The evolution of capital structure and operating performance after leveraged buyouts: Evidence from U.S. corporate tax returns✧

Jonathan B. Cohn[a,*], Lillian F. Mills[a], Erin M. Towery[a]

[a] McCombs School of Business, University of Texas at Austin, Austin, TX 78712, USA

April 2013

ABSTRACT

This study uses corporate tax return data to examine the evolution of firms' financial structure and performance after leveraged buyouts for a comprehensive sample of 317 LBOs taking place between 1995 and 2007. We find little evidence of operating improvements subsequent to an LBO, although consistent with prior studies, we do observe operating improvements in the set of LBO firms that have public financial statements. We also find that firms do not reduce leverage after LBOs, even if they generate excess cash flow. Our results suggest that effecting a sustained change in capital structure is a conscious objective of the LBO structure.

JEL Classification codes: G34, G32, H25
Keywords: Leveraged Buyouts, Private Equity, Capital Structure, Corporate Governance

✧ The Internal Revenue Service (IRS) provided confidential tax information to Mills and Towery pursuant to provisions of the Internal Revenue Code that allow disclosure of information to a contractor to the extent necessary to perform a research contract for the IRS. None of the confidential tax information received from the IRS is disclosed in this treatise. Statistical aggregates were used so that a specific taxpayer cannot be identified from information supplied by the IRS. We appreciate comments and suggestions received from Andres Almazan, Aydoğan Altı, Sugato Bhattacharyya, Merle Erickson, Peter Finley, Cristi Gleason, John Graham, Jay Hartzell, Justin Hopkins, Edith Hotchkiss, Michael Lemmon, Todd Milbourn, Bob Parrino, Uday Rajan, Matthew Rhodes-Kropf, Berk Sensoy, Doug Skinner, Matthew Spiegel, Laura Starks, Sheridan Titman, Toni Whited, Jaime Zender and participants at the Utah Winter Finance Conference, UBC Winter Finance Conference, Texas Finance Festival, University of North Carolina Tax Symposium, Washington University in St. Louis Corporate Finance Conference, Financial Intermediation Research Society Conference, Caesarea Finance Conference, Texas Tech University, University of Waterloo, University of Kentucky and University of Texas at Austin. We gratefully acknowledge research support from the McCombs Research Excellence Fund. Prasart Jongjaroenkamol, Jordan Nickerson, and Mitch Towner provided excellent research assistance.

* Corresponding author. Physical address: McCombs School of Business, University of Texas at Austin, One University Station B6400, Austin, TX 78712, USA. Telephone number: 512-232-6827. Facsimile number: 512-471-5073. Email address: jonathan.cohn@mccombs.utexas.edu.

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1. Introduction

A defining feature of the market for corporate control in recent years is the prominent role of private equity-led leveraged buyouts (LBOs). Kaplan and Strömberg (2009) report that private equity acquirers took almost three percent of the U.S. stock market (by market capitalization) private in LBOs in 2006 alone. Understanding the consequences of these transformative events for the firms that undergo them has long been regarded as important. However, the lack of public data for most private firms, at least in the United States, has remained an impediment to financial studies of LBO firms post-buyout.

This paper overcomes the lack of public financial data by instead relying on confidential federal corporate tax return data. Because all U.S. corporations must file tax returns, we are able for the first time to study the evolution of financial performance and structure post-LBO for a large, truly representative sample of U.S. public-to-private LBOs. Our primary sample consists of 317 previously-publicly-traded firms acquired in LBOs between 1995 and 2007 with assets of at least $10 million. This represents approximately 90% of LBO firms of this size during this period. We can therefore draw broad conclusions about the consequences of these important transactions that prior papers have been unable to.

We begin our analysis by studying changes in operating performance around LBOs. Using the tax return data, we find little evidence that LBOs in the 1990s and 2000s result in improvements in operating performance, on average. Mean and median pre-interest return on sales, return on assets, and a measure of economic value added (EVA) are all essentially flat from the two years before to the three years after LBOs. Relative to similar publicly-traded

firms that did not undergo LBOs, LBO firms experience at best a slight increase in pre-interest return on sales (less than 2%) but no improvement in the other performance measures.

While we find little evidence of improvements in operating performance after LBOs on average, one might imagine that the opportunity to improve operational performance is unlikely to have driven LBOs of firms that were already "healthy" pre-buyout.[1] We therefore separately examine changes in operating performance around LBOs of firms that were unprofitable pre-LBO. We do find some evidence that operating performance improves after LBOs of these "loss" firms, but not relative to firms with similar pre-LBO year operating performance that did not go private in LBOs. This suggests that any improvements we observe in operating performance for these loss LBO firms is driven by mean reversion in operating performance and would likely have occurred even in the absence of an LBO. Overall, our operating performance results appear inconsistent with the view that LBOs lead to improvements in operating performance, either through the disciplining effects of leverage and concentrated ownership (Jensen, 1989), or through operational expertise supplied by private equity acquirers.

These results contrast with the substantial improvements in operating performance found by papers that study samples of LBO firms that have public financial statements available for at least part of the time they are private, either because they have public debt outstanding or because they subsequently go public again and disclose historical financial information at that point. For example, using such samples, Kaplan (1989a), Smith (1990) and Smart and Waldfogel (1994) all find very large improvements after 1980s U.S. management buyouts

[1] As an example, when Texas Pacific Group and Warburg Pincus acquired Neiman Marcus in 2005, "Neiman Marcus had nothing wrong with it. The chain was coming off its strongest year ever, thanks to a boom in the luxury retail market." The scope for improving operations was unlikely to have been very large in this case, and indeed "TPG and Warburg Pincus always said they wouldn't meddle, and (Neiman Marcus CEO Burt) Tansky said they've kept their word, allowing the company to move forward with long-term goals while continuing to dominate the red-hot luxury retail market." Source: "Hands-Off Approach at Neiman Marcus," *Dow Jones News Service*, November 20, 2006.

(MBOs). Guo, Hotchkiss and Song (2011) find an 11% increase in EBITDA/Sales relative to a matched sample of firms that did not go private in LBOs in a sample period similar to ours, though their results are sensitive to the measurement window.[2] One possible explanation for this discrepancy is that LBO firms with available public financial statements are systematically better performers than those without. This seems plausible, as LBO firms are only likely to go public if they have performed well, and, in general, only higher-quality corporate borrowers issue public debt (Chemmanur and Fulghieri, 1994).

To investigate this possible explanation, we analyze changes in operating performance using the tax return data for the subsample of 71 LBO firms in our sample that also have public financial statements available covering at least their first two years post-LBO. Consistent with prior studies, we find substantial improvements in operating performance for this subsample. For example, relative to firms in the same industry with similar performance in the year before the LBO, LBO firms with public financial data experience a mean (median) increase in pre-interest ROS from the year before the LBO to two years after of 9.0% (4.1%). This, combined with the relative lack of improvement in performance after LBOs more generally, suggests difficulty in generalizing from studies of performance changes around LBOs relying only on firms with public financial data available.[3]

We also examine how firms' growth rates change around LBOs. While our data do not include investment measures such as capital expenditures, we can observe firms' total asset

[2] Leslie and Oyer (2009) find no evidence of improvements after U.S. LBOs during a similar period, though their sample consists predominantly of LBOs of already-private firms and they do not compare performance to a matched sample of firms that did not go private. Acharya, Gottschalg, Hahn and Kehoe (2011) and Weir, Jones and Wright (2008) find modest improvements in operating performance after LBOs in the U.K during this period. Boucly, Sraer and Thesmar (2011) and Bergström, Grubb and Jonsson (2007), in contrast, find large improvements in operating performance after LBOs during this period in France and Sweden, respectively.

[3] Improvements in performance in LBO firms with public financial data are much smaller when compared to a sample of firms matched using propensity scoring, suggesting that the results are sensitive to the benchmark. However, the propensity-matched sample has significantly worse pre-LBO performance than LBO firms, and mean reversion in performance at these firms could cause underestimation of the relative improvement in LBO firms.

levels and sales in the years before, during and after LBOs. The patterns here are somewhat unclear. On average, LBO firms' assets grow in the first year after the buyout but then shrink in the second and third years after the buyout. Sales, in contrast, are lower the year after the buyout than the years before, but then grow in the second and third years after the buyout. The fact that LBO firms in the 1990s and 2000s do not systematically shrink after buyouts suggests that these LBOs were not intended to unwind past wasteful investment of free cash.

We next turn our focus to the evolution of capital structure after LBOs. Kaplan (1989b) finds that firms taken private in MBOs in the 1980s pay down approximately 25% of their debt in the first two years after the MBO. In contrast, Kaplan (1991) finds that firms acquired in LBOs between 1979 and 1986 that remain privately-owned at the end of 1989 have leverage ratios comparable to those at the time the LBO was completed. However, he observes leverage ratios for only a fraction of the LBOs in his sample at the end of 1989, and acknowledges that this "leaves open the possibility of ex post selection bias." We are aware of no comparable analysis for the 1990s and 2000s. Such an analysis is important, as LBOs in the 1990s and 2000s lead to smaller increases in leverage than those in the 1980s. This makes it less likely that firms seek to reduce leverage post-LBO, but also results in lower interest payments, freeing up more cash flow to reduce debt if these firms choose to do so.

We find that the increases in leverage and debt levels in LBOs during the 1990s and 2000s are highly persistent post-LBO. If anything, leverage actually drifts slightly upwards in the years after an LBO, and is higher even five years after a buyout than at the first year-end after the buyout was completed. Of course, not all LBO firms generate enough cash flow to pay down their debt, especially in light of the large interest payments that these firms must make.

However, we find that even firms with cash flow in excess of their investment needs do not reduce their leverage post-LBO.

The sustained high leverage does not support the argument that private equity firms load up their targets with excessively high levels of debt to create pressure on managers to generate cash flow in order to pay down debt, a view articulated by Jensen (1989). Another view of the reliance on debt added to the target firm's balance sheet to finance LBOs is that it minimizes transaction costs. For example, Axelson, Strömberg and Weisbach (2009) argue that such financing minimizes costs associated with information asymmetries between the private equity acquirer and outside investors. While we do not test this theory directly, our results suggest that the use of debt in LBOs is motivated by a conscious effort to effect a one-time change in a firm's capital structure rather than a purely transactional motive, since an LBO firm would plausibly be expected to pay down at least some of its debt as it generates cash flow if the motive were purely transactional.

This conclusion raises questions as to why firms acquired in LBOs do not simply lever up on their own and remain publicly-traded. One possibility is that an LBO increases a firm's debt capacity by reducing financial distress risk. The fact that LBOs do not appear to be accompanied by substantial improvements in operating performance argues against this possibility. However, LBOs could still result in increased debt capacity if private equity funds commit to injecting capital into their portfolio companies when these companies face cash flow shortfalls. We investigate this possibility using information about equity contributions from our IRS data, though this data is limited to 2005-2009. We find that post-LBO equity contributions are substantial (8.55% and 2.66% of transaction value in the first and second years post-buyout,

respectively), especially in firms facing cash flow shortfalls, consistent with private equity firms backstopping their portfolio companies.

Our capital structure results have important implications for researchers studying the value of interest tax shields created by the debt taken on in LBOs (e.g., Kaplan, 1989a; Guo, Hotchkiss and Song, 2011; Jenkinson and Stucke, 2011). Such analyses must make assumptions about the persistence of the increase in debt, and the value of the tax shield is sensitive to these assumptions. Our results suggest that an assumption that debt remains at its level immediately after the buyout for at least several years is justified. Further, we observe that the distribution of scaled net income shifts toward zero but not toward large losses, further consistent with leverage that provides immediate tax benefits. This suggests that the value of tax shields is likely to be at the high end of the previous range of estimates.

Finally, we study dividend distributions from LBO firms. Some have suggested that private equity firms use LBOs to plunder healthy companies, paying themselves large dividends while leaving the acquired firm in a weakened long-run financial position.[4] Although we have dividend data available only for the period 2005 to 2009, we find that LBO firms paid surprisingly little in dividends during this period. The median LBO firm pays no dividends in the two years after an LBO and only a minimal amount in the third year after the LBO. Even the 90th percentile of dividends scaled by transaction value is only 0.1% in the first year after the LBO and 1.7% in the second year after the LBO. Moreover, these payout rates are actually lower than payout rates in the years prior to the LBO. These results continue to hold when we

[4] One vocal proponent of this view is Franz Müntefering, who, as Chairman of the Social Democratic Party in Germany in 2005, referred to private equity firms as "locust swarms, who measure success in quarterly intervals, suck off substance and let companies die once they have eaten them away." An often-cited example of a U.S. LBO firm that paid out large dividends is that of fruit-by-mail company Harry & David, which, after it obtained substantial debt financing, paid a $110 million dividend in 2005 to its private equity owner, Wasserstein & Co. Harry & David began to struggle financially in 2008 and ultimately filed for Chapter 11 bankruptcy in 2011.

look only at firms whose excess cash flow post-buyout creates the capacity to pay dividends. The absence of large payouts combined with sustained firm size post-LBO suggests that concerns about private equity firms looting the firms they acquire lack foundation. This is important because such concerns are one basis for arguments that private equity firms should be more heavily regulated.

The remainder of the paper is organized as follows. Section 2 describes the sample and research design. We discuss the operating performance and growth results in detail in Section 3, and the capital structure and dividend results in Section 4. Section 5 concludes.

2. Sample and research design

2.1. Sample

We begin by identifying LBOs between 1995 and 2007 of publicly-traded, stand-alone firms using Dealogic's Mergers & Acquisitions database and Thomson Financial's SDC Platinum mergers database. We exclude over-the-counter (OTC) securities, which did not file financial statements with the Securities and Exchange Commission pre-LBO. Panel A of Table 1 summarizes our sample construction. We exclude LBOs of bankrupt firms, partial LBOs and LBOs of firms with less than $10 million of assets. This yields an initial sample of 479 possible LBOs. We then hand-collect news articles discussing each of these transactions. Based on these news articles, we remove LBOs that were never actually completed, misclassified LBOs, LBOs of firms merged into other entities, and REIT and partnership LBOs.[5] This leaves us with 354 LBOs, which we then attempt to match with IRS data.

Insert Table 1 here

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[5] We eliminate LBOs of REITs and partnerships because these firms file different income tax returns. In general, we find that corporations acquired in LBOs file Form 1120 both before and after the transaction, suggesting minimal changes in tax structure resulting from the buyout.

Where possible, we match LBO firms with their corporate tax return data using the Employer Identification Number (EIN) recorded in Compustat. The Dealogic and SDC databases do not capture a firm's EIN to match with tax return data, so we obtain EINs by merging these datasets with Compustat. If we cannot match based on the EIN, we match based on company name. We are able to match 353 of the 354 total LBOs to the IRS tax return data.

Because we are interested in tracking operating performance and leverage post-LBO, we require that IRS data be available for the year prior to the LBO through two years after the LBO for inclusion in our sample. Tracking a firm in the IRS data over this four year period is complicated by the fact that, in an LBO transaction, the private equity acquirer sometimes creates a holding company that it merges with the acquired firm. As a result, the firm's EIN may change after the LBO. In addition, the surviving company sometimes retains the name of the holding company rather than the name of the acquired firm. When we cannot find a match using the EIN or the name of the acquired firm, we search news articles and public filings to identify the name of the company post-buyout. We then attempt to match the LBO firm to the tax return data using this name.

We succeed in identifying tax return data for the year before, year of and two years after the transaction for 317 LBOs, 90% of the 354 total LBOs. Thus, our full sample closely approximates the universe of U.S. LBOs of publicly-traded companies with assets of at least $10 million. We also conduct long-run tests, which require tax return data for the year before, year of, and five years after the transaction. This long-run sample consists of 153 LBOs. Survivorship bias could naturally affect our analysis of long-run operating performance, since the likelihood that a firm exits the sample could be systematically related to its profitability. Panel B of Table 1 shows the number of LBO firms for which we have different quantities of post-LBO data by

year. We see a significant increase in the number of LBOs in 2006 and 2007 relative to prior years. Nevertheless, firms with LBOs in these two years represent less than one-third of our full sample. Panel C of Table 1 presents the LBO outcomes. Of the 317 sample LBO firms, 33% were sold, 11% went public, 15% ended in bankruptcy and 41% were still privately held as of December 2010.

2.2. Corporate tax return data

All of the financial variables used in this study are constructed using corporate tax return data collected by the IRS in its Business Return Transaction File (BRTF). Prior studies have used tax return data transcribed by the Statistics of Income (Mills, 1998; Mills and Newberry, 2001). Although the BRTF captures a broader sample of firms, it contains more limited data items than the Statistics of Income data and far less than the entire tax return as filed.[6] However, our data are sufficient to compute standard measures of operating performance based on the taxable income detail (Form 1120, Page 1) and interest-bearing debt based on the book balance sheet (Form 1120, Page 5, Schedule L). The benefit of using tax return data rather than financial statement data is the unique ability to examine performance and leverage for firms during periods in which they are not filing public reports.[7]

Our measures of operating performance are based on tax reporting definitions of revenues and expenses from U.S. Corporation Income Tax Return, Form 1120, page 1, and are necessarily

[6] The BRTF data essentially transcribe limited data from the first five pages of the U.S. Corporation Income Tax Return Form 1120. Form 1120 includes taxable income statement data (page 1) and book balance sheet data (page 5, Schedule L), as well as some stockholders' equity reconciliation and book-tax difference information.

[7] Various authors compare financial data to tax return data to estimate tax payments (Lisowsky, 2009), simulated marginal tax rates (Graham and Mills, 2008), or book-tax differences (Manzon and Plesko, 2002). Although none of these papers focuses specifically on whether taxable income provides a reasonable measure of operating income, Manzon and Plesko (2002) conclude that differences between book and taxable income could be estimated consistently over time. Thus, although our measure of operating performance is based on taxable income, our cross-time tests should control for consistent differences between book and taxable income.

subject to any tax avoidance incentives.[8] We are therefore careful to interpret our results for firm-level changes in operating performance in light of the extent to which tax reporting incentives could have changed for our firms. We return to this point in Section 3.4, where we discuss why our conclusions would likely be strengthened if we could undo the effects of any changing tax incentives.

The tax return balance sheet on Form 1120, page 5, Schedule L conveniently uses a book basis of measurement. We acknowledge, however, the balance sheet unlikely represents the exact entities and consolidation methods that would be reported in the public financial statements. For example, the tax return balance sheet includes only the assets and liabilities of affiliated U.S. entities and reports foreign subsidiaries using the equity method. Since our tests relate to within-firm changes surrounding an LBO, any consolidation differences between the tax return balance sheet and a public financial statement should not present a problem.

2.3. Operationalizing post-transaction operating performance and leverage

To study general trends in operating performance and leverage before and after the LBO transaction, we adopt an event study approach by lining up the LBO years across firms. We designate the first tax return filed on or after the LBO completion date as the year t observation. The Appendix defines each of our variables.

We employ three measures of operating performance. The first measure is pre-interest return on sales (*PreInterestROS*), which equals *PreInterestIncome*, computed as pretax income for tax purposes (*NetIncome*, Form 1120, Line 28) plus the interest deduction (*IntDeduction*,

[8] Prior research broadly suggests that privately-held firms place less weight on book income and are therefore more willing to avoid tax in ways that could decrease book income in a conforming manner (Cloyd, 1995; Cloyd, Pratt and Stock, 1996; Mills and Newberry, 2001; Badertscher, Katz and Rego, 2011). However, to the extent that leverage becomes a substituted tax shield (MacKie-Mason, 1990; Graham, 1996; Dhaliwal, Trezevant and Wang, 1992; Cloyd, Limberg and Robinson, 1997; Graham, Lang and Shackelford, 2004), our LBO firms may use fewer non-debt tax shields. Because the data we presently have do not include book income for all observations, we cannot directly examine this trade-off.

Form 1120, Line 18), divided by gross receipts (*Sales*, Form 1120, Line 1e). We use pre-interest income because we are interested in studying operating performance before financing. This measure is analogous to earnings before interest and taxes (EBIT) as computed from a firm's financial statements. The second measure is pre-interest return on assets (*PreInterestROA*), which equals *PreInterestIncome* divided by lagged *TotalAssets* (Form 1120, Schedule L, Line 15), but substituting year t assets as the scalar for all years prior to year t+1. This substitution controls for any book basis adjustments resulting from the LBO.[9]

Our third measure of operating performance is *PreInterestEVA*. Economic value added (EVA) is technically defined as free cash flow less a charge reflecting the opportunity cost of the capital that the firm employs. Because we do not observe depreciation or capital expenditures, our tax return data do not allow us to compute free cash flow. Instead, we calculate a measure of EVA using *PreInterestIncome* as a substitute for free cash flow. This makes the level of *PreInterestEVA* we calculate difficult to interpret. However, the change in the measure over time should capture information about the amount of value a firm creates. We therefore focus on the change in *PreInterestEVA* from year t-k to t+i, which we define directly as:

$$[(PreInterestIncome_{t+i} - PreInterestIncome_{t-k}) - ((TotalAssets_{t+i} - TotalAssets_{t})*IndCostCap_{t-1})] / TotalAssets_{t}$$

[9] Business combinations treated as acquisitions under Accounting Standards Codification (ASC) 805 require restating most assets and liabilities to fair market value. The tax return balance sheet should reflect book accounting rules. However, tax rules come into play if any companies mistakenly report tax basis assets. Taxable purchases of free-standing C corporations create asset and liability revaluation if the acquirer elects to treat the acquisition as an asset purchase under Internal Revenue Code Section 338. However, such elections are rare because they require the target corporation to pay tax on any resulting gain (Scholes, Wolfson, Erickson, Maydew and Shevlin, 2009; Erickson, 1998). We refer to effects from either financial statement or tax revaluations broadly as basis adjustments.

If firms make basis adjustments in year t, the denominator of year t-i *PreInterestROA* would reflect the original asset measure while the denominator of year t+i *PreInterestROA* would be affected by any book basis adjustments. For the change in *PreInterestEVA*, the change in assets from pre-LBO to post-LBO might similarly be affected by basis adjustments. It seems more likely that profitable LBOs could experience asset write-ups whereas loss LBOs would experience asset write-downs. Asset write-ups would diminish ROA/EVA, all else equal, but asset write-downs would improve ROA/EVA. Guo, Hotchkiss and Song (2011) raise the same issue. They estimate the amount of the accounting adjustment using Form 10-K filings and add the adjustment to pre-transaction assets. We are unable to estimate this adjustment using public filings because most firms in our sample do not file public financial statements post-buyout.

for k > 0. *IndCostCap* equals the industry median cost of capital in year t-1, where industry is defined by 3-digit NAICS code. We again use year t total assets instead of total assets in year t-k because of the basis adjustment issue.

As noted, we use tax returns with the assurance that for most of our tests of changes across time, the firm is its own control and so method differences between book and tax accounting are less of a concern. However, to increase comfort with our tax return performance measures, we compute the Pearson (Spearman) correlations between tax return measures and financial statement measures. Untabulated correlations are $\rho = 56.7\%$ ($\rho = 62.0\%$) for ROS and $\rho = 65.0\%$ ($\rho = 61.2\%$) for ROA.

Our leverage measure (*DebtToAssets*) equals interest-bearing liabilities (*IntBearingLiab*) divided by *TotalAssets*, where *IntBearingLiab* equals short-term and long-term mortgages, notes and bonds payable (Form 1120, Schedule L, Lines 17 and 20).

2.4. Summary statistics

Table 2 provides descriptive information for the LBO firms in our sample for year t-1 (pre-LBO) and year t+2 (post-LBO). All of the data in this table are obtained or constructed from the tax return data. Panel A describes all 317 LBO firms. Panel B describes the 250 LBO firms that were operationally profitable (positive *PreInterestIncome*) in year t-1. We refer to these firms as 'profit LBO firms.' Panel C describes the 67 LBO firms that were operationally unprofitable (negative *PreInterestIncome*) in year t-1. We refer to these firms as 'loss LBO firms.'

Insert Table 2 here

Panel A indicates that the mean (median) LBO firm in our sample has pre-transaction *TotalAssets* of $921 ($253) million. Profit LBO firms are larger than loss LBO firms, with median total assets of $264 million and $134 million, respectively. The mean (median) firm has surprisingly high *DebtToAssets* of 44.7% (43.2%) in year t-1. This increases to 82.7% (77.5%) in year t+2. Loss LBO firms appear to be more levered than profit LBO firms both pre- and post-buyout. 83% of profit LBO firms have positive tax payments in year t-1, before the LBO transaction increases their leverage. This declines to only 42% in year t+2. Meanwhile, the percentage of loss LBO firms with positive tax payments increases from 3% in year t-1 to 28% in year t+2. The mean (median) firm in our sample has *PreInterestROS* in year t-1 of 8.9% (6.3%) and *PreInterestROA* in year t-1 of 4.4% (5.1%). By construction, the profit LBO firms have positive pre-interest operating performance and the loss LBO firms have negative pre-interest operating performance in year t-1.

3. Operating performance results

3.1. Trends in operating performance

Table 3 presents the trends in operating performance around LBOs. Panels A, B and C present trends in *PreInterestROS* for all LBO firms, profit LBO firms and loss LBO firms, respectively. We focus our analysis on the pre- and post-LBO years rather than the year of the LBO itself (year t) because the firm switches from public to private status during year t, making it a mixed year. As Panel A shows, LBOs are, on average, accompanied by neither an increase nor a decrease in *PreInterestROS* for the full sample of LBO firms. Mean (median) *PreInterestROS* changes from 8.9% (6.3%) in year t-1 to 10.7% (6.9%) in year t+1, 9.3% (6.8%) in year t+2 and 8.0% (6.4%) in year t+3. The inconclusive pattern suggests that LBOs generally do not produce improvements in performance on average. Panel B shows that *PreInterestROS*

declines for profit LBO firms. However, Panel C shows that *PreInterestROS* improves for loss LBO firms, consistent with firms with greater ex ante scope for improvement experiencing greater post-buyout improvement.

Insert Table 3 here

Panels D, E and F of Table 3 show analogous trends for *PreInterestROA*. The trend in Panel D suggests that, in the aggregate, operating performance remains relatively constant for LBO firms from before to after the LBO. The trend in Panel E suggests a decline in performance for profit LBO firms. However, Panel F shows that loss LBO firms experience improved operating performance after the buyout, consistent with the improvement in *PreInterestROS* for loss firms.

3.2. Tests of changes in operating performance after LBOs

The trends shown in Table 3 suggest LBOs do not result in improvements in operating performance, except in the case of firms that were unprofitable pre-LBO. However, we do not observe the counterfactual: how would a firm's operating performance have evolved had it not undergone an LBO? This is important because the trends we observe could be explained by mean reversion in profitability, the types of firms private equity acquirers choose to acquire, or industry- or market-level trends that affect profitable and unprofitable firms differently. For example, private equity acquirers might specifically target firms that would have experienced a decline in performance in the absence of the LBO. The observed lack of decline on average then would reflect a positive effect of LBOs on performance that counteracts the deterioration that would otherwise have taken place.

We address this issue using three approaches. The first approach is to examine industry-adjusted changes in *PreInterestROS/ROA/EVA*. We define industry-adjusted change in *PreInterestROS/ROA/EVA* as firm-level change in *PreInterestROS/ROA/EVA* minus the industry median change in *PreInterestROS/ROA/EVA* over the same period. We define industries by 3-digit NAICS codes, which are available in the tax return data. Removing the industry trend in performance allows us to control for any changes in industry conditions that might drive changes in an LBO firm's profitability. This is helpful if, for example, private equity firms target firms in industries likely to experience improvements or declines in performance in the near future. However, it does not account for any differences in within-industry performance trends between the types of firms acquired in LBOs and the types that are not.

Our second approach is to match each LBO firm to a publicly-traded firm in the same industry-year using propensity score matching. Specifically, we estimate an augmented version of the logit model of Opler and Titman (1993) to predict which publicly-traded firms are acquired in LBOs. We augment the Opler and Titman (1993) model by including four additional variables that could affect the likelihood of being acquired in LBOs: leverage, lagged change in ROA, lagged change in sales, and firm age. We compute all explanatory variables for our sample using Compustat data. The Appendix defines each of these variables. For each LBO firm, we find the publicly-traded firm with the closest propensity from the logit estimation in the same industry and year and use it as a match. We then compute "propensity-adjusted" *PreInterestROS/ROA/EVA* as firm-level change in *PreInterestROS/ROA/EVA* minus the change in *PreInterestROS/ROA/EVA* of the propensity score-matched firm.

Table 4 shows the results of the logit regression. The first column shows the results of a regression without the additional variables, while the second column shows the results of the augmented regression. Of particular note, the pseudo-R squared from the augmented regression is only 0.058. This suggests that predicting which firms are acquired in LBOs using publicly-available data is difficult, and raises questions about the quality of the matched sample. We also observe much wider variation in the pre-LBO performance of LBO firms than of firms in the matched sample. This raises the concern that propensity score matching may do little to address the possibility that mean reversion in performance drives the apparent performance improvement in loss LBO firms and performance decline in high profit LBO firms as seen in Table 3. We discuss this issue in more detail below.

Insert Table 4 here

Our third approach to addressing the lack of an observed counterfactual is to match each LBO firm to the publicly-traded firm in the same industry-year with the most similar level of profitability in the year before the LBO.[10] Specifically, we require performance match firms to have operating performance within 80% and 120% or within -0.01 and 0.01 of the LBO firm's operating performance in year t-1. This requirement reduces the sample to 302 observations. This third approach allows us to more directly confront the possibility of mean reversion in profitability that might drive changes in profitability after LBOs. However, unlike propensity score matching, it does not address concerns that other factors linked to the LBO decision might also drive subsequent changes in performance.[11]

[10] We define industries using 3-digit NAICS codes. If there are no match firms with the same 3-digit NAICS code, we relax this criterion and look for match firms with the same 2-digit NAICS code or 1-digit NAICS code.

[11] Our performance level-adjusted results are inferentially similar when matching on the change in operating performance from year t-2 to t-1 rather than the level of operating performance in year t-1. Our results are also

Table 5 presents the results for statistical tests of changes in *PreInterestROS*, both unadjusted and using each of the three approaches described above. We examine mean and median changes in *PreInterestROS* over different time horizons, as there is no standard time horizon for assessing the effects of an LBO on operating performance. Because the number of profit LBO firms is over four times the number of loss LBO firms, we split the profit LBO firms evenly into 'high profit LBO firms' and 'low profit LBO firms' based on *PreInterestROS* in year t-1. Panels A, B, C and D present the tests for all LBO firms, high profit LBO firms, low profit LBO firms and loss LBO firms, respectively.

Insert Table 5 here

For the full sample of LBO firms (Panel A), the mean and median changes in unadjusted *PreInterestROS* are not statistically distinguishable from zero. We do observe statistically significant positive median changes in industry- and performance level- adjusted (though not propensity-adjusted) *PreInterestROS* over most time horizons, but the magnitudes of these increases are relatively small (less than 2% in all cases).

Panel B shows a significant decline in unadjusted, industry-adjusted and propensity-adjusted *PreInterestROS* for high profit LBO firms relative to year t-1, but not relative to year t-2. One possible explanation for this is that these firms experienced unusually positive performance in year t-1, and that performance then reverted to more normal levels post-LBO. Indeed, high profit LBO firms have median *PreInterestROS* of 11.1% in year t-1, versus 6.1% for firms in the same industries, and 6.8% for the propensity score matched sample (untabulated). As further evidence that mean reversion is driving the decline in performance in

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inferentially similar when relaxing the constraint that the matched firm's performance level must be between 80% and 120% or within -0.01 and 0.01 of the LBO firm's operating performance in year t-1.

these firms relative to year t-1, there is no change in performance level-adjusted *PreInterestROS* relative to year t-1 or year t-2. Here, we are by construction comparing LBO firms to non-LBO firms that had similar performance in year t-1. This evidence suggests firms that were highly-profitable the year before the LBO would likely have experienced declines in performance post-LBO even if they had not been acquired in these transactions.

Panel C shows inconsistent changes in *PreInterestROS* for low profit LBO firms, which have intermediate levels of pre-LBO performance in our sample. The results in Panel D, which examines changes in *PreInterestROS* for loss firms, are the opposite of those in Panel B. These firms generally experience a large increase in unadjusted, industry-adjusted, and propensity-adjusted *PreInterestROS* after LBOs relative to year t-1, but not relative to year t-2. However, loss firms have median *PreInterestROS* of -9.1% in year t-1, versus 5.3% for firms in the same industries, and 3.4% for the propensity score matched sample (untabulated), and changes in performance level- adjusted *PreInterestROS* are generally small and insignificant relative to either year t-1 or t-2. This again suggests mean reversion in performance is driving any improvements relative to year t-1 observed in the other metrics. So, while LBOs of struggling firms do appear to be followed by large improvements in performance, it does not appear that the relationship is causal.

Figure 1 depicts the trends in *PreInterestROS* graphically. Panels A, B and C of Figure 1 depict the trends in unadjusted, industry-adjusted and performance level-adjusted *PreInterestROS* for all sample firms. Panels D, E and F depict the trends for profit LBO firms, and Panels G, H and I depict the trends for loss LBO firms.

Insert Figure 1 here

Table 6 presents the same set of tests as in Table 5, except for changes in *PreInterestROA* rather than *PreInterestROS*. These results are roughly consistent with the results for *PreInterestROS*, though if anything improvements in *PreInterestROA* are smaller and tend to be less statistically significant than improvements in *PreInterestROS*. Table 7 repeats the exercise for changes in *PreInterestEVA*, our final measure of operating performance. The results here are similar to those shown in Table 6 for changes in *PreInterestROA*. In untabulated tests analyzing changes in *PreInterestROA* and *PreInterestEVA* using lagged total assets instead of year t total assets as the scalar, we find inferences are unchanged.[12]

Insert Tables 6 & 7 here

While each of our approaches addresses some of the issues associated with the lack of an observed counterfactual, LBOs are ultimately not random events. Thus we cannot rule out the possibility that LBOs on average have either a significant positive or negative effect on average. Nevertheless, examining both unadjusted changes in performance as well as changes in performance relative to three different benchmarks, we find no evidence that they do lead to substantial changes in performance on average. The fact that any improvement in performance for loss LBO firms and decline in performance for high-profit LBO firms disappears once we adjust for the change in performance of firms with similar levels of profitability pre-LBO is highly-suggestive that these apparent changes are driven by mean reversion in performance.[13]

[12] In untabulated analysis, we also examine whether private equity firms are able to reduce the variability of LBO firms' cash flow. For the subsample of 161 LBO firms with at least three years of pre-LBO data and at least three years of post-LBO data, we find no evidence of decreasing operating performance variability post-LBO. This is consistent with the conclusions of Hotchkiss, Smith and Strömberg (2012), who find that LBO firms default on their debt with the same likelihood as non-LBO firms after controlling for leverage.

[13] One possible explanation for the lack of improvement in performance after LBOs in our sample is the effect of the financial crisis on these firms. If these firms suffered large declines in operating performance relative to non-LBO firms during the crisis, perhaps because of high financial distress costs due to their financial leverage, we might miss significant improvements in operating performance prior to the financial crisis in looking at the full sample of

3.3. Performance changes in LBO firms with and without public financial statements

The results in Tables 5, 6 and 7 contrast with prior studies examining only LBO firms for which public financial statements are available post-LBO. Table 8 displays the changes in *PreInterestROS* across time separately for LBO firms for which public financial statements are available post-LBO (panel A) and for LBO firms for which public financial statements are not available post-LBO (panel B). The sample of firms with publicly-available post-LBO data approximates the sample of firms used in Guo, Hotchkiss and Song (2011).

As in Tables 5, 6 and 7, we show unadjusted, industry-adjusted, propensity-adjusted, and performance-level adjusted changes in performance. For LBO firms with public financial data, we find weak evidence of improvement in pre-interest ROS, but stronger evidence of improvement on an industry-adjusted or performance level-adjusted basis. For example, the mean (median) performance level-adjusted change in *PreInterestROS* from year t-1 to year t+2 for these firms is 9.0% (4.1%) and is statistically different from zero at the 1% level. These results are consistent with past studies that have found evidence of improvements in performance for firms with public financial statements in general. More specifically, the performance level-adjusted improvement is consistent with that found by Guo, Hotchkiss and Song (2011) for a similar sample period and benchmark. However, propensity-adjusted performance improvement is much smaller (especially relative to year t-2 performance) and is statistically insignificant.

This may indicate that one reason previous studies find evidence of improvements in performance after LBOs when public financial data is available is that they are using an inappropriate benchmark. However, in the public financial data sample, pre-LBO performance

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LBOs. To see whether this is the case, we compare changes in performance for the first two post-LBO years of firms acquired in LBOs in 2005, 2006 and 2007 with those of firms acquired in LBOs before 2005. In untabulated results, we find virtually no difference in changes in operating performance between the two subsamples, suggesting that poor performance during the financial crisis is not masking performance improvements pre-financial crisis in the full sample.

is much weaker for propensity-matched firms than for LBO firms. For example, LBO firms in this sample have mean year t-1 *PreInterestROS* (*PreInterestROA*) of 0.091 (0.044), while propensity-matched firms have year t-1 *PreInterestROS* (*PreInterestROA*) of 0.069 (-0.111). If performance mean reverts, we would expect the propensity-matched firms to experience an improvement in performance in the post-LBO years relative to LBO firms, which would bias downward our estimates of the propensity-matched improvement in performance around LBOs. By construction, the performance-matched sample does not have this limitation. Thus, we are reluctant to conclude that propensity score matching is a better approach to benchmarking performance changes than performance matching.

Strikingly, LBO firms without publicly-available financial data (Panel B) exhibit effectively zero improvement in *PreInterestROS* around the LBO, regardless of the benchmark. The results thus show that any improvements in operating performance observed in Panel A of Table 5 are coming entirely from firms with publicly-available post-LBO data.[14]

The most likely explanation for differences in performance improvements between firms with and without public financial data is that these firms differ in ways that are difficult to account for. Financial statements are available for LBO firms during the time they are private only if they have public debt or if they subsequently go public again, at which point they are required to publish historical financial statements. In general, only higher-quality corporate borrowers issue public debt (Chemmanur and Fulghieri, 1994) and LBO firms are only likely to go public if they have performed well. Of the 71 LBO firms in our sample with public financial

[14] Untabulated tests of changes in *PreInterestROA* for the subset of firms with public financial statements available show small improvements in performance around LBOs. Unlike the results for *PreInterestROS*, our *PreInterestROA* measure is not directly comparable to that in papers studying LBO firms with public financial statements exclusively because of differences in accounting for possible basis changes. We do not find any change in *PreInterestEVA* for LBO firms with public financial statements. To our knowledge, this performance measure has not been used in existing LBO studies of firms with public financial statements post-LBO.

data covering at least the year before the LBO and the first two years after the LBO, 19 subsequently went public in IPOs (untabulated). Of these, 11 did not have public debt post-LBO, and therefore financial data is available for these firms during their time as private companies only because they subsequently went public. In contrast, only 16 of the 246 firms without public financial data covering at least the year before the LBO and the first two years after the LBO subsequently went public in IPOs. Thus the samples of LBO firms with public financial statements that prior papers have studied do not appear to be representative of LBO firms more generally.

Insert Table 8 here

3.3. Multivariate tests of changes in operating performance

To gain a deeper understanding of what explains changes in operating performance, we next conduct multivariate tests to explain the changes in *PreInterestROS, PreInterestROA* and *PreInterestEVA* from year t-1 to year t+2. We estimate the following multivariate model of changes in operating performance using OLS.

$$\begin{aligned}\Delta Performance_{i,(t-1,t+2)} &= \beta_0 + \beta_1 * PriorProfitIndicator_i + \beta_2 * PreLBOLeverage_i \\ &+ \beta_3 * ScaledChDebt_i + \beta_4 * MngtTurnoverIndicator_i \\ &+ \beta_5 * ClubDealIndicator_i + \beta_6 * \ln(TransValue)_i + \beta_7 * ManagementBuyout_i \\ &+ \beta_8 * PensionFunding_i + \beta_9 * AcquirerAge_i + \beta_{10} * PublicIndicator_i + \varepsilon_i \end{aligned} \quad \textbf{(1)}$$

where *ΔPerformance* is the performance level- adjusted change in operating performance from year t-1 to year t+2, for the performance measures ***PreInterestROS***, ***PreInterestROA*** or ***PreInterestEVA***. We use performance level-adjusted performance due to the evidence of mean reversion in performance that we find in Tables 5, 6 and 7. We include *PriorProfitIndicator* as an explanatory variable to test whether the scope for improvement in operating performance

helps explain whether an LBO transaction results in improved operating performance. *PriorProfitIndicator* equals 1 if *PreInterestIncome* is greater than zero in year t-1, and 0 otherwise. We include *DebtToAssets* in year t-1 (*PreLBOLeverage*) and the change in *IntBearingLiab* from year t-1 to t scaled by *PreInterestIncome* (*ScaledChDebt*) as proxies for the use of debt to discipline managers.

To examine whether changes in operating performance are explained by better corporate governance post-buyout, we include measures of management turnover and syndicate (or club) deals. *MngtTurnoverIndicator* equals 1 if the CEO, CFO and/or COO are replaced as a result of the buyout based on our hand-collected news stories. If management entrenchment contributes to poor operating performance prior to an LBO, changes in management could improve operating performance. Private equity firms have experience with monitoring LBO firms and are considered 'active investors' (Kaplan, 1991; Cotter and Peck, 2001). Club deals, where more than one private equity firm participates in the buyout transaction, could improve governance via board representation by multiple private equity firms. It can also worsen governance because each member of the club faces a free rider problem in supplying governance. Consistent with the latter argument, Officer, Ozbas and Sensoy (2010) find lower takeover premia in club deals, though this could also be consistent with a reduction in competition for the target. *ClubDealIndicator* equals 1 if at least two private equity firms are involved in the buyout and 0 otherwise. *TransValue* equals the value of the LBO transaction as reported by SDC or Dealogic and controls for size.

ManagementBuyout equals 1 if the transaction is a management buyout and 0 otherwise. We identify management buyouts from news articles describing the leveraged buyouts in our sample. We include *ManagementBuyout* to test whether firms improve more after LBOs in

which management acquires a large stake in the firm and therefore has strong incentives to improve performance. *PensionFunding* equals the amount by which the firm's pension plan is over- or under-funded prior to the transaction, and is equal to the value of pension assets (Compustat *pplao* + *pplau*) minus pension obligations (*pbpro* + *pbpru*). If some LBOs are primarily intended to transfer wealth from employees with claims to firm assets, LBOs with overfunded pensions may perform better post-LBO than other LBOs. *AcquirerAge* equals the number of years between the year in which the private equity sponsor was founded and the year of the LBO. We determine the founding year of each private equity firm using the 2009 edition of Dow Jones Galante's Venture Capital and Private Equity Directory, supplemented by Internet searches. We use this variable to test whether more experienced private equity firms generate better performance improvements. *PublicIndicator* equals one if the firm continues to file publicly-available financial statements after the LBO and 0 otherwise. We include *PublicIndicator* to test whether post-LBO operating performance improves more for firms that continue to file public financial statements, consistent with the univariate evidence in Table 8.

Table 9 presents the results from estimating model (1) for changes in operating performance around LBOs. The first two columns show the results for the performance level-adjusted change in *PreInterestROS*. The first column excludes *AcquirerAge*, which is not available for all LBO firms in the sample, and the second column includes all of the variables. Both specifications include LBO year and industry (defined by 3-digit NAICS code) fixed effects.

Insert Table 9 here

The *PriorProfitIndicator* coefficient is negative and statistically significant in both

columns of our *PreInterestROS* tests. While the results in Table 5 do not support a statistically significant increase in *PreInterestROS* for loss firms relative to performance-matched firms, it does appear that loss firms do better post-buyout relative to performance-matched firms than profit firms do. Strikingly, no other coefficients in the model are statistically significant. The coefficient on *Public Indicator* is positive and fairly large, indicating that LBO firms with public financial data available outperform those without by 6.4%, but is not significantly different than zero. The second two columns show the results for the performance level- adjusted change in *PreInterestROA*. The coefficient on *PriorProfitIndicator* is negative although not statistically significant in these two columns. The final two columns present the regression results for performance level- adjusted change in *PreInterestEVA*. Similar to the case in which change in *PreInterestROS* is the dependent variable, the coefficient on *PriorProfitIndicator* is negative and statistically significant. Overall, Table 9 suggests that loss LBO firms experience greater improvements in operating performance relative to performance-matched firms than profit LBO firms do.

3.4. Reporting incentives

Tax reporting incentives can change around an LBO because the new interest deduction provides a large tax shield. If LBO firms respond to these incentives by substituting away from non-debt tax shields such as depreciation, our tax return estimates of operating performance could increase for LBO firms, biasing us toward finding an increase in operating performance after LBOs. If anything, this strengthens our conclusions that LBOs do not lead to significant improvements in operating performance. The bias is likely to be larger for profitable firms, since these firms would have been more likely to seek non-debt tax shields to reduce their tax burdens pre-LBO.

3.5. Growth

Our final set of tests examining performance looks at the growth rate of LBO firms after LBO transactions. Table 10 shows the level of a firm's assets and sales in the years before and after an LBO. Panels A through C show the trend in *Sales*. The trend in *Sales* for the full sample (Panel A) around an LBO is unclear. *Sales* are lower in year t+1 than in the years before the LBO, but higher in year t+2. *Sales* appear to increase for the median profit LBO firm post-LBO (Panel B) and decrease substantially for the median loss firm (Panel C). The decline in *Sales* for the loss LBO firms suggests these firms could be curtailing unprofitable businesses.

Insert Table 10 here

Panels D through F of Table 10 show the trend in *TotalAssets*. On average, firms appear to have more assets post-LBO than they do pre-LBO. Panel D shows that *TotalAssets* of the median LBO firm grow by more than 25% in year t and then by about 8% in year t+1. While book basis adjustments from the LBO transaction itself could partially explain the increase in *TotalAssets* in year t, they should not lead to a further increase in *TotalAssets* in year t+1. *TotalAssets* decline from year t+1 to year t+2. They continue to decline in year t+3, though the fact that we only observe year t+3 assets for 248 of the 317 LBOs in our sample makes this decline difficult to interpret. The decline after year t+1 might reflect LBO firms selling off unproductive assets. In spite of this decline, *TotalAssets* in year t+3 still exceed *TotalAssets* in either year t-2 or t-1. As Panels E and F show, the median profit and loss firms appear to grow in year t+1.

4. Capital structure and payout policy results

4.1. Trends in financial leverage

We next analyze the evolution of capital structure after LBOs. We begin by examining the trends in *DebtToAssets* around LBOs. Table 11 shows these trends. Panels A and D show the short- and long-run trends in *DebtToAssets* for the full sample. As one would expect given the heavy reliance on debt to finance LBOs, both panels show a substantial increase in leverage in year t, the year the buyout takes place. Short-run mean (median) *DebtToAssets* increases from 0.447 (0.432) in year t-1 to 0.748 (0.754) in year t. Somewhat surprisingly, leverage actually continues to increase slightly after year t both in the short- and long-run.[15]

Insert Table 11 here

One possible reason that LBO firms do not reduce leverage is that they do not generate sufficient cash flow to pay off debt. We therefore also analyze post-LBO leverage changes separately for firms with excess cash flow in the years after the LBO. To do so, we construct a *FreeCashFlow* measure equal to *NetIncome* in years t+1 and t+2 plus an estimate of depreciation minus an estimate of capital expenditures in these years. Because our tax return data exclude capital expenditures and include only the depreciation in operating expense but not the depreciation included in cost of goods sold, we use industry median capital expenditures and depreciation from Compustat to estimate these amounts.[16] We refer to firms with positive *FreeCashFlow* as 'excess cash flow LBO firms' and firms with negative *FreeCashFlow* as 'cash flow shortfall LBO firms'.

[15] Our analysis is based on gross (rather than net of cash) debt because the IRS data contains cash for only the period 2005-2009. In untabulated analysis, we examine the evolution of net leverage around LBOs for this sample period. While the sample is small, we find patterns similar to those we find for gross leverage in the main analysis.

[16] Specifically, we compute median depreciation and median capital expenditures in years t+1 and t+2 from Compustat for all firms in the same 3-digit NAICS industry in the same years. We then divide median depreciation and capital expenditures by median property, plant and equipment for the industry in the same years to get year t+1 and t+2 industry depreciation and capital expenditure rates. We then calculate our firm-level estimate of depreciation and capital expenditures for each of the two years by multiplying these rates by firm-level property, plant and equipment as reported in the tax return data for the same years.

We examine the change in debt-to-assets around LBOs for both excess cash flow LBO firms and cash flow shortfall LBO firms. Panels B and E of Table 11 show that even firms that appear to generate excess cash flow and therefore likely have the capacity to reduce leverage do not do so either in the short-run or the long-run after the LBO. Panels C and F shows that leverage also further increases in the years after an LBO for cash flow shortfall LBO firms. Figure 2 depicts the leverage trends graphically. Panels A and B of Figure 2 depict the trends in *DebtToAssets* for all sample LBO firms and excess cash flow LBO firms, respectively.

The fact that LBO firms do not reduce their leverage post-buyout does not necessarily imply that they do not reduce debt. If their asset levels shrink post-buyout, sustained debt-to-assets would imply decreasing debt. Therefore, we also examine debt in years after the buyout as a percentage of the debt in year t (*DebtAs%ofYearTDebt)* to verify that firms are not, in fact, reducing their debt. Panels C and D of Figure 2 depict the trends in debt as a percentage of year t debt, and show that LBO firms do not reduce their debt post-buyout, even if they generate excess cash flow.

Insert Figure 2 here

4.2. Tests of changes in financial leverage after LBOs

We next formally test the mean and median changes in *DebtToAssets* and *DebtAs%ofYearTDebt* over several intervals after year t and present the results in Table 12. Panels A, B and C present the results for all LBO firms, excess cash flow LBO firms and cash flow shortfall LBO firms, respectively.

Insert Table 12 here

Table 12 shows that the increase in leverage after buyouts shown in Table 10 is only statistically significant for mean changes in *DebtAs%ofYearTDebt*. It also shows that LBO firms' debt levels increase slightly after the year of the buyout, even among excess cash flow LBO firms.

Finally, we conduct multivariate analysis of the change in leverage from year t to year t+2 to identify the determinants of post-buyout changes in leverage. We estimate the following model of changes in leverage using common determinants of leverage, including those from Lemmon, Roberts and Zender (2008).[17,]

$$\begin{aligned}\Delta Leverage_{i(t,t+k)} &= \beta_0 + \beta_1 * ExcessCFIndicator_i + \beta_2 * PreLBOLeverage_i \\ &+ \beta_3 * \ln(ChSales)_i + \beta_4 * ChAssetTangibility_i + \beta_5 * ChIndMedianLeverage_i \\ &+ \beta_6 * ChBondYieldSpread_i + \beta_7 * PublicUnratedDebtIndicator_i \\ &+ \beta_8 * PublicRatedDebtIndicator_i + \beta_9 * CumulativePayment\%toT{+}k_i + \varepsilon_i \end{aligned} \quad \textbf{(2)}$$

where *ΔLeverage* is the change in leverage from year t to year t+k, for the leverage measures *DebtToAssets* or *DebtAs%ofYearTDebt*. We examine the change in leverage starting in year t (that is, after the initial shock to leverage from year t-1 to year t) because we are primarily interested in whether LBO firms maintain higher leverage post-LBO. *ExcessCFIndicator* equals 1 if the LBO firm has positive *FreeCashFlow* in the k years after the buyout and 0 otherwise. A negative coefficient on *ExcessCFIndicator* would be consistent with firms reducing leverage more after the LBO if they have the means to do so.

We include *PreLBOLeverage* (*DebtToAssets* in year t-1) in our model. If high pre-LBO leverage represents a preference for higher target leverage overall, then LBO firms with high leverage in year t-1 should have smaller decreases in leverage after the LBO. We include the natural logarithm of the change in gross receipts (*ChSales = Sales in year t+k less Sales in year*

[17] We omit the following common determinants of leverage: the market-to-book ratio, dividend payments and cash flow volatility. The market-to-book is not available for LBO firms as they are not publicly-traded and the corporate tax return data do not capture dividend payments for most firm-years (see Section 4.4) and generally do not provide sufficient panel data to compute cash flow volatility measures.

t) to control for firm size and have no sign expectation. To the extent that depreciation deductions generated by fixed assets are a substitute for the tax shield afforded by debt, increases in capital intensity would predict a greater decrease in leverage after the transaction. *ChAssetTangibility* equals the change in *AssetTang* from year t to year t+k, where *AssetTang* equals net property, plant and equipment (Form 1120, Schedule L, Line 10) divided by *TotalAssets*. We include the change in industry median *DebtToAssets* from year t to year t+k to control for industry-wide changes in leverage, where industry is defined by 3-digit NAICS code.

Finally, we include the change in the yield spread between Aaa- and Baa-rated bonds from year t to year t+k (*ChBondYieldSpread*) to test whether firms are less likely to pay down debt when the interest rate on junk-rated debt increases.[18] If LBO firms have some fixed debt and interest rates rise, then the cost of debt issued at the time of the buyout becomes artificially low. This could make firms less likely to pay down debt. On the other hand, firms may choose to pay down variable rate debt when interest rates rise.

Table 13 reports our results from estimating model (2) for changes in leverage in the years after an LBO. The first column presents the results for the change in *DebtToAssets* from year t to year t+2. The insignificant coefficient on *ExcessCFIndicator* suggests firms with excess cash flow do not reduce their leverage post-buyout any more than firms with cash flow shortfall. The coefficient on *ChIndMedianLeverage* is positive and statistically significant, suggesting industry-wide changes in leverage at least partially explain changes in LBO firm leverage. The coefficient on *ChBondYieldSpread* is positive and statistically significant, suggesting firms refrain from paying down debt when interest rates on junk-rated debt rise. These two relations are consistent with findings in Axelson, Jenkinson, Strömberg and Weisbach (2012) that variation in market conditions is a major determinant of buyout leverage.

[18] We obtain bond yields from the St. Louis Federal Reserve website.

Insert Table 13 here

In the second column, we include additional variables for the 179 firms for which we are able to obtain data from DealScan on the loans used to finance the LBO. *PublicUnratedDebtIndicator* equals 1 if the LBO firm has unrated public debt outstanding post-LBO and 0 otherwise. *PublicRatedDebtIndicator* equals 1 if the LBO firm has rated public debt outstanding post-LBO and 0 otherwise. *CumulativePayment%toT+k* equals the percentage of the total term debt reported in Dealscan that is to be repaid by year t+k per the reported debt contracts. Although none of these variables is significant, our other results are unchanged.

The third column presents the results for the change in *DebtAs%ofYearTDebt* for model (2). The results are similar to the *DebtToAssets* model, though the coefficient on *ChIndMedianLeverage* is no longer statistically significant, except in column four for our sample of 179 firms with DealScan data. The last four columns of Table 13 present the results from estimating model (2) for changes in leverage from year t to year t+5. The results are inferentially similar to the short-run changes in leverage, although long-run changes in leverage are negatively correlated with *Sales* growth and positively associated with changes in *AssetTangibility*.

Overall, Table 13 provides further evidence that the increase in leverage during an LBO transaction is sustained post-LBO in the short-run and in the long-run. In untabulated analysis, we also examine leverage for the firms undergoing IPO transactions. For the subsample of 22 firms with tax return data surrounding the IPO date, we find that leverage remains high even in the year of the IPO. However, because we have tax return data at the IPO date for only 24 of the 35 LBO firms undergoing a subsequent IPO, we hesitate to draw strong conclusions from these

results.

4.3. Debt tax shields

One possible explanation for the LBO structure is that it is intended to increase leverage which allows a firm to generate more tax shields. Our results appear to support this argument. Figure 3 shows the percentage of LBO firms paying tax in years before and after the transaction both in the short-run (Panel A) and in the long-run (Panel B).

Insert Figure 3 here

Consistent with the increased tax shields afforded by debt, the number of firms paying tax drops dramatically in the year of the LBO and remains low even up to five years after the LBO. We further estimate the dollar magnitude of the incremental tax benefit by multiplying the incremental interest deduction that reduces net income, but not below zero, by 35 percent. The aggregate estimated incremental tax benefit for our sample is approximately $4.2 billion in year t+1 and $4.7 billion in year t+2 (untabulated). Thus, to the extent the IRS uses decreases in net income as an indicator of compliance risk, it should also consider how dramatic increases in leverage would explain reductions in income. The change in debt levels and leverage ratios accompanying an LBO are long-lived, and debt continues increasing after a buyout. Moreover, even those firms that generate excess cash flow post-LBO, and therefore have the capacity to pay down debt, do not do so.

To provide additional evidence about LBO debt providing tax shields, Figure 4 presents histograms of tax return net income (post-interest deduction) scaled by end-of-year total assets before and after the LBO.

Insert Figure 4 here

Panel A shows that in year t-1, ROA is right-skewed with numerous observations showing strong profitability. In post-LBO years t+1 (Panel B) and t+2 (Panel C), many more firms report near-zero or modest profits and fewer report large profits, but we do not observe much of an increase in the number of firms reporting losses. This centered distribution is consistent with acquiring sufficient leverage to provide immediate tax benefits, but not generating substantial losses that only provide tax refunds when future profits absorb net operating losses.

In sum, our evidence from Figures 3 and 4 is consistent with leverage providing immediate and long-lasting tax benefits. Naturally, there are financial distress costs associated with leverage as well. As Hotchkiss, Smith and Stromberg (2012) show, the increase in debt in an LBO results in a higher probability of bankruptcy, though no more so than an increase in leverage without an LBO would. We do not take on the question of whether the increased leverage in LBOs is optimal. Instead, we conclude that increased leverage and interest tax shields appear to be objectives of the LBO structure rather than artifacts of the transaction. We leave quantifying the present value of debt shields to future work.

4.4. Contributions

LBOs lead to a sustained increase in financial leverage. One reason why firms might be able to support more debt under an LBO structure than when publicly-traded is that the LBO structure reduces expected financial distress costs. Testing this hypothesis is difficult, as we do not observe distress costs directly. Our finding that operating performance does not increase substantially post-LBO does not support the argument that LBOs increase debt capacity. However, even if expected operational cash flow doesn't increase, distress costs could fall if the

private equity fund undertaking the LBO commits to injecting additional capital if there is a cash flow shortfall. Such a commitment might be valuable if the private equity firm initiating the fund can develop a reputation with lenders for covering losses in their funds' portfolio companies that might otherwise lead to bankruptcy.

To test whether private equity funds potentially reduce financial distress costs by injecting capital in their portfolio companies when needed, we examine post-LBO capital contributions. We compute equity contributions in a given year as the increase in paid-in capital (Form 1120, Schedule L) from the previous year. Unfortunately, the IRS data includes paid-in capital only in 2005 and later. However, this period does incorporate the financial crisis, a period when firms were more likely to face cash shortfalls and therefore to benefit from capital injections.

Table 14 presents our data on contributions. Panels A, B and C show contributions in dollars in the years around an LBO for all LBO firms, excess cash flow LBO firms and cash flow shortfall LBO firms, respectively. Panels D, E and F present the same information, with contributions scaled by the value of the LBO transaction.

Insert Table 14 here

Panels A and C show that, at least during the post-2005 period, investors do make significant contributions to LBO firms in the years following the LBO. Mean contributions as a percentage of transaction value are 0.0855 and 0.0266 in the first and second year after the LBO, respectively. The positive median values indicate that more than half of the firms in the sample receive injections in the first and second years post-LBO.

More importantly, Panels B and D show that investors inject more capital in firms that face cash shortfalls. Mean contributions as a fraction of transaction value for these firms are 0.1034 and 0.0307 in the first and second year after the LBO. This is consistent with LBOs increasing debt capacity by committing to supply additional equity capital in the case of a cash shortfall, which reduces financial distress risk. This financial backstop role is one possible channel through which LBOs might create value for investors, lending further credence to our interpretation that a primary purpose of LBOs could be to effect a permanent increase in leverage.

4. 5. Payout policy

Critics have argued that private equity firms routinely extract large distributions from the LBO firms that they own, leaving these firms with too little capital to operate effectively. This could explain why firms do not experience improvements in operating performance after LBOs. Therefore, as a final step, we examine changes in payout policy after LBOs. The IRS data used in this paper only contains distributions starting in 2005, so by necessity we limit our analysis of dividends paid (Form 1120, Schedule M-2, Line 5) by LBO firms to firms acquired in LBOs in 2005 and later. We only include LBO firms that report distributions (possibly zero) in at least years t, t+1 and t+2 in this analysis so that we can compare distributions for the same set of firms across years relative to the time of the LBO.

Table 15 presents the results of this analysis. Panels A, B and C show dividends in dollars in the years around an LBO for all LBO firms, excess cash flow LBO firms and cash flow shortfall LBO firms, respectively. Panels D, E and F present the same information, with dividends scaled by the value of the LBO transaction.

Insert Table 15 here

The table shows that LBO firms do not pay large dividends to their owners. The 75th percentile of dividends/transaction value for years t+1 and t+2 for all LBO firms is zero, and it rises to only 0.02 in year t+3. Cash flow shortfall LBO firms pay out more dividends as a fraction of transaction value than excess cash flow LBO firms, which might be consistent with critics' arguments that private equity acquirers starve the firms that they acquire. However, the magnitude of these dividends appears too small to be economically important.

5. Conclusion

This study uses U.S. corporate tax return data to examine the evolution of firms' financial structure and performance after leveraged buyouts for a comprehensive sample of 317 LBOs taking place between 1995 and 2007. Our empirical findings shed additional light on the motives for LBOs, their efficiency consequences and how LBO firms are managed.

We present three primary results. First, we find little evidence of operating improvements subsequent to an LBO on average. We do, however, observe operating improvements in the set of firms for which public financial data are available, which suggests that the conclusions of prior, albeit careful, studies showing performance improvements for this group do not generalize to the population of LBOs. Second, we show that leverage and debt levels increase after LBOs and the frequency of positive tax payments declines. Finally, we find no support for arguments that private equity firms use LBOs to opportunistically "strip" otherwise healthy firms. LBO firms make limited dividend payments following an LBO, and firms do not appear to shrink after LBOs. The healthiest firms – those that were operationally profitable pre-LBO – continue to grow post-LBO, even after the initial asset revaluation that likely occurs for financial reporting purposes. Further, even the loss firms tend to experience

asset growth both during and after the LBO. Our results collectively suggest that the primary effect of LBOs is to produce a sustained increase in financial leverage.

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Fig. 1. Trends in operating performance. This figure presents trends in *PreInterestROS*. Panels A, B and C provide the trend in *PreInterestROS* for all LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panels D, E and F provide the trend in *PreInterestROS* for the profit LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panels G, H and I provide the trend in *PreInterestROS* for the loss LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. Year t represents the LBO year.

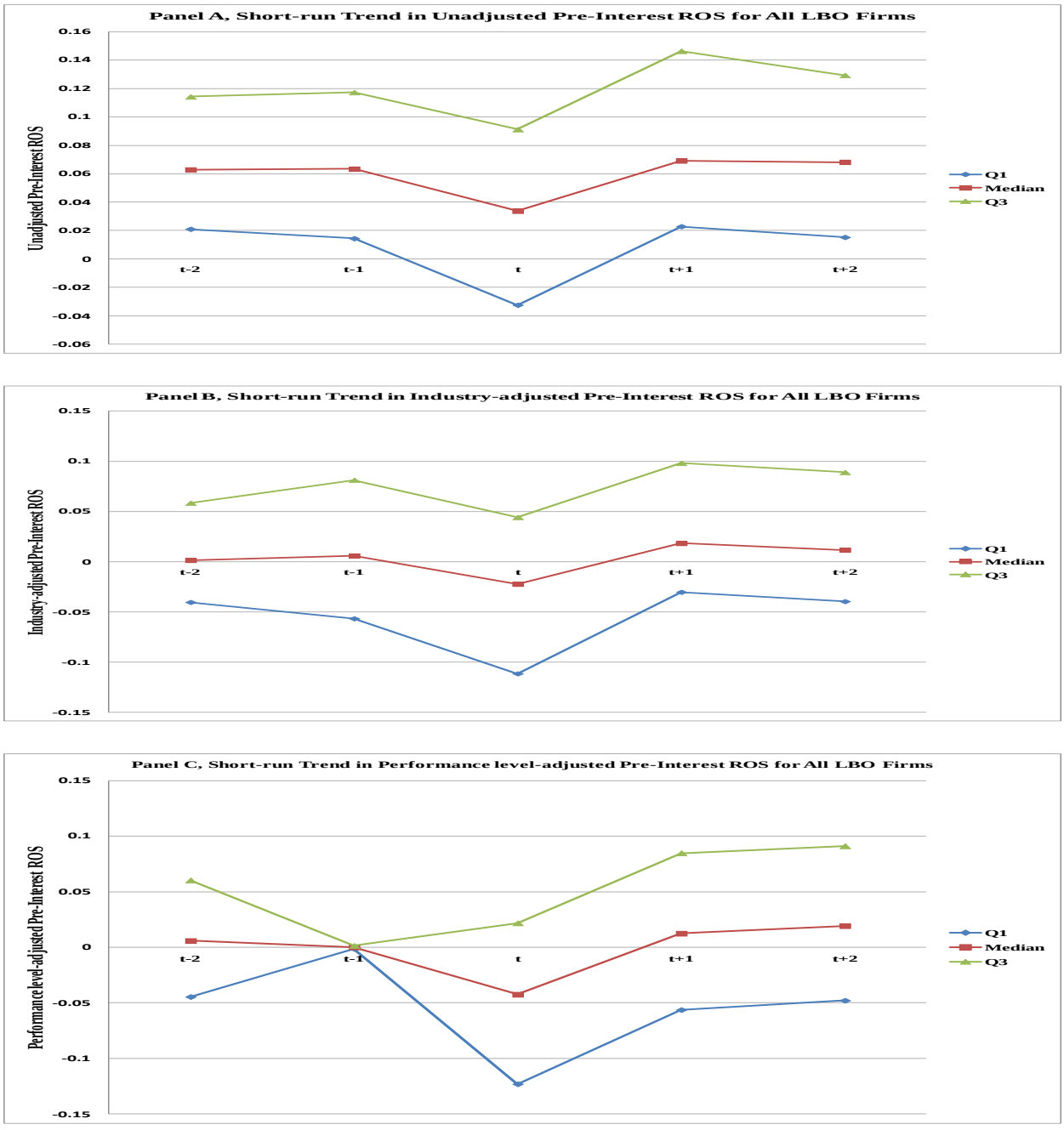
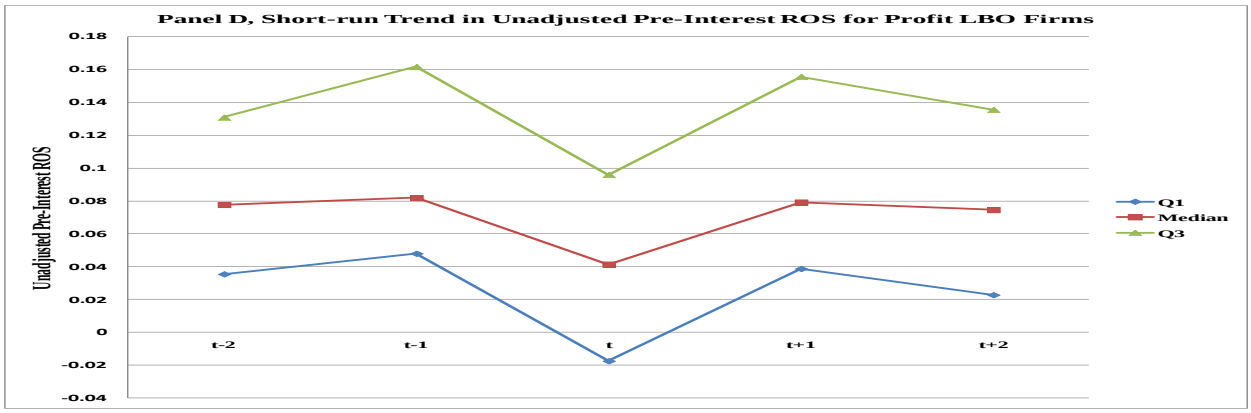
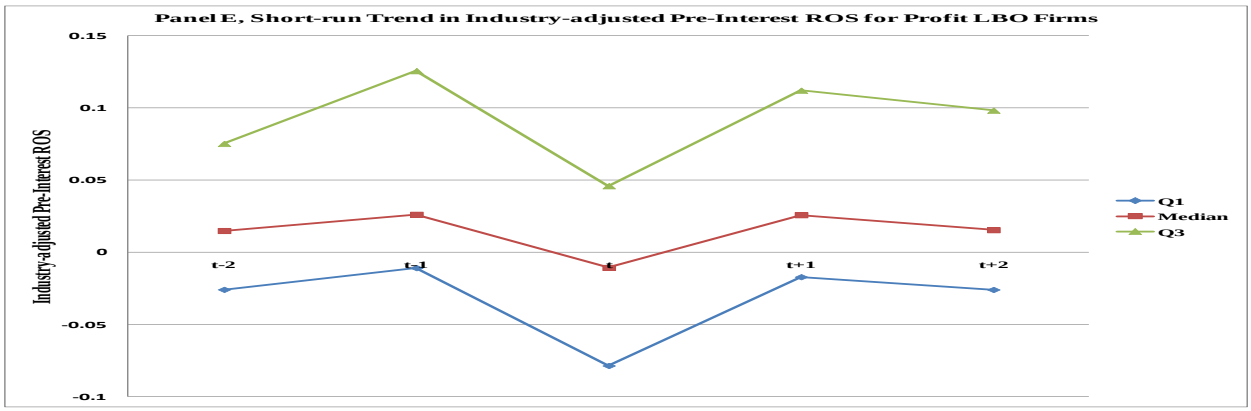


Fig. 1. (continued) Trends in operating performance. This figure presents trends in *PreInterestROS* . Panels A, B and C provide the trend in *PreInterestROS* for all LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panels D, E and F provide the trend in *PreInterestROS* for the profit LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panels G, H and I provide the trend in *PreInterestROS* for the loss LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. Year t represents the LBO year.





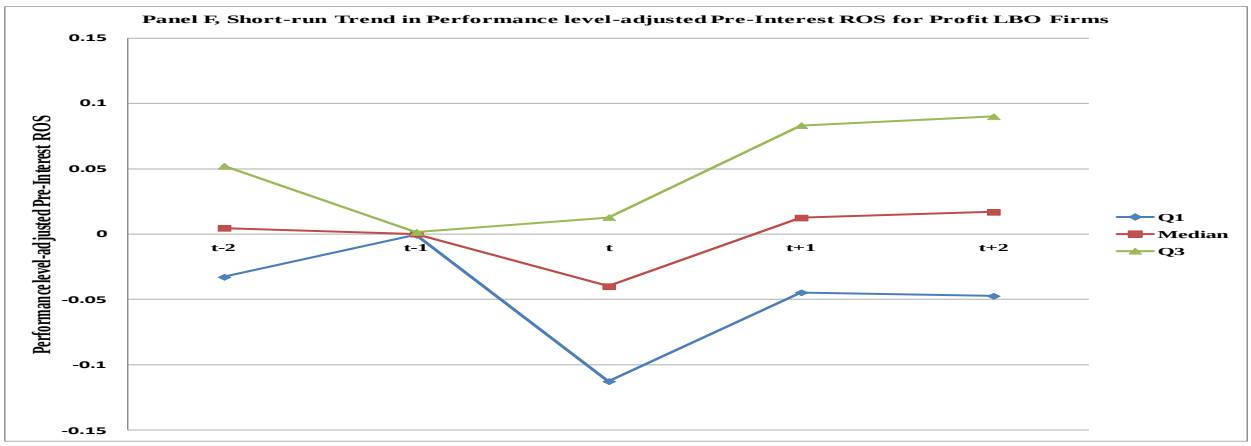
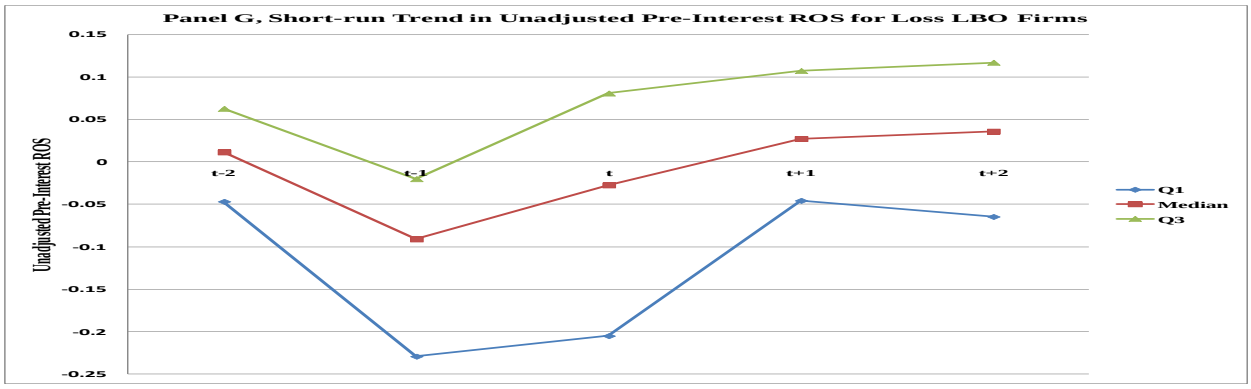
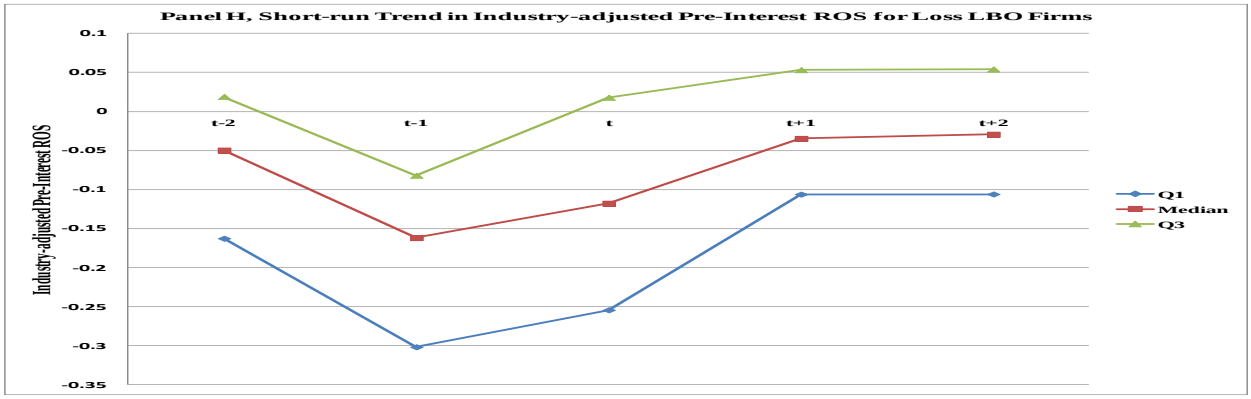


Fig. 1. (continued) Trends in operating performance. This figure presents trends in *PreInterestROS* . Panels A, B and C provide the trend in *PreInterestROS* for all LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panels D, E and F provide the trend in *PreInterestROS* for the profit LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panels G, H and I provide the trend in *PreInterestROS* for the loss LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. Year t represents the LBO year.





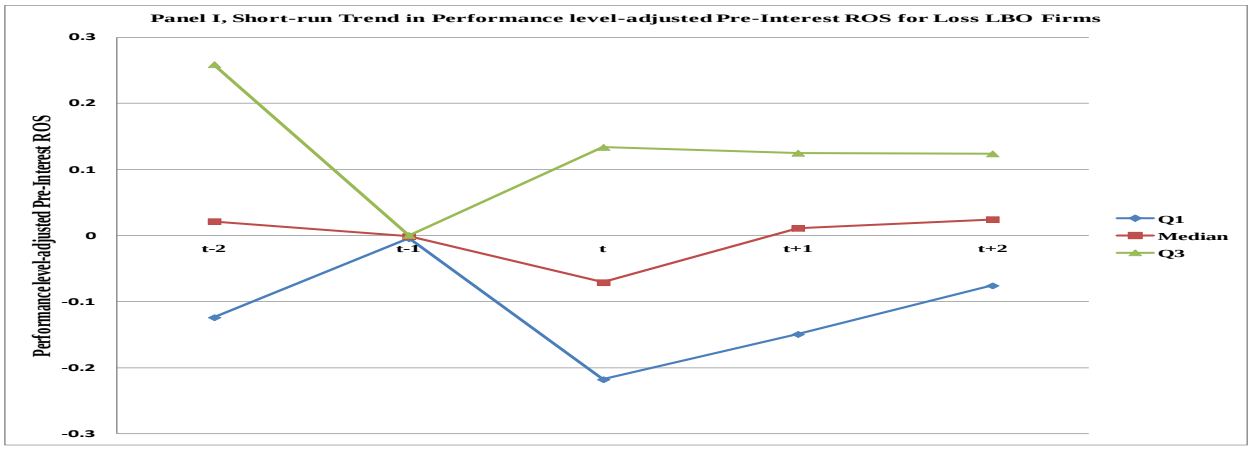
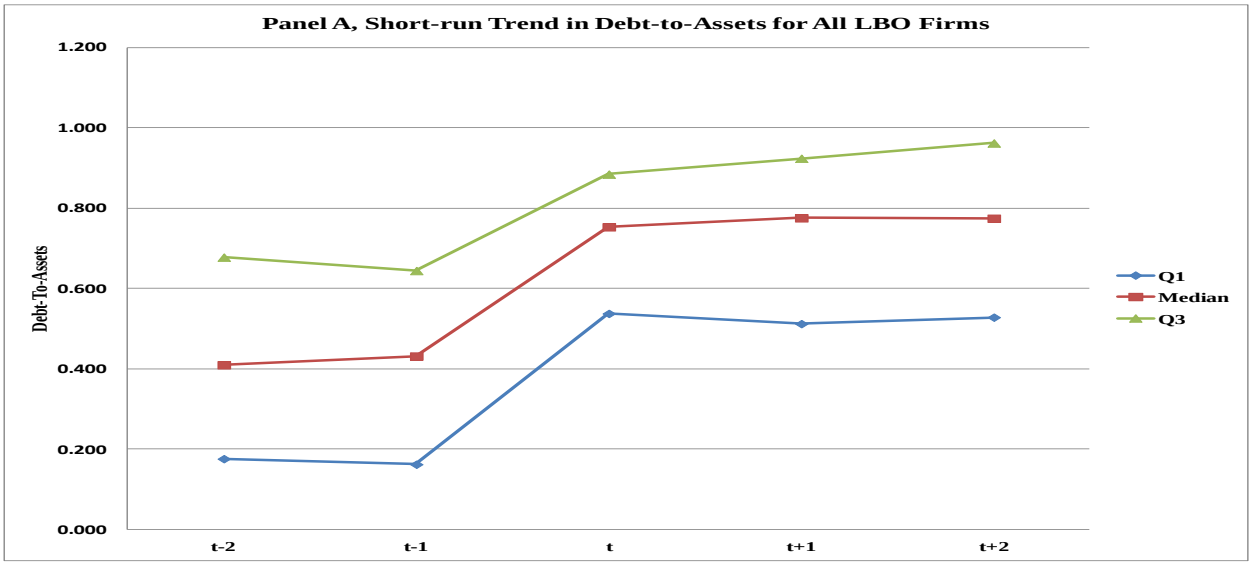


Fig. 2. Trends in leverage. This figure presents trends in *DebtToAssets* and *DebtAs%OfYearTDebt*. Panel A provides the trend in *DebtToAssets* for all LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panel B provides the trend in *DebtToAssets* for excess cash flow LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Excess cash flow LBO firms have positive *FreeCashFlow*. Panel C provides the trend in *DebtAs%ofYearTDebt* for all LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panel D provides the trend in *DebtAs%ofYearTDebt* for excess cash flow LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Year t represents the LBO year.



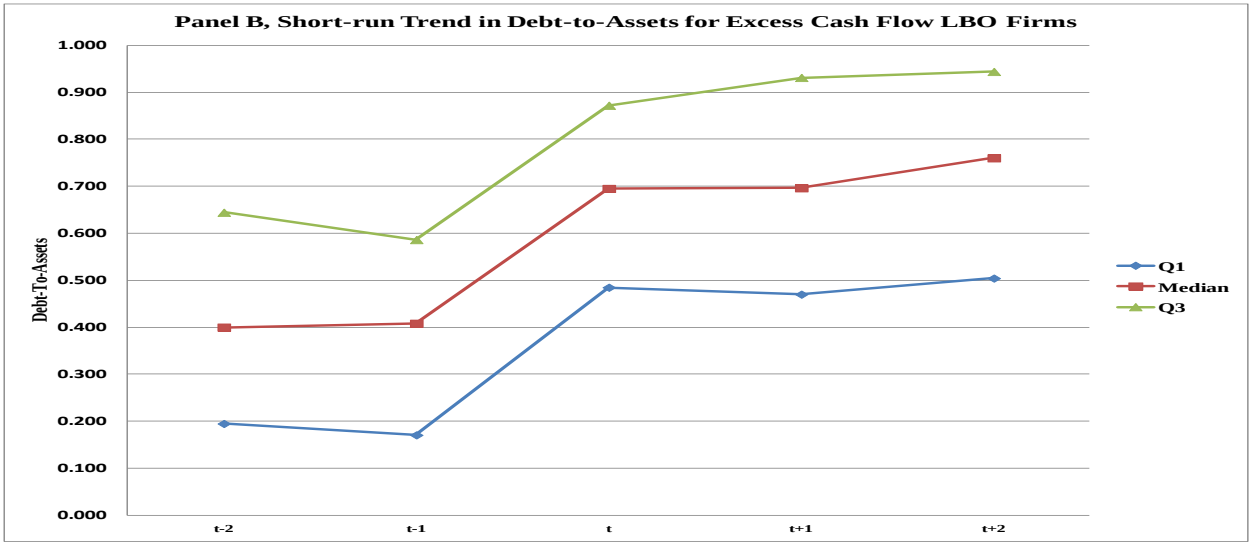
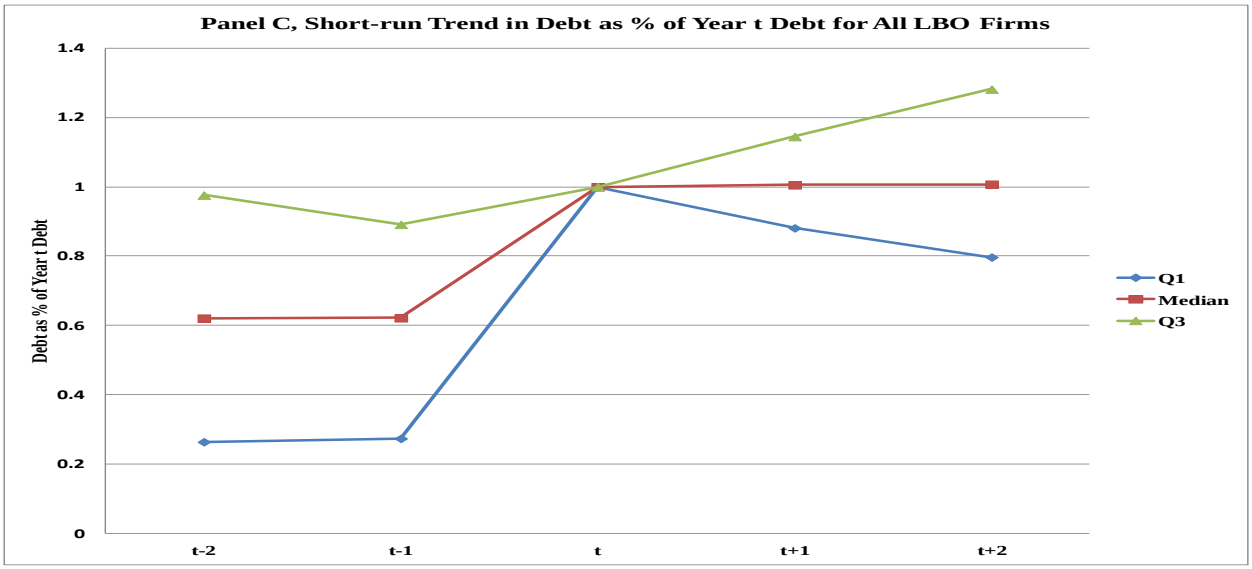


Fig. 2. (continued) Trends in leverage. This figure presents trends in *DebtToAssets* and *DebtAs%OfYearTDebt*. Panel A provides the trend in *DebtToAssets* for all LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panel B provides the trend in *DebtToAssets* for excess cash flow LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Excess cash flow LBO firms have positive *FreeCashFlow*. Panel C provides the trend in *DebtAs%ofYearTDebt* for all LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panel D provides the trend in *DebtAs%ofYearTDebt* for excess cash flow LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Year t represents the LBO year.



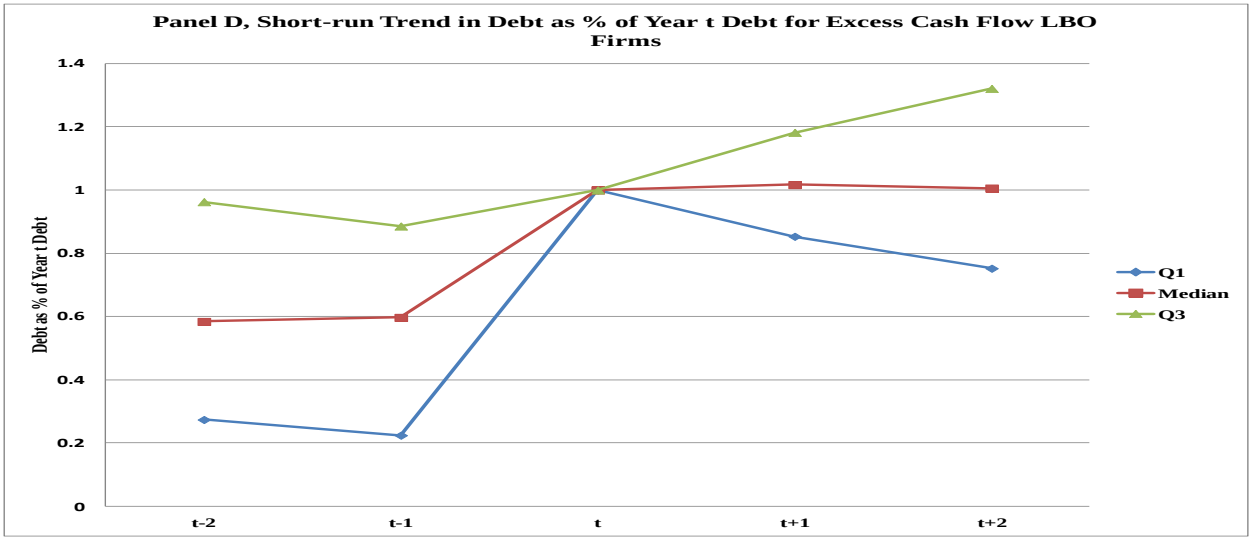
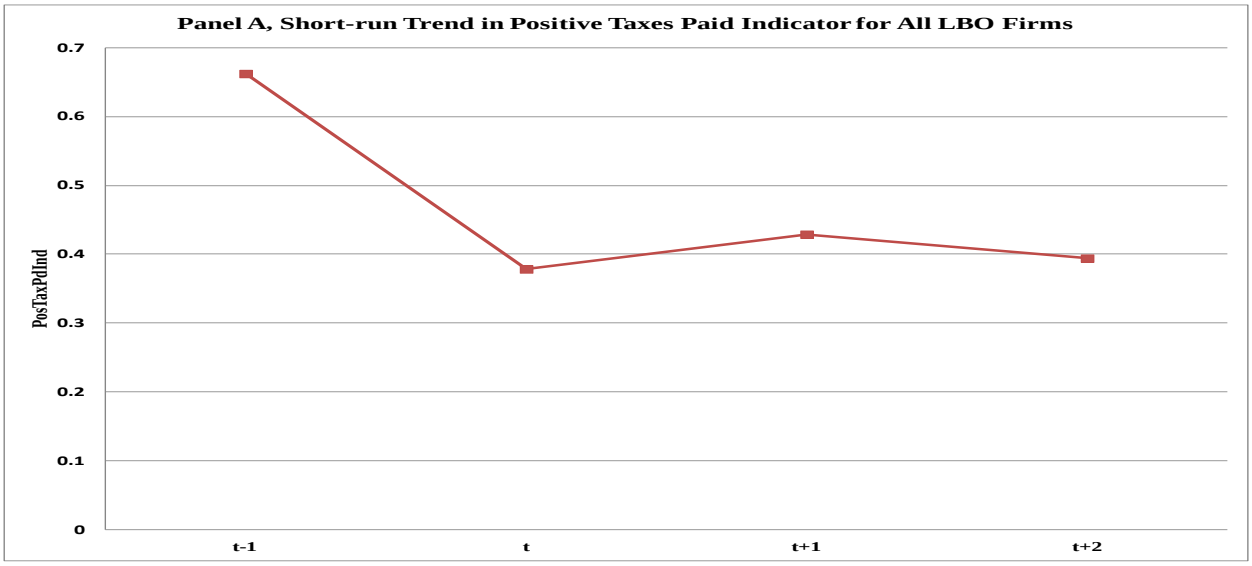


Fig. 3. Trends in tax payments. This figure presents trends in the percentage of LBO firms paying tax before and after the LBO transaction. Panel A provides the short-run trend in *PosTaxPdInd* for all LBO firms with at least one year of pre-transaction data and at least two years of post-transaction data. Panel B provides the trend in *PosTaxPdInd* for all LBO firms with at least one year of pre-transaction data and at least five years of post-transaction data. Year t represents the LBO year. *PosTaxPdInd* equals 1 if total tax reported on Page 1 of Form 1120 is positive and 0 otherwise.



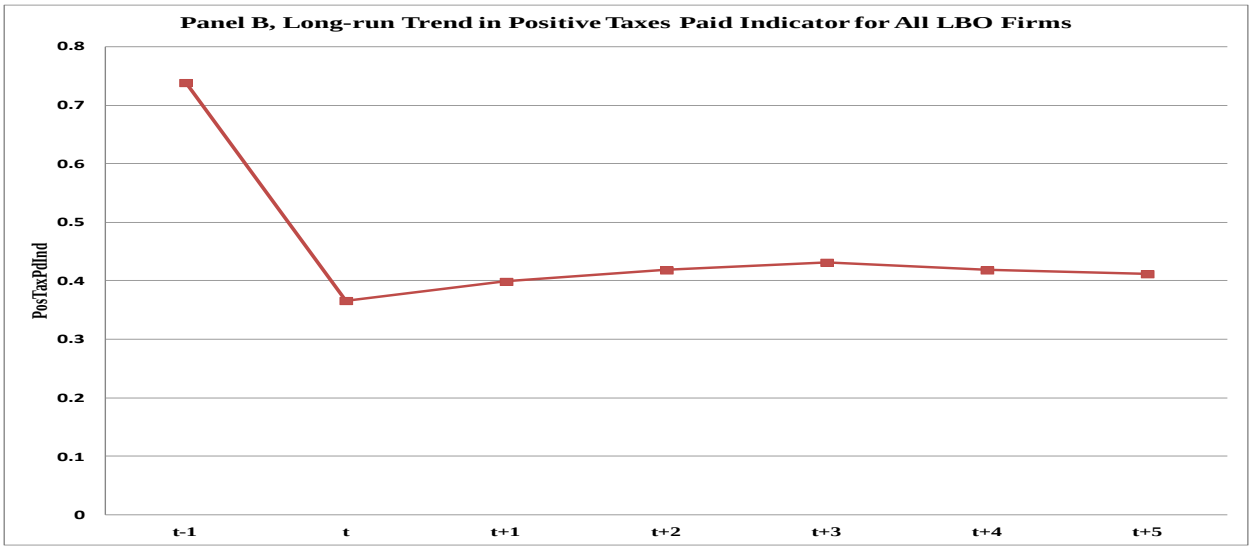
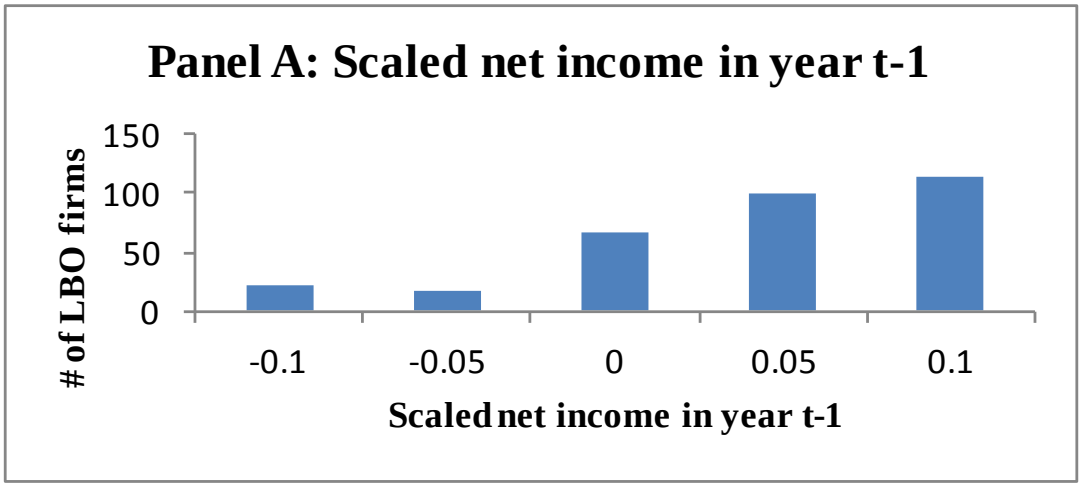
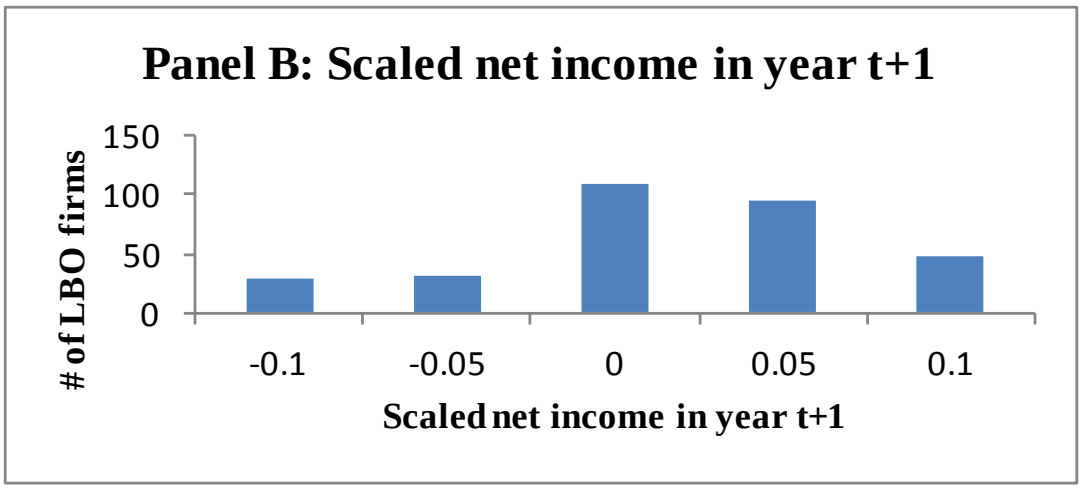
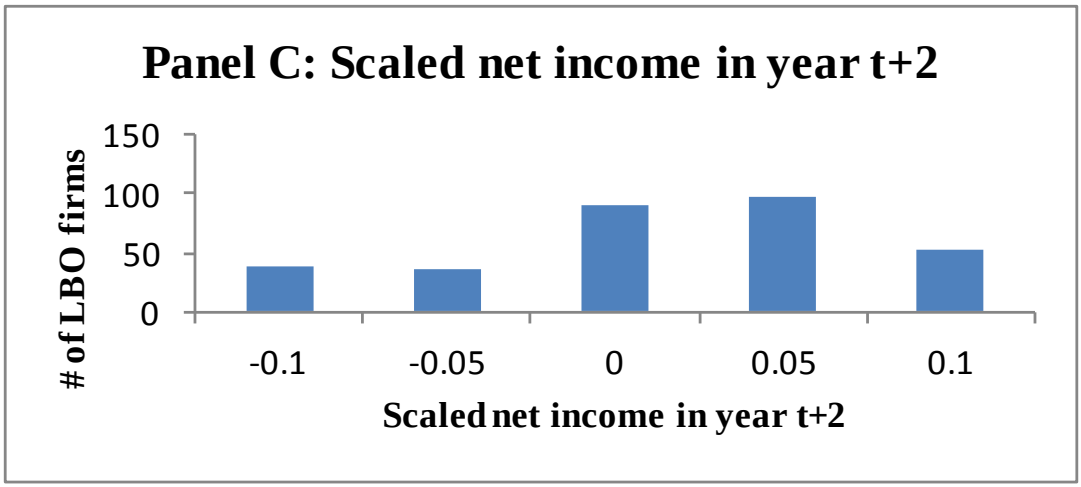


Fig. 4. Distribution of net income. This figure presents the distribution of net income scaled by total assets before and after the LBO. Panel A provides the distribution for all LBO firms in year t-1, Panel B provides the distribution for all LBO firms in year t+1 and Panel C provides the distribution for all LBO firms in year t+2. Net income equals net income reported on Page 1 of Form 1120 and total assets equals the end-of-year total assets reported on Schedule L of Form 1120.







Appendix
Variable definitions.

Variables for operating perfomance and leverage analyses:

NetIncome	=	Net income reported on Line 28 of Form 1120
IntDeduction	=	Interest deduction reported on Line 18 of Form 1120
PreInterestIncome	=	*NetIncome* plus *IntDeduction*
IntBearingLiab	=	Short-term and long-term mortgages, notes and bonds payable reported on Lines 17 and 20 of Form 1120 Schedule L
TotalAssets	=	Total assets reported on Line 15 of Form 1120 Schedule L
DebtToAssets		*IntBearingLiab* divided by *TotalAssets*
Sales	=	Gross receipts or sales reported on Line 1e of Form 1120
PosTaxPdInd	=	1 if total tax reported on Line 31 of Form 1120 is positive and 0 otherwise
PreInterestROS	=	*PreInterestIncome* divided by *Sales*
PreInterestROA	=	*PreInterestIncome* divided by lagged *TotalAssets*, although pre-LBO *PreInterestIncome* is divided by year t *TotalAssets* to mitigate the influence of basis adjustments.
PreInterestEVA	=	$[(PreInterestIncome_{t+i} - PreInterestIncome_{t-k}) - ((TotalAssets_{t+i} - TotalAssets_{t})*IndCostCap_{t-1})] / TotalAssets_{t}$, where *IndCostCap* equals the industry median cost of capital in year t-1; year t *TotalAssets* is used in place of years t-1 and t-2 *TotalAssets* to mitigate the influence of basis
PriorProfitIndicator	=	1 if the LBO firm has positive *PreInterestIncome* in year t-1 and 0 otherwise
PreLBOLeverage	=	*DebtToAssets* in year t-1
ScaledChDebt	=	[*IntBearingLiab* in year t minus *IntBearingLiab* in year t-1] divided by *PreInterestIncome*
MngtTurnoverIndicator	=	1 if management changes in conjunction with the LBO transaction and 0 otherwise
ClubDealIndicator	=	1 if at least two private equity acquirers were involved in the buyout transaction and 0 otherwise
TransValue	=	Value of the LBO transaction
ManagementBuyout	=	1 if the transaction is a management buyout and 0 otherwise
PensionFunding	=	Funding status of pension liabilities (Compustat pplao - pplau - ppro - pbpru)
AcquirerAge	=	Age in years of the private equity acquirer at the time of the buyout
PublicIndicator	=	1 for firms which file public financial statements post-LBO and 0 otherwise
FreeCashFlow	=	*NetIncome* in years t+1 and t+2 plus estimated depreciation in years t+1 and t+2 minus estimated capital expenditures in years t+1 and t+2
DebtAs%ofYearTDebt	=	*IntBearingLiab* in year t+k divided by *IntBearingLiab* in year t
ExcessCFIndicator	=	1 if *FreeCashFlow* is positive and 0 otherwise
ChSales	=	*Sales* in year t+k minus *Sales* in year t
ChAssetTangibility	=	*AssetTang* in year t+k minus *AssetTang* in year t, where *AssetTang* equals property, plant and equipment reported on Line 10b Column (d) of Form 1120 Schedule L divided by *TotalAssets*

Appendix (continued)
Variable definitions.

ChIndMedianLeverage	=	Industry median *DebtToAssets* in year t+k minus the industry median *DebtToAssets* in year t, where industry is defined by 3-digit NAICS code
ChBondYieldSpread	=	Yield premium of Baa- over Aaa-rated corporate bonds in year t+k minus the yield premium of Baa- over Aaa-rated corporate bonds in year t
PublicUnratedDebtIndicator	=	1 if the LBO firm has unrated public debt outstanding post-LBO and 0 otherwise
PublicRatedDebtIndicator	=	1 if the LBO firm has rated public debt outstanding post-LBO and 0 otherwise
CumulativePayment%toT+k	=	Percentage of the total term debt reported in Dealscan that must be paid by year t+k
Distributions	=	Cash distributions from Schedule M-2 on Form 1120
Contributions	=	Change in Additional paid-in capital from Schedule L of Form 1120
Variables for logit regression:		
OperatingIncome	=	Earnings before interest, taxes, depreciation, and amortization (Compustat EBITDA) divided by the market value of assets, where the market value of assets equals the book value of debt (Compustat LT) plus the market value of equity (Compustat PRCC_F * Compustat CSHO)
High(Low)OperIncInd	=	1 for firms with above (below) the sample median *OperatingIncome* and 0 otherwise
TobinsQ	=	Market value of assets divided by the book value of assets (Compustat AT), where the market value of assets equals the book value of debt (Compustat LT) plus the market value of equity (Compustat PRCC_F * Compustat CSHO)
High(Low)TobinsQInd	=	1 for firms with above (below) the sample median *TobinsQ* and 0 otherwise
MachineryIndicator	=	1 if the SIC code is between 3400 and 4000 and 0 otherwise
RDIntensity	=	Research and development expenditures (Compustat XRD) divided by sales (Compustat REVT)
SGAIntensity	=	Selling expenses (Compustat XSGA) divided by sales (Compustat REVT)
Size	=	Log of the book value of assets (Compustat AT)
HerfindahlIndex	=	Herfindahl index defined over 4-digit SIC codes
HighHerfindahlInd	=	1 if the firm has above the sample median *HerfindahlIndex* and 0 otherwise
Leverage	=	Long-term debt (Compustat DLTT) divided by total assets (Compustat AT)
ChROA	=	One year change in ROA (Compustat NI divided by lagged Compustat AT)
ChSales	=	One year change in sales (Compustat REVT)
Age	=	Number of years firm is covered by Compustat

Table 1
Sample Derivation.

This table provides a summary of the sample selection process. Panel A shows the aggregate number of LBO firms, Panel B shows the number of LBO firms by year and Panel C shows the LBO outcomes.

Panel A, Aggregate number of LBO firms

Number of non-bankrupt LBO firms in Dealogic and SDC from 1995-2007 with >=$10M assets	479
Less: Misclassified LBOs, REIT and partnership LBOs, and LBO firms merged into other entities	(125)
Number of LBO firms to be matched with IRS data	354
Less: LBO firm not matched with IRS data	(1)
Initial sample	353
Less: LBO firms without at least two years of post-transaction data	(36)
Number of LBO firms with at least two years of post-transaction data	**317**

Panel B, Number of LBO firms by year

	Initial Sample	t-1 to t+2	t-1 to t+3	t-1 to t+4	t-1 to t+5
1995	5	5	4	4	4
1996	7	6	6	4	4
1997	19	18	16	14	14
1998	25	21	21	21	19
1999	40	34	33	30	26
2000	39	34	32	28	29
2001	21	18	16	15	14
2002	15	10	9	8	6
2003	29	27	24	21	17
2004	21	15	15	14	12
2005	24	24	23	17	7
2006	40	40	30	3	1
2007	68	65	19	1	0
	353	**317**	**248**	**180**	**153**

Panel C, LBO Outcomes

	Sold	IPO	Bankruptcy	Privately held	Total
1995	2	0	1	2	5
1996	1	1	3	1	6
1997	9	3	2	4	18
1998	6	2	10	3	21
1999	14	4	10	6	34
2000	14	7	6	7	34
2001	8	1	4	5	18
2002	7	1	0	2	10
2003	13	4	2	8	27
2004	9	1	2	3	15
2005	8	4	1	11	24
2006	8	3	3	26	40
2007	5	4	5	51	65
	104	**35**	**49**	**129**	**317**

Table 2
Summary Statistics.

This table presents summary statistics measured at years t-1 and t+2. Panel A includes the summary statistics for all LBO firms. Panel B (Panel C) includes the summary statistics for the profit (loss) LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. Year t represents the LBO year. See Appendix for variable definitions.

Panel A, All LBO firms		Pre-LBO (Year t-1)					Post-LBO (Year t+2)				
	N	Mean	SD	Q1	Median	Q3	Mean	SD	Q1	Median	Q3
PreInterestIncome	317	46.9	92.8	2.0	12.8	47.1	75.2	180.0	1.3	14.8	53.3
IntDeduction	317	22.0	43.6	0.5	3.9	22.9	61.4	106.8	4.1	20.3	56.7
DebtToAssets	317	0.447	0.329	0.162	0.432	0.645	0.827	0.573	0.529	0.775	0.962
IntBearingLiab	317	481.3	1,108.0	17.6	103.8	354.8	999.1	2,089.1	73.3	239.0	718.3
TotalAssets	317	920.8	1,903.2	92.7	253.4	729.8	1,256.7	2,333.3	114.6	302.3	1,087.0
Sales	317	604.2	1,101.7	89.0	220.7	472.9	641.3	1,041.8	80.0	245.6	586.9
PosTaxPdInd	317	0.66	0.47	0	1	1	0.39	0.49	0	0	1
PreInterestROS	311	0.089	0.237	0.014	0.063	0.117	0.093	0.157	0.015	0.068	0.129
PreInterestROA	317	0.044	0.126	0.008	0.051	0.097	0.045	0.092	0.011	0.045	0.083
Panel B, Profit LBO firms											
	N	Mean	SD	Q1	Median	Q3	Mean	SD	Q1	Median	Q3
PreInterestIncome	250	64.1	97.0	7.6	23.8	65.9	86.6	196.6	2.9	18.3	63.2
IntDeduction	250	24.9	46.5	0.8	4.9	25.7	68.3	113.2	6.0	23.8	60.6
DebtToAssets	250	0.422	0.299	0.162	0.416	0.607	0.808	0.508	0.529	0.773	0.948
IntBearingLiab	250	507.6	1,137.8	21.9	105.4	363.8	1,077.2	2,169.6	83.8	275.8	820.5
TotalAssets	250	1,042.8	2,078.8	120.0	264.3	872.3	1,381.9	2,461.3	133.8	375.8	1,304.7
Sales	250	692.1	1,171.0	110.0	238.3	590.6	710.9	1,099.9	105.4	277.9	683.6
PosTaxPdInd	250	0.83	0.37	1	1	1	0.42	0.50	0	0	1
PreInterestROS	246	0.153	0.213	0.048	0.082	0.162	0.105	0.157	0.023	0.075	0.136
PreInterestROA	250	0.085	0.071	0.037	0.064	0.111	0.057	0.083	0.017	0.049	0.092
Panel C, Loss LBO firms											
	N	Mean	SD	Q1	Median	Q3	Mean	SD	Q1	Median	Q3
PreInterestIncome	67	-17.4	19.0	-25.0	-8.7	-2.0	32.5	83.5	-2.8	4.6	28.8
IntDeduction	67	11.0	27.6	0.0	0.5	10.1	35.8	73.3	0.6	6.3	29.1
DebtToAssets	67	0.540	0.409	0.155	0.539	0.855	0.899	0.770	0.509	0.778	1.105
IntBearingLiab	67	382.9	990.4	6.3	81.4	290.2	707.7	1,740.1	35.2	143.7	342.6
TotalAssets	67	465.3	878.5	70.6	133.5	402.8	789.5	1,712.0	53.0	191.1	430.8
Sales	67	276.0	706.3	34.2	121.9	270.6	381.7	738.6	32.3	110.2	372.8
PosTaxPdInd	67	0.03	0.17	0	0	0	0.28	0.45	0	0	1
PreInterestROS	65	-0.153	0.148	-0.229	-0.091	-0.020	0.049	0.151	-0.065	0.036	0.117
PreInterestROA	67	-0.111	0.163	-0.129	-0.033	-0.008	0.000	0.109	-0.028	0.025	0.071

Table 3
Trends in Pre-Interest ROS and Pre-Interest ROA.

This table presents trends in *PreInterestROS* and *PreInterestROA*. Panel A provides the trend in *PreInterestROS* for all LBO firms Panel B (Panel C) provides the trend in *PreInterestROS* for the profit (loss) LBO firms. Panel D provides the trend in *PreInterestROA* for all LBO firms. Panel E (Panel F) provides the trend in *PreInterestROA* for the profit (loss) LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. The LBO year (year t) is shaded. See Appendix for variable definitions.

Panel A, Trend in Pre-Interest ROS for All LBO firms

	N	Mean	SD	Q1	Median	Q3
PreInterestROS $_{t-2}$	284	0.089	0.206	0.021	0.063	0.114
PreInterestROS $_{t-1}$	311	0.089	0.237	0.014	0.063	0.117
PreInterestROS $_{t}$	311	-0.035	0.425	-0.032	0.034	0.091
PreInterestROS $_{t+1}$	307	0.107	0.211	0.023	0.069	0.146
PreInterestROS $_{t+2}$	302	0.093	0.157	0.015	0.068	0.129
PreInterestROS $_{t+3}$	238	0.080	0.142	0.015	0.064	0.126

Panel B, Trend in Pre-Interest ROS for Profit LBO firms

	N	Mean	SD	Q1	Median	Q3
PreInterestROS $_{t-2}$	223	0.120	0.203	0.035	0.078	0.131
PreInterestROS $_{t-1}$	246	0.153	0.213	0.048	0.082	0.162
PreInterestROS $_{t}$	246	-0.013	0.420	-0.017	0.041	0.096
PreInterestROS $_{t+1}$	242	0.118	0.199	0.039	0.079	0.156
PreInterestROS $_{t+2}$	238	0.105	0.157	0.023	0.075	0.136
PreInterestROS $_{t+3}$	194	0.089	0.133	0.024	0.069	0.134

Panel C, Trend in Pre-Interest ROS for Loss LBO firms

	N	Mean	SD	Q1	Median	Q3
PreInterestROS $_{t-2}$	61	-0.026	0.173	-0.047	0.011	0.063
PreInterestROS $_{t-1}$	65	-0.153	0.148	-0.229	-0.091	-0.020
PreInterestROS $_{t}$	65	-0.117	0.436	-0.205	-0.027	0.081
PreInterestROS $_{t+1}$	65	0.062	0.246	-0.046	0.027	0.107
PreInterestROS $_{t+2}$	64	0.049	0.151	-0.065	0.036	0.117
PreInterestROS $_{t+3}$	44	0.042	0.174	-0.029	0.027	0.101

Panel D, Trend in Pre-Interest ROA for All LBO firms

	N	Mean	SD	Q1	Median	Q3
PreInterestROA $_{t-2}$	288	0.051	0.087	0.014	0.046	0.081
PreInterestROA $_{t-1}$	317	0.044	0.126	0.008	0.051	0.097
PreInterestROA $_{t}$	317	0.022	0.107	-0.028	0.022	0.079
PreInterestROA $_{t+1}$	317	0.051	0.087	0.011	0.044	0.089
PreInterestROA $_{t+2}$	317	0.045	0.092	0.011	0.045	0.083
PreInterestROA $_{t+3}$	249	0.048	0.110	0.010	0.052	0.099

Panel E, Trend in Pre-Interest ROA for Profit LBO firms

	N	Mean	SD	Q1	Median	Q3
PreInterestROA $_{t-2}$	226	0.068	0.073	0.024	0.053	0.096
PreInterestROA $_{t-1}$	250	0.085	0.071	0.037	0.064	0.111
PreInterestROA $_{t}$	250	0.035	0.093	-0.011	0.032	0.082
PreInterestROA $_{t+1}$	250	0.062	0.081	0.023	0.051	0.092
PreInterestROA $_{t+2}$	250	0.057	0.083	0.017	0.049	0.092
PreInterestROA $_{t+3}$	202	0.056	0.102	0.020	0.056	0.101

Panel F, Trend in Pre-Interest ROA for Loss LBO firms

	N	Mean	SD	Q1	Median	Q3
PreInterestROA $_{t-2}$	62	-0.009	0.107	-0.050	0.010	0.050
PreInterestROA $_{t-1}$	67	-0.111	0.163	-0.129	-0.033	-0.008
PreInterestROA $_{t}$	67	-0.025	0.137	-0.112	-0.010	0.055
PreInterestROA $_{t+1}$	67	0.011	0.099	-0.051	0.013	0.065
PreInterestROA $_{t+2}$	67	0.000	0.109	-0.028	0.025	0.071
PreInterestROA $_{t+3}$	47	0.011	0.134	-0.048	0.018	0.088

Table 4
Likelihood of going private via LBO.

This table presents the results from the logit regression model estimating the likelihood of going private via an LBO transaction. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

Variable	Original Opler & Titman (1993) model	Augmented model
Intercept	-2.084 ***	-2.101 ***
	(-18.96)	(-18.61)
OperatingIncome	2.145 ***	2.156 ***
	(5.04)	(5.04)
TobinsQ	-0.068 **	-0.066 **
	(-2.38)	(-2.32)
MachineryIndicator	-0.186 ***	-0.138 **
	(-3.26)	(-2.37)
RDIntensity	-0.255	-0.287
	(-1.24)	(-1.33)
SGAIntensity	0.267 ***	0.274 ***
	(2.75)	(2.77)
Size	-0.064 ***	-0.054 ***
	(-4.86)	(-3.78)
HerfindahlIndex	0.226 *	0.314 **
	(1.74)	(2.36)
*HighOperIncInd * LowTobinsQInd*	0.168 ***	0.163 **
	(2.68)	(2.53)
*LowOperIncInd * HighTobinsQInd*	-0.12	-0.139 *
	(-1.45)	(-1.66)
*HighHerfindahlInd * LowTobinsQInd*	-0.12 *	-0.133 **
	(-1.87)	(-2.05)
Leverage		0.423 ***
		(3.9)
ChROA		0.109
		(0.76)
ChSales		-0.053
		(-0.88)
Age		-0.009 ***
		(-4.8)
Number of non-LBOs	33,897	33,897
Number of LBOs	317	317
$\chi 2$	165.64	208.73
Pseudo R-squared	0.046	0.058

Table 5
Univariate Tests of Pre-Interest ROS.

This table tests for changes in *PreInterestROS* using t-tests and Wilcoxon rank tests. Panel A presents the changes for all LBO firms. Panel B presents the changes for high profit LBO firms, Panel C presents the changes for low profit LBO firms and Panel D presents the changes for loss LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. High (low) profit LBO firms have above (below) median positive *PreInterestROS*. Year t represents the LBO year. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

		Change in *PreInterestROS*					
Panel A, All LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	0.021	0.011	0.002	0.019	0.014	0.006
	Median	0.006	0.005	0.001	0.006	0.005	0.001
	N	304	299	236	278	273	215
Industry-adjusted	Mean	0.038 ***	0.023 *	0.002	0.041 **	0.029 **	0.014
	Median	0.012 ***	0.006 **	0.002	0.017 ***	0.010 *	0.007
	N	304	299	236	278	273	215
Propensity-adjusted	Mean	0.002	-0.003	0.007	-0.014	-0.021 *	-0.006
	Median	0.004	0.012	0.025	0.000	0.008	0.021
	N	316	316	248	287	287	225
Performance level-adjusted	Mean	0.000	0.036 ***	0.017	-0.001	0.040 **	0.014
	Median	0.012 *	0.019 **	0.018 *	0.007 **	0.014 *	0.013 **
	N	286	282	208	266	262	191
Panel B, High Profit LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	-0.080 ***	-0.102 ***	-0.099 ***	-0.018	-0.029	-0.042 *
	Median	-0.039 ***	-0.064 ***	-0.060 ***	-0.003	-0.027 **	-0.024 **
	N	121	118	89	109	106	79
Industry-adjusted	Mean	-0.040 *	-0.076 ***	-0.089 ***	0.026	0.003	-0.019
	Median	-0.046	-0.081 ***	-0.070 ***	0.026 **	-0.009	0.002
	N	121	118	89	109	106	79
Propensity-adjusted	Mean	-0.085 **	-0.070 **	-0.041 *	-0.061	-0.033	-0.025
	Median	-0.029 ***	-0.035 ***	-0.020 ***	-0.029	-0.035	-0.020
	N	115	113	89	102	100	79
Performance level-adjusted	Mean	-0.012	0.034	0.012	-0.017	0.051 *	0.012
	Median	0.017	0.009	0.000	0.016	0.007	-0.001
	N	116	113	79	106	103	70

Table 5 (continued)
Univariate Tests of Pre-Interest ROS.

This table tests for changes in *PreInterestROS* using t-tests and Wilcoxon rank tests. Panel A presents the changes for all LBO firms. Panel B presents the changes for high profit LBO firms, Panel C presents the changes for low profit LBO firms and Panel D presents the changes for loss LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. High (low) profit LBO firms have above (below) median positive *PreInterestROS*. Year t represents the LBO year. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

		Change in *PreInterestROS*					
Panel C, Low Profit LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	0.021 *	0.027 **	0.015	0.015	0.020	0.009
	Median	0.003	0.007	0.001	0.006	0.009	0.004
	N	120	119	104	110	109	95
Industry-adjusted	Mean	0.026 **	0.034 ***	0.018	0.026	0.031 *	0.018
	Median	0.017 ***	0.013 ***	0.012	0.018	0.013 **	0.013 *
	N	120	119	104	110	109	95
Propensity-adjusted	Mean	0.015	0.037	0.017	-0.024	0.004	-0.031
	Median	0.025	0.018	0.031	0.014	0.007	0.020
	N	118	118	103	109	109	95
Performance level-adjusted	Mean	0.008	0.024	0.019	0.012	0.023	0.031 *
	Median	0.009	0.017 **	0.027 **	0.003	0.011	0.021 **
	N	117	116	94	110	109	88
Panel D, Loss LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	0.214 ***	0.199 ***	0.181 ***	0.096 **	0.083 ***	0.090 *
	Median	0.118 ***	0.127 ***	0.118 ***	0.016	0.025 *	0.015
	N	63	62	43	59	58	41
Industry-adjusted	Mean	0.212 ***	0.190 ***	0.153 ***	0.095 *	0.074 **	0.066
	Median	0.127 ***	0.132 ***	0.129 ***	0.015	0.020	0.017
	N	63	62	43	59	58	41
Propensity-adjusted	Mean	0.169 **	0.153 **	0.024	0.093	0.076	0.010
	Median	0.113 ***	0.117 ***	0.120 **	-0.010	-0.007	-0.004
	N	61	60	41	56	55	38
Performance level-adjusted	Mean	0.010	0.066 *	0.023	0.006	0.056	-0.030
	Median	0.014	0.026 *	0.010	-0.012	0.000	-0.016
	N	53	53	35	50	50	33

Table 6
Univariate Tests of Pre-Interest ROA.

This table tests for changes in *PreInterestROA* using t-tests and Wilcoxon rank tests. Panel A presents the changes for all LBO firms. Panel B presents the changes for high profit LBO firms, Panel C presents the changes for low profit LBO firms and Panel D presents the changes for loss LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. High (low) profit LBO firms have above (below) median positive *PreInterestROA*. Year t represents the LBO year. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

		Change in *PreInterestROA*					
Panel A, All LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	0.008	0.002	0.000	-0.001	-0.007	-0.001
	Median	-0.007	-0.007	0.001	-0.002	-0.002	0.006 **
	N	317	317	249	288	288	226
Industry-adjusted	Mean	0.018 **	0.011	0.008	0.013 **	0.005	0.012
	Median	0.006 ***	0.006 **	0.011	0.012 ***	0.012 ***	0.017 ***
	N	317	317	249	288	288	226
Propensity-adjusted	Mean	-0.002	0.007	-0.011	-0.033	-0.017	-0.047
	Median	0.011	0.009	0.020	-0.002	-0.004	0.007
	N	292	288	228	267	263	208
Performance level-adjusted	Mean	0.003	0.006	-0.007	0.013	0.013	0.006
	Median	-0.002	-0.002	0.003	0.006 *	0.006	0.011
	N	302	302	213	277	277	194
Panel B, High Profit LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	-0.045 ***	-0.055 ***	-0.064 ***	-0.010	-0.023 **	-0.016
	Median	-0.038 ***	-0.045 ***	-0.032 ***	-0.002	-0.010	0.003
	N	125	125	96	110	110	84
Industry-adjusted	Mean	-0.031 ***	-0.037 ***	-0.048 ***	0.009	-0.002	0.005
	Median	-0.029	-0.034 ***	-0.030 **	0.003 **	-0.002	0.002
	N	125	125	96	110	110	84
Propensity-adjusted	Mean	-0.042 ***	-0.049 ***	-0.045 **	-0.020	-0.031	-0.010
	Median	-0.040	-0.039	-0.017 *	-0.030	-0.028	-0.006
	N	125	125	96	110	110	84
Performance level-adjusted	Mean	-0.006	0.004	0.001	0.021	0.028	0.035
	Median	-0.006	-0.006	0.007	0.013 *	0.013 *	0.026
	N	124	124	88	109	109	76

Table 6 (continued)
Univariate Tests of Pre-Interest ROA.

This table tests for changes in *PreInterestROA* using t-tests and Wilcoxon rank tests. Panel A presents the changes for all LBO firms. Panel B presents the changes for high profit LBO firms, Panel C presents the changes for low profit LBO firms and Panel D presents the changes for loss LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. High (low) profit LBO firms have above (below) median positive *PreInterestROA*. Year t represents the LBO year. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

		Change in *PreInterestROA*					
Panel C, Low Profit LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	-0.001	0.000	-0.002	-0.002	-0.001	0.000
	Median	-0.001	-0.002	0.007	-0.003	-0.003	0.006
	N	125	125	106	116	116	97
Industry-adjusted	Mean	0.011	0.007	0.004	0.016 *	0.013	0.016
	Median	0.015 ***	0.011 ***	0.011	0.026 ***	0.023 **	0.023 **
	N	125	125	106	116	116	97
Propensity-adjusted	Mean	0.000	0.003	0.018	-0.017	-0.015	-0.002
	Median	0.007	0.018	0.028 **	0.007	0.018	0.028
	N	125	125	106	116	116	97
Performance level-adjusted	Mean	-0.008	-0.003	-0.014	0.007	0.013	0.010
	Median	-0.009	-0.003	-0.001	-0.003	0.003	0.005
	N	122	122	91	116	116	86
Panel D, Loss LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	0.122 ***	0.111 ***	0.136 ***	0.020	0.009	0.023
	Median	0.046 ***	0.058 ***	0.051 ***	0.002 *	0.015 **	0.008 **
	N	67	67	47	62	62	45
Industry-adjusted	Mean	0.124 ***	0.110 ***	0.134 ***	0.017	0.003	0.015
	Median	0.067 ***	0.067 ***	0.066 ***	0.009 *	0.008	0.008 **
	N	67	67	47	62	62	45
Propensity-adjusted	Mean	0.087 ***	0.071 ***	0.093 ***	0.003	-0.013	-0.007
	Median	0.060 ***	0.078 ***	0.080 ***	-0.011	0.007	0.009
	N	66	66	46	61	61	44
Performance level-adjusted	Mean	0.046 *	0.027	-0.009	0.006	-0.018	-0.074
	Median	0.022 *	0.002	-0.027	-0.019	-0.038	-0.068
	N	56	56	34	52	52	32

Table 7
Univariate Tests of Pre-Interest EVA.

This table tests for changes in *PreInterestEVA* using t-tests and Wilcoxon rank tests. Panel A presents the changes for all LBO firms. Panel B presents the changes for high profit LBO firms, Panel C presents the changes for low profit LBO firms and Panel D presents the changes for loss LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. High (low) profit LBO firms have above (below) median positive *PreInterestROA*. Year t represents the LBO year. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

		Change in *PreInterestEVA*					
Panel A, All LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	-0.006	-0.001	-0.014	-0.013 *	-0.006	-0.016
	Median	0.001	0.009	0.000	0.002	0.008	0.008
	N	314	314	246	286	286	224
Industry-adjusted	Mean	0.005	0.019 **	0.004	0.005	0.014	0.006
	Median	0.011 **	0.023 ***	0.011	0.015 **	0.023 ***	0.025 ***
	N	314	314	246	286	286	224
Propensity-adjusted	Mean	-0.003	0.002	0.014	-0.034 ***	-0.032 ***	-0.026
	Median	-0.010	0.004	0.007	-0.023 ***	-0.019 **	0.005
	N	314	314	246	286	286	224
Performance level-adjusted	Mean	-0.013	0.002	-0.019	-0.013	-0.001	-0.022
	Median	-0.010	-0.001	-0.003	-0.004	0.000	0.003
	N	300	300	211	276	276	193
Panel B, High Profit LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	-0.058 ***	-0.061 ***	-0.072 ***	-0.026 **	-0.029 **	-0.034 **
	Median	-0.032 ***	-0.039 ***	-0.041 ***	0.002	-0.006	-0.009
	N	125	125	96	110	110	84
Industry-adjusted	Mean	-0.041 ***	-0.039 ***	-0.046 ***	-0.006	-0.007	-0.001
	Median	-0.011 *	-0.012	-0.026 *	0.015	0.022 *	0.021
	N	125	125	96	110	110	84
Propensity-adjusted	Mean	-0.063 ***	-0.057 ***	-0.057 **	-0.061 ***	-0.058 ***	-0.060 **
	Median	-0.052 ***	-0.044 ***	-0.057 **	-0.033 ***	-0.024 **	-0.018
	N	125	125	96	110	110	84
Performance level-adjusted	Mean	-0.039 ***	-0.022 ***	-0.038 ***	-0.028	-0.021	-0.024
	Median	-0.027 *	-0.022	-0.013 *	0.002	-0.002 *	0.007
	N	124	124	88	109	109	76

Table 7 (continued)
Univariate Tests of Pre-Interest EVA.

This table tests for changes in *PreInterestEVA* using t-tests and Wilcoxon rank tests. Panel A presents the changes for all LBO firms. Panel B presents the changes for high profit LBO firms, Panel C presents the changes for low profit LBO firms and Panel D presents the changes for loss LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. High (low) profit LBO firms have above (below) median positive *PreInterestROA*. Year t represents the LBO year. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

		Change in *PreInterestEVA*					
Panel C, Low Profit LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	-0.014 *	0.003	-0.010	-0.015 *	0.001	-0.008
	Median	0.000	0.012	0.008	-0.007	0.007	0.008
	N	124	124	105	116	116	97
Industry-adjusted	Mean	0.000	0.023 **	0.004	0.009	0.027 **	0.014
	Median	0.016 *	0.023 ***	0.011	0.014	0.027 ***	0.024
	N	124	124	105	116	116	97
Propensity-adjusted	Mean	-0.003	0.009	0.036 *	-0.033 **	-0.025	0.003
	Median	-0.001	0.017	0.031 *	-0.020 *	-0.017	0.009
	N	124	124	105	116	116	97
Performance level-adjusted	Mean	-0.022 **	0.001	-0.009	-0.013	0.008	0.004
	Median	-0.012	0.003	0.000	-0.006	0.000	0.008
	N	121	121	90	116	116	86
Panel D, Loss LBO firms		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	0.108 ***	0.105 ***	0.102 ***	0.018	0.020	0.000
	Median	0.081 ***	0.090 ***	0.102 ***	0.015 *	0.018 *	0.032 *
	N	65	65	45	60	60	43
Industry-adjusted	Mean	0.104 ***	0.125 ***	0.112 ***	0.020	0.026	0.001
	Median	0.085 ***	0.116 ***	0.097 ***	0.018	0.033	0.054
	N	65	65	45	60	60	43
Propensity-adjusted	Mean	0.114 ***	0.104 ***	0.114 ***	0.013	0.001	-0.025
	Median	0.081 ***	0.069 ***	0.075 **	0.009	0.001	0.024
	N	65	65	45	60	60	43
Performance level-adjusted	Mean	0.068 ***	0.057 **	0.004	0.016	0.021	-0.090
	Median	0.022 **	0.019	0.000	0.000	0.000	-0.002
	N	55	55	33	51	51	31

Table 8

Univariate Tests of Pre-Interest ROS for LBO firms with post-LBO public data and without post-LBO public data.

This table tests for changes in *PreInterestROS* using t-tests and Wilcoxon rank tests. Panel A presents the changes for LBO firms which continue filing public financial statements post-LBO and Panel B presents the changes for LBO firms which do not file public financial statements post-LBO. Year t represents the LBO year. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

		Change in *PreInterestROS*					
Panel A, LBO firms with public data		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	0.047	0.034	0.036	0.053	0.038	0.025
	Median	0.015 *	0.031 **	0.028	0.006	0.022 *	0.019
	N	70	70	60	64	64	54
Industry-adjusted	Mean	0.070 **	0.057 **	0.049 **	0.086 **	0.070 ***	0.047 *
	Median	0.025 **	0.039 ***	0.041	0.028 **	0.042 ***	0.044 **
	N	70	70	60	64	64	54
Propensity-adjusted	Mean	-0.026	-0.028	0.042	-0.100	-0.086	-0.058
	Median	0.026	0.037	0.039	-0.009	0.002	0.004
	N	68	68	58	61	61	51
Performance level-adjusted	Mean	0.031	0.090 ***	0.071 ***	0.005	0.064 **	0.035
	Median	0.019 ***	0.041 ***	0.059 **	0.002 **	0.024 **	0.042 ***
	N	68	68	54	63	63	49
Panel B, LBO firms without public data		t-1 to t+1	t-1 to t+2	t-1 to t+3	t-2 to t+1	t-2 to t+2	t-2 to t+3
Unadjusted	Mean	0.013	0.005	-0.009	0.010	0.007	-0.001
	Median	0.005	-0.002	-0.012	0.008	0.001	-0.008
	N	234	229	176	214	209	161
Industry-adjusted	Mean	0.029 *	0.012	-0.014	0.027	0.017	0.002
	Median	0.008 **	-0.003	-0.002	0.012 *	0.002	0.002
	N	234	229	176	214	209	161
Propensity-adjusted	Mean	0.006	0.017	-0.029	-0.013	0.004	-0.044
	Median	0.010	0.003	0.006	-0.005	-0.012	-0.010
	N	224	220	170	206	202	157
Performance level-adjusted	Mean	-0.001	0.024	-0.003	0.001	0.034 *	0.006
	Median	0.008	0.012	0.000	0.007	0.011	-0.001
	N	215	211	152	200	196	140

Table 9
Multivariate Analysis of Pre-Interest ROS, Pre-Interest ROA and Pre-Interest EVA.

This table presents multivariate regression results for *PreInterestROS*, *PreInterestROA* and *PreInterestEVA* for the time period year t-1 to year t+2 for all LBO firms. Year t represents the LBO year. All three performance measures are adjusted by the performance of a performance match firm. t-statistics are reported in parentheses. See Appendix for variable definitions.

Variable Name	Pre-Interest ROS t-1 to t+2	Pre-Interest ROS t-1 to t+2	Pre-Interest ROA t-1 to t+2	Pre-Interest ROA t-1 to t+2	Pre-Interest EVA t-1 to t+2	Pre-Interest EVA t-1 to t+2
Intercept	0.100	0.111	-0.100	-0.061	-0.130	-0.121
	(0.27)	(0.30)	(-0.21)	(-0.12)	(-0.56)	(-0.54)
PriorProfitIndicator	**-0.078**	**-0.078**	-0.064	-0.030	**-0.069**	**-0.050**
	(-1.94)	**(-1.76)**	(-1.30)	(-0.54)	**(-2.84)**	**(-2.01)**
PreLBOLeverage	0.074	0.073	0.066	0.136	0.051	0.080
	(1.41)	(1.25)	(1.03)	(1.89)	(1.62)	(2.42)
ScaledChDebt	0.000	0.000	0.000	0.000	0.000	0.000
	(-0.03)	(0.25)	(-0.65)	(0.01)	(0.59)	(1.21)
MngtTurnoverIndicator	0.013	-0.028	-0.001	-0.025	0.016	0.010
	(0.28)	(-0.57)	(-0.02)	(-0.39)	(0.57)	(0.35)
ClubDealIndicator	0.006	0.000	0.048	0.044	0.021	0.020
	(0.16)	(0.00)	(1.04)	(0.88)	(0.93)	(0.86)
ln(*TransValue*)	0.011	0.016	-0.007	-0.010	-0.015	-0.014
	(0.79)	(1.07)	(-0.45)	(-0.54)	(-1.77)	(-1.69)
ManagementBuyout	-0.050	-0.290	0.051	0.013	-0.029	-0.117
	(-1.01)	(-1.16)	(0.81)	(0.04)	(-0.91)	(-0.79)
PensionFunding	0.001	0.001	0.000	0.000	-0.001	0.000
	(0.97)	(1.14)	(-0.21)	(0.19)	(-0.98)	(-0.59)
AcquirerAge		0.000		0.001		0.000
		(0.13)		(0.44)		(-0.16)
PublicIndicator	0.064	0.057	0.051	0.042	0.027	0.027
	(1.57)	(1.32)	(1.00)	(0.76)	(1.06)	(1.08)
Year Indicators	Yes	Yes	Yes	Yes	Yes	Yes
Industry Indicators	Yes	Yes	Yes	Yes	Yes	Yes
N	279	238	301	260	300	260
R-Squared	0.1371	0.1733	0.0578	0.0662	0.1247	0.1506

Table 10
Trends in Sales and Assets.

This table presents trends in *Sales* and *Assets*. Panel A provides the trend in *Sales* for all LBO firms. Panel B (Panel C) provides the trend in *Sales* for the profit (loss) LBO firms. Panel D provides the trend in *TotalAssets* for all LBO firms. Panel E (Panel F) provides the trend in *TotalAssets* for the profit (loss) LBO firms. Profit (loss) LBO firms record positive (negative) *PreInterestIncome* in year t-1. The LBO year (year t) is shaded. See Appendix for variable definitions.

Panel A, Trend in Sales for All LBO firms

	N	Mean	SD	Q1	Median	Q3
$Sales_{t-2}$	288	613.661	1058.498	106.229	228.152	520.770
$Sales_{t-1}$	317	604.174	1101.662	88.997	220.685	472.893
$Sales_{t}$	317	518.194	911.550	53.924	192.500	450.953
$Sales_{t+1}$	317	563.339	918.003	69.697	210.989	512.101
$Sales_{t+2}$	317	641.292	1041.782	80.010	245.573	586.867
$Sales_{t+3}$	248	560.723	816.559	77.922	243.993	545.507

Panel B, Trend in Sales for Profit LBO firms

	N	Mean	SD	Q1	Median	Q3
$Sales_{t-2}$	226	669.713	1117.915	122.673	229.918	594.047
$Sales_{t-1}$	250	692.122	1171.011	109.991	238.313	590.633
$Sales_{t}$	250	593.630	994.791	60.515	220.230	548.170
$Sales_{t+1}$	250	610.219	959.943	90.727	239.872	550.471
$Sales_{t+2}$	250	710.860	1099.879	105.443	277.877	683.603
$Sales_{t+3}$	201	614.388	849.699	112.032	293.093	672.098

Panel C, Trend in Sales for Loss LBO firms

	N	Mean	SD	Q1	Median	Q3
$Sales_{t-2}$	62	409.343	779.569	69.171	184.603	379.703
$Sales_{t-1}$	67	276.010	706.265	34.242	121.924	270.638
$Sales_{t}$	67	236.719	377.958	32.035	117.485	223.943
$Sales_{t+1}$	67	388.413	720.395	36.472	105.637	361.349
$Sales_{t+2}$	67	381.712	738.650	32.336	110.199	372.823
$Sales_{t+3}$	47	331.221	612.192	28.780	120.475	339.321

Panel D, Trend in Assets for All LBO firms

	N	Mean	SD	Q1	Median	Q3
$TotalAssets_{t-2}$	288	811.412	1549.669	109.121	247.348	672.908
$TotalAssets_{t-1}$	317	920.759	1903.153	92.653	253.393	729.751
$TotalAssets_{t}$	317	1336.379	2964.517	107.637	317.536	942.383
$TotalAssets_{t+1}$	317	1407.670	2858.834	112.253	341.550	1160.977
$TotalAssets_{t+2}$	317	1256.692	2333.328	114.637	302.339	1086.994
$TotalAssets_{t+3}$	248	1048.045	1984.108	99.987	256.352	823.849

Panel E, Trend in Assets for Profit LBO firms

	N	Mean	SD	Q1	Median	Q3
$TotalAssets_{t-2}$	226	895.187	1664.860	118.279	256.981	731.377
$TotalAssets_{t-1}$	250	1042.820	2078.762	119.976	264.296	872.338
$TotalAssets_{t}$	250	1450.210	3092.253	126.594	358.843	1107.603
$TotalAssets_{t+1}$	250	1541.181	2980.674	138.258	404.165	1279.722
$TotalAssets_{t+2}$	250	1381.894	2461.301	133.763	375.788	1304.727
$TotalAssets_{t+3}$	201	1128.725	2014.064	118.399	288.091	1112.456

Panel F, Trend in Assets for Loss LBO firms

	N	Mean	SD	Q1	Median	Q3
$TotalAssets_{t-2}$	62	506.039	976.863	81.078	196.970	423.113
$TotalAssets_{t-1}$	67	465.307	878.484	70.578	133.518	402.778
$TotalAssets_{t}$	67	911.639	2402.180	66.675	169.894	482.765
$TotalAssets_{t+1}$	67	909.494	2300.667	63.186	208.532	494.242
$TotalAssets_{t+2}$	67	789.523	1712.047	52.968	191.065	430.782
$TotalAssets_{t+3}$	47	703.014	1830.696	42.544	87.451	365.903

Table 11
Trends in Debt-To-Assets.

This table presents short-run and long-run trends in *DebtToAssets*. Panel A provides the short-run trend in *DebtToAssets* for all LBO firms. Panel B (Panel C) provides the short-run trend in *DebtToAssets* for excess cash flow (cash flow shortfall) LBO firms. Excess cash flow LBO firms have positive *FreeCashFlow* and cash flow shortfall LBO firms have negative *FreeCashFlow*. Panel D provides the long-run trend in *DebtToAssets* for all LBO firms. Panel E (Panel F) provides the long-run trend in *DebtToAssets* for excess cash flow (cash flow shortfall) LBO firms. The LBO year (year t) is shaded. See Appendix for variable definitions.

Panel A, Short-run trend in Debt-To-Assets for All LBO firms

	N	Mean	SD	Q1	Median	Q3
$DebtToAssets_{t-2}$	288	0.475	0.389	0.176	0.410	0.678
$DebtToAssets_{t-1}$	317	0.447	0.329	0.162	0.432	0.645
$DebtToAssets_{t}$	317	0.748	0.407	0.538	0.754	0.885
$DebtToAssets_{t+1}$	317	0.760	0.407	0.512	0.776	0.924
$DebtToAssets_{t+2}$	317	0.827	0.573	0.529	0.775	0.962

Panel B, Short-run trend in Debt-To-Assets for Excess Cash Flow LBO firms

	N	Mean	SD	Q1	Median	Q3
$DebtToAssets_{t-2}$	111	0.453	0.363	0.195	0.400	0.644
$DebtToAssets_{t-1}$	123	0.413	0.301	0.170	0.408	0.586
$DebtToAssets_{t}$	123	0.731	0.431	0.485	0.695	0.872
$DebtToAssets_{t+1}$	123	0.748	0.427	0.470	0.696	0.931
$DebtToAssets_{t+2}$	123	0.800	0.564	0.504	0.760	0.944

Panel C, Short-run trend in Debt-To-Assets for Cash Flow Shortfall LBO firms

	N	Mean	SD	Q1	Median	Q3
$DebtToAssets_{t-2}$	177	0.488	0.405	0.156	0.417	0.706
$DebtToAssets_{t-1}$	194	0.468	0.344	0.142	0.441	0.677
$DebtToAssets_{t}$	194	0.758	0.392	0.560	0.775	0.890
$DebtToAssets_{t+1}$	194	0.767	0.395	0.532	0.787	0.924
$DebtToAssets_{t+2}$	194	0.845	0.580	0.560	0.776	0.964

Panel D, Long-run trend in Debt-To-Assets for All LBO firms

	N	Mean	SD	Q1	Median	Q3
$DebtToAssets_{t-2}$	138	0.343	0.260	0.128	0.332	0.496
$DebtToAssets_{t-1}$	153	0.363	0.282	0.112	0.366	0.541
$DebtToAssets_{t}$	153	0.789	0.459	0.537	0.748	0.899
$DebtToAssets_{t+1}$	153	0.747	0.424	0.486	0.746	0.924
$DebtToAssets_{t+2}$	153	0.858	0.568	0.570	0.790	0.990
$DebtToAssets_{t+3}$	153	0.841	0.583	0.502	0.749	1.023
$DebtToAssets_{t+4}$	153	0.873	0.507	0.622	0.809	1.085
$DebtToAssets_{t+5}$	153	0.839	0.571	0.562	0.827	1.116

Panel E, Long-run trend in Debt-to-Assets for Excess Cash Flow LBO firms

	N	Mean	SD	Q1	Median	Q3
$DebtToAssets_{t-2}$	65	0.348	0.244	0.131	0.362	0.522
$DebtToAssets_{t-1}$	71	0.335	0.242	0.094	0.362	0.516
$DebtToAssets_{t}$	71	0.785	0.480	0.527	0.695	0.895
$DebtToAssets_{t+1}$	71	0.755	0.437	0.488	0.673	0.924
$DebtToAssets_{t+2}$	71	0.824	0.560	0.518	0.788	0.973
$DebtToAssets_{t+3}$	71	0.832	0.578	0.563	0.745	1.023
$DebtToAssets_{t+4}$	71	0.852	0.525	0.564	0.822	1.085
$DebtToAssets_{t+5}$	71	0.837	0.470	0.516	0.816	1.103

Panel F, Long-run trend in Debt-to-Assets for Cash Flow Shortfall LBO firms

	N	Mean	SD	Q1	Median	Q3
$DebtToAssets_{t-2}$	73	0.339	0.274	0.095	0.298	0.488
$DebtToAssets_{t-1}$	82	0.387	0.311	0.112	0.373	0.563
$DebtToAssets_{t}$	82	0.791	0.443	0.537	0.774	0.915
$DebtToAssets_{t+1}$	82	0.740	0.416	0.450	0.778	0.931
$DebtToAssets_{t+2}$	82	0.888	0.577	0.590	0.799	1.020
$DebtToAssets_{t+3}$	82	0.849	0.591	0.469	0.767	1.068
$DebtToAssets_{t+4}$	82	0.890	0.494	0.630	0.802	1.118
$DebtToAssets_{t+5}$	82	0.841	0.648	0.562	0.852	1.137

Table 12
Univariate Tests of Trends in Leverage.

This table tests for changes in leverage using t-tests and Wilcoxon rank tests. Panel A presents the changes for all LBO firms. Panel B (Panel C) presents the changes for excess cash flow (cash flow shortfall) LBO firms. Excess cash flow LBO firms have positive *FreeCashFlow* and cash flow shortfall LBO firms have negative *FreeCashFlow*. Year t represents the LBO year. Asterisks *, **, *** denote two-tailed statistical significance at 10%, 5%, and 1%, respectively. See Appendix for variable definitions.

		Change in Leverage							
Panel A, All LBO firms		t to t+2		t to t+3		t to t+4		t to t+5	
DebtToAssets	Mean	0.080	**	0.032		0.068		0.051	
	Median	0.021		-0.004		0.055	*	0.074	
DebtAs%ofYearTDebt	Mean	0.292	***	0.372	***	0.648	***	0.756	***
	Median	0.007		0.005		0.074	*	0.088	
Panel B, Excess Cash Flow LBO firms		t to t+2		t to t+3		t to t+4		t to t+5	
DebtToAssets	Mean	0.068		0.036		0.062		0.052	
	Median	0.065		0.056		0.119		0.121	
DebtAs%ofYearTDebt	Mean	0.298	**	0.503	**	0.674	***	0.625	**
	Median	0.006		0.049		0.055		0.028	
Panel C, Cash Flow Shortfall LBO firms		t to t+2		t to t+3		t to t+4		t to t+5	
DebtToAssets	Mean	0.087	**	0.030		0.074		0.050	
	Median	0.001		-0.032		0.034		0.077	*
DebtAs%ofYearTDebt	Mean	0.288	***	0.285	**	0.625	***	0.869	**
	Median	0.009		-0.034		0.083		0.143	*

Table 13
Multivariate Analysis of Changes in Leverage.

This table presents multivariate regression results for the changes in *DebtToAssets* and *DebtAs%ofYearTDebt* for all LBO firms. Year t represents the LBO year. t-statistics are reported in parentheses. See Appendix for variable definitions.

Variable Name	*DebtToAssets* t to t+2	*DebtToAssets* t to t+2	*DebtAs%of YearTDebt* t to t+2	*DebtAs%of YearTDebt* t to t+2	*DebtToAssets* t to t+5	*DebtToAssets* t to t+5	*DebtAs%of YearTDebt* t to t+5	*DebtAs%of YearTDebt* t to t+5
Intercept	0.127	0.252	0.104	0.296	0.042	0.872	2.450	7.293
	(0.55)	(1.03)	(0.18)	(0.52)	(0.06)	(1.13)	(0.79)	(1.53)
ExcessCFIndicator	-0.103	-0.099	-0.191	-0.227	0.052	-0.111	-0.706	-2.216
	(-1.65)	(-1.46)	(-1.26)	(-1.44)	(0.37)	(-0.49)	(-1.12)	(-1.58)
PreLBOLeverage	0.01	-0.114	0.075	-0.343	-0.076	-0.365	-0.862	-1.029
	(0.10)	(-0.96)	(0.30)	(-1.26)	(-0.28)	(-0.91)	(-0.72)	(-0.41)
ln(*ChSales*)	0.000	0.000	0.000	0.000	0.000	**-0.213**	**-0.400**	**-1.279**
	(0.58)	(1.18)	(-0.12)	(0.41)	(0.00)	**(-2.18)**	**(-1.90)**	**(-2.12)**
ChAssetTangibility	0.577	0.005	0.930	-0.226	**1.821**	0.684	**5.404**	12.206
	(1.51)	(0.01)	(1.00)	(-0.22)	**(2.63)**	(0.37)	**(1.76)**	(1.06)
ChIndMedianLeverage	**0.494**	**0.751**	0.690	**1.902**	0.025	**-0.906**	0.998	-0.718
	(2.32)	**(3.43)**	(1.33)	**(3.76)**	(0.06)	**(-1.92)**	(0.59)	(-0.25)
ChBondYieldSpread	**0.099**	**0.108**	**0.232**	**0.233**	-0.033	0.000	0.119	0.997
	(2.35)	**(2.10)**	**(2.26)**	**(1.97)**	(-0.24)	(0.00)	(0.20)	(0.63)
PublicUnratedDebtIndicator		-0.075		-0.108		-0.316		0.596
		(-0.96)		(-0.60)		(-1.07)		(0.33)
PublicRatedDebtIndicator		-0.138		-0.160		-0.359		0.137
		(-1.57)		(-0.78)		(-1.38)		(0.09)
CumulativePayment%toT+k		-0.086		0.218		-0.160		0.538
		(-0.08)		(0.09)		(-0.25)		(0.13)
Year Indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	314	179	314	179	99	42	99	42
Adjusted R-Squared	0.1202	0.2192	0.1265	0.1803	0.0252	0.2118	0.0014	-0.0479

Table 14
Analysis of Contributions by Equityholders.

This table presents the cash contributions made by equityholders from year t-1 to year t+3 for LBO firms with non-missing contributions from year t to year t+2. Panel A provides the cash contributions for all LBO firms. Panel B (Panel C) provides the cash contributions for excess cash flow (cash flow shortfall) LBO firms. Excess cash flow LBO firms have positive *FreeCashFlow* and cash flow shortfall LBO firms have negative *FreeCashFlow*. Panel D provides the cash contributions scaled by *TransValue* for all LBO firms. Panel E (Panel F) provides the cash contributions scaled by *TransValue* for excess cash flow (cash flow shortfall) LBO firms. Year t represents the LBO year. See Appendix for variable definitions.

Panel A, Contributions (in $millions) for All LBO firms

	N	Mean	SD	P10	Q1	Median	Q3	P90
Contributions $_{t-1}$	51	55.31	163.95	0.00	0.00	2.88	26.32	121.27
Contributions $_{t}$	68	248.97	662.48	0.00	0.00	2.97	126.50	828.69
Contributions $_{t+1}$	68	373.45	1,745.54	0.00	0.00	2.48	24.98	372.02
Contributions $_{t+2}$	68	197.54	1,464.53	0.00	0.00	1.27	9.23	68.52
Contributions $_{t+3}$	33	5.76	12.08	0.00	0.00	0.40	3.59	20.18

Panel B, Distributions (in $millions) for Excess Cash Flow LBO firms

	N	Mean	SD	P10	Q1	Median	Q3	P90
Contributionst-1	12	150.40	312.50	2.83	3.33	10.14	56.17	739.72
Contributionst	20	344.67	871.27	0.00	0.00	14.08	143.52	1,371.54
Contributionst+1	20	18.90	50.44	0.00	0.00	2.04	7.79	55.18
Contributionst+2	20	28.16	59.81	0.00	0.00	1.45	10.49	140.86
Contributionst+3	6	0.81	1.45	0.00	0.00	0.00	1.28	3.59

Panel C, Contributions (in $millions) for Cash Flow Shortfall LBO firms

	N	Mean	SD	P10	Q1	Median	Q3	P90
Contributionst-1	39	26.06	58.02	0.00	0.00	0.71	23.03	121.27
Contributionst	48	209.09	559.68	0.00	0.00	0.66	125.41	828.69
Contributionst+1	48	521.17	2,065.59	0.00	0.00	2.87	75.52	1,152.85
Contributionst+2	48	268.12	1,743.22	0.00	0.00	1.19	9.23	60.37
Contributionst+3	27	6.86	13.12	0.00	0.00	0.94	5.30	32.00

Panel D, Contributions for All LBO firms scaled by Transaction Value

	N	Mean	SD	P10	Q1	Median	Q3	P90
Contributionst-1	51	0.0371	0.1209	0.0000	0.0000	0.0058	0.0209	0.0501
Contributionst	68	0.1204	0.3559	0.0000	0.0000	0.0075	0.1266	0.3048
Contributionst+1	68	0.0855	0.2076	0.0000	0.0000	0.0021	0.0353	0.2996
Contributionst+2	68	0.0266	0.0857	0.0000	0.0000	0.0018	0.0092	0.0698
Contributionst+3	33	0.0561	0.2954	0.0000	0.0000	0.0007	0.0025	0.0121

Panel E, Contributions for Excess Cash Flow LBO firms scaled by Transaction Value

	N	Mean	SD	P10	Q1	Median	Q3	P90
Contributionst-1	12	0.0537	0.1293	0.0033	0.0065	0.0151	0.0345	0.0373
Contributionst	20	0.1263	0.1795	0.0000	0.0000	0.0451	0.1721	0.4203
Contributionst+1	20	0.0426	0.1078	0.0000	0.0000	0.0018	0.0147	0.1544
Contributionst+2	20	0.0168	0.0363	0.0000	0.0000	0.0026	0.0074	0.0594
Contributionst+3	6	0.0121	0.0286	0.0000	0.0000	0.0000	0.0021	0.0703

Panel F, Contributions for Cash Flow Shortfall LBO firms scaled by Transaction Value

	N	Mean	SD	P10	Q1	Median	Q3	P90
Contributionst-1	39	0.0320	0.1194	0.0000	0.0000	0.0028	0.0185	0.0655
Contributionst	48	0.1180	0.4093	0.0000	0.0000	0.0030	0.0732	0.2855
Contributionst+1	48	0.1034	0.2358	0.0000	0.0000	0.0037	0.1033	0.3012
Contributionst+2	48	0.0307	0.0994	0.0000	0.0000	0.0012	0.0101	0.0698
Contributionst+3	27	0.0659	0.3267	0.0000	0.0000	0.0009	0.0049	0.0121

Table 15
Analysis of Distributions to Equityholders.

This table presents the cash distributions made to equityholders from year t-1 to year t+3 for LBO firms with non-missing distributions from year t to year t+2. Panel A provides the cash distributions for all LBO firms. Panel B (Panel C) provides the cash distributions for excess cash flow (cash flow shortfall) LBO firms. Excess cash flow LBO firms have positive *FreeCashFlow* and cash flow shortfall LBO firms have negative *FreeCashFlow*. Panel D provides the cash distributions scaled by *TransValue* for all LBO firms. Panel E (Panel F) provides the cash distributions scaled by *TransValue* for excess cash flow (cash flow shortfall) LBO firms. Year t represents the LBO year. See Appendix for variable definitions.

Panel A, Distributions (in $millions) for All LBO firms

	N	Mean	SD	P10	Q1	Median	Q3	P90
Distributions $_{t-1}$	49	65.39	288.71	0.00	0.00	0.00	15.71	65.40
Distributions $_{t}$	63	30.80	95.39	0.00	0.00	0.00	2.76	73.33
Distributions $_{t+1}$	63	37.70	233.42	0.00	0.00	0.00	0.00	6.50
Distributions $_{t+2}$	63	12.63	45.94	0.00	0.00	0.00	0.00	19.48
Distributions $_{t+3}$	28	54.24	136.30	0.00	0.00	0.79	40.90	253.24

Panel B, Distributions (in $millions) for Excess Cash Flow LBO firms

	N	Mean	SD	P10	Q1	Median	Q3	P90
Distributions $_{t-1}$	12	34.93	78.66	0.00	0.00	0.23	39.55	65.40
Distributions $_{t}$	21	9.57	34.67	0.00	0.00	0.00	0.00	0.00
Distributions $_{t+1}$	21	2.28	6.53	0.00	0.00	0.00	0.00	6.50
Distributions $_{t+2}$	21	6.70	20.00	0.00	0.00	0.00	0.00	19.42
Distributions $_{t+3}$	8	34.70	97.87	0.00	0.00	0.00	0.33	276.92

Panel C, Distributions (in $millions) for Cash Flow Shortfall LBO firms

	N	Mean	SD	P10	Q1	Median	Q3	P90
Distributions $_{t-1}$	37	75.26	329.91	0.00	0.00	0.00	15.71	56.75
Distributions $_{t}$	42	41.42	113.26	0.00	0.00	0.00	23.52	91.01
Distributions $_{t+1}$	42	55.41	285.31	0.00	0.00	0.00	0.00	2.07
Distributions $_{t+2}$	42	15.59	54.49	0.00	0.00	0.00	0.00	26.07
Distributions $_{t+3}$	20	62.05	150.48	0.00	0.00	2.62	52.28	170.93

Panel D, Distributions for All LBO firms scaled by Transaction Value

	N	Mean	SD	P10	Q1	Median	Q3	P90
Distributions $_{t-1}$	49	0.0044	0.0093	0.0000	0.0000	0.0000	0.0056	0.0204
Distributions $_{t}$	63	0.0154	0.0554	0.0000	0.0000	0.0000	0.0018	0.0358
Distributions $_{t+1}$	63	0.0060	0.0368	0.0000	0.0000	0.0000	0.0000	0.0006
Distributions $_{t+2}$	63	0.0169	0.0832	0.0000	0.0000	0.0000	0.0000	0.0168
Distributions $_{t+3}$	28	0.0103	0.0159	0.0000	0.0000	0.0002	0.0204	0.0435

Panel E, Distributions for Excess Cash Flow LBO firms scaled by Transaction Value

	N	Mean	SD	P10	Q1	Median	Q3	P90
Distributions $_{t-1}$	12	0.0021	0.0032	0.0000	0.0000	0.0002	0.0042	0.0074
Distributions $_{t}$	21	0.0003	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000
Distributions $_{t+1}$	21	0.0015	0.0047	0.0000	0.0000	0.0000	0.0000	0.0005
Distributions $_{t+2}$	21	0.0343	0.1384	0.0000	0.0000	0.0000	0.0000	0.0177
Distributions $_{t+3}$	8	0.0011	0.0030	0.0000	0.0000	0.0000	0.0001	0.0084

Panel F, Distributions for Cash Flow Shortfall LBO firms scaled by Transaction Value

	N	Mean	SD	P10	Q1	Median	Q3	P90
Distributions $_{t-1}$	37	0.0052	0.0105	0.0000	0.0000	0.0000	0.0056	0.0213
Distributions $_{t}$	42	0.0229	0.0668	0.0000	0.0000	0.0000	0.0102	0.0700
Distributions $_{t+1}$	42	0.0082	0.0450	0.0000	0.0000	0.0000	0.0000	0.0006
Distributions $_{t+2}$	42	0.0082	0.0300	0.0000	0.0000	0.0000	0.0000	0.0113
Distributions $_{t+3}$	20	0.0140	0.0175	0.0000	0.0000	0.0022	0.0282	0.0436