THE EVOLUTION OF BUYOUT PRICING AND FINANCIAL STRUCTURE

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ABSTRACT

This paper presents evidence on systematic changes in the
pricing and financial structure of 124 large management buyouts
completed between 1980 and 1989. We find that over time: (1)
prices increased relative to current cash flows with no
accompanying decrease in risk or increase in projected future
cash flows; (2) required bank principal repayments accelerated,
leading to sharply lower ratios of cash flow to total debt
obligations; (3) private subordinated debt was replaced by public
debt while the use of strip-financing techniques declined; and
(4) management teams invested a smaller fraction of their net
worth in post-buyout equity. These patterns of buyout prices and
structures suggest that based on ex ante data, one could have
expected lower returns and more frequent financial distress in
later buyouts. Preliminary post-buyout evidence is consistent
with this interpretation.

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1.   Introduction

The value of leveraged buyouts (LBOs) grew dramatically in the 1980s, from just under $1 billion in 1980 to over $60 billion in 1988. More recently however, leverage has fallen out of favor. The value of going private transactions dropped below $20 billion in 1989 and declined even further in 1990.[1] The enormous run-up and subsequent sharp decline has been interpreted by many observers as a sign that the dealmaking pace of the late 1980s was fundamentally unsustainable, i.e., that the increase in volume came at the expense of a deterioration in transaction quality. Both academic research and press accounts have suggested that the LBOs of the early and mid-1980s generated high returns for debt and equity investors, and rarely failed to make debt payments.[2] In contrast, the LBOs of the later 1980s have drawn widespread criticism as having been unsoundly financed.[3] And, as we show below, a larger fraction of the later transactions have been unable to meet their debt service requirements.

In this paper, we examine detailed evidence from a sample of 124 large buyouts completed between 1980 and 1989. Our goal is to determine whether there were important systematic ex-ante differences between the deals done in the latter part of the decade and those done earlier. In other words, were there ex ante reasons to believe that the later deals were more likely to run into difficulties, or must any such difficulties be attributed to unforeseeable ex-post "bad luck" or poor performance?

We consider three potential sources of problems for buyout investors. The first is the overall price paid to take the company private. Regardless of the details of the capital

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[1] See W.T. Grimm's Mergerstat Review. The figures in this paragraph refer to buyouts of public companies only.

[2] See Kaplan (1989b), Smith (1990a), Smith (1990b), and the roundtable discussion (1990).

[3] See Smith (1990b); "The takeover game isn't dead, it's just gone private," Forbes, October 1, 1990, p.64; "Many firms find debt they piled on in 1980s is a cruel taskmaster," Wall Street Journal, October 9, 1990, p.a1; "Hard lessons from the debt decade," Fortune, June 18, 1990, p.76; "Leveraged buyouts fall to earth," Business Week, February 12, 1990, p.62.

structure, or the extent to which there are costs of financial distress, it is clear that investors will earn lower returns as the prices paid increase relative to the fundamental value of company assets.

A second potential source of problems is a capital structure that is poorly designed in terms of containing costs of financial distress. Even if the price paid to take a company private is a "reasonable" multiple of cash flow, a high probability of costly distress will obviously lower the prospective returns to some classes of investors. In evaluating this possibility, it is important to go beyond such aggregate measures of leverage as total debt to capital and interest coverage. While these measures can provide useful information about the likelihood that a company will be unable to meet its contractual obligations, they have much less to say about the attendant costs. In principle, very low coverage need not impose large costs as long as the debt is structured in a way that makes renegotiation frictionless. (See Jensen (1989)). Thus it is critical to focus not just on the absolute magnitude of the debt burden, but also on its contractual features -- seniority, maturity, and the division between private and public lenders. As emphasized in recent theoretical papers by Gertner and Scharfstein (1990) and Diamond (1991) the complex interaction between these features can play a key role in determining costs of financial distress.

The third and final source of potential problems concerns the incentives of buyout investors. One of the supposed spurs to improved performance in buyouts is the increased equity stake of management. Managers who invest a large portion of their wealth in and own a large percentage of post-buyout equity might be expected to manage better. Conversely, managers who "cash out" a large fraction of their pre-buyout equity investment at the time of the buyout may have more of an incentive to take part in overpriced or poorly structured deals. We examine whether these and other incentives changed over time.

Our results are consistent with each of the three "problems" worsening over time. We find that in the late 1980s: (1) prices increased relative to current cash flows with no

accompanying decrease in risk or increase in projected future cash flows; (2) required bank principal repayments accelerated, leading to sharply lower ratios of cash flow to total debt obligations; (3) private subordinated debt and bank debt were replaced by public subordinated debt while the use of strip-financing techniques declined; and (4) management teams invested a smaller fraction of their net worth in post-buyout equity.

We also present preliminary evidence on ex post buyout performance. This evidence confirms that buyouts have been increasingly unable to meet debt payments over time. Our evidence also fails to find strong differences in ex post operating performance between earlier and later buyouts suggesting that ex ante pricing and structuring have indeed played an important role in buyout success.

One interpretation of our results is that the initial success of early buyouts generated increased competition for later transactions with the resulting higher prices and more poorly structured deals. Our results strongly suggest that, in aggregate, investors should reasonably have expected lower returns in later deals.[4] This raises the question of which classes of investors bore the brunt of the changes in expected returns. It appears that banks reacted to the higher prices by reducing the fraction of total debt they provided, accelerating required principal repayments, and raising their fees substantially. In light of this behavior by banks, the increased involvement of public subordinated lenders in these transactions is puzzling, and would seem to represent either a degree of miscalculation or incentive problems at the institutions making the loans.

The paper is organized as follows. Section 2 describes our sample and data. Section 3 examines the pricing question by looking at the relationship between buyout valuations and

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[4]   It is harder to gauge whether later deals were "overpriced" or earlier deals were "underpriced" in any absolute sense.

such fundamentals as cash flow, risk, and growth expectations. Section 4 takes a first cut at the capital structures of our sample companies, presenting aggregate data on debt ratios and coverages. The next three sections focus more closely on individual components of the capital structure: Section 5 on senior bank debt; Section 6 on subordinated debt; and Section 7 on the composition of equity ownership and the associated management incentives. Section 8 presents our results on ex post performance. Finally, Section 9 summarizes and integrates the findings.

2.   Sample Description

2.1   Buyout Companies

Our sample of buyouts is taken from companies listed as leveraged buyouts or as acquisitions by private companies in Securities Data Corporation's merger database, in Morgan Stanley's merger database, and in W.T. Grimm's Mergerstat Review from 1980 to 1989. We restrict this sample to management buyouts (MBOs) in which at least one member of the incumbent management team obtains an equity interest in the new private firm. We focus on MBOs because ex ante data for these transactions are generally more readily available and more complete. The final sample satisfies the following criteria:

1. The Wall Street Journal (WSJ) contains an announcement that the company proposes to go private and the transaction is completed by the end of 1989.

2. The newly private firm is an independent entity, not a subsidiary of another private company.

3. The proxy statement, 14D statement or WSJ confirms that at least one member of the incumbent management team obtains an equity interest in the new private firm.

4. The total transaction value exceeds $100 million.[5]

5. Because loans involving leveraged ESOPs receive an interest rate subsidy, we exclude LBOs that receive the majority of their financing through a leveraged ESOP.

We obtained 124 buyouts completed between 1980 and 1989 that satisfy these criteria.[6] The total value of these 124 transactions exceeds $132 billion. Over the same period, W.T. Grimm's Mergerstat Review identifies $170.0 billion in going private transactions. Our sample, therefore, represents over three-quarters of the dollar volume of going private transactions during this period.

Throughout the paper, we classify MBOs by the year in which the final transaction terms of the buyout are set. Although this date is often the buyout announcement date, it can be some time after the initial announcement date. We use this classification because the transaction setting date is the date on which capital investors commit to provide capital to the buyout at the actual deal price. Column 1 of Table 1 summarizes the distribution of MBOs by the year in which the final transaction terms are set.

2.2   Pre-buyout and Post-buyout Data

For each successful MBO, information describing the transactions is taken from proxy, 10-K, 13-E and 14-D statements and from the WSJ.[7] Stock prices two months before the buyout is announced and at delisting are obtained from the Center for Research in

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[5] The intent of this size criterion is to restrict the sample to larger, more fully disclosed transactions. This criterion also lowers the likelihood that the reduction of regulatory costs is a major source of value. Savings on the costs of preparing documents for public shareholders and the SEC are likely to be small in relation to value in these transactions.

[6] The sample includes the buyout of RJR Nabisco. We consider this a management buyout because the buyout sponsor, Kohlberg, Kravis and Roberts, explicitly noted that they would offer equity to the ultimate management team.

[7] One company did not file any SEC statements. The relevant information is taken from the WSJ article.

Security Prices (CRSP) database and Standard & Poor's Daily Stock Price Record . Other

financial data are obtained from the COMPUSTAT Tapes.

Post-buyout information is available for 81 of the 124 MBOs in the WSJ, the list of

SEC filing companies available from Disclosure, and Going Public: The IPO Reporter.

3.   Buyout pricing

3.1   Price to cash flow measures

The first question we ask is how buyout prices have varied over time relative to

fundamentals. We measure the buyout price (which we also refer to as "total capital") as the

sum of (1) the market value paid for the firm's equity; (2) the book value of the firm's

outstanding debt; and (3) the fees paid in the transaction; less (4) any excess cash removed

from the firm to finance the buyout.

In computing the market value paid for the firm's equity, we value non-cash

distributions paid to stockholders (usually debt or preferred stock) using the market value of

the securities as recorded in the Capital Changes Reporter. When we cannot obtain a value

from the Capital Changes Reporter, we use the last traded price of the stock to estimate the

combined market value of the cash and securities distributed to old shareholders. We also

value shares retained by insiders at the same price as the shares purchased from outside

shareholders.

We consider two primary measures of cash flow. The first is earnings before interest,

depreciation, amortization, and taxes (EBITDA). EBITDA is a measure of gross cash

generated from operations, and thus represents an upper bound on the cash available to pay

investors.[8] The second measure, net cash flow, equals EBITDA less capital expenditures.

In a world without taxes, net cash flow would be the primary component of the numerator in

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[8] EBITDA is also referred to as operating income before depreciation and amortization.

a discounting analysis that sought to value a company under its current operating strategy.

We calculate the two cash flow measures for the most recently completed fiscal year available when the proxy statement or 14D describing the buyout is released. Because some of the buyouts are announced well into the following fiscal year, we also have recalculated the cash flow measures for the most recent 12 months using quarterly financial statements. Unfortunately, these computations are less reliable because some buyout firms do not report capital expenditures, depreciation, or both in those quarterly reports.[9] Nevertheless, both sets of measures generally produce qualitatively similar results. In order to conserve space, we only report the results based on complete fiscal years in what follows.

3.2   The behavior of cash flow to price ratios over time

Columns 2 and 3 of table 1 display yearly median ratios of net cash flow and EBITDA to total capital (or price). The ratios are broadly consistent with the popular notion that buyout prices rose relative to fundamentals in the late 1980s. The ratio of net cash flow to total capital declines sharply from a median value of 8.39% in 1985 to a low of 4.48% in 1987, before recovering somewhat to 7.27% in 1988. The EBITDA-based measure confirms that 1987 was the worst year in our sample in terms of cash flow to price, and that 1988 was also well below par.

Here and in much of the analysis that follows, we use two methods to quantify the statistical significance of the temporal patterns in the data. First, we measure the non-parametric (or rank) correlation between our variables and a simple annual time trend. Second, we use non-parametric rank tests to compare the median values of the variables in three distinct periods: 1980 to 1982 (or the "early 1980s"; 1983 to 1985 (or the "mid-1980s");

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[9] When firms do not explicitly report depreciation and amortization in their quarterly report, we assume that depreciation and amortization equal their values for the preceding fiscal year.

and 1986 to 1988 (or the "late 1980s"). We do not include the 1989 deals among the late 1980s buyouts because they appear different from those in 1986 to 1988, and there are too few such buyouts to warrant consideration as a distinct regime.

Table 1 shows that over the entire sample period, both cash flow to price ratios exhibit a statistically significant downward trend. Furthermore, both cash flow ratios are statistically lower (at the 5% level or better) for late 1980s buyouts than for mid-1980s buyouts, and are statistically lower (at the 5% level or better) for mid-1980s buyouts than for early 1980s buyouts. We repeated all these tests using means and t-tests rather than medians and rank tests. The results are qualitatively unaffected and the patterns are somewhat more pronounced. Net cash flow to price ratios average 5.77%, 4.85%, and 5.81%, respectively, in 1986, 1987, and 1988. All other yearly averages exceed 8.07% except for 1983 buyouts which average 6.90%.

The temporal patterns of the cash flow to price ratios in columns 2 and 3 appear to reflect two distinct sets of forces. First and most obviously, buyout valuations moved with the general level of the stock market. Column 4 of table 1 shows the earnings to price ratio of the S&P 500 over the sample period. The fluctuations of cash flow to price ratios for the buyout companies mirror market-wide movements in earnings-price ratios.

The tendency for buyout prices to track the level of the market as a whole can be seen more explicitly by regressing our cash flow to price measures against market E/P ratios:

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\begin{array}{llllll}
\text{CF} / \text{V} & = & -0.93\% & + & 1.00\,\text{E}/\text{P}. & R^2 = .15 \qquad N=120 \\
& & (1.84) & & (0.22) & \\[2mm]
\text{EBITDA} / \text{V} & = & 6.71\% & + & 0.82\,\text{E}/\text{P}. & R^2 = .21 \qquad N=124 \\
& & (1.12) & & (0.14) &
\end{array}
$$

where CF equals net cash flow, V equals total capital, and E/P equals the earnings-price ratio of the S&P 500 in the month the buyout is priced. (Standard errors are in parentheses.) These regressions suggest that whatever factors drove the overall stock market boom in 1987

also played a role in the increased buyout valuations.

But it also appears that there was a separate, buyout-specific set of forces at work in the late 1980s. Column 5 of table 1 presents the yearly median premiums paid to shareholders. The premiums are measured as the percentage difference between the price paid for a firm's equity and the price two months before the first announcement of buyout or takeover activity. Buyout premiums in the 1980s generally trended upward although this trend is not significant. However, the overall trend masks a significant decline in buyout premiums from the early to mid-1980s, and then a significant increase in the late 1980s. Median premiums rose steadily from 25.7% in 1985 to 48.1% in 1988, almost doubling over this period. The increased premiums in the late 1980s are consistent with a more competitive or overheated buyout market at this time.

The decline in premiums from the early to mid-1980s is more difficult to explain, although several possibilities exist. Pre-buyout stock prices may have reflected an increased probability of takeover in the mid-1980s. The mid-1980s also saw the introduction of tender offers initiated by the buyout investors and managers. Initially, this may have improved the relative bidding position of buyout investors by giving competing bidders less time to react. Whatever the reasons, the higher premiums of the early 1980s occurred when market E/P ratios were high. The late 1980s were unique in terms of the combination of high premiums and low market E/P ratios.

3.3   Changes in buyout company risk over time

In tables 2 and 3, we make a crude attempt to assess two possible "fundamental" explanations for the trend increase in buyout prices in the 1980s: lower discount rates and higher growth expectations. All else equal, buyout price to cash flow multiples should increase if the overall risk of the company's cash flows (and, therefore the relevant discount rate) decrease, or if expectations of future growth increase.

Table 2 presents four different measures of risk. First, we calculate asset betas for the sample companies, where the asset beta equals the product of the equity beta and the ratio of the market value of equity to the value of total capital two months before the first buyout announcement. We calculate equity betas using the Scholes-Williams estimation technique, daily returns, and the CRSP value-weighted index over the period 560 to 40 days before the buyout announcement.[10,11]

Column 1 presents the yearly sample median asset betas. The asset betas trend downward over time, but this trend is small and not significant. Furthermore, the asset betas in the early, mid-, and late 1980s subsamples are not significantly different from one another -- there is no indication that buyout firm risk is significantly low in the late 1980s. In fact, the median asset beta for 1987 of 0.76 is greater than the unconditional sample median of 0.63.

The second measure of systematic risk we use is the industry earnings beta calculated by Bernanke et al. (1990). This beta is the coefficient from a regression of the growth rate of (two-digit SIC code) industry real earnings on the growth rate of real GNP from 1970 to 1988. These earnings betas trend upward over time, but this trend is small and not significant. The earnings betas in the early, mid-, and late 1980s, again, are not significantly different from one another. The earnings betas, therefore, also fail to provide evidence that buyout companies in the late 1980s were less risky than those involved in earlier deals.

Column 3 presents a measure of total risk (both systematic and unsystematic) calculated using financial data for the buyout companies -- the standard deviation of the growth rate of operating margins (where operating margin equals the ratio of EBITDA to

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[10] Thirteen sample companies either do not appear in the CRSP database or do not have a sufficient number of returns available to calculate equity betas.

[11] Our results are similar when we use an equal-weighted index to calculate betas. Our asset beta calculation assumes that pre-buyout debt betas equal 0. The results, however, are not sensitive to this assumption because pre-buyout debt is only 22.7% of pre-buyout total capital.

sales). This is calculated using up to ten years, but not fewer than six years of pre-financial data. This measure trends upward throughout the 1980s, but not significantly. In addition, the late 1980s buyouts have significantly greater risk (at the 5% level) than those in the mid-1980s. Again, this is clearly not consistent with a decrease in the risk of late 1980s buyout companies.

Finally, column 4 presents a measure of industry total risk used by Bernanke et al. -- the standard deviation of the growth rate of industry real earnings. The pattern of this industry measure is almost identical to that of our firm-specific measure. The trend is positive (and significant at the 5% level), and the risk is significantly higher for buyouts of the late 1980s than for those in the mid-1980s.

An essentially similar story, therefore, emerges from all four risk measures. None give any indication that buyout firm risk was lower in the late 1980s than in the earlier periods. Indeed, the total risk measures suggest that buyout firm risk increased throughout the 1980s, and particularly in the late 1980s.

3.4   Projected growth over time

An alternative explanation for changing buyout prices relative to cash flows is increased growth expectations. It is possible that over time, as practitioners became more experienced with buyout structures, they revised their forecasts as to how rapidly buyout cash flows could be expected to grow. All but 19 of the companies in our sample include some post-buyout financial projections in the 14D or proxy statement describing the buyout. The projections include forecasts of future sales in all cases, forecasts of EBITDA (or EBIT) in

most cases, and, less frequently, forecasts of capital expenditures.[12]

In what follows, we divide projected growth into two components: the total projected growth from the last pre-buyout year to the first post-buyout year; and the compound annual growth rate from the first post-buyout year to the nth post-buyout year, where n is the last post-buyout year with forecast sales. The former measure can be interpreted as expected immediate operating changes or short-term growth while the latter measure can be interpreted as expected long-term growth. We exclude projections of pre- to post-buyout growth when the post-buyout projections assume that asset sales have taken place and no comparable pre-buyout measures exist. Similarly, we exclude projections of post-buyout growth when they include asset sales.

Columns 1 to 4 of table 3 present our two growth measures for both sales and EBITDA. The patterns are generally inconsistent with the hypothesis that growth expectations are systematically more optimistic in the late 1980s. The trend for all four measures is negative. And, none of these growth measures is higher in the 1986 to 1988 period than in the two earlier periods. Columns 5 presents the expected short-term growth in operating margins. Unlike the sales and EBITDA measures, this measure includes transactions with planned asset sales. Again, there is no significant time trend.

Columns 6 and 7 present projected short-term growth rates in capital expenditures and capital expenditures to sales for those companies that reported capital expenditure projections. We find that the medians for the entire sample are negative -- companies enter into buyouts planning to cut capital expenditures. Again, however, the 1986 to 1988 buyouts are not characterized by significantly greater projected capital expenditure cuts than those in

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[12] The projections we present are nominal projections. In most cases, we do not have the inflation forecasts used by the buyout investors. Except for the early 1980s when expected inflation is high, the variation in the growth rates of the nominal projections is probably much larger than that of expected inflation.

the earlier periods.[13] Although we do not present them separately, the trends of short-term growth in net cash flow are not significant.

Taken together, the results in this section suggest that buyout prices rose over the 1980s relative to observable measures of fundamental value such as cash flow, risk, and growth expectations. Part of this increase reflects the same market-wide forces that drive the S&P 500 to historically high levels in August 1987. But there is also some evidence of a separate, buyout specific component to the run up after 1985.

4. Aggregate debt burdens of buyout companies

Higher buyout prices may lead to lower returns for buyout investors, but they do not necessarily lead to a higher likelihood of financial distress. That likelihood also depends on buyout financial structure, which we examine in this section. As a first cut, we lump all forms of debt together and examine some simple statistics on the proportion of debt to total capital and on the coverage of contractual obligations.

Column 1 of table 4 presents the yearly medians of total post-buyout debt to total capital where total post-buyout debt equals the sum of (the market value of) new debt issued to finance the buyout and (the book value of) pre-buyout debt retained.[14] The market value of most new debt is equal to its face value. When it is not, usually in the case of new

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[13] The projections for EBITDA and operating margins are slightly higher than the actual results reported by Kaplan (1989b). He finds that EBITDA in the first (second) post-buyout year is 15.6% (30.7%) higher than in the last pre-buyout year. Similarly, operating margins in the first (second) post-buyout year are 7.1% (11.9%) higher than in the last pre-buyout year. The overall sample median projections -- 12.8% and 22.9% cuts in capital expenditures and capital expenditures to sales respectively -- are roughly consistent with Kaplan (1989b) who finds actual reductions of 21.1% and 23.3%.

[14] The use of the book value rather than the market value of pre-buyout debt has a very minor effect because the median book value of retained pre-buyout debt to total debt is only 6.7%.

debt issued directly to selling shareholders (so-called "cram down" debt), we obtain the market value from the Capital Changes Reporter.

The median debt to total capital ratios appear remarkably constant between 1980 and 1988, never dropping below 86% (in 1985) and never rising above 90.7% (in 1986). The relative uniformity of the debt ratios goes beyond the pattern in the yearly medians. Over our entire sample, the 25th percentile debt ratio is 83.8% while the 75th percentile ratio is 92.0%. Although the changes in debt to total capital ratios do not appear to be economically meaningful, the ratios in 1986 to 1988 (90.5%) are statistically greater than those in 1980 to 1982 (88.0%) and 1983 to 1985 (86.5%). The time trend is also positive at the 5% level.

Our measure of total debt may understate the amount of debt in the capital structure because it excludes preferred stock with fixed commitments. In several cases, such preferred stock is exchangeable into subordinated debt. Accordingly, column 2 of table 4 presents the yearly medians of post-buyout common stock to total capital, where post-buyout common stock includes preferred stock convertible into common stock (but not straight preferred stock or preferred stock convertible into debt). These medians appear to vary somewhat more over time than those for debt to total capital. The median percentages of common stock in buyout company capital structure are lowest from 1986 to 1988, reaching a low of only 4.04% for 1987 deals. Again the median ratio of 5.5% from 1986 to 1988 is significantly lower than the medians of 9.1% and 8.8% for early and mid-1980s buyouts.

The slight increase in the debt ratios is an interesting and somewhat puzzling aspect of buyout financial structures. For example, in spite of the projections data presented in section 3.4, the high prices paid relative to cash flows in 1987 will no doubt strike many as prima facie evidence that 1987 buyouts were associated with more optimistic growth expectations than those in other years. But if the benefits of the 1987 deals were more "back-loaded" in time, shouldn't firms have taken on less debt relative to total value, so that they could afford to meet interest payments with their comparatively lower short-term cash

flows?

To explore this issue further, the remainder of table 4 presents several measures of the adequacy of current cash flows relative to contractual obligations. These measures use net cash flow and EBITDA in the last full year before the buyout. We calculate expected interest payments from the interest rates and debt amounts projected in the proxy or 14D statements describing the buyouts. Because most of the bank debt in these transactions is priced at a spread over the London Interbank Offering Rate (LIBOR) or the prime rate, we calculate expected interest payments on the bank debt using the rates in effect at the date uncertainty about the bid is resolved. This may underestimate true expected interest payments in the later deals because many of the later buyouts involved interest rate swaps that effectively converted some floating rate debt into fixed rate obligations. Because the yield curve has an upward slope during most of the sample period, the fixed swap rates are greater than the floating rates.

Columns 3 and 4 compare net cash flow and EBITDA to expected total interest payments in the first post-buyout year. Consistent with the lower cash flow to price ratios and constant leverage ratios, we find a negative time trend for both interest coverage measures, with both net cash flow and EBITDA to interest reaching a minimum in 1987 and 1988. However, because the ratios in 1986 are at least as high as those in previous years, the time trend is not significant for net cash flow, and is significant only at the 10% level for EBITDA.[15]

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[15] The high 1986 ratios may be due to the fact that long- and, particularly, short-term interest rates reached a minimum in 1986. The median ratios for 1987 and 1988 buyouts of 0.60 and 1.11 are significantly lower than the ratios of 0.75 and 1.25 for pre-1987 buyouts at the 6% and 1% levels, respectively. The relative lack of variation in the interest coverage ratios may surprise some readers. Wigmore (1990) presents similar EBITDA to interest ratios for all junk bond issues (not just buyout related issues) in the 1980s, and finds a steady decline. His annual ratios exceed 2.73 before 1983, average 1.74 between 1983 and 1985, and drop to 1.26 between 1986 and 1988. It is likely that the large decline in his sample is caused by a shift to merger and buyout related issues over time.

The ratios in columns 3 and 4 use total interest obligations, which include both cash and non-cash interest. Non-cash interest is associated with deferred interest debt which includes zero-coupon and pay-in-kind (PIK) bonds. Including non-cash interest payments may present a misleading picture because the use of such payments increased significantly in the second half of the 1980s (as we show below, in section 6). In fact, they may have been introduced precisely to allow firms with more "back-loaded" cash flows to safely assume high levels of debt.

Columns 5 and 6 of table 4 repeat our coverage calculations using cash interest payments that exclude interest payments on deferred interest debt. As expected, this adjustment improves the relative standing of the coverage ratios of the later deals. None of the time trends or period comparisons presented in the table is significant.[16]

Although interest coverage is an often-used measure of financial soundness, it does not fully capture a firm's ability to meet all its debt-related obligations. Cash flow must also be devoted to making principal repayments. Ninety of the transactions in our sample report a principal repayment schedule for the bank debt portion of the capital structure. Column 7 displays the ratio of required debt repayments to EBITDA in the first two post-buyout years for these ninety transactions. Required repayments rise sharply over time, with an especially pronounced break between 1985 and 1986, when principal repayments rise by a factor of more than 2.7. The time trend and period comparisons all show increases in this ratio that are significant at the 1% level.

Columns 8 and 9 repeat our coverage calculations, but now consider how net cash flow and EBITDA compare to total cash obligations, which we define as the sum of cash interest and one-half of the first two years' required principal repayments. These coverages are now substantially (and significantly) lower for buyouts of 1986 to 1988 than for earlier

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[16] However, the EBITDA to cash interest ratio is still significantly lower (at the 10% level) for 1987 and 1988 buyouts than for pre-1987 buyouts.

deals. For example, the median ratio of EBITDA to cash obligations is always above one before 1986, but falls to between .66 and .76 for the 1986-88 period. Similarly, the median ratio of net cash flow to cash obligations, which was always above 0.56 before 1985, does not exceed 0.41 during 1986-88.

The cash coverage ratios after 1985 imply a sharp deterioration in the ability of buyout firms to meet their total debt-related obligations out of operating cash flows. For example, a buyout with the 1988 median net cash flow to cash obligation ratio of 0.41 -- the highest median of the 1986 to 1988 period -- would need to increase net cash flow by 144% (0.59/0.41) to meet cash obligations with net cash flow. This is a much larger increase than those found in Kaplan (1989b) for a sample of management buyouts announced between 1979 and 1985. He finds net cash flows in the first three post-buyout years are 41%, 59%, and 96% higher, respectively, than net cash flow in the last pre-buyout year.[17] In light of this historical performance data, it is hard to see how operating cash flows could be expected to meet required debt service payments.

These coverage numbers, however, present only part of the overall picture on financial soundness. First, as Shleifer and Vishny (1991) emphasize, asset sales represent an alternative means of generating the cash to make debt-related payments. The acceleration in principal repayment schedules in the late 1980s almost certainly led to an increased reliance on (and expectations of) asset sales. Second, even if planned asset sales fail to materialize, and required payments cannot be met, this need not necessarily spell disaster. The costs at this point will depend critically on the ability of creditors to restructure their claims in an efficient manner.

In sum then, the data in this section suggest that the buyouts of the late 1980s may

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[17] Holding assets constant, Kaplan (1989b) finds increases of 43%, 66%, and 79% over the same post-buyout periods.

have had a higher ex-ante probability of winding up in a restructuring situation, particularly if asset sales plans were subject to some uncertainty. The data have thus far had less to say about the possible costs involved in such restructurings.

5. Senior bank debt and the role of asset sales

We now focus our attention on specific components of buyout capital structures. The most senior part of the capital structure for most of our MBOs takes the form of a term loan (and, often, an accompanying revolving credit loan) arranged by one or more commercial banks. We refer to these loans as bank debt.[18] Table 5 presents the annual medians for several bank debt characteristics.

The first column in the table shows the median value of the ratio of bank debt to total debt by year. Bank debt represents over 70% of the debt in 1982, 1983, and 1984. In 1985, this pattern breaks distinctly, with bank debt dropping to 42% of all debt. After 1985, the ratio stabilizes, ranging between 52% and 57% from 1986 to 1989. Interestingly, the decline in bank debt ratios coincides with an increased usage of public low-grade debt. We discuss this issue in more detail in section 6 below.

In the second and third columns, we report the interest rate terms of the bank loans. In most of the deals, the interest rate on the bank debt is set as the minimum of a spread over the prime rate or a spread over LIBOR. We report both the median spreads over prime and LIBOR by year. (In the few cases the term loan and revolving credit loan spread differ, we use the value-weighted average of the spreads.) The spreads are statistically significantly higher in the late 1980s than in the mid-1980s. However, in economic terms, the spread differences appear to be remarkably stable over time. The median value of the prime-based spread rises gradually from 1.25% in 1982 to 1.50% in 1985, and stays at exactly

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[18] We also classify similarly structured term loans made by bank-like organizations such as General Electric Credit as bank debt.

1.50% for the remainder of the 1980s.

The lack of variation in spreads shows up strongly in the cross section as well. When we pool all deals between 1985 and 1989, both the 25th and 75th percentile prime-based spreads equal 1.50%. The uniformity in loan pricing in conjunction with the uniformity in total debt to capital ratios from the previous section is puzzling. If we take a heterogeneous group of companies, and impose the same aggressive capital structure on all of them, one might expect a great deal of variation in the riskiness of the debt, and, hence, a good deal of variation in its pricing.

There are several possible answers to this puzzle. First, it might be the case that some banks are simply not doing a very good or sophisticated job of pricing their LBO loans. The successes enjoyed in some of the deals of the early 1980s may have led banks to become more optimistic about the prospects for later deals. Given the inherent incentive problems associated with deposit insurance, it is possible that an underpricing of risky loans took place.

A second factor which might help explain pricing behavior is the development of the inter-bank loan sales market. As documented by Gorton and Pennachi (1991), the volume of loan sales grew enormously in the 1980s, from $27 billion in the second quarter of 1983 to $291 billion in the third quarter of 1989. By facilitating the diversification of LBO loans, loan sales may have made it rational for banks to accept lower expected returns. Alternatively, to the extent that moral hazard problems exist for risk-taking in banks, the loan sales market may have allowed larger banks that originated LBO loans to sell them to smaller banks more eager to accept high risks for lower returns.[19]

A final, and related factor, is the level of fee income earned by banks in buyout transactions. Columns 4 of table 5 shows a dramatic rise in the level of fees over time, going

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[19] Another important aspect of the loan sales market concerns its implications for the renegotiation of distressed loans. We touch on this issue below.

from .40% of the bank loan in 1983 to 2.49% in 1988. The increased fee income may be economically equivalent to higher interest rates. Accordingly, we calculate a fee-adjusted interest rate and a corresponding fee-adjusted spread to the reference rate. For example, if a bank loan requires a 2.49% up front fee, the "fee adjusted spread" on a 7 year loan with level principal repayments is 2.37% over prime (when prime is 10%), not the unadjusted spread of 1.50%.

Column 5 of table 5 reports the annual median fee-adjusted spreads over the prime rate. The fee adjusted spread over prime jumps noticeably from 1.59% in 1984 to 2.13% in 1985 and remains between 2.12% and 2.24% from 1985 to 1988 -- there is both a statistically and economically significant increase in this spread over time.

There are, however, two reasons why treating fees and interest income as economically equivalent can be misleading. The first relates to the loan sales market. Although hard data are not available, conversations with bankers indicate that when a loan is sold, some of the fee income is retained by the originating bank. This appears to have been the case even when the originating bank sold off most of the loan. If so, the fee-adjusted spreads reported in table 5 overstate the returns to banks that actually fund the loan and bear the risk. In the extreme case, the unadjusted spread is the correct measure of the funding bank's return.

Second, banks might plausibly prefer fee income because of capital regulations -- banks care about the book value of their net worth. Since fee income shows up in earnings (and hence flows to net worth) in the first year of the buyout, it can have a higher shadow value to banks than an economically equivalent interest rate. The greater fee income we find in late 1980s buyouts may have tempted banks into making buyout loans that offered a less favorable risk-return tradeoff.[20]

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[20] Although we are unaware of them, we acknowledge that tax or other considerations may also have come into play.

Thus far, our narrow focus on interest spreads has led us to ignore a potentially important set of "non-price terms of credit." Bankers have a number of tools other than interest rates at their disposal that can be used to improve their risk-return tradeoff. For example, as deal pricing became more aggressive relative to cash flow, banks may have required more collateral or tighter covenants. We have already seen that banks reduced the amount they loaned in later deals. Non-price credit terms are particularly relevant given that banks are the senior lenders in the buyout transactions. Because bank debt is typically only 50% of the value of the company, it is possible that the banks could structure their loans to virtually eliminate default losses. If so, it would make sense to lend at the same relatively low interest rate in all deals. Interestingly, this logic is consistent with Diamond (1991). He presents a model in which the senior lenders, i.e. banks, react to changes in credit quality by adjusting the size of the loan rather than the interest rate.

We do not have comprehensive data on non-price credit terms for the bank loans in our sample. However, the principal repayment schedules for the bank debt examined in the previous section do provide some evidence that banks were, over time, increasingly taking some steps to protect themselves. As noted earlier, the acceleration of repayment schedules appears to reflect an increased reliance on asset sales. Indeed, the more rapid repayment schedules (and the correspondingly tighter coverages) seen in many deals in the late 1980s would seem to be a mechanism for forcing buyout companies to sell assets in order to raise cash.

We have some data that allows us to examine the role of asset sales more explicitly. Many of the proxy and 14D statements describing the buyouts note post-buyout asset sales intentions, although these intentions are not necessarily obligations. Columns 7 and 8 present annual medians for both (i) the fraction of deals where there are explicit plans to sell assets; and (ii) the amount of anticipated asset sales as a percentage of total capital for those deals where asset sales are planned. The numbers indicate a moderate increase in

importance for expected asset sales over time. Asset sales are expected in 21.4% of the pre-1983 MBOs, 27.0% of the 1983 to 1985 MBOs, and 40.9% of the 1986 to 1988 MBOs. These differences are not, however, statistically significant. The asset sales are a roughly constant fraction of total capital, at a median 15.5%, 19.8%, and 18.5%, respectively, for the three periods.

The time series trend towards deteriorating coverage of debt-related obligations is thus matched to some extent by a trend towards increased reliance on asset sales. This correlation appears more strongly in the cross-section. In columns 1 and 2 of table 6, we regress the ratios of net cash flow and EBITDA to expected cash debt obligations against a dummy variable that equals 1 for buyouts with expected asset sales. Both regressions also include dummy variables that control for the year of the buyout. Regression 1 shows that buyouts with expected asset sales are associated with coverage ratios 0.26 lower (significant at the 1% level) than buyouts without expected asset sales. For example, a 1987 buyout without expected asset sales is associated with a net cash flow to cash debt obligation ratio of 0.39 (0.90- 0.51) while one with expected asset sales is associated with a ratio of only 0.13 (0.39-0.26). Regression 2 indicates that expected asset sales are associated with a 0.27 decrease (significant at the 1% level) in the ratio of EBITDA to cash debt obligations.

A correlation between tight coverages and the use of asset sales is not, in itself, terribly surprising -- the two features seem clearly complementary. More striking is the fact that asset sales are also associated with more aggressive pricing of buyout transactions. Table 6 also presents regressions in which our pricing measures are regressed against the expected asset sale and yearly dummy variables. The table documents that expected asset sales are associated with a statistically significant decline in net cash flow and EBITDA to total capital ratios. Regression 3 associates asset sales with a decrease in net cash flow to capital of 2.4% (significant at the 5% level). For example, a 1987 buyout without expected asset sales is associated with a net cash flow to total capital ratio of 5.9% (11.6 - 5.7) while

one with expected asset sales is associated with a ratio of only 3.5% (5.9-2.4).

Regressions 3 and 4 in table 6 are interesting because it is not obvious on theoretical grounds why plans to sell assets should make a firm more valuable in the aggregate. The first order effect of asset sales would seem to be to <u>transfer</u> value from junior to senior creditors, not to create new value.[21] It is understandable why senior bank lenders would be willing to lend to more aggressively priced deals if they could force asset sales. It is less clear why junior lenders would be willing to participate in such deals.[22]

To summarize the results of this section: senior bank lenders appear to have placed a small emphasis on interest rate spreads in their structuring of buyout loans. Rather, it seems that they attempted to protect themselves by reducing the fraction of the total debt they provided and by imposing more rapid repayment schedules (which could only be met by firms selling assets and giving the proceeds to the banks) on the more aggressively priced deals. While these adjustments may have made sense from the banks' senior perspective, they raise two sorts of questions: (1) who and why were the junior lenders agreeing to this type of structure; and (2) what are the implications of such a structure for the likelihood of financial distress?

6. Subordinated debt

We now turn to an examination of the subordinated debt in our sample transactions. In what follows, we focus on non-price attributes of this debt -- private placement versus public issuance, the use of deferred interest securities, and the use of "strip" financing

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[21] This is easily seen by considering the polar case where the asset sale generates enough cash to completely repay the senior debt. In this case, the use of asset sales makes the senior debt riskless, thereby increasing its value while shifting more risk onto the junior debt.

[22] See, however Shleifer and Vishny (1991) who offer a theory that a liquid asset-sale market can lead to higher asset values for companies that can readily sell off assets.

techniques. In contrast to our analysis of the senior bank debt, we pay very little attention to promised coupon yields. Given the extremely junior nature of some of this debt, variations in promised yields are likely to be relatively uninformative about variations in expected returns. In other words, promised yields probably do not give an accurate picture of "true" subordinated debt pricing.[23]

Table 7 presents yearly averages of several characteristics of the subordinated debt used to finance the sample buyouts. Column 2 shows the fraction of buyouts financed using publicly issued low-grade, or junk bonds -- bonds rated less than BBB by Standard and Poor's or Baa by Moody's. Only one pre-1985 buyout used public junk bonds. In contrast, over 54% of the subsequent buyouts used them. To the extent that free-rider and information problems make it more difficult to renegotiate widely-held public debt than closely-held private debt, the increased reliance on junk bonds may be expected to increase the costs of financial distress. Gilson, John, and Lang (1990) find evidence consistent with this -- financially distressed firms are more likely to restructure debt outside of bankruptcy the higher the proportion of private bank debt to total liabilities and the fewer the classes of debt outstanding.

Many buyouts also issued a second type of widely-held debt as part of the buyout financing -- commonly called "cram down" debt. Cram down is debt issued by the new

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[23] An example helps make this clear. Suppose we have two LBOs. In the first, the senior debt has a slow repayment schedule, and the subordinated debt receives cash interest starting right away. In the second, the senior debt has a very fast repayment schedule and the subordinated debt receives no cash interest for several years. Suppose further that the coupon on the second LBO's subordinated debt is 200 basis points higher. This does not say much about the relative expected returns on the two junk bonds. The subordinated debt in the second deal is effectively more junior and will expect to suffer greater losses in adverse states. For evidence on the returns and risk of low grade debt, see Asquith, Mullins, and Wolff (1989) and Kaplan and Stein (1990).

Interest rate spreads will also be unreliable when subordinated debtholders invest in post-buyout equity. Such debtholders may be willing to take accept lower interest rates in exchange for the equity "kicker." As we document below, the use of such arrangements changed over time.

buyout firm as part of the payment to the pre-buyout shareholders to take the company private. Because the pre-buyout shares are widely-held, so is the cram down debt. Column 3 also shows an increased reliance on the use of "cram down" debt, particularly after 1984.

Column 4 of table 7 presents the ratio of new public buyout debt -- combined junk and cram down debt -- to total capital over time. Consistent with the previous two columns, the ratio rises sharply in 1985. Before 1985, new public debt is a small fraction of total capital; from 1985 and beyond, it always exceeds 17.5% of total capital. The increase over time is significant at the 1% level. Note that these are unconditional averages, including buyouts both with and without widely-held debt. These averages, therefore, understate the importance of new public debt in those transactions which utilize such debt.

As we noted earlier, the increased use of public subordinated debt, particularly junk bonds, coincides with the adjustment by banks to reduce the size of their loans. The time-series relation is very strong. Without controlling for the year of the transaction, the ratio of bank debt to total debt is 11.8% lower (significant at 1%) in buyouts that rely on junk bonds than in buyouts that do not. Column 1 of table 8 presents a cross-sectional regression that uses year-dummies to control for the time series variation. In this regression, the ratio of bank debt to total debt is still 6.2% lower in buyouts using junk bonds. This is significant at the 7% level using a one-tailed test (but only at the 13% level using a two-tailed test).

Table 7 points out two additional trends in subordinated debt financing, both significant at the 5% level or better. First, columns 5 and 6 show that the use of deferred interest debt increases after 1984. Such debt is used in only 12% of pre-1985 buyouts, but in more than 50% of the buyouts after 1984. Similarly, deferred interest debt as a percentage of total capital increases as well, exceeding 8.5% in all years after 1986.

The increase in deferred interest on the subordinated debt has, all else equal, a similar effect to the faster senior debt repayment -- it further "juniorizes" the subordinated debt, potentially transferring value to the senior bank lenders. In buyouts that use deferred

interest debt, most of the bank debt is scheduled to be paid off before the buyout firm begins cash payments on the deferred interest debt.

Interestingly, this juniorization appears to have occurred disproportionately with public subordinated debt. The majority of deferred interest debt is public debt -- either junk or cram down. Of the 59 buyouts that do not use junk or cram down debt, only 3 issue deferred interest debt. In contrast, deferred interest debt is issued by 44 of 65 buyouts that issue public debt.

The juniorization of public subordinated debt also appears to have had consequences for the overall pricing of transactions. There is a strong time series relation between our pricing measures and the use of junk debt. This relation also appears, albeit moderately, in the cross-section. Columns 2 and 3 of table 8 regress our pricing measures against the junk debt and yearly dummy variables. The regressions indicate the use of junk debt is associated with a decline in both net cash flow and EBITDA to total capital ratios of 1.6%. The coefficient in the EBITDA to capital regression is significant at the 5% level.[24]

Finally, at the same time public subordinated debt became more juniorized, the use of strip financing declined. The last two columns of table 7 present the percentage of transactions using some form of strip financing and strip debt as a fraction of total capital. Strip financing is present when lenders invest in post-buyout equity. In most cases of strip financing, it is the subordinated debtholders who hold the equity. However, we also include several cases in which the senior lender or lenders purchase equity. Over 70% of the buyouts before 1984 utilized some form of strip-financing. The debt owned by strip holders equalled at least 24.5% of the total capital of these buyouts. In contrast, fewer than 25% of the post-1985 buyouts used strip financing, with strip debt worth at most 12% of total capital.

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[24] Our results are economically similar when we distinguish between buyouts financed with junk or cram down from those financed with no public debt.

As in the case of deferred interest debt, the use of strip financing is related to the use of widely-held debt, although in this case the relation goes the opposite way. Over 59% (35/59) of the buyouts that did not use public debt used strip financing, compared to fewer than 22% (14/65) of the buyouts that did use public debt.

Overall, the patterns in table 7 indicate that over the later part of the 1980s, management buyouts dramatically increased their use of public subordinated debt. At the same time, the public subordinated debt appears to have been juniorized through an increase in the use of deferred interest payments and an acceleration in the principal repayments on senior debt. This juniorization is associated with both a time-series and cross-sectional decline in the ratio of operating cash flows to price.

Our analysis also raises questions about possible value destruction associated with costly financial distress. The fact that buyouts using public subordinated debt were less likely to use strip financing than those using only private subordinated debt would seem to further increase the potential for problems in a renegotiation situation. We return to these issues in section 9.

7.   Equity, management and buyout investor incentives.

The third and final source of potential problems concerns the incentives of buyout investors. One of the supposed spurs to improved performance in buyouts is the increased equity stake of management. Managers who invest a large portion of their wealth in and own a large percentage of post-buyout equity might be expected to manage better. As we noted in table 4, the percentage of common stock to total capital declined after 1985, just as pricing and coverages became more aggressive. Table 9 considers the change in equity ownership in more detail.

Columns 1 and 2 present the median percentage of pre-buyout and post-buyout equity

(fully diluted to account for stock options) owned by the post-buyout management team. Before the buyout, the new management team owns a median of 5.0% of equity. This percentage trends upward, peaking at more than 8% in both 1987 and 1988. The median management equity ownership of the post-buyout company is 22.3%. This percentage also trends upward. Column 3 combines the information in columns 1 and 2 by calculating the ratio of the percentage of post- to pre-buyout equity owned by the management team. This ratio provides a measure of the change in the intensity of the relationship between managerial effort and compensation. The median ratio for the 102 buyouts with pre- and post-buyout information is 4.14. The ratio trends downward, but not significantly so.

Although buyouts are almost always associated with increases in management's percentage stock ownership, it is also important to recognize that managers typically "cash out" in dollar terms at the time of the transaction. This cashing out could have important adverse incentive effects. In particular, managers may be more tempted to go along with (or encourage) an overpriced or poorly structured deal the larger the capital gain they are able to realize on the shares they sell at the time of the buyout.

Column 4 of table 9 presents the ratio of the dollar value of post- to pre-buyout equity owned by the management team. The median ratio is 0.460, indicating that the management team typically invests less than half as much in post-buyout equity as it invested in pre-buyout equity. This ratio drops sharply after 1984. Before 1984, the median ratio is 0.57. From 1985 to 1988, the ratio is 0.35. This difference is significant at the 5% level. The time trend of this variable over the 1980s is also significantly negative at the 10% level. These results, therefore, provide evidence that management "cashed-out" more and risked less in management buyouts in the late 1980s.

It has also been suggested that managers increasingly used buyouts as a mechanism to escape from hostile takeovers. According to this view, as hostile takeover pressure increases, managers will want to maintain control at any cost. Column 5 of table 9 presents the annual

fraction of transactions subject to overt hostile pressure. We define hostile pressure as (1) the presence of a competing takeover bid; or (2) the presence of a stockholder who owns at least 5% of the company's stock and is opposed in some way by management in the six months before the buyout. Surprisingly, we do not find a significant time trend in hostile pressure for these firms -- such pressure has always been present in larger buyouts.

Management investors are not the only parties driven by incentives. So are buyout promoters, investment banks, and lenders. Most buyout participants are compensated both with long-term security interests and with up front fees. As up front fees increase, the incentive to produce long-term payoffs decreases, other things equal. As we showed in section 5, banks required higher up front fees in the later 1980s than before. Column 6 of table 9 indicates that the same is true for total buyout related fees.[25] The largest portion of these fees are paid to buyout promoters, investment banks, and commercial banks. The upward trend in fees is significant at the 1% level. The column indicates that total fees to total capital make their largest jump in the late 1980s. They range from 2.05% to 2.66% before 1985, rise to 3.69% in 1985, and peak at 5.97% in 1988.

The results in this section suggest that the more aggressive pricing and financial structure in later buyouts were accompanied by weaker incentives to insure that the deals would succeed. Buyout managers apparently cashed out a larger fraction of their net worth while other buyout participants extracted larger up front fees in the late 1980s.

8.   Ex post results

Until now, we have restricted our analysis to information available at the time of the

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[25] Total buyout related fees are almost always listed in the proxy or 14D statement describing the buyout. We do not present separate fees for different parties because these fees are not always disaggregated.

buyout. Our results suggest that the ex ante likelihood of financial distress increased over time. The ex post incidence of financial distress will be determined by both the ex ante likelihood of distress and unexpected (poor) post-buyout performance. In this section, we present preliminary evidence on (1) the extent to which management buyouts have been unable to meet debt payments and (2) ex post performance over time. We stress the preliminary nature of these results, particularly for buyouts undertaken in the last several years of our sample period. The ultimate success or failure of many of these later deals is still unresolved.

Column 1 of table 10 presents the percentage of each year's buyouts that have subsequently been unable to meet their post-buyout debt payments as of February, 1991. We determine whether a buyout has missed a debt payment by consulting 10-K filings, the WSJ index, and the Nexis database.[26] Consistent with our ex ante analysis, defaults increase significantly (at the 10% level) over time. None of the pre-1983 deals, four of 39 buyouts in 1983 to 1985, and 14 of 66 buyouts in 1986 to 1988 have defaulted. Buyouts completed in 1986 appear to have been unusually unsuccessful, with 6 of 15 defaulting on post-buyout debt payments. These measures clearly understate the number of post-1985 deals in distress.[27]

Column 2 of table 10 presents the percentage of buyouts that have filed for Chapter 11 bankruptcy. One-half of the companies that have defaulted on debt payments also have filed for Chapter 11. Because defaults usually precede a Chapter 11 filing, this number may increase over time, particularly for later transactions.

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[26] Buyout companies that default after a post-buyout releveraging are not considered to have defaulted because the original buyout did not default.

[27] Two additional post-1985 buyouts appear on the verge of distress: one is negotiating with creditors after a failed exchange offer, while one is attempting a distressed exchange offer. Four additional buyouts have all their public debt currently rated at CCC or below. When we exclude 1988 buyouts whose distress is less likely to have been fully resolved, the time trends toward more defaults in later deals become more strongly significant.

The increase in defaults may be caused by a combination of ex ante changes in pricing and ex post surprises in performance. Columns 3-5 present the annual medians of changes in EBITDA, net cash flow, and capital expenditures to sales in the first post-buyout year. For the entire sample, these ratios change by 9.1%, 36.5%, and -37.6%, respectively. There are no significant differences in these operating changes over time. The default and performance patterns are, therefore, consistent with the ex ante changes in buyout pricing and financial structure playing an important role in the increased number of defaults over time.

We do not intend to suggest that ex post surprises have not contributed at all to the increases in defaults. The 1986 buyouts exhibit particularly poor performance ex post that undoubtedly contributes to their high default percentage. Furthermore, short-term interest rates reached a minimum in 1986 and rose steadily thereafter. Because most buyouts have some unhedged floating rate debt, ex post rate increases may have increased the incidence of default.

Again, we emphasize the preliminary nature of these ex-post results. At this time, we do not have post-buyout EBITDA results for approximately one-third of the sample companies. We recognize that this leaves open the possibility of a selection bias. We have post-buyout financial data on eight of the sixteen late-1980s buyouts that have defaulted. In contrast, we have such data on 34 of 50 the late-1980s buyouts that have not defaulted. This may ultimately affect our conclusions on the trend of ex post performance for this sample.[28]

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[28]   See, also, Long and Ravenscraft (1991) for more recent evidence on ex-post buyout performance.

9. Summary and discussion

9.1   Costs of financial distress

Although we have discussed the evolution of buyout financing techniques in some detail, we have not yet fully addressed a central question: to what extent did changes in buyout capital structure affect expected costs associated with financial distress? The increase in price to cash flow ratios over time, the deterioration of coverages and the correlation of those ratios with ex post distress suggest that the likelihood of financial distress increased over time. Our results, thus far, have less to say about the costs conditional on such distress.

It is difficult to quantify the costs of financial distress since that would require disentangling exogenous shocks to operating performance from those caused by financial structure. However, even without attempting to measure financial distress costs directly, we can draw some tentative and qualitative conclusions. There is a well-developed body of theoretical work that suggests a number of factors that might be expected to increase costs of financial distress, and we can examine our data in light of these theories. In other words, we can try to gauge the extent to which the theoretical "pre-conditions" for costly financial distress change over time.

We already have noted two of the more obvious pre-conditions. First, the dramatic shift from privately-placed to widely-held subordinated debt that occurred in 1985 points towards higher expected costs of financial distress. With widely dispersed creditors, free-rider problems are more likely to impede efficiency-enhancing actions. For example, it can be in the collective interest of subordinated debtholders to contribute new funds for investment, but any single holder may find it individually rational not to do so.[29] In this regard, it is also worth noting the rapid emergence of the secondary market for senior bank buyout loans. Although we do not have accurate data for buyouts, conversations with

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[29] See Bulow and Shoven (1978) and White (1980 and 1983) for early models that show how the inability to renegotiate with public debtholders leads to inefficiencies.

commercial bankers suggest that, over time, the ownership of senior bank loans has become more fragmented. Gorton and Pennachi (1991) present evidence that this is true for bank loans in general.

A second change in the pre-conditions for costly financial distress is the decline of the strip financing technique common in earlier buyouts. When a firm is in distress, conflicts of interest between lenders and equityholders can lead to the types of distortions discussed by Jensen and Meckling (1976) and Myers (1977). By partially resolving conflicts of interest, strip financing arguably reduces these distortions. Some observers have singled out strips as an important innovation that made highly leveraged capital structures more prudent than they otherwise appeared. Jensen (1988) writes "because every securityholder in the highly leveraged firm has the same claim on the firm, there are no conflicts between senior and junior claimants over reorganization of the claims in default. Thus the firm will not go into bankruptcy; a reorganization can be accomplished voluntarily, quickly, and at a lower cost than in bankruptcy proceedings." If this logic is correct, the decline of strip financing in the late 1980s is surprising.

In addition to the movement towards public debt and away from strip financing, other changes in buyout debt structure may also have important implications for expected costs of financial distress. One such change is the acceleration of principal repayments on senior bank debt. This acceleration may have especially significant effects in those transactions where the junior tier of debt is widely-held.

Gertner and Scharfstein (1990) point out that the combination of senior bank debt and junior public debt can have an adverse impact on the ability of distressed firms to invest. The logic is as follows. Suppose a firm is in financial difficulty and needs an infusion of new money to make a positive net present value investment. On the one hand, bank lenders would seem to be the best hope for putting up the new money, since they do not face as severe a free-rider problem as the widely-dispersed junior lenders. On the other hand, the

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banks' senior status probably reduces their incentive to invest -- the banks may already be well-protected, and may not have much upside to gain from further investment.

Now consider what happens if the bank's principal repayments are moved forward in time. This has two negative effects. First, the higher debt service burden raises the probability that there will be a distress situation -- it is more likely that the firm will be unable to meet its contractual obligations. Second, the fact that the banks extract value more rapidly effectively enhances their senior status relative to the subordinated debt.[30] This further protects the banks, and may correspondingly further reduce their incentives to contribute new money. It seems possible, at least in theory, that the faster repayment schedules might increase expected costs of financial distress.

In summary, although our ex ante data do not allow us to draw any definitive conclusions about expected costs of financial distress, they are, nonetheless, suggestive in this regard. The buyouts of the late 1980s seem to be characterized by more of the theoretical pre-conditions for costly distress. The increased use of widely-held debt and the decreased use of strip-financing are relatively unambiguous examples of this trend. The acceleration of principal repayments on the senior bank debt could also have adverse consequences although this effect is more subtle and, perhaps, less robust.

9.2   Summary

We now come back to our original question: are there ex ante differences in the pricing and financial structure of management buyouts in the later 1980s that might have led to disappointing investor returns relative to those in the earlier deals? In brief, our analysis of 124 larger management buyouts completed between 1980 and 1989 supports the following

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[30] This is true so long as the firm does not immediately file for bankruptcy protection. In this case, the repayment schedules would no longer be relevant, since all debt would effectively come due immediately.

conclusions:

(1)   Prices rose relative to current cash flows, with no evidence of an accompanying decrease in risk or increase in projected future growth. In part, this movement reflected trends in the stock market as a whole, but there also appears to have been a buyout-specific component to the increased price levels.

(2)   The more aggressive pricing was coupled with more precarious financial structures. Debt to total capital ratios rose, leading to somewhat lower cash flow to interest ratios. More strikingly, bank principal repayments accelerated dramatically, leading to sharply lower ratios of cash flow to total cash debt obligations. In later buyouts, the low coverages necessitated an increased reliance on asset sales.

(3)   Private subordinated debt was in large part replaced by widely-held public subordinated debt. The public subordinated debt, in particular, may have been reduced in value by the combination of increased deferred interest payments and faster senior debt principal repayments. Correspondingly, the use of public debt was also associated with somewhat higher ratios of buyout prices to cash flows.

(4)   The public subordinated debt also made significantly less use of strip financing, financing that can facilitate debt renegotiations in financial distress.

(5)   Finally, other interested parties such as management and deal promoters took more money out of the transactions up front. Arguably, this increased the incentives to simply get a deal done and decreased the incentives to ensure that a buyout was correctly priced and structured.

Many of these trends can be interpreted in different ways. In one view, the pricing and (some of the) structuring adjustments may have been a natural competitive response to abnormal positive returns earned in earlier buyouts. In this view, investors in later transactions may have received ex ante competitive returns. Alternatively, our results are consistent with some investors in later LBOs systematically overpaying. Given the defensive

reaction by senior lenders over time, it would appear that public subordinated debt holders may have borne the brunt of any such overpayment. Well-known agency problems at institutions making such investments -- including insurance companies and savings and loans -- could help explain this phenomenon.

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References

Asquith, Paul, David Mullins and Eric Wolff, 1989, Original issue high yield bonds: Aging analyses of defaults, exchanges and calls, Journal of Finance 44, 923-952.

Bernanke, Ben, John Campbell, and Toni Whited, 1990, U.S. corporate leverage: Developments in 1987 and 1988, Brookings Papers on Economic Activity 1, 255-286.

Bulow, J. and J. Shoven, 1978, The bankruptcy decision, Bell Journal of Economics, Spring, 437-456.

Diamond, D., 1991, Seniority and maturity structure of bank loans and publicly traded debt, Working paper (University of Chicago, Chicago, IL).

Gertner, R. and D. Scharfstein, 1990, A theory of workouts and the effects of reorganization law, Working paper (University of Chicago, Chicago, IL).

Gilson, S., K. John, and L. Lang, 1990, Troubled debt restructurings, Journal of Financial Economics 27, 315-354.

Gorton, G. and G. Pennachi, 1991, Banks and Loan Sales: Marketing Nonmarketable Assets, National Bureau of Economic Research, Working Paper 3551.

Harris, Milt and Artur Raviv, 1990, Capital structure and the informational role of debt, Journal of Finance 45, 321-349.

Jensen, Michael, 1989, The eclipse of the public corporation, Harvard Business Review No. 5, 61-74.

Jensen, Michael and William Meckling, 1976, Theory of the firm: Managerial behavior, agency costs, and ownership structure, Journal of Financial Economics 3, 305-360.

Kaplan, Steven, 1989a, Management buyouts: evidence on taxes as a source of value, Journal of Finance 44, 611-632.

Kaplan, Steven, 1989b, The effects of management buyouts on operations and value, Journal of Financial Economics 24, 217-254.

Kaplan, Steven, 1989c, Campeau's acquisition of Federated: Value destroyed or value added? Journal of Financial Economics 25, 191-212.

Kaplan, Steven and Jeremy Stein, 1990, How risky is the debt in highly leveraged transactions?, Journal of Financial Economics 27, 215-246.

Long, William and David Ravenscraft, 1991, The financial performance of whole-company LBOs, Working paper (University of North Carolina).

Myers, Stewart, 1977, The determinants of corporate borrowing, Journal of Financial Economics 5, 147-175.

Roe, Mark, 1987, The voting prohibition in bond workouts, The Yale Law Journal 97, 232-279.

Roundtable discussion, 1990, The economic consequences of high leverage and stock market pressures on corporate management, Journal of Applied Corporate Finance 3, No. 2, 6-37.

Scholes, Myron and Joseph Williams, 1977, Estimating betas from nonsynchronous data, Journal of Financial Economics 5, 309-328.

Shleifer, Andrei, and Robert Vishny, 1991, Asset Sales and Debt Capacity, Working paper (University of Chicago, Chicago, IL).

Smith, Abbie, 1990a, Corporate ownership structure and performance: The case of management buyouts, Journal of Financial Economics 27, 143-164.

Smith, Roy, 1990b, The money wars: the rise and fall of the great buyout boom of the 1980s (Truman Talley Books, New York, New York).

White, Michelle, 1980, Public policy towards bankruptcy: Me-first and other priority rules, Bell Journal of Economics 11, 550-564.

White, Michelle, 1983, Bankruptcy costs and the new bankruptcy code, Journal of Finance 38, 477-487.

Wigmore, Barrie, 1990, The decline in credit quality of new-issue junk bonds, Financial Analysts Journal, September-October, 53-62.

Table 1: PRICING

Median buyout prices relative to fundamentals, market earnings price ratios, and buyout premiums for 124 management buyouts completed in the period 1980-1989. Buyouts listed by year in which final transaction terms set.

Year	(1) Number of MBOs	(2) Net Cash Flow to Capital (as %)	(3) EBITDA to Capital (as %)	(4) Market E/P Ratio (as %)	(5) Premium (as %)
1980 + 1981	6	8.85	16.30	11.25	51.1
1982	8	13.27	17.18	13.24	64.8
1983	10	7.10	13.54	8.07	34.4
1984	17	7.85	14.34	9.86	40.8
1985	12	8.39	12.98	8.53	25.7
1986	15	7.54	13.48	6.01	38.7
1987	20	4.48	10.81	5.03	41.2
1988	31	7.27	11.48	6.93	48.1
1989	5	9.16	13.32	7.86	56.7
Total	124	7.56	12.75	7.65	43.0
		120	124	124	122
Time Trend		(--)**	(--)***	(--)***	(+)
1980-82 vs. 1983-85		(--)**	(--)***	(--)***	(--)***
1983-85 vs. 1986-88		(--)**	(--)***	(--)***	(+)**

Net cash flow equals EBITDA less capital expenditures in the last full year before the management buyout announcement. EBITDA equals operating income before interest, taxes, depreciation and amortization. EBIT equals EBITDA less depreciation and amortization. Capital equals the sum of (1) the market value paid for the firm's equity; (2) the book value of the firm's outstanding debt; and (3) the fees paid in the transaction; less (4) any excess cash removed from the firm to finance the buyout. Premium equals the percentage difference between the price paid for a firm's equity and the price two months before the first announcement of buyout or takeover activity. Market E/P ratio is the ratio of earnings to price for the S&P 500 in the month uncertainty about the buyout price is resolved. *** signifies medians are significantly different over time or in comparison periods at the 1% level; ** at the 5% level; and * at the 10% level.

Medians of company risk for 124 management buyouts completed in the period 1980-1989 (Dollars in millions). Buyouts listed by year in which final transaction terms set. The two rows in each cell are the median and number of observations, respectively.

Year	Measures of Risk			
	(1) Asset Beta	(2) Bernanke-Campbell Estimated Industry Earnings Beta	(3) Std. Dev. fractional change in operating margin	(4) Bernanke-Campbell Estimated Std. Dev. Industry Earnings
1980 + 1981	0.88 4	2.60 6	0.18 6	0.213 6
1982	0.52 8	2.22 7	0.19 8	0.249 7
1983	0.51 9	1.09 9	0.17 10	0.074 9
1984	0.75 16	1.35 16	0.13 16	0.249 16
1985	0.72 12	1.07 12	0.13 11	0.249 12
1986	0.66 13	3.55 13	0.19 12	0.348 13
1987	0.76 18	1.07 18	0.20 17	0.249 18
1988	0.60 26	3.26 28	0.18 24	0.249 28
1989	0.45 5	7.17 5	0.18 3	0.262 5
Total	0.63 105	2.16 114	0.17 108	0.249 114
Time Trend	(-)	(+)	(+)	(+)**
1980-82 vs. 1983-85	(+)	(-)	(-)	(-)
1983-85 vs. 1986-88	(-)	(+)	(+)**	(+)*

(1) Asset beta equals the product of the equity beta and the ratio of the market value of equity to the value of total capital two months before the first buyout announcement. Equity betas are estimated by the Scholes-Williams estimation technique, daily returns, and the CRSP value-weighted index over the period 560 to 40 days before the buyout announcement. (2) and (4) Bernanke-Campbell industry earnings betas and standard deviations are taken from Bernanke et al. (1990). (3) Standard deviation of fractional change in operating margin is calculated from at least six years and up to ten years of pre-buyout financial data. *** signifies medians are significantly different over time or in comparison periods at the 1% level; ** at the 5% level; and * at the 10% level.

Table 3: PROJECTED GROWTH

Summary statistics of projected growth for 124 management buyouts completed in the period 1980-1989 (Dollars in millions). Buyouts listed by year in which final transaction terms set. The two rows in each cell are the median and number of observations, respectively.

Year	Measures of Expected Growth						
	(1) Proj. Growth Sales T-1 to T+1	(2) Proj. Growth Sales T+1 to T+n	(3) Proj. Growth EBITDA T-1 to T+1	(4) Proj. Growth EBITDA T+1 to T+n	(5) Proj. Growth EBITDA / Sales T-1 to T+1	(6) Proj. Growth CAPX T-1 to T+1	(7) Proj. Growth CAPX / Sales T-1 to T+1
1980 + 1981	26.3	11.2	28.6	14.6	3.2	-24.4	-37.4
	6	5	5	4	5	1	1
1982	22.4	12.4	47.2	14.2	15.2	-33.3	-30.2
	6	6	6	5	5	1	1
1983	20.4	7.7	31.5	10.3	8.3	- 6.7	-17.9
	7	7	6	7	5	3	3
1984	26.3	9.0	29.6	11.7	6.3	-17.0	-33.4
	14	14	13	13	13	6	6
1985	11.0	9.3	44.5	11.5	20.3	30.3	17.3
	9	10	8	9	9	3	3
1986	14.7	5.5	28.0	7.3	16.5	-51.1	-60.5
	11	15	9	13	12	4	4
1987	14.7	8.1	27.6	10.1	11.0	- 2.3	-14.9
	18	19	19	19	19	6	6
1988	23.7	7.4	39.3	10.3	9.0	- 5.9	-20.9
	26	25	23	21	24	12	12
1989	12.9	9.9	34.1	12.0	22.2	-12.0	-21.1
	4	4	4	4	4	2	2
Total	20.4	8.3	33.2	10.8	12.2	-12.7	-22.8
	101	105	93	95	96	38	37
Time Trend	(-)	(-)*	(-)	(-)	(+)	(+)	(+)
1980-82 vs. 1983-85	(-)	(-)***	(-)	(-)**	(+)	(+)	(+)
1983-85 vs. 1986-88	(-)	(-)	(-)	(-)	(-)	(-)	(-)

All projections are obtained from proxy of 14D1 statements describing buyout transactions. EBITDA equals operating income before interest, taxes, depreciation and amortization. CAPX equals capital expenditures on property, plant, and equipment. Year T-1 is the last full year before the buyout announcement. Year T+i is the ith full year after the buyout announcement. *** signifies medians are significantly different over time or in comparison periods at the 1% level; ** at the 5% level; and * at the 10% level.

Summary statistics of capital structure for 124 management buyouts completed in the period 1980-1989 (Dollars in millions). Buyouts listed by year in which final transaction terms set. The two rows in each cell are the median and number of observations, respectively.

Year	(1) Post-Buyout Debt to Capital (as %)	(2) Common Stock to Capital (as %)	(3) Net Cash Flow to Interest	(4) EBITDA to Interest	(5) Net Cash Flow to Cash Interest	(6) EBITDA to Cash Interest	(7) Req'd Debt Repay in 2 yrs to EBITDA (as %)	(8) Net Cash Flow to Cash Interest + (Repay in 2 yrs) /2	(9) EBITDA to Cash Interest + (Repay in 2 yrs) /2
1980 + 1981	88.3	10.53	0.63	1.15	0.63	1.15	0	0.56	1.15
	6	6	5	6	5	6	6	5	6
1982	87.3	6.67	0.79	1.28	0.90	1.28	0	0.75	1.16
	8	8	7	8	7	8	6	5	6
1983	87.2	11.54	0.67	1.26	0.67	1.26	22.3	0.69	1.18
	10	10	10	10	10	10	7	7	7
1984	88.7	7.91	0.74	1.29	0.74	1.29	32.3	0.66	1.12
	17	17	17	17	17	17	11	11	11
1985	86.0	7.03	0.75	1.22	0.82	1.30	59.2	0.59	1.09
	12	12	12	12	12	12	11	11	11
1986	90.7	5.60	0.73	1.50	0.73	1.75	160.0	0.36	0.72
	15	15	13	15	13	15	10	8	10
1987	88.9	4.04	0.43	1.12	0.52	1.27	103.5	0.21	0.76
	20	20	19	20	19	20	14	14	14
1988	90.5	6.13	0.61	1.11	0.70	1.16	103.5	0.41	0.66
	31	31	29	31	29	31	21	20	21
1989	83.2	13.20	0.83	1.27	0.83	1.27	43.3	0.62	0.89
	5	5	5	5	5	5	4	4	4
Total	89.1	6.52	0.68	1.20	0.74	1.27	60.0	0.46	0.89
	124	124	117	124	117	124	90	85	90
Time	(+)**	(-)*	(-)	(-)*	(-)	(-)	(+)***	(-)**	(-)***
80-2 vs. 83-5	(-)	(+)	(-)	(-)	(+)	(+)	(+)***	(-)	(-)
83-5 vs. 86-8	(+)***	(-)***	(-)	(-)	(-)	(-)	(+)***	(-)***	(-)***

Table 4 (continued)

Capital equals the sum of (1) the market value paid for the firm's equity; (2) the book value of the firm's outstanding debt; and (3) the fees paid in the transaction; less (4) any excess cash removed from the firm to finance the buyout. Post-buyout debt includes new buyout debt and pre-buyout debt that is not refinanced. Net cash flow equals EBITDA less capital expenditures in the last full year before the management buyout announcement. EBITDA equals operating income before interest, taxes, depreciation and amortization. Expected interest payments are calculated using the interest rates and debt amounts projected in the proxy or 14D statements describing the buyouts. Because most of the bank debt in these transactions is priced at a spread over the London Interbank Offering Rate (LIBOR) or the prime rate, we calculate expected interest payments on the bank debt using the rates in effect at the date uncertainty about the bid is resolved. Cash interest equals interest less non-cash interest payments. Required debt repay in two years equals the principal amount of bank debt required in the first two post-buyout years. *** signifies medians are significantly different over time or in comparison periods at the 1% level; ** at the 5% level; and * at the 10% level.

Table 5
BANK DEBT

Annual medians of bank debt variables for 124 management buyouts completed in the period 1980-1989 (Dollars in millions). Buyouts listed by year in which final transaction terms set. The two rows in each cell are the median and number of observations, respectively.

Year	(1) Bank Debt to Total Debt	(2) Bank Interest Rate versus Prime	(3) Bank Interest Rate versus LIBOR	(4) Bank Fees to Bank Debt	(5) Fee Adjusted Bank Interest Rate versus Prime	(6) Bank Loan Maturity (years)	(7) Asset Sales (% of deals)	(8) Asset Sale Amount as % of Capital (if Asset Sale
1980 + 1981	39.0	0.75	1.25	0.21	N.A.	8.0	50.0	15.5
	6	5	2	1	0		6	3
1982	72.9	1.25	2.50	1.28	1.31	8.5	0.0	N.A.
	8	7	2	5	5		8	0
1983	75.7	1.38	2.25	0.40	1.44	8.5	33.3	21.1
	10	8	6	8	8		9	3
1984	73.1	1.44	2.25	0.79	1.59	7.75	18.8	23.2
	16	16	13	14	13		16	3
1985	44.7	1.50	2.25	1.94	2.13	7.25	33.3	14.2
	11	11	7	7	7		12	4
1986	52.0	1.50	2.75	2.06	2.21	6.8	60.0	19.3
	15	13	12	13	12		15	8
1987	54.7	1.50	2.50	2.06	2.13	7.0	40.0	22.4
	18	17	14	15	15		20	8
1988	56.1	1.50	2.50	2.49	2.24	7.0	32.3	14.8
	28	27	25	22	22		31	10
1989	57.1	1.50	2.50	2.38	1.98	8.0	20.0	11.4
	5	5	4	4	3		5	1
Total	57.1	1.50	2.50	1.93	2.12	7.5	33.6	18.1
	117	109	85	89	85	112	122	40
Time Trend	$(-)^{**}$	$(+)^{***}$	$(+)^{***}$	$(+)^{***}$	$(+)^{***}$	$(-)^{**}$	$(+)$	$(-)$
80-82 vs. 83-85	$(+)$	$(+)$	$(+)$	$(-)$	$(+)$	$(-)$	$(+)$	$(-)$
83-85 vs. 86-88	$(-)^{**}$	$(+)^{***}$	$(+)^{***}$	$(+)^{***}$	$(+)^{***}$	$(-)^{*}$	$(+)$	$(-)$

Bank debt is debt provided to finance the buyout in the form of a senior term loan or revolving credit loan. Bank interest rate is the interest rate charged for the bank debt as a spread over the prime rate or over LIBOR -- the London Interbank Offer Rate. Bank fees are upfront fees paid to the lenders of bank debt. Fee-adjusted bank interest rate calculates the effective interest rate on the bank debt after reducing the bank debt by the upfront bank fees and amortizing the bank debt. Asset sales are present if they are mentioned as expected in the proxy or 14D statement describing the buyout transaction. *** signifies medians are significantly different over time or in comparison periods at the 1% level; ** at the 5% level; and * at the 10% level.

Table 6
ASSOCIATION OF ASSET SALES TO COVERAGE AND PRICING

Regressions of cash flow to debt obligations and cash flow to total capital as a function of expected asset sales for 124 management buyouts completed in the period 1980-1989.

	(1) Net Cash Flow to Cash Debt Obligations		(2) EBITDA to Cash Debt Obligations		(3) Net Cash Flow to Total Capital (%)		(4) EBITDA to Total Capital (%)	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Constant	0.90^{***}	0.16	1.26^{***}	0.13	11.6^{***}	2.3	17.4^{***}	0.9
1982 MBOs	-0.46^{**}	0.23	-0.12	0.18	-0.5	3.0	0.0	1.4
1983 MBOs	-0.17	0.21	-0.09	0.17	-3.7	2.8	-3.7^{**}	1.4
1984 MBOs	-0.11	0.19	-0.06	0.16	-2.5	2.6	-2.6	1.2
1985 MBOs	-0.20	0.19	-0.19	0.16	-2.7	2.7	-4.2^{**}	1.4
1986 MBOs	-0.34^{*}	0.21	-0.25	0.16	-4.3	2.7	-2.8^{*}	1.3
1987 MBOs	-0.51^{***}	0.19	-0.42^{***}	0.15	-5.7^{**}	2.6	-5.7^{***}	1.2
1988 MBOs	-0.38^{**}	0.18	-0.41^{***}	0.14	-4.9^{**}	2.5	-5.6^{***}	1.1
1989 MBOs	-0.27	0.24	-0.30	0.20	-2.7	3.3	-4.3^{**}	1.8
Expected Asset Sales	-0.26^{***}	0.09	-0.27^{***}	0.07	-2.4^{**}	1.1	-1.2^{*}	0.7
N Obs.	85		90		120		124	
R-squared	0.28		0.35		0.15		0.28	

Net cash flow equals EBITDA less capital expenditures in the last full year before the management buyout announcement. EBITDA equals operating income before interest, taxes, depreciation and amortization. Cash debt obligations equal the sum of expected post-buyout cash interest payments and bank debt principal repayment in the first post-buyout year. Capital equals the sum of (1) the market value paid for the firm's equity; (2) the book value of the firm's outstanding debt; and (3) the fees paid in the transaction; less (4) any excess cash removed from the firm to finance the buyout. Expected Asset Sales variable equals 1 if proxy or 14D statement acknowledges plans to sell assets after the buyout; it equals 0 otherwise.
*** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.

Table 7
SUBORDINATED DEBT

Summary statistics on subordinated debt for 124 management buyouts completed in the period 1980-1989 (Dollars in millions).

Year	(1) Number of MBOs	(2) % of Deals with Public Junk Debt	(3) % of Deals with Cram Down Debt	(4) Average Junk and Cram Down to Capital (%)	(5) % of Deals with PIK or Disc. Debt	(6) Average PIK or Disc. Debt to Capital (%)	(7) Strips (% of deals)	(8) Average Strip Debt to Capital (%)
1980 + 1981	6	0.0	0.0	0.0	0.0	0.0	83.3	36.6
1982	8	0.0	12.5	1.2	25.0	3.0	75.0	24.5
1983	10	0.0	10.0	1.1	10.0	1.1	70.0	27.5
1984	17	5.9	23.5	5.7	11.8	2.1	47.1	17.3
1985	12	58.3	58.3	25.9	50.0	7.6	50.0	19.7
1986	15	40.0	26.7	17.5	26.7	5.6	33.3	7.4
1987	20	50.0	45.0	24.9	50.0	9.7	10.0	4.4
1988	31	61.3	38.7	22.5	61.3	8.5	29.0	12.0
1989	5	60.0	40.0	21.5	60.0	10.6	20.0	9.4
Total	124	37.1 124	32.3 124	16.1 124	37.9 124	6.1 124	39.5 124	14.8 124
Time trend		$(+)^{***}$	$(+)^{**}$	$(+)^{***}$	$(+)^{***}$	$(+)^{***}$	$(-)^{**}$	$(-)^{***}$
1980-82 vs. 1983-85		$(+)^{*}$	$(+)^{*}$	$(+)^{**}$	$(+)$	$(+)$	$(-)$	$(-)$
1983-85 vs. 1986-88		$(+)^{***}$	$(+)$	$(+)^{***}$	$(+)^{***}$	$(+)^{***}$	$(-)^{***}$	$(-)^{***}$

Junk debt is publicly-issued debt rated below BBB- by Standard & Poor's or below Baa3 by Moody's. Cram down debt is debt issued to pre-buyout shareholders as part of the going private payment. PIK (pay-in-kind) and discount debt are debt obligations which do not require cash interest payments. Strip financing refers to transactions in which some debtholders hold at least 5% of post-buyout equity. *** signifies medians are significantly different over time or in comparison periods at the 1% level; ** at the 5% level; and * at the 10% level.

Table 8
ASSOCIATION OF JUNK DEBT TO BANK PARTICIPATION AND BUYOUT PRICING

Regressions of bank debt to total debt and cash flow to total capital as a function of use of junk debt for 124 management buyouts completed in the period 1980-1989.

	(1) Bank Debt to Total Debt (%)		(2) Net Cash Flow to Total Capital (%)		(3) EBITDA to Total Capital (%)	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Constant	48.6***	7.0	10.4***	2.1	16.8**	1.3
1982 MBOs	21.9**	9.3	0.7	2.7	1.3	1.7
1983 MBOs	25.3***	8.8	-3.4	2.6	-3.6**	1.7
1984 MBOs	19.3**	8.2	-1.8	2.4	-2.2	1.5
1985 MBOs	-1.9	9.0	-1.4	2.6	-3.0*	1.7
1986 MBOs	7.4	8.4	-2.4	2.5	-1.6	1.6
1987 MBOs	6.3	8.4	-4.7*	2.4	-4.8***	1.6
1988 MBOs	11.4	8.1	-3.6	2.4	-4.4***	1.5
1989 MBOs	7.5	10.6	-0.9	3.1	-3.0	2.0
Use Junk Debt	-6.2	4.0	-1.6	1.1	-1.6**	0.7
N Obs.	117		120		124	
R-squared	0.25		0.06		0.26	

Bank debt to total debt is the ratio of the senior debt (term loan and revolving credit loan) provided by the senior lender to the total debt of the buyout company. Regression 1 excludes transactions not using bank debt. Net cash flow equals EBITDA less capital expenditures in the last full year before the management buyout announcement. EBITDA equals operating income before interest, taxes, depreciation and amortization. Capital equals the sum of (1) the market value paid for the firm's equity; (2) the book value of the firm's outstanding debt; and (3) the fees paid in the transaction; less (4) any excess cash removed from the firm to finance the buyout. Use Junk Debt variable equals one if the buyout is financed using publicly-held junk debt; it equals 0 otherwise. Junk debt is publicly-issued debt rated below BBB- by Standard & Poor's or below Baa3 by Moody's.
*** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.

Table 9
INCENTIVES AND EQUITY OWNERSHIP

Annual medians of pre- and post-buyout percentage and dollar management equity ownership, and total fees to capital for 124 management buyouts completed in the period 1980-1989. Number of observations is below median.

Year	(1) Old Mgmt. Equity (%)	(2) New Mgmt. Equity (%)	(3) New % / Old % Mgmt. Equity	(4) New $ / Old $ Mgmt. Equity	(5) Hostile Pressure	(6) Total Fees to Capital
1980 + 1981	1.5	10.1	7.58	0.707	50.0	2.05
	6	6	6	6	6	6
1982	2.0	23.1	6.79	0.958	50.0	2.66
	8	8	8	8	8	8
1983	5.2	15.5	3.42	0.524	30.0	2.58
	10	9	9	9	10	9
1984	4.4	27.5	3.81	0.670	23.5	2.21
	17	17	17	17	17	17
1985	3.5	22.5	4.51	0.334	41.7	3.69
	12	11	11	11	12	12
1986	5.1	20.8	6.28	0.314	46.7	5.06
	12	13	11	11	15	15
1987	8.1	19.0	3.54	0.410	50.0	4.32
	17	14	14	14	20	20
1988	8.4	28.5	2.86	0.349	30.0	5.97
	25	24	22	22	30	31
1989	6.2	15.3	2.93	0.542	25.0	5.73
	4	4	4	4	4	5
Total	5.0	22.3	4.14	0.460	37.7	3.81
	111	106	102	102	122	123
Time trend	$(+)^{**}$	$(+)^{*}$	$(-)$	$(-)^{*}$	$(-)$	$(+)^{***}$
1980-82 vs. 1983-85	$(+)^{**}$	$(+)^{**}$	$(-)$	$(-)$	$(-)$	$(+)$
1983-85 vs. 1986-88	$(+)$	$(+)$	$(-)$	$(-)^{**}$	$(+)$	$(+)^{***}$

Old management equity percentage is the percentage of pre-buyout equity held by the post-buyout management team. New management equity percentage is the percentage of post-buyout equity held by the post-buyout management team. New % / Old % Mgmt. Equity is the ratio of new management equity percentage to old management equity percentage. New $ / Old $ Mgmt. Equity is the ratio of the dollar value of post- to pre-buyout equity held by the post-buyout management team. Old equity is valued at the final buyout equity value. Total fees include all fees reported in the proxy or 14D statement describing the buyout transaction. Capital equals the sum of (1) the market value paid for the firm's equity; (2) the book value of the firm's outstanding debt; and (3) the fees paid in the transaction; less (4) any excess cash removed from the firm to finance the buyout. *** signifies medians are significantly different over time or in comparison periods at the 1% level; ** at the 5% level; and * at the 10% level.

Table 10: POST-BUYOUT PERFORMANCE

Percentage of transactions defaulting on debt payments and filing for Chapter 11 bankruptcy, and medians for post-buyout performance measures for 124 management buyouts completed in the period 1980-1989. Number of observations on second line.

Year	(1) Default on debt payment	(2) Chapter 11	(3) Actual Growth Operating Margins T-1 to T+1	(4) Actual Growth Cash Flow Margins T-1 to T+1	(5) Actual Growth CAPX Margins T-1 to T+1
1980 +	0.0	0.0	2.5	22.7	-26.0
1981	6	6	3	2	2
1982	0.0	0.0	1.6	29.4	-37.3
	8	8	5	4	4
1983	0.0	0.0	9.2	55.7	-41.9
	10	10	8	7	7
1984	5.9	5.9	-1.3	28.4	-41.1
	17	17	12	12	12
1985	25.0	16.7	14.3	30.2	-19.3
	12	12	11	11	11
1986	40.0	26.7	-16.7	-7.6	-63.9
	15	15	8	7	8
1987	25.0	15.0	17.1	53.2	-30.6
	20	20	16	14	15
1988	16.1	0.0	13.9	37.3	-43.5
	31	31	18	16	17
Total	16.8	8.4	9.1	36.5	-37.6
	119	119	81	73	76
Time Trend	(+)*	(--)	(+)	(--)	(--)
1980-82 vs. 1983-85	(+)	(+)	(+)	(+)	(+)
1983-85 vs. 1986-88	(+)*	(+)	(+)	(--)	(--)
Time Trend (No 1988)	(+)***	(+)**	(+)	(--)	(+)
1983-85 vs. 1986-87	(+)**	(+)	(--)	(--)	(--)

Firms that default on debt payments have been unable to meet debt service requirements incurred under the terms of the going private transaction. Net cash flow equals EBITDA less capital expenditures (CAPX) in the last full year before the management buyout announcement. EBITDA equals operating income before interest, taxes, depreciation and amortization. Year T+i is the ith full fiscal year of post-buyout operations. Growth in operating margins T-1 to T+1 is the percentage change in the ratio of EBITDA to Sales from the last full fiscal year of pre-buyout operations to the first full fiscal year of post-buyout operations. Growth in cash flow and CAPX margins are the percentage changes for the ratios of net cash flow to sales and capital to sales from year T-1 to year T+1. *** signifies medians are significantly different over time or in comparison periods at the 1% level; ** at the 5% level; and * at the 10% level.