Evolution of Recapitalizations in Recent Decades: An Empirical Analysis

Abstract

In the 1980s and 1990s there was an intense but brief flurry of research on highly leveraged transactions such as LBOs and recapitalizations. In the last two decades there has been a marked increase in such actions. I consider four broad explanations for sharp increases in financial leverage: agency conflicts, exploiting under-used tax shields, costs of financial distress, and market or macroeconomic conditions. Firms rarely publicly announce major shifts in leverage, or the reasons for the changes. Therefore, to collect a broad sample, I employ four-fold rules to detect large one-time recapitalizations. I identify firms that increase debt and reduce equity on their balance sheet by at least 20%, and who pay-out most of these funds to shareholders. Research suggests that LBOs in recent years are mainly in response to inefficient firm operations. But, recapitalizations, where the shares remain publicly traded, seem driven by two different causes. First, the firms that relever are very profitable and highly-valued in the market, but they have low leverage. They appear to raise debt to increase the value of the tax shield. But, financial distress costs may preclude organizations in some sectors from taking such actions. The other powerful motive is obviously the current extraordinary and prolonged low interest rate regime. Collectively, these results suggest that firms with low financial constraints and strong operating performance are best able to exploit favorable rate environments. After recapitalization, leverage increases to about average levels. The profitability and market valuation of the relevering firms decline slightly.

Keywords: Capital Structure, Leverage, Increase Debt, Recapitalize, Relever

Introduction

In the late 1980s and early 1990s a line of research flourished on firms making drastic increases in debt in their capital structures. This was mainly in response to the initial wave of leveraged buyouts (LBO). However, there were also several studies of leveraged recapitalizations, where an entity issues debt and pays out the proceeds to the shareholders. These firms are simply altering the leverage in their capital structure, as shown in many theoretical corporate finance textbooks. In contrast to an LBO, the shares remain publicly traded.

Since this intense early interest, studies of leveraged recapitalizations have been rare. But, in the last twenty years these actions have increased dramatically. They are now far more prevalent than in the 1980s. In recent studies Guo, Hotchkiss and Song (2011) and Cohn, Mills and Towery (2014) reexamine the rationale for and effects of recent LBOs. This suggests a need to revisit the reasons for the increasing volume of leveraged recapitalizations, and to determine if their financial performance subsequently improves.

Firms rarely announce major shifts in their debt financing policies, nor explain the reasons for the decisions. Therefore, to collect a broad sample, I employ four-fold rules to detect large one-time recapitalization. I identify firms that increase the debt and reduce equity on their balance sheet by at least 20%, and who pay-out most of these funds to shareholders through either dividends or stock repurchases. Of a sample of over 100,000 firm-years during the forty-year period from 1973 to 2013, 699 firms recapitalize by these definitions. Of these, 198 do so more than once. This yields a sample of 1,041 recapitalizations, slightly more than 1% of the total.

I consider four broad explanations for why firms might sharply increase financial leverage. I compare differences in numerous corporate operating variables in the years before a recapitalization for firms that relever and those that do not. I present univariate statistics for these variables and conduct a series of binary logistic models to examine the differences in a multivariate setting. I also compare firm performance before and after the recapitalization.

First, I explore whether agency problems might drive decisions to radically relever. This has been the focus of much of the prior research on recapitalizations and LBOs. Agency theorists predict that firms that generate excessive undistributed cash flows, where managers have unchecked discretion over these funds, and that are under-valued by the markets, should have

incentives to increase debt in their capital structure. In contrast to recent findings on LBOs, there is little support for the notion that the firms that relever have low relative equity values (Tobin's Q) or inefficient operations. In addition, their profitability and share prices do not decline markedly after. There is also scanty evidence that they are making insufficient payouts to shareholders or are over-investing in their operations. The firms that recapitalize pay higher than average dividends and share repurchases in the years before, and their historic revenue growth is much lower than for comparable entities. So there is little indication that they are recapitalizing as a spur to improve managerial performance.

The next two major reasons for firms to relever arise from the well-known Static Trade-Off theory. First, they might try to better exploit the tax shield associated with higher leverage. I find consistent evidence that the firms that recapitalize have very low levels of debt in their capital structure; this is in sharp contrast to recent findings on LBOs. In the years after recapitalization these entities maintain this increased leverage, by some measures at levels slightly higher than for the control firms. There is some support for the notion that they also pay higher than average tax rates. Collectively these results indicate that these firms were underexploiting the tax deductibility of debt, and this seems a prime motive for their decision to recapitalize.

The other explanation for capital structure decisions within the Static Trade-Off theory is limitations created by the costs of financial distress. It may be prohibitive for firms in intangible intensive industries or that manufacture durable goods to employ high levels of debt. My findings in this area are mixed. There is some evidence that durable goods manufacturers are less likely to recapitalize. The firms that relever also have lower than average research and development costs, even when compared to industry norms. However, there are also seemingly

contrary results. There is evidence that the entities that relever have higher than average adverting and selling, general and administrative costs, which are two other widely used proxies for intangibility.

Finally, much recent interest in the capital structure literature has focused on "Market Timing" for financing based on market and economic conditions. I find that firms are more likely to recapitalize when interest rates are low, and when the economy is weak. This is consistent with counter cyclical patterns in debt financing found in earlier studies. However, these behaviors only hold in the most recent years, when economic conditions have fluctuated wildly and interest rates have been unusually low. There is no evidence of these relationships in the 20th century.

Overall the results suggest that poor performance arising from agency conflicts are not an important motivation for these recapitalizations.The firms that relever and remain publicly traded have historically high profitability and Tobin's Q, and carry low debt burdens. This is in sharp contrast to the findings on LBOs of Guo, Hotchkiss and Song (2011) and Cohn, Mills and Towery (2014). Two primary factors seem to account for these large one-time increases in leverage. First, these efficient, low-debt firms seem intent on exploiting unused tax shields. Though, this is somewhat tempered for intangible intensive entities and especially durable goods manufactures that face higher financial distress costs. The second factor that seems to have driven the recent wave of recapitalizations is the unprecedented low interest rates that have prevailed since the last contraction. These results correspond to findings by Korajczyk and Levy (2003) and Eril, Julio, Kim and Weisbach (2012) suggesting that strong firms with low financial constraints are most able to exploit an attractive rate environment.

The remainder of this paper is organized as follows. In the next section I discuss the prior literature on capital structure choices and on highly leveraged transactions. Then I summarize possible motivations for leverage recapitalizations. I next discuss data collection procedures and the binary logistic modeling. The empirical results on the rationale for the recapitalization and the effect of the relevering on corporate performance are presented in the following section. Finally, I summarize my findings and draw conclusions.

Literature Review

Early studies of capital structure choice revolve around two seminal theoretical edifices. The first is the Static Trade-off Theory, proposed by Robichek and Myers (1966), which evolved out of arguments about the works of Modigliani and Miller (1958, 1963). This line-of-reasoning suggests that there is a trade-off between the value of the tax shield created by the tax deductibility of interest payments and the potential costs of bankruptcy associated with high levels of debt financing. The tax shield is most valuable to firms with higher marginal tax rates.

The second major work to influence studies of capital structure choices is Jensen and Meckling (1976), who analyze agency conflicts among the firm stakeholders. They note that managers have powerful incentives to hoard funds and over-invest in their operations. These firms often have low values of Tobin's Q and high levels of free cash flows. Jensen (1986) and Stulz (1990) argue that increasing debt in the capital structure can help to overcome some of these problems and discipline the managers. The higher interest obligations can deprive managers of discretion over the cash flows, making it more costly for them to consume perquisites.

In the 1980s there was a wave LBOs. The novelty of these transactions captured the imagination of academics, which prompted a series of empirical studies of the motives for these

drastic shifts in capital structure and ownership. DeAngelo, DeAngelo, and Rice (1984), Torabzadeh and Bertin (1987), Marais, Schipper and Smith (1989), Lehn and Paulsen (1989), Kaplan (1989), and Opler (1992) all conduct event studies of the gains to shareholders in the days around an LBO.

Opler and Titman (1993) analyze the operating performance of firms that execute LBOs. They concentrate on agency problems and financial distress. They argue that there are high costs of financial distress for intangible intensive operations and for manufacturers of durable goods. As expected, they find that firms that go-private tend to have low values of Tobin's Q and high free cash flows, and that those with high costs of financial distress are less likely to undertake an LBO. Opler and Titman also try to identify differences between the first wave of LBOs in the 1980s and those that followed in the next decade.

After the initial flurry of studies of LBOs in the late-1980s and early-1990s, interest in the subject waned. But, recently Guo, Hotchkiss and Song (2011) and Cohn, Mills and Towery (2014) have again turned to this topic. They find that LBOs are more common in the last two decades than in the 1980s when their novelty attracted so much attention. Therefore, one focus of these two works is to compare earlier transactions to later ones. In recent years the firms that undertake LBOs tend to have low profitability and share price. Interestingly, they already have very high financial leverage. Both studies concentrate most heavily on operating performance after the LBO, which is problematic because of lack of public data. Guo, Hotchkiss and Song find that the firms perform better after the transactions. But, Cohn, Mills and Townery find little support of such improvements.

While LBOs, where the firms go private, are more dramatic and attracted the most attention, some researchers examine leveraged recapitalizations, where the entities drastically

increase debt in their capital structure and decrease equity, but remain publicly traded. Such a transaction is a hallmark of advanced theoretical corporate finance; the firm floats a significant bond issue and uses the proceeds to pay a large special dividend or to repurchase shares.

Kleiman (1988), Gupta and Rosenthal (1991), Handa and Radhakrishnan (1991), and Denis and Denis (1993) conduct event studies of shareholder returns around recapitalizations. They all analyze relatively small samples of firms that publically announce their actions. Gupta and Rosenthal, and Handa and Radhakrishnan note that most of these announced recapitalizations are in response to takeover threats.

Denis and Denis (1993) and Walker (1996, 1998) analyze some other measures of the performance of firms that announce leveraged recapitalizations both before and after the actions. These studies focus mainly on the agency arguments of Jensen and Meckling (1976). They collect data on companies that announce recapitalizations, which necessitates small samples. They analyze firm performance before the change, and if it improves after. Denis and Denis find evidence of poor investment decisions by the managers of firms that later recapitalize. Undistributed cash flows, capital expenditures and firm size all decrease after the change in capital structure. In his two studies, Walker employs a matching set of firms that do and do not relever. He finds little evidence that the entities that recapitalize are less efficient than the matching set. The firms that relever do shrink in size, but he finds no support for an improvement in operating efficiency.

In the last twenty-five years the "Market Timing" theory, first advanced by Loughran and Ritter (1995), has opened exciting new horizons in research on the evolution of corporate capital structures. One aspect of this line-of-reasoning is that choices of whether to issue equity or debt are driven by market and macroeconomic conditions. When equity markets are frothy, as in the

late 1990s, firms should tend to float shares. But, if stock markets are in the doldrums and interest rates are low, they should prefer to raise capital through debt issues.

Early studies by Taggart (1977) and Marsh (1982) confirm that firms are more likely to issue debt when interest rates are low. More recently Barry, Mann, Mihov and Rodriguez (2009) find similar evidence of firms issuing debt when rates are low by historical standards. Contemporary popular press articles by Zeiler (2011), Chemey (2014), Platt and Renninson (2015) and in *Money News* (2012) note that in the years following the economic downturn American corporations have been issuing record amounts of debt in response to an unprecedented and sustained low interest rate environment.

Choe, Masulis and Nanda (1993) find that corporations are more likely to issue equity when the market or economy is strong, and are more prone to float debt in troughs in the cycles. More recently, Korajczyk and Levy (2003) and Eril, Julio, Kim and Weisbach (2012) have found that the counter cyclicality is mostly the result of issues by financially unconstrained firms, and that weaker firms do not exhibit this behavior.

These works clearly suggest that debt issuance is related to conditions in the market and the economy. Therefore, it is reasonable to assume that recapitalizations might be more prevalent when interest rates are low and markets and the economy are in slow cycles.

Motivations for Leveraged Recapitalization

I analyze four broad motives for sudden and drastic increases in financial leverage. Where possible I try to examine several variables to proxy different aspects of these motivations. Clearly, it is important to look at performance leading up to recapitalization. Therefore, for most of the variables I calculate average measures for the three years before the releveraging. When I examine performance after the releveraging I also generally study averages for the three year

period following the change. For a few of the variables I look at only the year before (and after) the decision.

Agency Problems

The motive that has been studied most intensely in the past are stories related to agency conflicts. Jensen and Meckling (1976) argue that if managers are not carefully monitored they will tend to operate the firm inefficiently, resulting in low profitability and share prices. They have strong motivations to hoard free cash flows, preferring further inefficient investment to distributing earnings to shareholders. Jensen (1986) and Stulz (1990) contend that increasing debt can help to ameliorate these problems by disciplining managers. Higher debt commitments will force them to improve efficiency, and the promised interest obligations compel the payout of funds.

I study eight common measures of agency problems. Tobin's Q (TOBINQ) is widely used as a proxy for the valuation of the firm's equity in the market, inefficient firms should be undervalued. I look at three measures of operating efficiency that give varying views of firm profitability: the gross profit margin (GPM), net profit margin (NPM), and the ratio of free cash flow to sales (FCFS). As in earlier studies, I focus on Tobin's Q and free cash flows.

Jensen and Meckling (1976) argue that managers should also be reluctant to payout cash flows to shareholders. They suggest that increasing corporate leverage forces the distribution of funds. When a firm executes a classic textbook recapitalization, they issue a substantial block of bonds and use the proceeds to pay a large special one-time dividend or to repurchase shares. This suggests that part of this choice might also involve a change in future payout policy. Do firms that relever distribute unusually low levels of cash flows, and does this change after the recapitalization? I employ two measures of distribution policy. The first is a dividend yield, the

ratio of dividends to the prior year market-value of equity (DIV). The second is a repurchase yield (REPO), which is the ratio of total share repurchases to the previous year equity value. I estimate the average of these two measures for the three years before and after the recapitalization.

Two other operating variables might be reasonable proxies for agency problems. Jensen (1986) and Stulz (1990) argue that unconstrained managers will tend to over-invest in their enterprise. So I examine the growth rate of revenues over the prior three years (REVGR). Walker (1996) also suggests that managers have incentives to hoard cash. Therefore, I look at the ratio of cash holdings to assets (CASHASS) for the year before (and after) recapitalization.

Value of the Tax Shield

The debates around the work of Modigliani and Miller (1958, 1963) ultimately lead to Robichek and Myers' (1966) Static Trade-off Theory. One pillar of this story is that firms using too little debt may not be adequately exploiting the tax deductibility of interest payments. This tax shield is also more valuable when the entity's marginal tax rate is higher.

I examine two widely-used measures of leverage. The first is a debt-to-asset ratio based on the book values of assets, total debt and equity (DA). The second debt-to-asset ratio is based on the book values of assets and total debt, but on the (end-of-fiscal-year) value of equity (DAM).

I also look at two measures of a firm's tax obligation. The first is the firm's effective tax rate; the ratio of income taxes paid to taxable income (TAXR). However, the tax rate may not give a clear picture of the change in tax obligations. If a firm uses higher debt, it would pay less taxes, due to the tax deductibility of interest payments, even if it faces the same tax rate as a less

levered firm. Therefore, my second measure is the ratio of income taxes paid to operation profit before depreciation (TAX_GP).

A firm may wish to increase debt to exploit the tax shield, but they may be precluded if they cannot easily tap capital markets. Firm size is a widely used proxy for such access. I employ the average book value of assets (ASSETS) as the measure. In the logit regressions it is common to employ the logarithm of this value (LOGASS). Earlier, Gupta and Rosenthal (1991) find that larger firms are more likely to recapitalize.

Financial Distress

The other side of the Static Trade-off Theory is that high levels of debt financing may create undue financial distress. Opler and Titman (1993) argue that intangible intensive operations and firms that manufacture durable goods that require on-going commitments to customers face high distress costs.

I employ four variables to capture these costs of financial distress. Following Opler and Titman I use a one/zero dummy variable set to one if the firm is in the manufacturing sector (D_MACH), SIC 3400 to 3999, as a proxy for producers of durable goods. I use three common measures for intangibility of operations; the ratio of research & development expenses to sales (RDS), the ratio of selling, general and administrative expenses to sales (SGAS), and the ratio of advertising expenditures to sales (ADS). Opler and Titman and Cohn, Mills and Towery (2014) employ the first two, but advertising expenses are also widely used as a proxy.

Market and Economic Conditions

There is growing evidence that firms make decisions to issue debt or equity in response to market and economic conditions. Clearly, this might be a strong motive for leveraged recapitalizations. I use four additional explanatory variables to test the effects of these conditions

on the probability of firms relevering. Two series capture different aspects of the interest rate environment; the yield on ten-year Treasury bonds (TBOND), and the spread of Baa rated corporate bonds over Treasuries (BBBSPRD). To capture overall stock market performance I include the annual return on the CRSP Value-Weighted index for the fiscal year (CRSPVW). I employ the percentage changes in annual real per capita gross domestic product (CHRPCGDP) to proxy the macroeconomic conditions. These measures are all taken in the contemporary year.

Historic Firm Equity Performance

It is also interesting to examine a firm's historical equity market performance. I concentrate on three measures. The first is the annualized return on the firm's stock over the three prior (or following) years (STKRET). Then I use two measures of the riskiness of the stock. One is the annualized standard deviation of daily stock returns for the year before or after the recapitalization (STD_STKRET). The other is an estimate of the beta of the firm's stock (BETA) estimated for the year before or after the releveraging.

Data and Modeling

The central data for this study are drawn from the Compustat database through 2013. I eliminate all firms that do not trade on the major North American stock exchanges.[1] Then I delete all observations with figures for revenues or assets less than or equal to zero. As is common, I also delete firms in the financial services industries (SIC 6000 – 6999 and Fama-French industry sectors 45 - 48).

I eliminate observations that are missing data for any of the variables used in the logistic regression models (described below). Because the raw univariate statistics for some of the

[1] These are the Toronto, Montreal and Alberta Stock Exchanges in Canada, and the New York, American, Boston, Midwest, Pacific, and Philadelphia Exchanges, as well as NASDAQ in the United States.

variables are not well-behaved it is necessary to delete obvious extreme outliers. I winsorize the ratio of free cash flows to sales for the prior three years at both the 1% and 99% tails. I also winsorize revenue growth, Tobin's Q, asset size, dividend yield and repurchase yield at the upper (99%) tail. All are bounded at zero at the lower end.

I collect data on daily corporate stock returns and value-weighted market returns from the CRSP database. I carefully match the Compustat observations for a fiscal year with those days in the CRSP dataset. I estimate the standard deviation and beta using one-year of daily returns. I estimate beta using a simple market model. A firm must have at least 100 observations for a fiscal year to calculate these performance variables.

Data on average annual yields on 10-year Treasury bonds, and indices of Moody's Baa rated bonds are available from the Federal Reserve Board (http://www.federalreserve.gov/releases/h15/data.htm). The yields on the Baa bond index begin in 1976. The Bureau of Labor Statistics publishes the annual real per capita gross domestic product (http://research.stlouisfed.org/fred2/data/USARGDPC.txt).

I employ a fourfold test to identify firms that execute a leveraged recapitalization. The first two criteria capture the change of debt and equity on the balance sheet. First, the total book value of debt must increase by at least 20% from the previous fiscal year. Second, the book value of equity must decline by at least 20%. This is calculated as the current level of equity minus the sum of the value of equity for the previous year and net income for the current year. This difference is divided by the value of equity for the prior year. The other two criteria reflect the level of payouts, the capital raised in the debt issue must be substantially paid out to the stock holders. Payouts are the sum of dividends and net share repurchases for the current fiscal year. If, net share repurchases are negative (the firm issues more stock than it repurchases), this value is

set to zero. For a firm to be classified as recapitalizing, payouts must be at least 20% of equity for the prior year, and they must be at least 80% of the change in the value of total debt from the prior fiscal year. If all four conditions are satisfied, I assume the firm has executed a leveraged recapitalization for the fiscal year.

According to my four criteria, there are 1,041 leveraged recapitalizations during the forty-year period from 1973 to 2012. This is about 1% of the 100,128 observations in the overall sample. This involves 699 firms that relever. Of these, 198 recapitalize more than once; 120 firms relever two-times, and 78 more than twice. That are a handful of serial-recapitalizers; 39 firms relever more than three-times. [2]

First, I will compare these variables in the years before a releveraging for the firms that recapitalize and the broad aggregate sample of those that do not. Eliminating observations with missing required observations or serious outliers, a sample of 957 recapitalizations remain.

However, the aggregate observations may give a slightly misleading picture. Therefore, I also select a matched sample of firms for comparison. I roughly follow the method of Cohn, Mills and Towery (2014) in constructing this sample. I use five selection criteria. First, the matched observation must be in the same Fama-French industry sector and the same fiscal year as the entities that relevers. Next, the average value of its total assets for three previous years must be within 30% of the target firm. After matching on these three criteria I eliminate all potential control firms that have themselves executed a recapitalization in the three proceeding

[2] According to my definition, Graco, Inc. and Papa John's International, Inc. recapitalize seven times during the period.

years or the three subsequent years.[3] Then, of the remaining firms I select the observation with the net profit margin closest to the relevering firm. I find 808 adequate matching firms.

To assess the effects of these factors on the decision to recapitalize I estimate a series of binary logistic regression models, that include (up to) sixteen of the explanatory variables that capture the essential characteristics on the relationships. The dependent variable is a one/zero dummy variable set to one if the firm has recapitalized in the fiscal year (RECAP). These models take this general form:

$$\begin{aligned}\text{Prob(RECAP)} = {} & \alpha_0 + \beta_1 \text{ FCFS} + \beta_2 \text{ REVGR} + \beta_3 \text{ TOBINQ} + \beta_4 \text{ DIV} + \\ & \beta_5 \text{ REPO} + \beta_6 \text{ DA} + \beta_7 \text{ TAX} + \beta_8 \text{ LOGASS} + \beta_9 \text{ RDS} + \\ & \beta_{10} \text{ ADS} + \beta_{11} \text{ SGAS} + \beta_{12} \text{ D\_MACH} + \beta_{13} \text{ TBOND} + \\ & \beta_{14} \text{ BBBSPRD} + \beta_{15} \text{ CRSPVW} + \beta_{16} \text{ CHRPCGDP} + \varepsilon \qquad [1]\end{aligned}$$

Because the firms in the matched sample include observation from the same industry and fiscal year as those that recapitalize, it is meaningless to include the dummy variable for firms in the machinery sector and the four variables to capture the market and macroeconomic effects in those specifications.

Empirical Results

This section contains my empirical results to demonstrate whether the broad stories may explain the decision to sharply increase leverage. I first present historical statistics on the distribution of leveraged recapitalizations by year and industry. Then I show comparisons of univariate statistics for firms that recapitalize to those who do not. Next, I present the results of six binary logistic models to study the motives for relevering in a multivariate setting. This

[3] I do not strictly enforce the rule that the firm must not recapitalize in the subsequent three years for observations after 2010. Since three years of data are not available in these cases, all the observations would be lost if I forced the issue.

includes an examination of behavior before 2005 and since. Finally, I compare univariate statistics after recapitalization to both firm performance before and to a matched sample after.

Distribution of Leveraged Recapitalizations by Year and Industry

Table 1 contains data on the number of recapitalizations in each fiscal year from 1973 to 2013. Here I do not eliminate any observations for missing values, so the total sample consists of 100,128 firm-years, and 1,041 or slightly more than 1% of these relever according to my definition.

The wave of recapitalizations in the 1980s captured the attention of academics studying capital structure choices. But, it is clear in Table 1 that the pace of recapitalizations has increased rapidly since 1996; over 70% of the actions in the sample have occurred since then. There is an apparent peak at the time of the internet bubble at the turn of the last century from 1998 to 2000. Then the numbers explode around the recent contraction and the ensuing slow recovery. The reasons for the increasing volume of leveraged recapitalizations in the last fifteen years have not been investigated systematically.

Table 2 shows the number of recapitalizations by the forty-five Fama-French industry groups.[4] Earlier Ambrose and Winters (1992) could find no clear evidence of industry effects in the LBO wave of the 1980s. Recapitalizations are obviously far more common in some industries. In fact, several of the industry groups near the top of Table 2 appear to have possibly have high financial distress costs as explained by Opler and Titman (1993) and Cohn, Mills and Towery (2014). Firms that produce durable goods, such as in the fabricated products, computer software, ship building and rail road equipment, aircraft, and defense are among the top fifteen sectors. Machinery and electronic equipment manufacturers are also in the top half of the table.

[4] This is based on the Fama-French fifty industry classification, but the financial sectors have been removed.

But, this presentation can be deceptive. Some of the sectors have significantly more overall observations. Table 3 shows the portion of recapitalizations for each industry. By my definition slightly more than 1% of the observations have recapitalized. Nineteen of the forty-five sectors have above average levels of restructuring. Seven of these nineteen industrial groups have reasonably small numbers of overall observations. So, they do not appear high in Table 2. On the other hand, some sectors with a large number of recapitalizations also have a large number of observations, meaning that they are much lower in Table 3 than in Table 2.

Univariate Analysis of the Aggregate Sample

Table 4 contains univariate statistics for the broad set of operating variables for firms that recapitalize compared to those that do not. In the aggregate sample there are up-to 92,746 firm-year observations, and 957 of these have recapitalized according to my definition. The four columns in the middle of the table contain the number of observations, the median, mean and standard deviation for the explanatory variables for both the sample of firms that recapitalize and those that do not. Test statistics for the significance of the difference between the samples of firms that recapitalize and those that do not are given in the last two columns. The first is a T-test based on the difference of the means between the two samples. Because the variances between the subsamples are unequal, I use the Satterthwaite approximation of the T-value. The test statistic for a non-parametric Wilcoxon Rank Test is given in the final column.

I examine several proxies to test whether agency problems are a strong motive to recapitalize. The earlier literature suggests that firms with high agency costs operate inefficiently. But, in my sample the entities that relever are obviously more profitable by all measures; their gross and net margins are both clearly higher than for the other firms. Their free cash flows are also much greater. This often suggests that agency conflicts may be a problem.

But, usually these high free cash flows come in-tandem with low equity valuation. But here the measures of Tobin's Q are obviously much higher for the firms that recapitalize. Historic revenue growth is also lower for these enterprises, which makes it seem unlikely, that executives are over-investing in the operations.

Jensen and Meckling argue that managers should be reluctant to payout excess cash flows to shareholders as dividends or through repurchases. Therefore, recapitalization may be a spur to reduce hoarded cash or as a signal of increased distributions in the future. But, the median levels of historic dividends and share repurchases for the firms that relever are clearly higher than for the others. These results make it seem unlikely that the recapitalizations are executed to encourage increased future payouts.

The one contrary result is that firms that relever have somewhat higher cash holdings than the broad control sample, which can be used by managers to consume perquisites. Despite this outlier, the collective results are strongly counter to agency conflict arguments. They do not suggest that these entities have increased financial leverage to pressure managers to improve corporate performance.

The second major contention is that firms that recapitalize seek to increase the value of corporate tax shields. Both the book-value-based and market-value-based ratios of debt-to-asset are clearly lower than average for the organizations that recapitalize. This is in sharp contrast to recent LBOs, where Guo, Hotchkiss and Song (2011) and Cohn, Mills and Towery (2014) find that the firms have very high levels of financial leverage even before the buyouts. In addition, the entities that recapitalize pay higher than average taxes compared to both taxable income and operating profits before depreciation, which stresses that the releveraging is probably motivated by a desire to add to the value of the corporate tax shield. Firm that relever are also larger than

those that do not. Size may proxy ease of access to capital markets, and earlier Gupta and Rosenthal (1991) find that large firms are more likely to recapitalize, which is consistent with static trade-off theory arguments for why an entity might increase debt sharply.

Titman and Wessels (1988) and Opler and Titman (1993) suggest that costs of financial distress are much higher for intangible intensive firms and manufactures of durable goods (those in SIC codes 3400 through 3999), which should shy-away from using extreme levels of debt. Recently, Cohn, Mills and Towery (2014) find that firms that execute leveraged buyouts have low SGA expenses and are unlikely to manufacture durable goods. In support of this proposition, the firms that recapitalize are less likely to be in one of the machinery industries, and they tend to have low R&D expense. But, contrary to this argument for the other two proxies for intangible intensiveness, advertising and SGA costs, they spend more than usual. So, the evidence on the costs of financial distress associated with intangibility as a motive to relever are somewhat mixed.

There is mounting evidence that firms may alter their capital structures in response to market and economic conditions. The results in Table 4 suggest that entities are far more likely to recapitalize when rates on Treasury bonds and stock market returns are low. This supports the "windows of opportunity" argument that it is attractive to issue debt under these conditions. These results are somewhat consistent with the findings by Taggart (1977), Marsh (1982), and Barry, Mann, Mihov and Rodriguez (2009). However, in this sample the evidence on the effect of the default spreads on BBB bonds is confounding; the firms seem more willing to recapitalize when the spreads are higher. The state of the economy also seems to affect decisions to recapitalize. Relevering is more likely when the growth in real per capita GDP is low. This corresponds to earlier results of Choe, Masulis and Nanda (1993), Korajczyk and Levy (2003)

and Eril, Julio, Kim and Weisbach (2012), who find that firms tend to issue more debt when the economy is slow.

Finally, the stock market performance of the firms that recapitalize seems somewhat different from others. There is evidence, mainly from the nonparametric Wilcoxon Rank Test, that the median stock returns for the prior three years and the beta for the previous year are higher for the companies that recapitalize than for the rest of the sample. However, the standard deviation of stock returns for the relevering firms is clearly lower than average.

Univariate Analysis of the Matched Sample

In the aggregate sample the control firms are much smaller, less profitable and less highly valued in the market than those that do recapitalize. Therefore, I select a narrower matched sample for comparison. Following Cohn, Mills and Towery (2014), I select matching firms based on fiscal year, (Fama-French) industry group, size and net profitability. They also must not carry out a leveraged recapitalization in the three years before and after the study year. This yields a sample containing up-to 808 firm-year observations of entities both that recapitalize and those that do not; for an overall sample size of 1,616 observations. The results are given in Table 5. The layout of this table is similar to Table 4. Most of the unique characteristic of the firms that recapitalize are still evident in this comparison with matched firms. Note, that because the control sample is chosen by fiscal year, it is impossible to test propositions about the market and economic conditions and of the portion of observations in machinery intensive sectors.

First, consider the factors which proxy agency problems. Even though net profitability is the final matching criteria, the firms that recapitalized have much higher levels of historic earnings and free cash flows than entities that do not. The relevering firms also have much higher measures of Tobin's Q. It is still clear that their historical sales growth is unusually low.

Those that recapitalize also have made higher levels of historical share repurchases than the firms that do not relever, but the support for their paying higher dividends is weaker than in Table 4. Also, in the previous table, there was evidence that that the organizations that recapitalize have high cash holding, which seems contrary to the agency story. But, when compared to a closer matched sample, this is no longer evident. So, overall, there is little support for the notion that agency problems are the fundamental motivation for relevering.

There is still compelling evidence that the firms that recapitalize may be trying to increase the value of corporate tax shields. As in Table 4, the firms that relever have very low levels of both the book-value-based and market-value based debt-to-asset ratio, and their tax obligations are also higher than average. Because asset size is one of the sorting criteria, it is not surprising that there is no evidence that revenues for the firms that relever are larger than the others.

Again, the firms that recapitalize have higher intangible based expenditures on advertising and SGA. But, their R&D expenses are not significantly different than for entities that do not relever. Finally, when comparing to a matched sample, the historical stock market returns and betas are not significantly different for the control firms. But, as in the previous result, the entities that recapitalize have unusually low standard deviations of stock returns.

Logit Analysis of the Aggregate Sample

To better understand the characteristics of firms that undertake leveraged recapitalization in a multivariate setting I estimate a series of binary logistic regressions. The results in Table 6 are comparisons of the entities that relever to the broad sample.

I present the parameter estimates and standard errors for each explanatory variable. However, the coefficient estimates in a logit model are not directly comparable to those in OLS.

Therefore, I also calculate the "marginal effects" (at the means) for each estimate. These can be interpreted as the average change in the probability of the dependent variable event for a one-unit change in an independent variable.

There is a sample of 827 entities that recapitalize and 70,800 control firms have all of the raw data required for the first specification. After adjusting for average industry performance, the samples are 814 and 68,710 firms respectively.

The estimated parameters for the raw measures are given in the three columns to the left. The three columns to the right contain those for industry-adjusted variables, which are the difference between the raw firm measures and the medians of the measures for their Fama-French industry classification and year. The one/zero dummy variable for the machinery industry is not adjusted to the sector median.[5] There is controversy about goodness-of-fit measures like pseudo-r^2 for logit models, but the estimated maximum rescaled r^2 suggest that the model based on raw values explains about 18% of the variability in the decision to relever, and about 15% in the model adjusted to industry average.

The coefficients on Tobin's Q and free cash are positive and significant in both specifications. Historical revenue growth is unusually low for firms that relever, suggesting it is unlikely that their managers are over-investing. The entities that recapitalize also do not appear to be hoarding funds. They have low cash holdings, and they are not skimping on payouts to shareholders, with high levels of historic share repurchases and dividend payments above their

[5] In the models based on the raw data, the proxy for firm size is the logarithm of lagged assets. Because it is impossible to take the logarithm of a negative number, the proxy in the industry adjusted specifications is simply the difference between the firm's assets and the median measure of the same variable for the Fama-French sector for that fiscal year.

sector averages. Again, these collective results do not seem to support agency conflict explanations for why these firms increase financial leverage.

There is more strong support for the notion that the firms that recapitalize are not fully exploiting the tax shield. They have significantly lower debt-to-asset ratios, and there is some evidence that they pay unusually high tax rates, especially compared to their industry average. The coefficient on the raw value for asset size suggests that firms that recapitalize are larger than others. But, after controlling for typical industry size, this relationship disappears.

The evidence in these logit models is more in-line with the conjecture by Opler and Titman (1993) that intangible intensive firms should be less likely to take on more leverage, but it is still not perfectly consistent. In the model base on raw values, the entities that recapitalize have significantly lower levels of R&D expenditure. While they are less likely to be in industries that manufacture durable goods (SIC 3400 – 3999) after controlling for sector average performance. To the contrary, there is consistent evidence that they have unusually high advertising costs, but Opler and Titman did not include this variable in their study. In the logit model the expenditures on SGA for firms that recapitalize are not significantly different from others.

Finally, I consider the effect of market and economic conditions on the decision to recapitalize. Here the results are considerably different from those shown in the univariate analysis in Table 4. The coefficient estimates for the default spread on BBB rated bonds are negative and significant in both specifications, and on the Treasury bond yield in the industry adjusted model. This suggests that firms are more likely to undertake large debt issues when rates are low. In the logit models there is no evidence of a relationship between stock market performance and the probability of relevering. So firms do not necessarily shy-away from

relevering when market-wide share prices are high. Again, the results verify the earlier findings that recapitalizations are much more likely when GDP growth is slow in both specifications.

Overall, comparing the entities that relever to the broad aggregate sample suggests that these firms raise the levels of debt in their capital structure to better exploit the tax shield. They are clearly more likely to execute these transactions when interest rates are low and the economy is weak. Equity market prices seem to have little effect on the choice. There is no support for the notion that they are trying to reduce excessive agency costs, and there is inconsistent evidence about whether they have extremely low financial distress problems. However, the magnitudes of the estimated marginal effects in these specifications do not suggest that most of these relationships are very robust.

Logit Analysis of the Matched Sample

In Table 7 I present binary logit regression results for matched samples of firms that relever and an equal number that do not. Again, the matching firms are chosen from the same industry and fiscal year. They are of roughly the same size and the closest net profitability as the recapitalizing observation. The matching firms also must not have recapitalized in the three prior or following years. There are 808 matched-pairs in the model based on raw data and 793 for the specification adjusted for industry performance. Because of the matching by year, the four variables for the market and economic conditions are omitted from these specifications. Since the matching firms are from the same industry, I also delete the dummy variable for firms in the machinery sector. These models have greater explanatory power than those using the broad aggregate sample. The Maximum Rescaled r^2 are over 25% for both specifications. Many of the results from the logit analysis of the broad aggregate sample are still evident in the matched sample.

There is still little support for the proposition that agency problems drive the decision to recapitalize. The firms that relever still have high measures of both Tobin's Q and free cash flows, and low historical sales growth. Their cash holdings are low. They have a history of large stock repurchases and pay dividends higher than their industry average.

In the matched sample comparison, the support for explanations based on the tax shield are somewhat weaker. There is now not significant evidence that the firms that recapitalize pay higher tax rates. But, their debt-to-asset ratios are still clearly far lower than for the firms that relever than for the matched firms. They are now a bit smaller than the control firms, especially when not adjusting for industry averages.[6]

Results on the effects of financial distress costs and intangibility on the decision to recapitalize are, again, mixed. The firms that relever have high advertising costs, there is weak evidence that they have low R&D expenses, and their SGA expenditures do not differ from the matched firms.

The results for the specification based on the matched sample confirm many of the findings in Table 6. However, note that in this setting the magnitude of the marginal effects is considerably higher (often by a factor of ten). This lends considerable support to the earlier findings. Unfortunately, it is not possible to test the market and economic effects in this setting.

Logit Analysis of Recapitalizations Before and Since 2005

The distribution of recapitalizations over time shown in Table 1 makes it clear that releveraging has been much more common in recent years, particularly during the recovery following the sharp contraction in 2008 and 2009. Therefore, I also estimate binary logit

[6] Firm size is one of the matching criteria. But, this is (purposely) based on sales revenue, while the measures in the logit model are based on total assets.

specifications, dividing the full sample, not adjusting for industry averages, into two subsets; one for observation since 2004, the other for the earlier years. The subsample from the more recent years contains almost 46% of the recapitalizations, but only about 26% of total observations. The results are shown in Table 8. The Maximum Rescaled r^2 is about 15% for the model of the earlier period, and over 22% for the recent years.

The results concerning the control of agency conflicts, the value of the tax shield and of financial distress costs, are similar to the earlier findings in both time periods. The firms that recapitalize use low leverage and face high tax rates. There is little evidence that agency conflicts are a primary motivation for the relevering. And the results for the proxies for intangibility and financial distress are mixed. It is interesting to note that the marginal effects are usually considerably larger in the second period (often by a factor of two),

The most intriguing findings in Table 8 concern the effects of the economic and market conditions on the decision to recapitalize. The results in Table 6 show that firms are more likely to relever when interest rates are low and when GDP growth is sluggish. However, neither of these behaviors are evident before 2005, in fact, there are positive relationships of the choice to recapitalize with both economic growth and Treasury Bill rates. But, the negative relationships with economic activity and interest rates are clear in the more recent period. This is strong evidence that the unprecedented extended low interest rate regime during and after the 2008 - 2009 contraction may have been a principal cause of the recent tidal wave of recapitalizations.

Univariate Analysis of Firm Performance Before and After Recapitalizations

In this section I examine the changes in firm performance after recapitalization. I analyze the same set of operating variables for the firms that relever in the three-year periods before and after the recapitalization, and I also compare them to the matched observations. All of the firms

included in this analysis must have full data for the three years following the change in leverage. Because of this limitation all observations after 2009 are eliminated. Approximately 652 firms that recapitalize have observations both before and after relevering.

The comparisons of the variables before and after recapitalization are shown in Table 9. The second column contains the number of observations. The median, mean and standard deviation of the measures before recapitalization are shown in the third, fourth and fifth columns. The same univariate statistics for the period after the releveraging are given in the next three columns. The ninth column contains a T-test statistic for the difference between the mean performance before recapitalization to that after. The test-statistic in the tenth column is for a Wilcoxon Rank Test between the values before recapitalization and those after. For both test statistics positive signs mean that value is higher after relevering.

The results for the performance after recapitalization for firms the relever and the matched that do not are given in Table 10. The univariate statistics for the entities that recapitalize are in the first three columns and those for the matching firms in the next three. The statistics for the T-test and the Wilcoxon Rank Test are given in the two columns to the left. Positive signs on the test statistics mean that the value for the firms that recapitalize is higher. Again, there are up-to 652 matched pairs.

The results in Table 10 show that the firms that recapitalize are still more profitable, make higher payouts to shareholders, and have higher values of Tobin's Q after relevering. But, the figures in Table 9 suggest that operating performance after the change is a bit weaker for the entities that recapitalize. Net profits are lower after. But, this is not surprising, because of the addition of greater interest payments. The gross profit margins and the free cash flows are not significantly different after relevering. The firms that relever had unusually low revenue growth

before the change in leverage, and it is even lower in the subsequent period. There is a statistically significant decline in Tobin's Q for the firms that recapitalize, but it remains markedly higher than for the matched sample. So, in general, the recapitalizations do not seem intended to spur the managers to improve operating performance. There is also no evidence that the relevring results in a long-term change in payout policy. The entities that recapitalize do not alter their dividend or share repurchase yields after the change, and they continue to distribute more of their earnings than the matching firms. They do lower their cash holdings slightly in the years after recapitalization, and it is then below the averages for the matched sample. So the cash hoards may be partially disbursed in the payouts associated with the releveraging.

There is still strong evidence in support of the story that recapitalizations are enhancing the value of corporate tax shields. Asset size increases after recapitalization, but it is still no higher than for the matching firms. Not, surprisingly, both the book-value-based and market-value based measures of the debt-to-asset ratios are significantly higher after relevering. In fact, the average book-value-based debt ratio is greater than for the sample of matching firms, though the market-value-based ratio is still slightly lower. There is also considerable evidence that relative tax obligations decline, the decrease in the ratio of taxes to operating income before depreciation is clear. However, the tax payments of the firms that relever are still higher than for the matched sample. These results provide strong support for the notion that these radical changes in debt financing do increase the value of the tax shield.

There is an appreciable change in stock market performance after recapitalizing. The results in Table 5 suggest that both historical stock return and beta for the firms that relever are not significantly different from the matched sample, and that the recapitalizing firms have lower standard deviations of returns. However, the figures in Table 9 show that stock returns decline

after relevering, and the standard deviation increases. The changes do not have a statistically significant effect of the measures of beta. But, In Table 10 all three measures of performance for the firms that relever are lower than for the matched sample after the change.

Summary and Conclusions

In the 1980s and 1990s there was an intensive but brief flurry of research on highly leveraged transactions such as LBOs and recapitalizations. Recently, there has been a marked increase in the number of firms raising their financial leverage significantly. In two current studies Guo, Hotchkiss and Song (2011) and Cohn, Mills and Towery (2014) provide further insights for the causes and effects of recent LBOs. There is clearly a need to extend the research on the reasons for and results of large recapitalizations where the firm remains publicly traded.

I study leveraged recapitalizations over the last forty years. Most firms that relever do not publicly announce the decision nor explain their rationale. Therefore, I use four criteria with respect to changes in debt and equity on the balance sheet and increases in payout to shareholders to identify a large sample of firms that significantly raise leverage. I confirm that in the last fifteen years the magnitude of recapitalizations has increased to levels far higher than twenty-five years ago. However, dramatic one-time changes in leverage are still rare; only about 1% of firms consciously raise their levels of debt and increase equity by as much as 20% in a fiscal year. But, these decisions present the elements of capital structure choice in a clear context. Therefore, I assess four widely discussed motivations for these large increases in financial leverage.

I can muster little support for typical predictions based on agency theory stories. While I do find that the firms that recapitalize have larger than average free cash flows, their profitability and relative share price (Tobin's Q) are far higher than usual. So these entities do not seem to be

poor performers trying to stir their managers to increase operating efficiency. High profitability and share price persist after the increase in leverage. There is also little evidence that the managers are avoiding distributing cash flows to shareholders and hoarding the proceeds. The firms that relever payout a higher than normal portion of dividends and share repurchases, and their historic sales growth is lower than average, which does not suggest that they are over-investing. Before recapitalization their cash holding are somewhat high, but they decrease thereafter.

Exploiting an under-used corporate tax shield seems to be a strong motive for many of the recapitalizations. The debt-to-asset ratios for these firms are clearly much lower than average, and by some measures they are a bit higher than normal after recapitalizing. There is some evidence that they pay slightly higher tax rates than others, and that the tax obligations are lower after relevering.

The use of high levels of debt could create unbearable costs of financial distress for some firms. Opler and Titman (1993) argue that intangible intensive companies and manufactures of durable goods face such high financial distress costs. I find some evidence in support. Firms that manufacture durable goods and those with high R&D costs are less likely to relever. But, to the contrary, corporations with high advertising and SGA expenditures, two other common proxies for intangibility, are more apt to recapitalize.

Finally, I find that the probability of leveraged recapitalizations depends upon market and economic conditions. Firms are more likely to relever when interest rates are low, and when the economy is weak. But, this effect is only significant for recapitalizations in the 21st century. Clearly, there has been an unprecedented boom in releveraging, encouraged by the extended low interest rate environment during the recent contraction and the following slow recovery.

In recent studies Guo, Hotchkiss and Song (2011) and Cohn, Mills and Towery (2014) have found that historical operating inefficiencies arising from agency conflicts among stakeholders are the primary motivation for many LBOs. In my sample, the firms that drastically relever have unusually high profitability and Tobin's Q, and low financial leverage. Therefore, the firms that raise debt and remain publicly traded seem to have very different motives. This recent wave of leveraged recapitalizations appears to be driven by two primary causes. The first is clearly under-levered firms trying to better exploit the tax shield. But, financial distress costs may provide incentives for firms in some sectors to avoid too large an increase. The other powerful motive for the recent massive number of recapitalizations is obviously the sustained extraordinarily low level of interest rates since the economic contraction. Overall these results are in-line with the findings by Korajczyk and Levy (2003) and Eril, Julio, Kim and Weisbach (2012) suggesting that firms with low financial constraints and strong operating performance are best able to take advantage of favorable interest rate environments.

Appendix Variable Definitions		
Variables for Agency Costs		
GPM	Gross Profit Margin	Ratio of Net Income to Sales (3 Year Average)
NPM	Net Profit Margin	Ratio of Gross Profits to Sales (3 Year Average)
FCFS	Free Cash Flows to Sales	Sum of Net Income, Deprecation and Capital Expenditures To Sales (3 Year Average)
REVGR	Revenue Growth	Revenue Growth Over the Prior Three Years (3 Year Average)
CASHASS	Cash-to-Assets	Ratio of Cash to Assets (1Year Before)
TOBINQ	Tobin's Q	Ratio of the Sum of Market-Value of Equity and Book-Value of Debt to the Book Value of Assets (3 Year Average)
DIV	Dividend Yield	Ratio of Dividends to Prior Year Market-Value of Equity (3 Year Average)
REPO	Repurchase Yield	Ratio of Stock Repurchases to Prior Year Market-Value of Equity (3 Year Average)
Variables for the Value of the Tax Shield		
DA	Debt-to-Assets–Book-Value	Ratio of Total Debt to Assets (3 Year Average)
DAM	Debt-to-Assets–Market-Value	Ratio of Total Debt to the Sum of the Book-Value of Liabilities and the Market-Value of Equity (3 Year Average)
TAXR	Effective Tax Rate	Ratio of Income Taxes to Taxable Income (3 Year Average)
TAX_GP	Taxes to Gross Profits	Ratio of Income Taxes to Operating Income Before Depreciation (3 Year Average)
ASSETS	Assets	Average of Assets for 3 Years
LOGASS	Logarithm of Assets	Logarithm of the Average of Assets for 3 Years
Variables for Financial Distress Costs		
RDS	R&D to Sales	Ratio of R&D Expenses to Sales (3 Year Average)
ADS	Advertising Costs to Sales	Ratio of Advertising Costs to Sales (3 Year Average)
SGAS	SGA Expenses to Sales	Ratio of SGA Expenses to Sales (3 Year Average)
D_MACH	Dummy-Durable Goods	Dummy Variable set to one if the Firm is in a Durable Goods Manufacturing Industry (SIC 3400 – 3999)

Appendix
Variable Definitions
(Continued)

Variables for Market and Macroeconomic Conditions		
TBOND	Treasury Bond Yield	Average Yield on 10-Year Treasury Bonds (Current Year)
BBBSPRD	Spread on BBB Bonds	Average Spread on Moody's Baa Rated Bonds Over Treasury Bonds (Current Year)
CRSPVW	Return on the CRSP Index	Return on the CRSP Value-weighted Index (Current Fiscal Year)
CHRPCGDP	Change in Real Per Capita GDP	Change in Real Per Capita GDP (Current Year)
Variables for Firm Equity Market Performance		
STKRET	Stock Returns	Annualized Average Stock Return based on Daily Returns for Three Fiscal Years
STD_STKRET	Standard Deviation Returns	Annualized Standard Deviation of One-Year of Daily Returns
BETA	Beta	Beta from a Market Model Using One-Year of Daily Returns Compared to the CRSP Value-Weighted Index

References

Ambrose, Brent and Drew B. Winters, "Does an Industry Effect Exist for Leveraged Buyouts," *Financial Management*, 21(1), Spring 1992, pp. 89-101.

Anonymous, "Global Company Bond Issuance Hits Record $3.9 Trillion," *Money News*, December 17, 2012.

Barry, Christopher B., Steven C. Mann, Vassil Mihov, and Mauricio Rodriguez, "Interest Rates and the Timing of Corporate Debt Issues." *Journal of Banking and Finance*, 33(4), April 2009, pp. 600-608..

Chemey, Mike, "U.S. Bond Issuance Nears $1 Trillion: Companies Take Advantage of Low Interest Rates to Issue Bonds," *Wall Street Journal*, August 12, 2014

Choe, Hyuk, Ronald W. Masulis and Vikram Nanda, "Common Stock Offerings Across the Business Cycle," *Journal of Empirical Finance*, 1(1), June 1993, pp. 3-31.

Cohn, Jonathan B., Lillian F. Mills and Erin M. Towery, "The Evolution of Capital Structure and Operating Performance after Leveraged Buyouts: Evidence from U.S. Corporate Tax Returns," *Journal of Financial Economics*, 111, 2014. Pp. 469-494.

DeAngelo, Harry, Linda DeAngelo and Edward M. Rice, "Going Private: Minority Freezeouts and Shareholder Wealth," *Journal of Law and Economics*, 27(2), October 1984, pp. 367-401.

Denis, David J. and Diane K. Denis, "Managerial Discretion, Organizational Structure and Corporate Performance," *Journal of Accounting and Economics*, 16(1-3), 1993, pp. 209-236.

Erel, Isil, Brandon Julio, Woojin Kim and Michael S. Weisbach, "Macroeconomic Conditions and Capital Raising," *Review of Financial Studies*, 25(2), 2012, pp. 341-376.

Guo, Shourun, Edith S. Hotchkiss and Weihong Song, "Do Buyouts (Still) Create Value," *Journal of Finance*, 66(2), April 2011, pp. 479-517.

Gupta, Atul and Leonard Rosenthal, "Ownership Structure, Leverage, and Firm Value: The Case of Leveraged Recapitalizations," *Financial Management*, 20(3), Autumn 1991, pp. 69-83.

Handa, Puneet and A.R. Radhakrishnan, "An Empirical Investigation of Leveraged Recapitalizations with Cash Payout as Takeover Defense," *Financial Management*, 20(3), Autumn 1991, pp. 58-68.

Jensen, Michael C., "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*, 76(3), June 1986, pp. 323-329.

Jensen, Michael C. and William H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics*, 3(4), October 1976, pp. 305-360.

Kaplan, Steven, "The Effects of Management Buyouts on Operations and Value," *Journal of Financial Economics*, 24(2), October 1989, pp. 217-254.

Kleiman, R., "The Shareholder Gains From Leveraged Cash-Outs: Some Preliminary Evidence," *Continental Bank Journal of Applied Finance*, Spring 1988, pp. 46-53.

Korajczyk, Robert A., Amnon Levy, "Capital Structure Choice: Macroeconomic Conditions and Financial Constraints," *Journal of Financial Economics*, 68(1), April 2003, pp. 75-109.

Lehn, Kenneth and Annette Paulsen, "Free Cash Flows and Stockholder Gains in Going Private Transactions," *Journal of Finance*, 44(3), July 1989, pp. 771-787.

Loughran, Tim and Jay R. Ritter, "The New Issues Puzzle," *Journal of Finance*, 50(1), March 1995, pp. 23–51.

Marais, Laurentius, Katherine Schipper and Abbie Smith, "Wealth Effects of Going Private for Senior Securities," *Journal of Financial Economics*, 23(1), June 1989, pp. 155-191.

Marsh, Paul, "The Choice Between Equity and Debt: An Empirical Study," *Journal of Finance*, 37(1), March 1982, pp. 121-144.

Modigliani, Franco and Merton H. Miller, "The Cost of Capital, Corporate Finance, and the Theory of Investment," *American Economic Review*, 48(3), June 1958, pp. 261-297.

Modigliani, Franco and Merton H. Miller, "Corporate Income Taxes and the Cost of Capital," *American Economic Review*, 53(3), June 1963, pp. 433-443.

Opler, Tim C., "Operating Performance in Leveraged Buyouts," *Financial Management*, Spring 1992, pp. 27-34.

Opler, Tim and Sheridan Titman, "The Determinants of Leveraged Buyout Activity: Free Cash Flows vs. Financial Distress Costs," *Journal of Finance*, 48(5), December 1993, pp. 1,985-1,999.

Platt, Eric and Joe Renninson, "Dash for Debt Ahead of US Rate Rise," *Financial Times* (FT.com), November 8, 2015.

Robichek, Alexander A. and Stewart C. Myers, "Problems in the Theory of Optimal Capital Structure," *Journal of Financial and Quantitative Analysis*, 1(2), June 1966, pp. 1-35.

Stulz, Rene M., "Managerial Discretion and Optimal Financing Policies," *Journal of Financial Economics*, 26(1), July 1990, pp. 3-28.

Taggart, Robert A., "A Model of Corporate Financing Decisions," *Journal of Finance*, 32(5), December 1977, pp. 1,467-1,484.

Titman, Sheridan and Roberto Wessels, "The Determinants of Capital Structure Choice," *Journal of Finance*, 43(1), March 1988, pp. 1-19.

Torabzadeh, Khalil M., and William J. Bertin, "Leveraged Buyouts and Shareholder Returns," *Journal of Financial Research*, 10(4), Winter 1987, pp. 313-319.

Walker, M. Mark, "On the Shareholder Wealth Maximization Objective of Corporate Governance: The Case of Leveraged Recapitalizations," *Managerial Finance*, 22(4), 1996, pp. 53-70.

Walker, M. Mark, "Leveraged Recapitalizations, Operating Efficiency, and Stockholder Wealth," *Financial Review*, 33(3), August 1998, pp. 99-114.

Zeiler, David, "Record Low Interest Rates Create Stampede to Issue Corporate Bonds," *Money Morning*, May 31, 2011.

Table 1
Number of Leveraged Recapitalizations by Year

1973	8	1987	34	2001	17
1974	2	1988	23	2002	17
1975	2	1989	23	2003	21
1976	3	1990	22	2004	25
1977	7	1991	10	2005	42
1978	10	1992	13	2006	63
1979	3	1993	16	2007	98
1980	6	1994	16	2008	56
1981	6	1995	15	2009	17
1982	15	1996	30	2010	28
1983	4	1997	29	2011	50
1984	20	1998	54	2012	42
1985	27	1999	50	2013	52
1986	19	2000	46		
				Total	1,041

Table 2
Recapitalizations By Fama-French Industry
1973 - 2013

Rank	FF Industry Number	Industry	Recapitalizations
1	43	FABRICATED PRODUCTS	78
2	13	COMPUTER SOFTWARE	72
3	34	NON METALLIC & INDUSTRIAL METALS	71
4	44	SHIP BUILDING & RAIL ROAD EQUIPMENT	58
5	14	HEALTHCARE	54
6	42	TEXTILES	51
7	9	FOOD PRODUCTS	47
8	30	RUBBER & PLASTIC PRODUCTS	44
9	21	ENTERTAINMENT	42
10	2	PHARMACEUTICAL PRODUCTS	37
11	32	AIRCRAFT	37
12	36	TOBACCO PRODUCTS	35
13	37	DEFENSE	30
14	39	SHIPPING CONTAINERS	29
15	41	AGRICULTURE	28
16	17	PRINTING & PUBLISHING	26
17	11	COMMUNICATION	25
18	8	MACHINERY	22
19	12	ELECTRONIC EQUIPMENT	21
20	23	MEASURING & CONTROL EQUIPMENT	19
21	7	WHOLESALE	18
22	38	PRECIOUS METALS	17
23	22	ELECTRICAL EQUIPMENT	16
24	10	PETROLEUM & NATURAL GAS	15
25	35	CONSTRUCTION	14
26	4	RESTARAUNTS, HOTELS, & MOTELS	13
27	5	CHEMICALS	13
28	31	CANDY & SODA	13
29	19	CONSTRUCTION MATERIALS	12
30	15	BUSINESS SUPPLIES	11

Table 2
Recapitalizations By Fama-French Industry
1973 - 2013
(Continued)

Rank	FF Industry Number	Industry	Recapitalizations
31	3	BUSINESS SERVICES	10
32	6	CONSUMER GOODS	10
33	33	PERSONAL SERVICES	10
34	28	UTILITIES	9
35	24	BEER & LIQUOR	8
36	18	MEDICAL EQUIPMENT	7
37	26	COMPUTER HARDWARE	4
38	27	STEEL WORKS	3
39	29	RECREATION	3
40	1	RETAIL	2
41	40	OTHERS (ALMOST NOTHING)	2
42	50	CONGLOMERATES	2
43	16	TRANSPORTATION	1
44	20	AUTOMOBILES & TRUCKS	1
45	25	APPAREL	1
46	49	COAL	0
		AGGREGATE	1,041

Table 3
Proportional Recapitalizations by Fama-French Industry
1973 - 2013

Rank	FF Numb	Industry	Tot Obs	Recaps	Portion
1	5	CHEMICALS	256	13	5.08%
2	44	SHIP BUILDING & RAIL ROAD EQUIPMENT	2,194	58	2.64%
3	3	BUSINESS SERVICES	394	10	2.54%
4	26	COMPUTER HARDWARE	162	4	2.47%
5	4	RESTARAUNTS, HOTELS, & MOTELS	575	13	2.26%
6	13	COMPUTER SOFTWARE	3,187	72	2.26%
7	8	MACHINERY	1,063	22	2.07%
8	14	HEALTHCARE	2,797	54	1.93%
9	9	FOOD PRODUCTS	2,474	47	1.90%
10	2	PHARMACEUTICAL PRODUCTS	2,455	37	1.51%
11	34	NON METALLIC & INDUSTRIAL METALS MINING	5,224	71	1.36%
12	11	COMMUNICATION	1,859	25	1.34%
13	39	SHIPPING CONTAINERS	2,246	29	1.29%
14	43	FABRICATED PRODUCTS	6,093	78	1.28%
15	29	RECREATION	247	3	1.21%
16	7	WHOLESALE	1,515	18	1.19%
17	28	UTILITIES	764	9	1.18%
18	6	CONSUMER GOODS	870	10	1.15%
19	42	TEXTILES	4,524	51	1.13%
20	10	PETROLEUM & NATURAL GAS	1,572	15	0.95%
21	24	BEER & LIQUOR	848	8	0.94%
22	32	AIRCRAFT	4,029	37	0.92%
23	21	ENTERTAINMENT	4,682	42	0.90%
24	15	BUSINESS SUPPLIES	1,249	11	0.88%
25	23	MEASURING & CONTROL EQUIPMENT	2,169	19	0.88%
26	41	AGRICULTURE	3,309	28	0.85%
27	33	PERSONAL SERVICES	1,247	10	0.80%
28	17	PRINTING & PUBLISHING	3,248	26	0.80%
29	22	ELECTRICAL EQUIPMENT	2,098	16	0.76%
30	36	TOBACCO PRODUCTS	4,648	35	0.75%

Table 3
Proportional Recapitalizations by Fama-French Industry
1973 - 2013
(Continued)

Rank	FF Numb	Industry	Tot Obs	Recaps	Portion
31	30	RUBBER & PLASTIC PRODUCTS	5,973	44	0.74%
32	12	ELECTRONIC EQUIPMENT	2,880	21	0.73%
33	35	CONSTRUCTION	2,080	14	0.67%
34	38	PRECIOUS METALS	2,562	17	0.66%
35	19	CONSTRUCTION MATERIALS	2,161	12	0.56%
36	1	RETAIL	372	2	0.54%
37	18	MEDICAL EQUIPMENT	1,452	7	0.48%
38	37	DEFENSE	6,244	30	0.48%
39	25	APPAREL	212	1	0.47%
40	27	STEEL WORKS	694	3	0.43%
41	40	OTHERS (ALMOST NOTHING)	510	2	0.39%
42	50	CONGLOMERATES	543	2	0.37%
43	31	CANDY & SODA	4,915	13	0.26%
44	20	AUTOMOBILES & TRUCKS	467	1	0.21%
45	16	TRANSPORTATION	929	1	0.11%
46	49	COAL	135	0	0.00%
		AGGREGATE	100,128	1,041	1.04%

Table 4
Univariate Statistical Analysis
Aggregate Sample

Variables for Agency Costs

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
GPM	Recap	957	0.1665	0.1889	0.1110	12.02***	14.46***
GPM	Non-Recap	92,746	0.1199	0.1454	0.1320		
NPM	Recap	957	0.0692	0.0834	0.0749	20.54***	19.89***
NPM	Non-Recap	92,746	0.0379	0.0333	0.0930		
FCFS	Recap	957	0.0550	0.0675	0.0851	26.52***	24.56***
FCFS	Non-Recap	92,746	0.0141	-0.0062	0.1173		
REVGR	Recap	957	0.0849	0.0912	0.1817	-5.24***	-4.12***
REVGR	Non-Recap	92,746	0.0989	0.1223	0.2686		
TOBINQ	Recap	910	1.9988	2.2995	1.1282	20.48***	24.99***
TOBINQ	Non-Recap	82,986	1.2785	1.5313	0.7990		
CASHASS	Recap	957	0.0700	0.1122	0.1185	2.52**	4.88***
CASHASS	Non-Recap	92,746	0.0535	0.1025	0.1280		
DIV	Recap	957	0.0122	0.0166	0.0186	3.15***	7.98***
DIV	Non-Recap	92,746	0.0000	0.0147	0.0220		
REPO	Recap	957	0.0148	0.0236	0.0279	18.24***	27.55***
REPO	Non-Recap	92,746	0.0000	0.0071	0.0173		

Variables for Value of the Tax Shield

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
DA	Recap	954	0.1808	0.1900	0.1351	-17.81***	-14.18***
DA	Non-Recap	92,613	0.2507	0.2685	0.1787		
DAM	Recap	908	0.0828	0.1055	0.0923	-34.21***	-21.73***
DAM	Non-Recap	82,883	0.1863	0.2117	0.1571		
TAXR	Recap	957	0.3648	0.3352	0.2038	5.70***	-0.56
TAXR	Non-Recap	92,746	0.3672	0.2972	0.2931		
TAX_GP	Recap	957	0.2486	0.2317	0.1384	12.18***	10.47***
TAX_GP	Non-Recap	92,746	0.1966	0.1765	0.2256		
ASSETS	Recap	957	0.0012	0.0045	0.0102	5.43***	19.78***
ASSETS	Non-Recap	92,746	0.0002	0.0027	0.0137		

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 4
Univariate Statistical Analysis
Aggregate Sample
(Continued)

Variables for Financial Distress Costs

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
RDS	Recap	957	0.0000	0.0229	0.0464	-1.26	2.30**
RDS	Non-Recap	92,746	0.0000	0.0248	0.0601		
ADS	Recap	957	0.0011	0.0194	0.0377	7.85***	9.93***
ADS	Non-Recap	92,746	0.0000	0.0098	0.0256		
SGAS	Recap	957	0.1997	0.2176	0.1503	3.72***	5.05***
SGAS	Non-Recap	92,746	0.1726	0.1994	0.1624		
D_MACH	Recap	957	0.0000	0.2163	0.4119	-4.96***	-4.55***
D_MACH	Non-Recap	92,746	0.0000	0.2828	0.4503		

Variables for Market and Macroeconomic Conditions

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
TBOND	Recap	945	5.0200	5.6743	2.6241	-11.43***	-10.95***
TBOND	Non-Recap	86,642	6.3500	6.6563	2.8848		
BBBSPRD	Recap	945	2.1000	2.2813	0.6484	2.44**	2.12**
BBBSPRD	Non-Recap	86,642	2.1000	2.2295	0.6634		
CRSPVW	Recap	874	14.5220	12.2677	16.5267	-2.32**	-2.84***
CRSPVW	Non-Recap	80,226	16.6240	13.5750	18.0831		
CHRPCGDP	Recap	945	1.6890	1.2064	2.0656	-7.16***	-6.55***
CHRPCGDP	Non-Recap	86,642	2.0280	1.6898	1.9650		

Variables for Firm Equity Market Performance

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
STKRET	Recap	807	0.2263	0.2745	0.2442	1.69	4.31***
STKRET	Non-Recap	70,693	0.1974	0.2598	0.3368		
STD_STKRET	Recap	857	0.3056	0.3408	0.1488	-28.04***	-19.04***
STD_STKRET	Non-Recap	77,934	0.4240	0.4857	0.2665		
BETA	Recap	839	0.8312	0.8619	0.4729	1.90*	3.02***
BETA	Non-Recap	77,931	0.7792	0.8310	0.5785		

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 5
Univariate Statistical Analysis
Matched Sample

Variables for Agency Costs

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
GPM	Recap	808	0.1639	0.1880	0.1138	3.15***	3.28***
GPM	Non-Recap	808	0.1457	0.1700	0.1160		
NPM	Recap	808	0.0681	0.0203	0.0764	5.56***	5.76***
NPM	Non-Recap	808	0.0551	0.0628	0.0618		
FCFS	Recap	808	0.0542	0.0651	0.0864	6.64***	7.51***
FCFS	Non-Recap	808	0.0365	0.0370	0.0837		
REVGR	Recap	808	0.0889	0.0939	0.1641	-4.66***	-4.18***
REVGR	Non-Recap	808	0.1035	0.1359	0.1964		
TOBINQ	Recap	808	1.9863	2.2986	1.1563	10.74***	10.15***
TOBINQ	Non-Recap	808	1.5424	1.7642	0.8150		
CASHASS	Recap	808	0.0676	0.1132	0.1225	1.76*	1.14
CASHASS	Non-Recap	808	0.0649	0.1033	0.1110		
DIV	Recap	808	0.0126	0.0168	0.0185	1.57	2.53**
DIV	Non-Recap	808	0.0076	0.0155	0.0204		
REPO	Recap	808	0.0153	0.0242	0.0282	11.55***	12.82***
REPO	Non-Recap	808	0.0000	0.0103	0.0193		

Variables for Value of the Tax Shield

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
DA	Recap	808	0.1774	0.1845	0.1347	-8.47***	-8.26***
DA	Non-Recap	808	0.2310	0.2476	0.1635		
DAM	Recap	808	0.0813	0.1054	0.0940	-11.54***	-10.86***
DAM	Non-Recap	808	0.1488	0.1716	0.1332		
TAXR	Recap	808	0.3660	0.3371	0.2030	2.42**	-1.70*
TAXR	Non-Recap	808	0.3592	0.3109	0.2323		
TAX_GP	Recap	808	0.2506	0.2353	0.1334	5.93***	7.29***
TAX_GP	Non-Recap	808	0.2053	0.1928	0.1537		
ASSETS	Recap	808	0.0011	0.0037	0.0077	0.58	0.61
ASSETS	Non-Recap	808	0.0012	0.0039	0.0080		

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 5
Univariate Statistical Analysis
Matched Sample
(Continued)

Variables for Financial Distress Costs

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
RDS	Recap	808	0.0000	0.0239	0.0484	0.04	1.00
RDS	Non-Recap	808	0.0000	0.0238	0.0472		
ADS	Recap	808	0.0000	0.0173	0.0364	3.18***	4.25***
ADS	Non-Recap	808	0.0000	0.0119	0.0310		
SGAS	Recap	808	0.2010	0.2190	0.1482	1.90*	2.43**
SGAS	Non-Recap	808	0.1831	0.2048	0.1531		

Variables for Firm Equity Market Performance

Variable		Observations	Median	Mean	Std Deviation	T-Test	Wilcoxon Rank
STKRET	Recap	718	0.2283	0.2823	0.2685	0.48	1.57
STKRET	Non-Recap	710	0.2164	0.2746	0.3266		
STD_STKRET	Recap	738	0.3095	0.3457	0.1521	-3.96***	-3.54***
STD_STKRET	Non-Recap	733	0.3356	0.3818	0.1958		
BETA	Recap	738	0.8305	0.8578	0.4798	1.34	1.10
BETA	Non-Recap	733	0.8858	0.8924	0.5105		

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 6
Binary Logistic Regression Models
Aggregate Sample

	Raw Firm Variables			Industry Median Adjusted Variables		
	Estimate	**Std Error**	**Marginal Eff**	**Estimate**	**Std Error**	**Marginal Eff**
Intercept	-2.5046***	0.2848		-3.3171***	0.2346	
FCFS	4.2116***	0.5075	0.0454	4.8856***	0.4705	0.0540
REVGR	-1.6263***	0.2544	-0.0176	-1.1211***	0.1947	-0.0124
TOBINQ	0.6786***	0.0355	0.0073	0.6772***	0.0354	0.0075
CASH	-1.9162***	0.3687	-0.0207	-2.0249***	0.3489	-0.0224
DIV	0.6087	2.1265	0.0065	9.5493***	2.0088	0.1055
REPO	21.5164***	1.1725	0.2322	22.1882***	1.1358	0.2452
DA	-3.1658***	0.2902	-0.0342	-2.0611***	0.2504	-0.0228
TAXR	0.3411*	0.1870	0.0037	0.4775***	0.1543	0.0053
LOGASS	0.2167***	0.0206	0.0023	-1.8177	2.3846	-0.0201
RDS	-4.9031***	1.0636	-0.0529	-1.2051	1.0622	-0.0133
ADS	4.0561***	1.0125	0.0438	5.0618***	0.9844	0.0559
SGAS	0.1947	0.3148	0.0021	0.0910	0.3206	0.0010
D_MACH	-0.1251	0.0915	-0.0014	-0.2277***	0.0878	-0.0027
TBOND	-0.0243	0.0196	-0.0003	-0.1097***	0.0180	-0.0012
BBBSPRD	-0.3684***	0.0640	-0.0040	-0.4006***	0.0648	-0.0044
CRSPVW	-0.0004	0.0027	0.0000	0.0004	0.0026	0.0000
CHRPCGDP	-0.0669***	0.0231	-0.0007	-0.0923***	0.0227	-0.0010
Observations		71,627			69,524	
Recapitalizations		827			814	
Max Re-Scaled R^2		0.1819			0.1544	

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 7
Binary Logistic Regression Models
Matched Sample

	Raw Firm Variables			Industry Median Adjusted Variables		
	Estimate	**Std Error**	**Marginal Eff**	**Estimate**	**Std Error**	**Marginal Eff**
Intercept	-1.7498***	0.3465		-0.5981***	0.0851	
FCFS	1.5847**	0.7837	0.3197	1.8413**	0.7996	03682
REVGR	-1.3253***	0.3490	-0.2674	-1.0130***	0.3373	-0.2025
TOBINQ	0.6093***	0.0704	0.1218	0.6243***	0.0732	0.1247
CASH	-1.4710***	0.5639	-0.2968	-1.3729**	0.5707	-0.2745
DIV	8.2507***	2.9444	1.6647	3.5120	3.3172	0.7023
REPO	24.0372***	2.6449	4.8499	24.6559***	2.6884	4.9306
DA	-2.6529***	0.4386	-0.5353	-2.9309***	0.4211	-0.5861
TAXR	0.1994	0.2741	0.0402	0.0356	0.2645	0.0071
LOGASS	-0.1220***	0.0316	-0.0246	-13.4352*	7.5594	-2.6867
RDS	-2.6449*	1.4985	-0.5337	-3.1033*	1.8450	-0.6206
ADS	4.9642**	1.8865	1.0016	4.8133**	1.9695	0.9625
SGAS	-0.5828	0.4706	-0.1176	0.2172	0.4958	0.0434
Observations		1,616			1,586	
Recapitalizations		808			793	
Max Re-Scaled R^2		0.2535			0.2622	

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 8
Binary Logistic Regression Models
Recapitalizations Before and Since 2005
Aggregate Sample

	Recapitalizations 1977 - 2004			Recapitalizations 2005 - 2013		
	Estimate	**Std Error**	**Marginal Eff**	**Estimate**	**Std Error**	**Marginal Eff**
Intercept	-3.6434***	0.4097		0.0238	0.7919	
FCFS	4.6932***	0.7521	0.0383	3.5472***	0.7112	0.0629
REVGR	-1.5594***	0.3208	-0.0127	-1.7288***	0.4440	-0.0307
TOBINQ	0.6074***	0.0496	0.0050	0.8114***	0.0563	0.0144
CASH	-1.1619***	0.5117	-0.0134	-2.8162***	0.5297	-0.0500
DIV	1.3140	2.6596	0.0107	-2.8715	3.9465	-0.0509
REPO	19.4008***	1.6435	0.1582	23.5616***	1.7991	0.4180
DA	-3.2592***	0.4199	-0.0266	-2.9681***	0.4084	-0.0527
TAXR	0.2583	0.2688	0.0021	0.4475*	0.2525	0.0079
LOGASS	0.2479***	0.0283	0.0020	0.1654***	0.0318	-0.0029
RDS	-6.9064***	1.6318	-0.0563	-2.3391*	1.3768	-0.0415
ADS	3.9804***	1.2671	0.0325	3.7293**	1.7003	0.0662
SGAS	0.9486**	0.4199	0.0077	-0.6986	0.4816	-0.0124
D_MACH	-0.1795	0.1238	-0.0015	-0.0455	0.1381	-0.0008
TBOND	0.0549**	0.0236	0.0005	-0.3703***	0.1070	-0.0066
BBBSPRD	-0.1519	0.1041	-0.0012	-0.9588***	0.1490	-0.0170
CRSPVW	-0.0003	0.0034	0.0000	-0.0034	0.0059	0.0001
CHRPCGDP	0.0818**	0.0338	0.0007	-0.1903***	0.0540	-0.0034
Observations		52,684			18,979	
Recapitalizations		449			378	
Max Re-Scaled R^2		0.1490			0.2254	

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 9
Univariate Statistical Analysis
Firm Performance Before and After Leveraged Recapitalizations

Variables for Agency Costs

		Before Recapitalization			After Recapitalization				
Variable	**Obs**	**Median**	**Mean**	**Std Dev**	**Median**	**Mean**	**Std Dev**	**T-Test**	**WilcoxRank**
GPM	652/652	0.1619	0.1855	0.1074	0.1569	0.1826	0.1065	-0.49	-0.49
NPM	652/652	0.0685	0.0848	0.0673	0.0659	0.0750	0.0695	-2.59***	-2.60***
FCFS	652/652	0.0550	0.0661	0.0784	0.0575	0.0654	0.0750	-0.16	- 0.46
REVGR	652/652	0.0885	0.0951	0.1641	0.0486	0.0551	0.1067	-5.21***	-7.07***
TOBINQ	652/640	2.0621	2.3405	1.1699	1.9394	2.1673	1.0209	-2.84***	-2.28**
CASHASS	652/652	0.0614	0.1051	0.1165	0.0502	0.0843	0.0981	-3.50***	-3.07***
DIV	652/637	0.0155	0.0188	0.0187	0.0176	0.0199	0.0185	1.05	1.46
REPO	652/641	0.0156	0.0237	0.0275	0.0122	0.0211	0.0245	-1.80	-0.88

Variables for Value of the Tax Shield

		Before Recapitalization			After Recapitalization				
Variable	**Obs**	**Median**	**Mean**	**Std Dev**	**Median**	**Mean**	**Std Dev**	**T-Test**	**WilcoxRank**
DA	652/651	0.1789	0.1820	0.1264	0.2654	0.3023	0.2209	12.06***	12.10***
DAM	652/639	0.0808	0.1035	0.0914	0.1384	0.1669	0.1263	10.32***	9.87***
TAXR	652/652	0.3679	0.3494	0.1726	0.3526	0.3354	0.1827	-1.42	-3.54***
TAX_GP	652/652	0.2558	0.2494	0.1164	0.2233	0.2060	0.1513	-5.81***	-6.64***
ASSETS	652/652	0.0012	0.0045	0.0105	0.0015	0.0063	0.0146	2.48***	2.57***

Variables for Financial Distress Costs

		Before Recapitalization			After Recapitalization				
Variable	**Obs**	**Median**	**Mean**	**Std Dev**	**Median**	**Mean**	**Std Dev**	**T-Test**	**WilcoxRank**
RDS	652/652	0.0012	0.0214	0.0392	0.0016	0.0226	0.0405	0.57	0.45
ADS	652/652	0.0006	0.0204	0.0389	0.0009	0.0195	0.0359	-0.41	0.00
SGAS	652/652	0.1995	0.2174	0.1438	0.2107	0.2198	0.1445	0.30	0.31

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 9
Univariate Statistical Analysis
Firm Performance Before and After Leveraged Recapitalizations
(Continued)

Variables for Firm Equity Market Performance

		Before Recapitalization			After Recapitalization				
Variable	**Obs**	**Median**	**Mean**	**Std Dev**	**Median**	**Mean**	**Std Dev**	**T-Test**	**WilcoxRank**
STKRET	575/597	0.2229	0.2681	0.2502	0.1629	0.1884	0.2360	-5.60***	-5.73***
STD_STKRET	591/601	0.3050	0.3364	0.1512	0.3300	0.3874	0.1885	5.16***	4.83***
BETA	591/601	0.8043	0.8438	0.4753	0.7950	0.8027	0.4453	-1.54	-1.25

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 10
Univariate Statistical Analysis
Firm Performance After Leveraged Recapitalizations
Matched Sample

Variables for Agency Costs

		Firms that Recapitalize			Firms that do Not Recapitalize				
Variable	**Obs**	**Median**	**Mean**	**Std Dev**	**Median**	**Mean**	**Std Dev**	**T-Test**	**WilcoxRank**
GPM	572/559	0.1537	0.1818	0.1102	0.1346	0.1580	0.1051	3.72***	3.79***
NPM	572/559	0.0616	0.0731	0.0711	0.0425	0.0429	0.0727	7.05***	6.85***
FCFS	572/559	0.0497	0.0634	0.0634	0.0273	0.0214	0.0953	8.14***	8.32***
REVGR	572/559	0.0487	0.0558	0.1104	0.0667	0.0800	0.1352	-3.30***	-3.03***
TOBINQ	563/555	1.9257	2.1482	1.0187	1.4266	1.6315	0.7640	9.60***	9.78***
CASHASS	572/559	0.0468	0.0819	0.0973	0.0579	0.0965	0.1072	-2.40***	-2.24***
DIV	560/554	0.0169	0.0193	0.0188	0.0113	0.0166	0.0194	2.32**	3.16***
REPO	564/556	0.0120	0.0212	0.0251	0.0020	0.0125	0.0214	6.19***	7.57***

Variables for Value of the Tax Shield

		Firms that Recapitalize			Firms that do Not Recapitalize				
Variable	**Obs**	**Median**	**Mean**	**Std Dev**	**Median**	**Mean**	**Std Dev**	**T-Test**	**WilcoxRank**
DA	572/559	0.2631	0.2999	0.2220	0.2369	0.2569	0.1766	3.61***	3.35***
DAM	563/555	0.1384	0.1687	0.1292	0.1581	0.1877	0.1431	-2.32***	-2.02***
TAXR	572/559	0.3559	0.3416	0.1880	0.3507	0.2936	0.2765	3.41***	1.82*
TAX_GP	572/559	0.2250	0.2066	0.1584	0.1867	0.1658	0.1879	3.94***	5.18***
ASSETS	572/559	0.0012	0.0048	0.0098	0.0015	0.0052	0.0103	-0.59	1.65*

Variables for Financial Distress Costs

		Firms that Recapitalize			Firms that do Not Recapitalize				
Variable	**Obs**	**Median**	**Mean**	**Std Dev**	**Median**	**Mean**	**Std Dev**	**T-Test**	**WilcoxRank**
RDS	572/559	0.0007	0.0231	0.0416	0.0000	0.0260	0.0561	0.97	1.67*
ADS	572/559	0.0000	0.0176	0.0354	0.0000	0.0123	0.0317	2.66***	3.93***
SGAS	572/559	0.2043	0.2164	0.1441	0.1881	0.2070	0.1549	1.05	1.67*

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level

Table 10
Univariate Statistical Analysis
Firm Performance After Leveraged Recapitalizations
Matched Sample
(Continued)

Variables for Firm Equity Market Performance

		Firms that Recapitalize			Firms that do Not Recapitalize				
Variable	**Obs**	**Median**	**Mean**	**Std Dev**	**Median**	**Mean**	**Std Dev**	**T-Test**	**WilcoxRank**
STKRET	528/519	0.1602	0.1857	0.2436	0.1737	0.2173	0.2524	-2.06**	-1.71*
STD_STKRET	531/520	0.3313	0.3884	0.1883	0.3701	0.4365	0.2430	-3.59***	-2.76***
BETA	531/520	0.7829	0.7939	0.4451	0.8507	0.8718	0.4846	-2.71***	-2.56***

*** 99% Confidence Level ** 95% Confidence Level * 90% Confidence Level