternatives, reduce the net leverage ratio by 0.22, from an assumed initial ratio of 0.78 to 0.56.

**Figure 1:** Alternative ways to decrease the level of leverage in a firm



Out of the 6301 observations matched in SDC\_CCM we exclude 482 events. Those represent the second or third consecutive issue done by the same issuer in a single quarter. Considering

that when the issues are so close to each other, the first issue success or failure might influence the announcement effect of the others, we exclude them from the analyses. We also drop 17 events (15 equity issues and 2 exchange offers) which do not provide balance sheet items data after the event. Some of these firms go bankrupt; others are merged or have been acquired.

We finally match the announcement date in SDC with stock price information in CRSP and estimate abnormal returns. For the event study analysis, we consider each firm-date couple, so that each daily rate of return is the security return of a firm for a specific event date. The event window is defined as the number of trading days before and after the announcement date under inquiry, where day 0 is the announcement date of the transaction (filing date for equity issues in SDC). Differently from the case of exchange offers, for buybacks of debt we have only the announcement date for the equity issue preceding the buyback. The data from balance sheet is at best quarterly so we cannot find the exact date of the debt retirement and this kind of transaction normally is not announced in the markets. Therefore, we analyze the market reaction based on the equity issue announcement and then classify into groups based on the use of the proceeds that firms make.

Convertible preferred stock issues are excluded because convertible securities variance and risk, is on average higher than the non-convertible ones and consequently we would expect different price reactions.<sup>17</sup>

## 4.2 Descriptive data

Out of the 6301 matched firm-years in SDC - Crisp - Compustat, approximately 2000 are cases in which the equity issues are followed by a leverage increase, which in turn are associated to a debt increase in 1237 of the cases. This means that a good part of industrial firms increase their level of debt after issuing equity. This result is aligned with Eckbo & Masulis (1995) who show that most of the equity issues are followed by debt issues, so the reduction in leverage may be only temporary. We don't include these firms in our analysis. Our final sample consists of 3780 leverage decreasing recapitalizations by U.S. corporations in the last thirty years.<sup>18</sup> We recall that the LDRs we consider in the paper are pure recapitalizations or cash (assets) growth. Here are not included cases in which the LDRs are done using internal funds or through asset sales. If the threshold is changed from 5% to 2.5%, the sample increases considering that the requirement is lower. At the same time the significance of the results in the empirical analysis loses significance, for this reason we do not report the results for the threshold of 2.5% in the paper.

In Figure 2, we can notice a boom of the issues that persists during all the 1990s and the highest number of exchange offers in 2009. It is interesting to notice that while the other two forms of LDRs are present across all the timeline, the equity for debt swaps completely

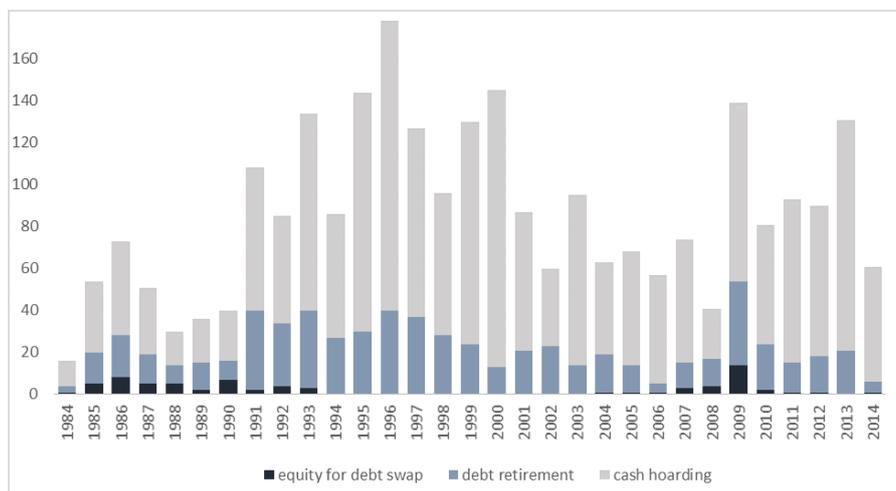
---

<sup>17</sup>Masulis (1980) - The effects of Capital structure change on security prices, page 16

<sup>18</sup>Sum of 1165 debt retirements, 2524 cash hoardings and 91 equity for debt swaps.

disappear from 1994 to 2007. This phenomena is related to the particular characteristics of these operations: equity for debt exchanges combine buyback and issuance operations in a single operation. Issuance and buyback take place at the same time and they are operationally

**Figure 2:** Year by year frequency of LDRs



linked in the sense that the participants must take part either in both operations or not at all. A particular type of these swaps, the 3(a)9 exchanges, have been particularly attractive to the firms because they did not require SEC review and could be accomplished very quickly.<sup>19</sup> A second important element related to those exchange offers is that they have been tax-free until 1986, even if the securities had a combined value of less than the original claim. In the late 1980s, the reduction in debt was considered a taxable event.<sup>20</sup> Hence after that, the firms found no reason to undertake exchange offers because they would have caused an increase in taxes. Indeed, for a long time these exchanges were practiced very rarely as we perceived from the Figure 2. Still, in the years post financial crises, most of the companies put increased effort in restructuring and strengthening their balance sheets through exchange offers.

Relative to retirements, equity for debt exchanges may have some advantages. They could become particularly convenient in periods of turmoil: suppose the firm is issuing equity in a moment where markets are highly volatile then it will be difficult for the company to sell

<sup>19</sup>An exchange offer also involves the offer of new securities so it must comply with, or satisfy an exemption from, the registration requirements of the Securities Act. An issuer may rely on the private placement exemption provided under Section 4(2) of the Securities Act or the exemption provided by Section 3(a)(9) of the Securities Act. The four main requirements of Section 3(a)(9) are as follows: 1) Same issuer. The issuer of the old securities being surrendered is the same as the issuer trying to effectuate an exchange of the new securities. 2) No additional consideration from the security holder. The security holder must not be asked to part with anything of value besides the outstanding securities. 3) Offer only to existing security holders. The exchange must be offered exclusively to the issuer's existing security holders. 4) No remuneration for the solicitation. The issuer must not pay any commission or remuneration for the solicitation of the exchange.

<sup>20</sup>The reduction in indebtedness through exchange offers was not considered an increase in gross income (and thus not taxable as income) even if the securities had a combined value of less than the original claim.

shares at the price offered. The investors may have limited liquidity. Even in case the equity issuance performs really well, the firm must deal with the cash tender offer. The advantages of

**Table 2:** Descriptive data

Debt retirement			
Variable	Obs	Mean	Median
Book leverage	723	0.61	0.57
Market leverage	721	0.36	0.32
Total assets	715	839	254
Profitability	671	0.03	0.04
Capex/Assets	717	0.05	0.02
Market to Book	721	2.88	1.69
Tangible assets	721	0.34	0.28
Cash Hoarding			
Variable	Obs	Mean	Median
Book leverage	1982	0.37	0.29
Market leverage	1976	0.15	0.08
Total assets	1982	491	107
Profitability	1828	-0.02	0.02
Capex/Assets	1960	0.04	0.02
Market to Book	1976	4.58	3.31
Tangible assets	1978	0.19	0.11
Equity for Debt Swap			
Variable	Obs	Mean	Median
Book leverage	59	0.97	0.89
Market leverage	57	0.75	0.85
Total assets	61	5412	354
Profitability	53	-0.00	0.02
Capex/Assets	60	0.03	0.02
Market to Book	59	1.42	1.21
Tangible assets	61	0.38	0.34

Market Leverage is defined as book debt divided by the sum of book debt and market equity, where market equity is equal to common shares outstanding times the stock price at the end of the fiscal quarter, both of which we draw from CRSP. Profitability is defined as operating profit divided by total assets. Market-to-Book is the sum of market equity and book debt divided by total assets. Tangible Assets is defined as net property/plant/equipment divided by total assets.

the exchanges relative to the buybacks are in part offset by the coincidental needs problem. In an exchange offer of the type ‘equity for bond swap’ investors should have an interest to trade their debt exactly with those kind of securities the firm offers. This may reduce the demand. Furthermore, these offers are influenced by a variety of factors, including the terms of the offers and the type of the bondholders who are offered equity.

Danis (2013) argues that the growing CDS market has lowered the bondholders participation

to these offers. If bondholders are hedged in the CDS market they may not be willing to exchange their securities unless they gain more than face value. Finally, the offer has to be sufficiently attractive to avoid the ‘free rider’ problem. The choice between these similar ways of decreasing leverage may depend on the characteristics of the firms that undertake the operations.

Table 2 illustrates some firm characteristics for different groups of LDRs. It is interesting to notice the level of book leverage and market leverage for the three groups. The firms that reduce leverage with the occurring of a debt retirement have on average a higher leverage ratio compared to the cash hoarding group but a consistently lower leverage compared to the firms that undertake securities exchanges. We also notice that firms, which carry out pure exchange offers, are bigger firms in terms of assets. These firms have on average activities that are ten times the Cash hoarding firms and six times the Debt retirement firms. This relates to the fact that typically the equity for debt offers are done for specific classes of debt, in big firms that have many different classes of debtholders. The firms that perform exchange offers have on average a lower market to book ratio and a higher level of tangible assets compared to both the other groups. We also notice that firms, which issue equity and buy back debt with the proceeds, have higher profitability than Cash hoarding firms and Exchange offer firms. These numbers suggest that profitability might be related to the usage of leverage. Not surprisingly the cash hoarding firms have a level of leverage which is half of the leverage of the debt retirement group while their profitability is -2% in front of the +3% of the other group.

## 5 Empirical analysis

### 5.1 Leverage decreasing recapitalizations and bankruptcy menace

In this section, we analyze the influence of the financial soundness of a firm on its propensity to undertake a leverage decreasing recapitalization. According to the dynamic models of capital structure the firms would decrease the level of leverage only if close to bankruptcy. To assess whether this is true in practice, we scan the financial situation of the firms in our LDRs sample. In addition we examine the relationship between the financial soundness of the firm and the possibility of undertaking an LDR, using multinomial logit regressions.

Because we want to know about the financial health of the firms, we calculate the Altman’s Z-score in the quarters prior to the leverage reduction announcement. The Altman Z-Score is found to be 80-90% accurate in predicting bankruptcy one year prior to the event.<sup>21</sup> If the Altman Z-Score is close to or below three, it is wise to do some serious due diligence before considering investing.

Taking in consideration that our sample is totally composed of public industrial firms, we use the industry Z-score that is calculated as follows:

---

<sup>21</sup>Altman E., (2000). Predicting Financial Distress of Companies: Revisiting the Z-Score and Zeta Models.

$$1.2 * \frac{\text{WorkingCapital}}{\text{TotalAssets}} + 1.4 * \frac{\text{RetainedEarnings}}{\text{TotalAssets}} + 3.3 * \frac{\text{EBIT}}{\text{TotalAssets}} + 0.6 * \frac{\text{MarketValueofEquity}}{\text{BVofTotalLiabilities}} + 1.0 * \frac{\text{Sales}}{\text{TotalAssets}}$$

where:

Working capital over total assets measures liquid assets as firms in trouble will usually experience shrinking liquidity. The second ratio indicates whether the firm is paying for assets using profits or using debt. A high ratio indicates that profits are being used to fund growth, while a low ratio indicates that growth is being financed through increasing debt. EBIT over total assets shows how productive a company is in generating earnings, relative to its size. The fourth ratio offers a quick test of how far the company’s assets can decline before the firm becomes technically insolvent, which means its liabilities exceed its assets. Finally, asset turnover is a measure of how effectively the firm uses its assets to generate sales.

We first calculate the Z-score and then define ‘financial soundness’, a categorical variable that takes three values: one for companies who are safe, two for those who are in the grey area and three for the ones that are in financial trouble.<sup>22</sup> We also add a second categorical variable ‘Type’ that takes on three values: Hoarding cash (Type = 1), Buybacks of debt (Type = 2), and Exchanges (Type = 3) according to the different types of leverage decreasing recapitalizations we consider here.

**Table 3:** Descriptive data for *Financial Soundness*

Category	Hoarding	Buyback	Swap	Total
<b>Financial soundness</b>				
Safe	1,378 (73.30%)	641 (58.70%)	10 (17.54%)	2,029 (67%)
Grey	179 (9.52%)	194 (17.77%)	4 (7.02%)	377 (12%)
Distress	323 (17.18%)	257 (23.53%)	43 (75.44%)	623 (20%)
Total	1,880	1,092	57	3,029

In Table 3 we report the results of a first univariate analysis. The sample becomes smaller because not all of the previous companies have the items used to calculate the Z-score in the semester preceding the event. At this step of the analysis, we have 3029 firm-event observations. We can easily notice from the data that 67% of the firms that undertake a leverage decreasing

<sup>22</sup>The Z-score results usually have the following zones quote of interpretation:

- Z Score above 2.99 means ‘Safe’ Zones. The company is considered ‘Safe’ based on the financial figures only.
- Z score between 1.8 and 2.99 means ‘Grey’ Zones. There is a good chance of the company going bankrupt within the next 2 years of operations.
- Z score below 1.80 means ‘Distress’ Zones. The score indicates a high probability of distress within this time period.

recap is safe financially at that same year. Given these numbers, we can surely reject the first hypothesis. The practical idea behind the first hypothesis is the following. If the firms undertake LDRs only when close to bankruptcy, then we should not observe leverage decreasing recapitalizations out of the distressed firms group. According to Table 3 results, at least 2029 different times financially sound firms undertake leverage decreasing recaps. The statistics suggest that the equity for debt swap is the only type of LDR that happens mostly when close to distress while firms that perform an LDR through buying back debt or hoarding cash are financially sound for the biggest share.

The univariate analysis shows that financially safe firms undertake leverage decreasing recapitalizations. In our sample, it happens pretty often and we recall that the sample is quite comprehensive (embodies approximately thirty years of data). However, at the same time we are aware of the fact that firms might undertake practices of leverage decreasing operations which are not part of this study. For this reason we want to examine through a multivariate analysis if still exists a significant negative relationship between financial condition and propensity to do an LDR, as the literature suggests. Altman Z-score is a comprehensive indicator of the financial condition of a firm but it does not consider all the factors that might lead a firm to a leverage reduction.

Leverage can change when the firm's financial condition changes but it can also change due to the firm's active decision to issue equity or to retire debt originated by other reasons. The capital structure literature identifies a large number of cross sectional variables that appear related to leverage. Frank and Goyal (2007) show that only some of these factors are financially significant. Putting together the empirical evidence for factors that exhibit the most robust correlation with leverage, and our preliminary analysis of the financial condition of firms that make LDRs we set the stage for the multivariate analysis that follows.

Through the multinomial logit regressions we check the link between the financial soundness and LDRs, and explore the potential other firm's characteristics that might drive the decision to undertake or not a leverage decreasing recap. In the equations (1), (2) and (3) in Table 4 we aim to identify the variables that are effective influencers of the decision of doing an LDR. Further, in equations (4) and (5) we examine the same variables to check the influence in the type of the LDR chosen, given that the firm does a LDR. The control variables considered in the previous literature, for example, the log of the assets, the level of leverage and the capital expenditure are included. Further controls are the increase in investments, the sale of property and the management participation in the firm's shares. All firm specific control variables are based on Compustat data.

In model (1) and (2) in Table 4, we run a multinomial Logit regression with the LDR dummy as dependent variable and the firm's financial situation as a regressor. The dependent variable takes the value one if the firm does an LDR and zero otherwise. Column (1) in Table 4, the base specification, tells that undertaking a LDR is on average less probable if the firm is financially sound. The odds ratio of safe companies doing LDRs is less than half of the odds ratio of

**Table 4:** Regression Results

	Dependent variable				
	LDR (1)	LDR (2)	LDR (3)	Hoard vs Ret. (4)	Exch. vs Ret. (5)
Financial soundness	-1.037*** (-13.00)	-1.008*** (-11.65)		-0.278* (-1.41)	-25.75 (-0.82)
log(Assets)	0.299*** (17.58)	0.331*** (17.54)	0.162*** (12.36)	0.159** (2.70)	1.719** (2.31)
Retained Earnings	-0.0000427*** (-4.71)	-0.0000862*** (-5.22)	-0.000249*** (-9.54)	0.00017 (1.33)	0.00037 (0.69)
Capex	-0.00207*** (-6.73)	-0.00326*** (-6.67)	-0.00171*** (-6.13)	0.000462 (0.51)	-0.0577** (-2.05)
R&D Expense	0.0011 (0.60)	0.0012 (0.56)	0.00065 (0.62)	-0.0234 (-1.23)	14.53 (0.00)
Market Leverage	-5.254*** (-22.87)	-5.441*** (-21.08)	-3.250*** (-16.10)	-3.183*** (-6.14)	4.910** (1.84)
Increase in Investments	-0.0013*** (-4.91)	-0.00137*** (-4.89)	0.00004 (0.15)		
Sale of Property		0.0018** (2.38)	0.0016** (2.30)	-0.0007 (-0.29)	-0.0055 (-0.86)
Managers Share		-0.0001** (-1.90)			
Working Capital			-0.000105 (-1.48)		
Cash and equivalents			-0.00263*** (-5.63)		
_cons	-3.369***	-3.468**	-2.282**	0.751**	-14.42**
<i>N</i>	69149	58050	31956	2411	1237

Estimation results of multilogit (probit only in model (3)) regressions, where the dependent variables are: in models (1), (2) and (3) the leverage decreasing recapitalization dummy indicating whether the firm undertakes an LDR or no, in model (4) the Hoarding *vs* Retirement dummy which tells the choice of the firm between the two types of LDR given that the firm does a leverage decreasing recap.; in model (5) the Equity for debt swap *vs* Retirement dummy which tells the choice of the firm between the last two types of LDR given that the firm does a leverage decreasing recap. The independent variables are a dummy that indicates whether a firm is safe financially or no (we exclude the firms in the grey area according to Altman score), the log of the total assets, the retained earnings of the year of the event, the capital expenditure, the in-process R&D expenses, the market leverage, the change in investment that year, the sale of property and the shared of the company owned from the managers.

distressed firms doing LDRs.<sup>23</sup> This is an economically important number, and the financial soundness dummy is significant across all specifications.<sup>24</sup> Our finding of a negative correlation between financial soundness indicator and the decision to decrease leverage is aligned with the theoretical literature.

Among the various statistically significant covariates, the size of the firm and the level of market leverage present coefficients of economic relevance. A possible explanation for the higher propensity of large firms to reduce leverage is the pecking order argument of the inverse relation between leverage and firm size. Large firms are better known in the markets and face lower adverse selection. Consequently, they can more easily issue equity to keep the proceeds or to retire debt compared to small firms with more severe adverse selection problems.

One possible explanation for the negative coefficient in front of the market leverage, could be the agency view according to which managers (when acting in the interest of shareholders) will voluntarily avoid to reduce the leverage unless they are close to bankruptcy. In addition, a firm who already has a high level of leverage will find it more difficult than a low levered firm to issue equity. Less investors will be willing to buy shares in a highly indebted company. Reassuming, the first two models in Table 4 show that the probability of a safe firm to do a leverage reduction is approximately one third that of a distressed firm, but safe firms do still perform LDRs. The first two regressions do not detect why financially sound firms might undertake leverage reducing operations. In the third model in Table 4, we run a Probit model of the LDR dummy variable on different firm characteristics. This time, we consider only the subsample of firms who's Z-score is above three, in other words the safe firms. The market leverage of the firm alone, is able to explain 17% of the variability in the decision of doing an LDR ( $R^2 = 0.17$ ). Other controls are also highly significant: highly leveraged firms dislike doing LDRs, more so when they have cash and equivalents in their accounts. Bigger firms with high working capital are more prone to go for a leverage decrease recap. If we consider the working capital ratio as a measure of the company's efficiency and its short-term financial health we can argue that, in the subsample of safe firms, the healthier firms perform more LDRs.

More generally, the firms will be inclined to undertake an LDR when they are close to distress and have no other options, or, on the complete opposite, when they are healthy, efficient and actively adjusting their leverage ratio. The evidence presented so far is partially consistent with the previous literature. In the remaining models reported in Table 4, we analyze the role of the firm characteristics in the choice of the LDR's type, given that the firm does a LDR.

In equation (4) we explore the choice between hoarding cash and retiring debt. In equation

---

<sup>23</sup>According to the interpretation of the logistic regression with dichotomous dependent variable and dichotomous predictor variable, the coefficient in front of the 'financial soundness' variable is equal to the  $\log(\text{the odds of safe firms to make an LDR} / \text{the odds of distressed firms to make an LDR}) = -1.037$  which in turn gives that the odds of safe firms are  $e^{-1.037} = 0.35$  times the odds of troubled firms.

<sup>24</sup>The LDRs are only a part of all the possible leverage decreasing operations that a firm can undertake. When we refer to the probability of undertaking a leverage reduction, we are talking only about the three types of leverage decrease considered in this paper.

(5) we check the factors that might influence the choice between exchange offers and retiring debt. Both models are the result of a multilogit regression in which the base group to compare with, is the group of the firms that retire debt. We find that, all the rest kept constant, firms with high level of leverage will prefer to retire debt instead of hoarding cash, and prefer exchange offers to retiring debt. Financially safe firms do slightly prefer the retiring to hoarding, and definitely the retiring to the exchanges even though this last result is not statistically significant. We claim that the non significance is related to the size of the exchange offers group, relatively small compared to the others.

## 5.2 Leverage decreasing recapitalizations and stock market reaction

The event study we perform here focuses on leverage reductions realized through equity issues and exchange offers. Even though we consider a single class of news story, the analysis is quite comprehensive since the sample includes thirty years of data. In the typical event study, the market is supposed to jump straight away when the news become public and according to the efficient market hypothesis [Fama (1991)] the market should absorb the new information fully within at most two days. However, as we observe in the data, the process does not end within two trading days. In contrast with the efficient market hypothesis, Antweiler and Frank (2006) argue that, one or two days after the news, there is typically a significant drift in the opposite direction of the initial jump. For this reason, we analyze the cumulative abnormal returns for different event windows. To assess the average magnitude and statistical significance of stock price changes that follow announcements, we want to separate the effect of the news from the unrelated effects.

We assume that the stochastic process generating security rates of return is:

$$\mathbf{Ret}_{it} = \mu_{it} + \epsilon_{it} \text{ where } \mathbf{E}(\epsilon_{it}) = 0 \text{ and the } \mathbf{cov}(\epsilon_{it} \epsilon_{it-1}) = 0 \quad (1)$$

for all firms and dates.

The non-stochastic term is a component determined based on the assumed asset pricing model and the assumed normal distribution of the stock returns. The error term includes both security specific effects and market wide influences. In order to evaluate the impact of new information on security prices, we detach the error term from an estimation for  $\mu_{it}$ . This estimation is done through CAPM, which specifies the following statistical relationship between stock return and market return:

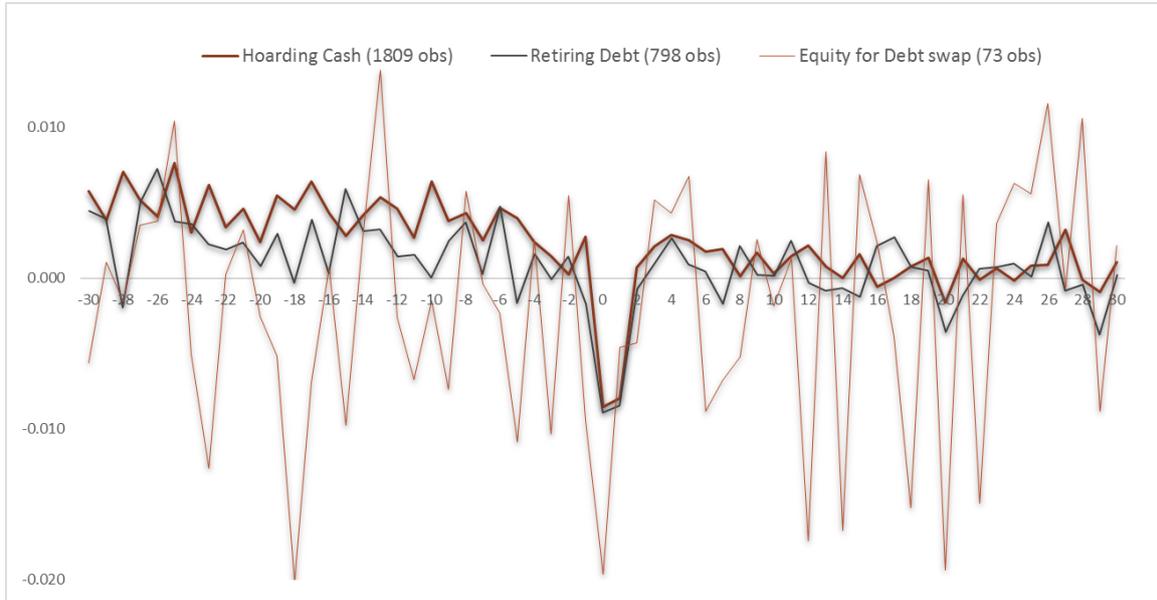
$$\widehat{\mu}_{it} = \widehat{\alpha}_i + \widehat{\beta}_i \mathbf{Ret}_{mt} \quad (2)$$

We then subtract this estimated value from the realized return on the stock to have a value for the abnormal returns.

$$\mathbf{Abnorm.Ret}_{it} = \mathbf{Ret}_{it} - \widehat{\mu}_{it} \quad (3)$$

Finally, we regress the cumulative abnormal returns (*CAR*) on the leverage ratio and the different control variables.

**Figure 3:** Average abnormal returns of LDRs in a large window



The plots show the average abnormal returns for three different event announcements. In the x axes we find the distance from the event day (day 0) in trading days. The number of observations from each type is given after the name of the event type in the chart legend.

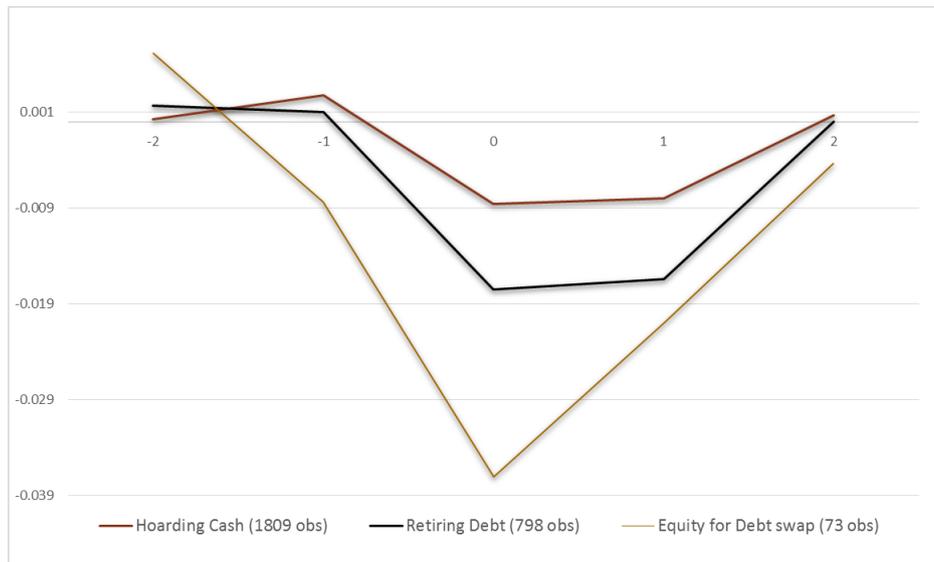
The Figure 3 shows the average abnormal returns for three types of leverage decreasing recapitalizations in an extended window (-30: +30) while Figure 4 captures closer the average abnormal returns around the event day. As it is easily distinguishable in the charts the abnormal returns are larger and mostly irregular in the case of exchange offers. The abnormal returns follow pretty much the same pattern for buybacks and hoardings.

Outside of equity for debt swaps who present irregular fluctuations along all the way, the other two groups show abnormal returns that are constantly positive, even though not statistically significant, in the month preceding the event. This does not indicate information leakage preceding the announcements for these firm-event observations. As shown empirically in Korajczyk, Lucas and McDonald (1991) the stock price tends to rise prior to the announcement of an equity issue.<sup>25</sup> This result is theoretically supported by the lemons principle, regarding the adverse selection problems in issuing equity.<sup>26</sup> This principle explains why we see an over performance of the two groups before the announcement day. Managers who plan to decrease leverage have an incentive to delay until any news that might positively affect the stock price

<sup>25</sup>Korajczyk R., Lucas D., and McDonald R., (1991). "The Effect of Information Releases on the Pricing and Timing of Equity Issues," *Review of Financial Studies*, Vol. 4, pp 685–708. They find that stocks with equity issues outperformed the market by almost 50% in the year prior to the announcement of the issue.

<sup>26</sup>Masulis R. and Korwar A., (1986). "Seasoned Equity Offerings: An Empirical Investigation," *Journal of Financial Economics*, Vol. 15, pp 91–118; and Mikkelson W. and Partch M., (1986). "Valuation Effects of Security Offerings and the Issuance Process," *Journal of Financial Economics*, Vol. 15, pp 31–60.

**Figure 4:** Average ab. returns around the event day for selected types of LDRs



The event windows commence at two trading days before the event days (marked by -2 in the chart). The number of observations for each type is given after the name of the event type in the chart legend.

becomes public. In contrast, there is no incentive to delay if managers expect negative news to come out.

The pattern that we observe across all types of LDR shows that in the day immediately after the event the returns drift in the opposite direction of the initial negative jump. This process, named stock market overreaction by Antweiler and Frank (2006), is the reason why the conclusion of our event study might be sensitive to the event window chosen. Because of this, we provide the cumulative abnormal returns for larger intervals starting from trading day -1 and extending until a month after the news publication date.

In the first column of Table 5, we report the cumulative abnormal returns (based on eq. 2) for the announcement day and the day immediately before and after the announcement day. Unlike the previous figures, Table 5 reports two more subcategories of LDRs: the firms who use the proceeds both to add cash and to retire debt, and the firms which hoard the proceeds for two quarters only, to use them in the third quarter from the event.

In line with our second hypothesis the 3-day  $CAR$  is negative and significant across all types of leverage decreasing recapitalizations. The security price changes and the abnormal returns are larger in the case of exchange offers. In line with our prediction (that the reaction of the markets should be relatively better for firms, which hoard cash compared to those who use the cash to buy back debt) the average of the 3-day  $CAR$  is higher for firms that hoard cash.

Apparently the hoarding firms, having a lower level of leverage compared to debt retirement firms, let investors think that they do not dread the upper boundary of leverage. So, if they decide to lower down the leverage through hoarding cash, is very likely that they keep cash as a buffer in case of new investment opportunities. Differently, buyback firms which have on

average a leverage ratio of 0.61 compared to the 0.37 of the others, might need cash to pay back debt. This can be the explanation of the higher magnitude of the abnormal returns associated to debt retirements. The same reasoning might provide an explanation for the exchange offer firms, which according to the evidence are less stable also before the event and have the highest leverage ratio.

**Table 5:** Cumulative abnormal returns for leverage decreasing recaps.

Event	N	3 day CAR (-1:+1)	10 day CAR (-1:+8)	20 day CAR (-1:+18)	30 day CAR (-1:+28)
All	2979	-1.54***	-0.20	1.13**	0.45
Hoarding cash	1054	-1.45***	0.51	2.55***	2.31***
Hoarding & Buyback	516	-1.41**	-1.03	-0.15	0.42
Buyback of debt	578	-1.66***	-1.03*	-0.68	-0.83
Outflow later	778	-1.51***	-0.19	1.03	-0.26
Equity for debt	53	-3.62**	-4.44**	-10.14***	-6.58*

Average cumulative abnormal returns are scaled by 100 for easier readability. The columns identify the length of the event window measured in trading days, starting one trading day before the event day. Statistical significance at the 90%, 95% and 99% levels of confidence is indicated by the superscripts \*, \*\* and \*\*\*, respectively. The market model regressions are based on a 120 calendar days pre event and the value-weighted market index. Instead of testing the abnormal return for each company, we calculate the cumulative abnormal for all companies in the same group:  $\text{reg } CAR \text{ if } dif=0, \text{ robust}$ . The p-value on the constant from this regression gives us the significance of the cumulative abnormal return across all companies. This test is preferable to a t-test because it allows us to use robust standard errors.

The other columns in Table 5 show that the choice of the length in the event window brings different results. Focus on the 30-day *CAR* (last column in Table 5). The hoarding cash firms have statistically significant positive abnormal returns of about 1.26%. The reaction to the news of hoarding cash is first negative and then positive. This seems like a process of overreaction. The market impulsively reacts negatively to some news that in less than a month reveal themselves to be good news about the firm's future performance. It takes some time for investors to recognize the information behind the financial decision of the firm and to fully adjust their portfolios according to that. This different answer of the market in a longer term, is consistent with an intertemporal linkage between financial and investment decisions that are forward-looking in nature.<sup>27</sup>

---

<sup>27</sup>Different dynamic models of capital structure show that the impact of current decisions on the firm's future

Differently, the alternative event window does not change the picture for buybacks, and it is even worse for the equity for debt swaps. The average *CAR* for buyback firms is negative -1.2% even though it is not statistically significant at this level. The abnormal returns for the equity for debt swap group is -6.82%, twice the magnitude of the 3-day *CAR*. So far, results support our third hypothesis. The announcement returns of LDRs in which you hoard the cash not only, are less negative compared to the other groups but also turn positive when a larger post-news event window is considered.

This result is consistent with the option value of the cash holdings explored in Kisser (2012) and with the value of financial flexibility explained in Gamba and Triantis (2008). Focusing on the strategic management of corporate liquidity and its relationship with the firm's financing and investment policies, these papers show that there is value in building cash buffers. The better reaction of the markets reflects this value creation. Kisser (2012) finds also that an increase in volatility generally reduces the value of internal funds. The 'exchange offer' firms, which are highly volatile in their stock prices and stock returns prior to the event, would then have a lower benefit of cash hoarding differently from the other firms. This might be one of the reasons why they do exchange offers instead of issuing equity to hoard the cash.

Acharya, Almeida, and Campello (2006) who examine the difference between cash and negative debt, emphasize through their model that cash is retained in low cash-flow states while cash flow is directed towards paying down debt in high cash-flow states. According to this model, the firms hold cash only if their cash flows are scarce and not aligned with the investments. In contrast, Gamba and Triantis (2008) find that cash flow is frequently used to increase a firm's liquidity even though investment opportunities are perfectly correlated with cash flow. Our results are consistent with Gamba and Triantis (2008).

So far, we classified our news based on the use that firms are going to make with the proceeds. In other words, we have split our sample by type of LDR. The market reaction for each type is not the same. Nevertheless, we want to check whether appertaining to one category of LDR is the exclusive reason for the corresponding market reaction. We are interested in finding other possible drivers of the observed abnormal returns.

The effect that the leverage decreasing recapitalization announcements cause on investors may depend on a bunch of other factors: for example the firm size, the profitability, the level of leverage before the issue, the market to book ratio, the state of the economy, manager-shareholders relationship etc. Similarly, the marginal benefit of cash, which explains the relative better reaction of the markets for cash-hoarding firms, depends on many other characteristics of the firm. Faulkender and Wang (2006) empirically examine the marginal value of liquidity for firms and find that the marginal value of cash is higher for firms with less liquidity, greater investment opportunities, and higher external financing constraints. Mikkelsen and Partch (2003), empirically show that the market value of cash reserves is lower when firms are poorly

---

states and the corresponding state-dependent decisions are considered when making decisions today. Gamba and Triantis (2008) measure the benefits of joint optimization of dynamic financing and investment policies.

governed and there is weak shareholder protection.

For all these reasons, in the following subsection we estimate regressions of the  $CAR_i$  on the LDR type and other covariates. The results are shown in Table 6 and Table 7. We report regressions both for the 3-day event window as well as for the 30-day event window. The dependent variable in the regressions, is firm's  $i$  cumulative abnormal returns ( $CAR_i$ ). The regressors are firm variables that may influence or even drive the market reaction. In addition to the LDR type, we consider the covariates that are standard in the empirical capital structure literature. Among these controls, the variable of main interest is the level of market leverage. Surprisingly the coefficient in front of this variable is not significant. For this reason in the regression that follows we regress the  $CAR_i$  on the change in leverage, instead of the level of leverage itself.

The first column of Table 6, the base specification for the 3-day event window, shows that the abnormal returns to exchange offer announcements (type 3 of LDR) are lower compared to the abnormal returns to cash hoarding announcements (type 1 of LDR). On the other hand, cash hoarding  $CARs$  are not statistically different from the buyback announcement effects (type 2 of LDR). The second column in Table 6, the base specification for the 30-day event window, shows that the abnormal returns for exchange offers are lower than the  $CARs$  for buybacks, which in turn are lower than the abnormal returns of cash hoardings. These results are consistent with the significance test we performed and reported in Table 5.

*Habitual issuers.* Adding the 'Issue number' control, we split the sample to investigate the variation in the market reaction according to the frequency of the issues by the same issuer. In our sample, 482 firms perform at least two equity issues in different years. Some firms realize up to seven issues in the years of data we have. An equity issue from a habitual issuer might be less of a surprise to the market compared to firms that never issued equity in the past. At the same time, the success or failure of a first issue can influence the ongoing of a second one and so on. The regression results in column (1) and (4) show that the second issue on average causes a worse reaction in the markets compared to the first, while from the third issue and on the reaction of investors improves monotonically, with the highest level of significance at the fourth issue.

*Market to book.* As results in column (3), (5) and (7) show, the  $CAR$  turns out to be negatively correlated with the capital expenditure and positively related to the market to book ratio. We know that the market to book is often used as a proxy for growth opportunities. The static trade-off theory and several agency theories predict a negative relation between leverage and growth. Growth firms lose more of their value when they go into distress so the market would expect those firms to have a lower level of leverage on average. Besides, the economic relevance of this result is questionable as the coefficients in front of these controls are minor.

*Size.* We also use the size and the profitability of the firm as a sorting variable. Since large firms tend to be more diversified and with lower default risk, the tradeoff theory predicts they should have higher levels of leverage. Larger firms are also typically more mature, and having a reputation in the markets allows them to have high levels of debt without occurring high agency costs. Because they are highly leveraged to start with, some of them might adjust towards the target ratio when exceeded. Another explanation might be the news coverage highly skewed

**Table 6:** Regression results for CARs

	(1)	(2)	(3)	(4)
	3-day <i>Cum.Ab.Ret.</i>	31-day <i>Car</i>	3-day <i>Cum.Ab.Ret.</i>	3-day <i>Cum.Ab.Ret.</i>
TypeLDR				
2	-0.00023 (-0.83)	-0.01692* (-1.36)	-0.00221 (-0.46)	-0.00846 (-1.11)
3	-0.16741*** (-4.13)	-0.36226*** (-3.43)	-0.02093** (-1.79)	-0.18290*** (-4.51)
Issue number				
2	-0.00536* (-1.66)	0.01071 (0.52)		-0.0068* (-1.54)
3	0.00599* (1.48)	0.02187 (0.68)		0.0110* (1.34)
4	0.03562** (2.02)	-0.02480 (-0.54)		0.03555** (1.82)
5	0.00745* (1.34)	-0.08498 (-0.98)		0.00436* (1.53)
Market Lev.	0.01053 (0.55)	0.02294 (0.46)		
Retained Earnings	-3.19E-05 (-0.28)	-0.00002 (-1.21)		
Capex			-0.00003** (-2.13)	-0.04836 (-0.83)
RD expenses	-0.00002 (-0.94)	-0.00004 (-0.73)		-0.00002 (-0.82)
Market/Book			0.00161* (1.39)	0.00157* (1.48)
Profitability			-0.03353 (-1.23)	-0.03669 (-0.93)
Size			0.00114 (0.66)	0.00077 (0.712)
Tangibles			0.0014 (0.75)	0.00052 (0.53)
_cons	-0.01923**	0.01946	-0.02499**	-0.02486
<i>N</i>	697	710	1365	748

*t* statistics in parentheses

towards large firms.<sup>28</sup> There is also evidence that both financial factors and prior news stories help predict forthcoming news and leave less to a surprise. It is not the same for small firms. Aligned with our expectations, the results of eq. (6) in Table 7 show that the market reaction is better for larger firms.

*Profitability.* With regard to the relation between profitability and leverage, there are different views. We already know about the well-established puzzle that leverage is negatively correlated with measures of profitability. The predictions vary based on the model under consideration.<sup>29</sup> Only in eq. (8) we find statistical significance in front of the profitability control for the 30-day *CAR*. In this case, the higher the profitability of the firm, the less negative the market reaction.

*State of the economy.* Prior research shows that the stock market generally digests news regarding issues more rapidly during a boom than it does during a recession. Antweiler and Frank (2006) show that during normal economic conditions the majority of the adjustment is completed in three weeks. During recessions, the adjustment is more prolonged but they are not able to clearly identify in their study the point at which it typically completed. To take in consideration this fragment, we add in the controls a business cycle dummy, ‘State of economy’ which takes the value zero during recessions in US starting from the middle 1980s up to 2014, and one otherwise. The variable takes the value 0 in the years during the recession of the early 1990s financial crises, during the burst of the dot-com bubble and in the years of the subprime mortgage crisis.<sup>30</sup> The results in Table 7 show that the coefficient in front of ‘State of economy’ is negative and significant for the 30-day *CAR*, while positive and not significant for the 3-day *CAR*. The firms that decrease their level of leverage during economic booms cause in a longer term a market reaction which is worse than the ones in period of recessions. In the very short term the state of the economy does not matter.

*Management share.* The tradeoff theory, when reasoning about leverage related agency costs, usually refer to the potential conflicts between debt holders and equity holders. Because top managers often hold shares in the firm, are hired, and retained with the approval of the board of directors, which itself do shareholders elect, managers are empirically shown to make decisions that increase the value of the firm’s equity. However, the separation of ownership and control suggests that there might be management entrenchment as well. According to the free cash flow hypothesis, leverage increases firm value because it commits the firm to making future interest payments, thereby reducing wasteful investment by managers. Since managers whose interests are aligned with those of the shareholders tend to issue less equity, we would expect

---

<sup>28</sup>Dzielinski M., (2011). News Sensitivity and the Cross - Section of Stock Returns. Working paper

<sup>29</sup>Jensen (1986) in his static trade-off theory predicts that highly profitable firms should have more debt. The empirical studies typically find a negative relationship which is consistent with the pecking order theory. In addition, in a dynamic trade off model, Danis A., Retzl A. and Whited T. (2014) find that at times when firms are close to their optimal level of leverage, the cross-sectional correlation between profitability and leverage is positive.

<sup>30</sup>source: The National Bureau of Economic Research.

**Table 7:** Regression results for CARs

	(5)	(6)	(7)	(8)
	3-day <i>Cum.Ab.Ret.</i>	3-day <i>Cum.Ab.Ret.</i>	31-day <i>Car</i>	31-day <i>Car</i>
TypeLDR				
2	0.0069 (1.01)	0.0073 (0.79)	-0.0263** (-1.79)	-0.0115* (-1.41)
3	-0.1275*** (-3.5)	-0.0661* (-1.44)	-0.2668*** (-2.61)	-0.2272* (-1.56)
Profitability		0.1993** (1.78)	0.1902 (1.04)	0.8127** (2.24)
Size	-0.0011 (-0.52)	0.0071** (1.93)		
Change in Net M. Lev.	0.0039 (0.3)	-0.0737*** (-2.61)	-0.0023 (-0.07)	-0.1102* (-1.44)
Market/Book	0.0015 (2.85)			
State of economy	0.0044 (0.64)	0.0101 (0.96)	-0.0428*** (-2.58)	-0.0349* (-1.39)
Retained earnings			-5.24E-05 (-0.74)	-0.00002 (-0.87)
Capex			-0.1554 8 (-1.21)	-0.1902 (-0.76)
RD expenses	-0.00003 (-0.93)		-0.00057 (-0.82)	-0.00003 (-0.41)
Manag. Share/Bonus		7.90E-06** (1.79)		4.01E-06*** (3.08)
Change in investment			-0.0003* (-1.35)	
<u>_cons</u>	-0.0184* 847	-0.0643*** 434	0.0654*** 756	0.0050 403

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Estimation results of OLS regressions, where the dependent variable is the cumulative abnormal return and the independent variables are: Type of LDR, a categorical variable that takes the value 1 for cash hoardings, 2 for buybacks and 3 for exchanges; Size calculated as the  $\log(\text{Assets})$ ; State of economy, a dummy that takes the value 0 in the years during the recession of the early 1990s financial crises, the burst of the dot-com bubble, the years of the subprime mortgage crisis and zero otherwise, market/book and capex already defined in Table 2; the other variables are items from the balance sheet of the firm.

an automatic negative market reaction to issues started by managers that affect downwards the leverage ratio. A good proxy of interest alignment between shareholders and managers is the amount of stock hold by the manager in the firm and their total compensation in bonuses.<sup>31</sup> In Table 7 we include this control in eq. (6) and (8). As we expected, in both regressions, the coefficient in front of this factor turns out to be positive and significant. Firms with fewer conflicts between management and stockholders, trigger a better market reaction at LDRs announcements.

---

<sup>31</sup>This might be more relevant for small-medium firms as it is shown that in most large corporation managers own a very small fraction of the outstanding shares. (see Jenter D. and Lewellen K. (2014) Performance-induced CEO Turnover. Working Paper No. 3054)

## 6 Conclusion

The common view, in dynamic capital structure theory, is that firms do not decrease their level of leverage unless they are close to bankruptcy. Since a firm might decrease the level of leverage, because is constantly optimizing their capital structure and actively adjusting leverage towards the target, we believe that avoiding bankruptcy is not the only motivation behind this decision.

In order to test our hypothesis we gather three decades of corporate data from SDC, Crisp and Compustat. Via multivariate logit regressions, we find that while distressed firms are more predisposed to reduce leverage compared to financially safe firms, also the latter's undertake leverage-decreasing recapitalizations quite often. Large safe firms, with high working capital will do more leverage decreases compared to other safe firms. We also find that within financially sound firms, highly leveraged firms, dislike undertaking *LDRs*.

We run an event study and find that there are sizable and significant abnormal returns on the day when a leverage decreasing recapitalization is announced. The leverage decreasing recaps have been classified according to the channel through which the leverage reduction is done: increasing cash, reducing debt, combinations of the two or equity for debt swaps. The stock market reaction to these announcements is typically negative but it varies across types of *LDRs* and event window size. The 3-day window valuation effects are the most negative for equity for debt swaps, considerably less negative for buybacks of debt and least negative for cash hoarding firms.

Considering the particular time evolution of the events considered here, meaning that the *LDR* types are revealed only later, we do the same analysis for a longer event window. The results for the 30-day *CAR* again meet our hypothesis. The longer run only emphasizes the differences between the three groups. The *CAR* for the exchange offers becomes even more negative -6.8%, while the *CAR* for 'hoarding cash' firms turns positive +1.3% . Our results are consistent with a real option value of cash holdings.

## References

- Almeida H., Acharya V. and Campello M., (2006). *Is Cash Negative Debt? A Hedging Perspective on Corporate Financial Policies*. London Business School IFA Working Paper Series.
- Admati A. R., DeMarzo P. M., Hellwig M. F. and Pfleiderer P. C., (2012). *Debt Overhang and Capital Regulation*. Rock Center for Corporate Governance at Stanford University, Working Paper No. 114.
- Altman E., (2000). *Predicting Financial Distress of Companies: Revisiting the Z-Score and Zeta Models*. Handbook of Research Methods and Applications in Empirical Finance, Originally published in Journal of Banking & Finance, Vol. 1 (1977).
- Altman E. and Karlin B., (2009). *The re-emergence of distressed exchanges in corporate restructurings*. Salomon Center, NYU Stern School of Business.
- Antweiler W. and Frank M Z., (2006). *Do US stock markets typically overreact to corporate news stories?* Journal of Financial Economics (JFE).
- Asvanunt A., Broadie M. and Sundaresan S. (2011). *Managing Corporate Liquidity: Strategies and Pricing Implications* International Journal of Theoretical and Applied Finance, Vol. 14, pp. 369–406.
- Baker M and Wurgler J., (2002). *The Equity Share in New Issues and Aggregate Stock Returns*. The Journal of Finance, Vol. 55, No. 5.
- Chatterjee S., Dhillon U. and Ramirez G., (1995). *Coercive Tender and Exchange Offers in Distressed High- Yield Debt Restructurings: An Empirical Analysis*. Journal of Financial Economics (JFE).
- Choe H., Masulis R. and Nanda V., (1993). *Common Stock Offerings across the Business Cycle: Theory and Evidence*. Journal of Empirical Finance, Vol. 1, No. 1, pp. 3-31.
- Danis A., Retzl D. A. and Whited T. M., (2014). *Refinancing, Profitability, and Capital Structure*.
- DeAngelo H. and DeAngelo L., (2007). *Payout Policy Pedagogy: What Matters and Why*. European Financial Management, Vol. 13, pp. 11–27.
- De Angelo H., De Angelo L. and Whited T., (2011). *Capital structure dynamics and transitory debt*. Journal of Financial Economics, Vol. 99, pp. 235–261.
- DeAngelo H., and Masulis R., (1980). *Optimal capital structure under corporate and personal taxation*. Journal of Financial Economics (JFE), Vol. 8, pp. 3-29.
- Eckbo B. E., (1986). *Valuation Effects of Corporate Debt Offerings*. Journal of Financial Economics (JFE), Vol. 15, pp.119-151.

- Eckbo B. E and Masulis R W., (1995). *Seasoned Equity Offerings: A Survey*. Finance (North-Holland, Handbooks of operations research and management science), Ch. 31, pp. 1017-1072.
- Eckbo B. E. and Thorburn K. S., (2013). *Corporate Restructuring, Foundations and Trends in Finance*.
- Fan H. and Sundaresan S. M., (2000). *Debt valuation, renegotiation, and optimal dividend policy*. Review of Financial Studies, Vol. 13, pp. 1057 – 1099.
- Fischer E. O., Heinkel R. and Zechner J., (1989). *Dynamic capital structure choice: theory and tests*. Journal of Finance, Vol. 44, pp. 19 – 40.
- Frank M. Z. and Goyal V. K., (2007). *Capital Structure Decisions: Which Factors are Reliably Important?*
- Gamba A. and Triantis A., (2008). *The Value of Financial Flexibility*. The Journal of Finance, Vol. 63, pp. 2263–2296.
- Graham J. and Harvey C., (2001). *The theory and practice of corporate finance: evidence from the field*. Journal of Financial Economics, Vol. 60, pp. 187 – 243.
- Graham J., Hughson E. and Zender J., (1999). *Market Reactions to Capital Structure Changes: Theory and Evidence*. Duke University.
- Goldstein R., Ju N. and Leland H., (2001). *An Ebit-based Model of Dynamic Capital Structure*. Journal of Business, Vol. 74, pp. 483-512.
- Hovakimian A., Hovakimian G. and Tehranian H., (2004). *Determinants of target capital structure: The case of dual debt and equity issues*. Journal of Financial Economics, Vol. 71, pp. 517-540.
- Kalra R., Chan K. and Raines G., (1996). *The effect of equity for debt swaps on security returns: some new evidence*. Journal of Financial and Strategic Decisions, Vol. 9.
- Kisser M., (2012). *The Real Option Value of Cash*. Forthcoming in the Review of Finance.
- Korajczyk R., Lucas D., and McDonald R., (1991). *The Effect of Information Releases on the Pricing and Timing of Equity Issues*. Review of Financial Studies, Vol. 4, pp. 685–708.
- Korwar A. N. and Masulis R. W., (1986). *Seasoned Equity Offerings: An Empirical Investigation*. Journal of Financial Economics, Vol. 15, pp. 91-118.
- Leland H. E., (1994). *Corporate Debt Value, Bond Covenants, and Optimal Capital Structure*. The Journal of Finance, Vol. 49, pp. 1213–1252.
- Lie E., Lie H. and McConnell J., (2001). *Debt-reducing exchange offers*. Journal of Corporate Finance, Vol. 7, pp. 179–207.

- Loughran T. and Ritter Jay R., (1997). *The Operating Performance of Firms Conducting Seasoned Equity Offerings*. The Journal of Finance, Vol. 52, No. 5.
- Mikkelson W. and Partch M., (1986). *Valuation Effects of Security Offerings and the Issuance Process*. Journal of Financial Economics, Vol. 15, pp. 31–60.
- Morellec E., Nikolov B. and Schürhoff N., (2012). *Corporate Governance and Capital Structure Dynamics*. The Journal of Finance, Vol. 67, pp. 803–848.
- Myers S. C., (1984). *The Capital Structure Puzzle*. The Journal of Finance, Vol. 39, pp. 574-592.
- Myers S. C. and Majluf N. S., (1984). *Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have*. Journal of Financial Economics, Vol. 13, No. 2.
- Raghuram G. R. and Zingales L., (1995). *What Do We Know about Capital Structure? Some Evidence from International Data*. The Journal of Finance, Vol. 50, pp. 1421-1460.
- Ross S. A., (1977). *The Determination of Financial Structure: The Incentive-Signaling Approach*. The Bell Journal of Economics, Vol. 8, pp. 23-40.
- Shah K., (1997). *Why do firms undertake intra-firm exchange offers?* Research in finance, Vol. 15.
- Strebulaev I. A., (2007). *Do Tests of Capital Structure Theory Mean What They Say?* The Journal of Finance, Vol. 62, pp. 1747–1787.
- Titman Sh. and Tsyplakov S., (2007). *A Dynamic Model of Optimal Capital Structure*. Review of Finance, Vol. 11, pp. 401-451.