

LEVERAGED BUYOUTS: AN ANALYSIS
OF PREMIUMS AND STOCK
PRICE REACTIONS

By

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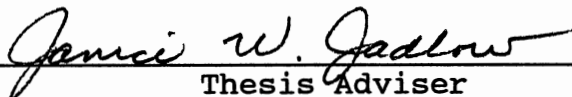
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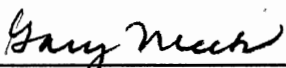
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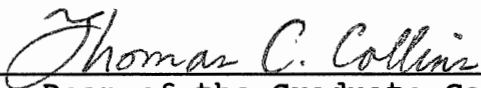


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Dean of the Graduate College

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**Praise God
from Whom all blessings flow.**

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CHAPTER I

INTRODUCTION

The Growth of Corporate Debt

Leveraged buyouts (LBOs) became increasingly popular during the 1980's. Investment banking firms grew adept at arranging them and investors channeled their money into junk bond funds. The level of corporate debt rose from \$965 billion in 1982 to \$1.8 trillion in 1988, representing an increase from 32 percent to 37 percent of the U.S. gross national product in those six years (Greenwald, 1988). The household and federal government sectors increased their holdings of debt from 52 percent of the U.S. gross national product in 1980 to 62 percent in 1987 and from 27 percent of the U.S. gross national product in 1980 to 43 percent in 1987, respectively (Heinz, Congressional Hearings, 1989). Between the years 1984 and 1987 nonfinancial corporations retired a net \$313 billion of equity and borrowed a net \$613 billion of debt (Brady, Congressional Hearings, 1989). These are typical of the data used to explain the magnitude of the trend toward leverage. Not all of the debt was LBO-related, but the size of the debt issued in the course of LBO transactions drew attention.

The purpose of this paper is to examine the characteristics of firms that have undergone leveraged buyouts from 1980 through 1990. An empirical analysis using financial, economic, and descriptive variables will extend, complement, and synthesize previous research in the area. The objective of this study is to determine whether the purchasers of bought-out firms considered, at the time of purchase, the firms' abilities to withstand recessionary periods. It is important that this factor be weighed into a buyout decision. Failure to do so could lead to problems for acquiring firms during economic downturns if the firms are not able to service the debt acquired in the buyout. There is also a possibility of harm to the economy in general since bankruptcies of bought-out firms would be likely to have further impact due to multiplier, or ripple, effects.

Nicholas Brady, Secretary of the Department of Treasury, described the growth in LBO activity as one result of a "fly-now, pay-later mentality", with great emphasis on the short-term and little concern about long-term consequences. The investment community has traditionally placed more emphasis on current performance, as reflected in quarterly and yearly earnings reports (Brady, Danforth, Ruder, Kidder, Congressional Hearings, 1989). Corporate managers take a short-term view, placing less emphasis on long-range planning. Managers are understandably reluctant to provide proprietary information

on long-term projects. Thus most of the publicly available information about firms is of a short-term nature.

Brady has expressed concern with the growing use of corporate leverage and its potential impact on the nation's economy. Young talent and financial resources have been diverted for "financial engineering", while other nations have been planning for the future. Brady notes that past periods of economic growth were characterized by the use of savings to create new jobs, new products, and new services at lower prices. LBOs have produced fundamental changes in the financial structure of the nation's corporations. Brady contends that the economic future of the U.S. and its ability to remain competitive in a global economy are jeopardized.

Although corporate debt-to-equity ratios rose sharply over the decade, the rates are not unprecedented for the United States economy, nor are they above the levels of some competitors, such as Japan. Even before the tax code provided incentives for holding debt, i.e. before World War I, debt-to-equity ratios were substantial (Summers, Congressional Hearings, 1989). However, Chairman of the Federal Reserve System Board of Governors Alan Greenspan argued in 1989 that the ability of firms to meet their interest payments has deteriorated. Low interest coverage ratios, as a result of heavier debt loads and interest burdens at the end of the 1980's, were more characteristic of past recessionary periods when weak profits had been the

culprit. The average corporate bond rating, based on Greenspan's large sample of firms, was "A-" in 1989 as compared to an "A+" average rating in the late 1970s. In his opinion this is a significant change, reflecting a decline in the underlying corporate debt quality.

Greenspan's view is supported by research which indicates that the initial debt ratings of the acquiring firms in LBOs are often downgraded (Amihud, 1989; Marais et al., 1987); also, these bonds often experience negative abnormal returns (Lehn and Poulsen, 1989; Marais et al., 1987; Travlos and Cornett, 1990).

Along with a shift in attitudes toward the short run, there have been innovations in capital markets which make higher levels of debt possible. Historically, bonds were generally investment grade when issued, but may have become "fallen angels" through corporate misfortune (Brady, Congressional Hearings, 1989). Junk bonds are low grade when issued. The loan-sale market among banks for junk bond debt has developed substantially. In addition, the participation of foreign banks in U.S. markets has added liquidity to the low-grade ("junk bond") corporate debt market. This results in increased marketability. Therefore more investors are willing to hold junk bonds than would be the case if their marketability were highly restricted, as it had been in the past.

A growth in arbitrage activity has added to the trend toward increased debt levels (Brady, Congressional

Hearings, 1989). At the suggestion that a corporation is being considered as a buyout target, arbitragers typically anticipate gains on the company's stock based on previous patterns for buyout target stocks. They may then enter into the market as buyers of significant numbers of shares, thus driving the stock's price up. The likelihood of a successful bid may be increased by the strong interest that arbitragers have in the stock. Potential sellers are inclined to act quickly due to their limited information and eagerness to sell while prices are up. Add substantial up-front transactions fees for investment advisors, brokers, underwriters, and LBO fund managers, with no long-term risk involvement, and there are many groups with incentives to take a short-term view.

Parties Involved in LBOs

The effects of an LBO may concern not only parties who are directly involved, but also those indirectly affected by the impact on the economy as a whole. Typically the bought-out firm's new owners and the junk bond holders anticipate high returns. The firm's current shareholders, investment banks, commercial banks, and lawyers initially receive high rates of return on their investments of monetary or human capital. The firm's initial bondholders can expect a fall in the bonds' market value because they become much riskier as the firm drastically increases its debt level. U.S. taxpayers are affected indirectly; the

original stockholders pay taxes on their gains, but the tax deductibility of the interest payments on debt later will presumably lead to reduced collections of corporate income tax (Congressional Hearings, 1989; Newport, 1989; Greenwald, 1988).

Employees of bought-out firms may have long-term or short-term adjustments to make as the corporate reorganization takes place. The AFL-CIO has several concerns about the potential negative impact of buyouts. The group estimates that mergers, takeovers, and LBOs over the past decade have directly led to about 90,000 of its members losing their jobs (Kirkland, Congressional Hearings, 1989). There may be negative effects for the communities in which the firms are located. Corporate assets and subsidiaries may be sold to reduce the debt load. There have been instances of companies' funds being used inappropriately to pay greenmail. New management may choose to terminate established bargaining relationships and to cancel collective agreements that have been made (Congressional Hearings, 1989).

Senator Donald W. Riegle (Congressional Hearings, 1989) cited the psychological effects of the LBO trend on investors and chief executive officers (CEOs), in terms of their taking a short-term view and having an increased fear of the company becoming a takeover target.

Favorable Opinions About LBOs

Opinions about the desirability of LBOs are varied. One view is that they are valid investment opportunities, providing a proper return for the level of risk involved, while dramatically increasing the efficiency of the firm.

Jensen's (1986) agency cost hypothesis states that going private may control the agency costs of free cash flow. Firms which have stable business histories, low growth prospects, and high potential for generating cash flow are seen as likely LBO candidates by Jensen. In these circumstances the agency costs of free cash flow are likely to be high.

Surplus funds should be distributed to shareholders if firm value is to be maximized. But managers may choose to take on negative net present value projects or retain excess funds to increase the resources under their control. Going private allows the firm to use its free cash flow more efficiently.

In this case debt serves a control function in LBOs, with the interest payments to bondholders substituting for dividend payments to stockholders. The ensuing interest payments on debt may be an alternative to having used the free cash flow to pay dividends (Travlos and Cornett, 1990). The buyout may be seen as having led to a liquidating dividend for stockholders, thus eliminating free cash flow and the agency costs associated with it.

Further discussion of Jensen's free cash flow hypothesis as applied to going private transactions can be found in the Harlow and Howe (1988) paper.

Supporters of LBOs maintain that companies are better managed after the transaction, especially when managers have become owners of the firm. Prior to the buyout, management may have been inefficient and incurred high agency costs. It is not uncommon for the members of a corporation's board of directors to be friendly with corporate managers, and for members of the board to hold little financial stake in the corporation. In this situation the board of directors would give priority to management's interests rather than stockholders' interests. This would allow the incidence of agency costs that are higher than would be the case if management's sole focus were on benefiting shareholders. The LBO process may then be considered a disciplinary tool for management and directors that generate high agency costs.

David S. Ruder, Chairman of the Securities and Exchange Commission, points out that LBOs created significant wealth gains for U.S. stockholders during the 1980s. Much of this wealth was reinvested in the securities markets, resulting in increased availability of financial capital. The SEC, of course, is mainly concerned with the adequacy of disclosure in LBO transactions, and not with who benefits or loses as a result of the transactions.

not with who benefits or loses as a result of the transactions.

Some LBOs may be justified on the grounds that the bought-out firms are divisions of large corporations that the companies desire to sell. The conglomerate trend of the 1960s, during which disparate companies were assembled, is being reversed. A buyout of a firm's subdivision could result in more efficient operation of it and the remaining divisions of the firm due to the benefits of specialization in management and production.

Unfavorable Opinions About LBOs

An opposing belief is that LBOs result in excessive prices being paid for acquired firms at the expense of the losing parties including the firm's bondholders. It is well documented that there is a wealth transfer from bondholders to stockholders upon announcement of a buyout (Lehn and Poulsen, 1989; Marais et al., 1987; Travlos and Cornett, 1990).

There are also fears that the increase in corporate debt will increase firms' risk of bankruptcy, and that this elevated risk has the potential for worsening future recessions. Faust (1990) found that bankruptcy risk, as measured by firms' financial debt ratios, did increase during the 1980s, and that there was a dramatic rise in the number of business failures from 1979 through 1986. Some of the failures might have been explained by changes in

bankruptcy laws in 1979, but the effects of this change should have been felt early in the decade and leveled off before mid-decade.

Faust (1990) also documents an increase in interest rate premiums (over ten year Treasury bonds) within a bond risk class relative to expansionary periods before the 1980s. This supports the reported downgrading of bonds by rating services, reflecting the increase in bond riskiness.

The primary concern of Faust (1990) and some government policy makers is that this increase in bankruptcy risk may increase the severity of the next economic recession. Firms facing cash flow difficulties tend to compensate by curtailing investment. Firm investment decreases by an estimated \$.20 to \$.40 for each \$1.00 decrease in cash flow (Fazzari, Hubbard, and Petersen, 1988).

This type of reaction by troubled firms can extend to other firms that supply the troubled firms with raw materials, investment goods, or financial goods or services. Thus, a "ripple effect" could lead to a lengthier recession in the future because firms would not have the resources for investment if they find themselves in a cash flow squeeze. Reduced lending due to a decrease in credit worthiness resulting from cash flow problems would also heighten the impact.

Another area of concern for the economy in general is the holding of junk bonds by financial institutions. Some

state insurance regulators have proposed restrictions on the extent to which insurance companies can hold such debt. Greenspan has looked at guidelines for federally chartered banks. In 1989 the Federal Reserve estimated that LBO loans comprised 9.9 percent of all commercial loan activity in large banks. Since banks generally issue secured debt, Secretary Brady pointed out that banks have fared pretty well in the LBOs that have gone sour to this point. But the effects during leaner economic times were still uncertain at the end of the decade.

Some savings and loans (S&Ls), however, took on high risk investments, including junk bonds and mutual funds composed of junk bonds. Some parties see the S&Ls' junk bond portfolios as contributing significantly to the thrift crisis due to an erosion of the bonds' value. Senator Lloyd Bentsen sees this not as the main cause of the S&L problems, but as a marginal contributor to them. Ruder of the SEC has defended the holdings of junk bonds by financial institutions. His reasoning is that the purchasers are primarily sophisticated financial institutions, which thoroughly analyze the risk and return characteristics of the instruments.

Many institutions have limits on the amount of equity they can have in their portfolios. Life insurance companies limit equity to a certain percent of the portfolio, and banks are not generally allowed to hold securities. But the characteristics of junk bonds are in

many ways more like equity than like debt. Thus the regulatory limitations are circumvented when these institutions hold junk bonds.

Many financial analysts have predicted a decrease in the number of LBO transactions that may transpire in future years. It is possible that there was a "backlog of needed restructurings", in Greenspan's words, and that the mergers, acquisitions, and LBOs of the 1980s reduced inefficiencies substantially. But the question of the long-term impact of the trend remains to be answered. Perhaps the most disturbing factor is that a vast majority of the restructurings took place during a long period of economic expansion, and, as of the end of the decade, had not been tested by the trials of recession. Consequently, we cannot rely on past data to predict how well the parties involved and the economy in general will fare in the coming years.

A particular concern is whether the firms' purchasers are considering the possibility of an economic recession and the impact this could have on their ability to pay off the new debt. The new owners, which frequently include former managers, often plan to enact a reverse-LBO eventually, in which the firm goes public again. Therefore they would want to avoid bankruptcy. If the premium paid in an LBO does not reflect the cyclicalities of the firm's cash flows and the industry(ies) in which it operates, then the debt load of the leveraged firm might be too large to

avoid bankruptcy. The new owners need to protect their interests with regard to these factors so that the firm's cash flows will be adequate to service the debt acquired during the buyout.

Brady notes that a disproportionate share of LBOs occurred in industries that are considered to be relatively noncyclical and that have strong cash flows, which should be better able to support leverage. Several witnesses who testified before the Senate Committee on Finance hearings on leveraged buyouts and corporate debt indicated that they were cautious in their LBO dealings and considered such things as whether the bought-out firms could support the new debt levels. They looked at the companies' performances during past recessionary periods (e.g. 1974 and 1981) to see what the impact was at that time.

Kidder assured the committee that Kohlberg, Kravis, Roberts (KKR) used the criteria of recession resistance and a stable growth pattern when identifying potential buyout targets. Thomas H. Lee, president of Thomas H. Lee Co. and chairman and individual general partner of ML-Lee Acquisition Fund, testified before the Senate as a public witness in January 1989. He indicated that the amount paid for a "recession-proof" company would be substantially more than for a company in a highly cyclical business. Lee felt that most deals were carefully analyzed in this regard, resulting in reasonable decisions.

In contrast, Dr. Lawrence H. Summers of Harvard University, testified before the same committee that although LBOs are generally beneficial there would probably be some bankruptcies due to excessive LBO debt during the next recession. Dr. Alan J. Auerbach of the University of Pennsylvania testified that he feared the steady growth in the economy since the recession of 1981-1982 had caused people to "have shorter memories about what happens to corporate debt during recessions". In response to those citing Japan's very high debt-to-equity ratios throughout this period, Auerbach reminded the committee that Japan's research and development expenditures were much higher than those of U.S. firms. The Japanese were apparently using much of the debt to enhance future prospects, whereas U.S. firms were not.

Government Regulation Possibilities

This conflict has led to consideration of government regulation of LBOs, including possible constraints on prices paid for bought-out firms. To the extent that the consequences of wide-scale default could be devastating to the U.S. economy, the federal government could justify intervening in LBO transactions. The cost of intervention would presumably be a reduction in economic efficiency, specifically a less efficient allocation of capital. Alan Greenspan has found it disturbing that the U.S. tax structure subsidizes corporate leveraging to such a high

degree. The Federal Reserve is concerned about the increasing share of restructuring loans made by banks. Greenspan warns, however, that the solution should not be sought through tax code changes or regulatory reform for financial institutions. In his opinion, these types of changes tend to be farther-reaching than the immediate problems which they are meant to solve. One probable effect of further regulation would be to give foreign acquirers an "artificial edge" to the extent that they could avoid the restrictions. Changes like those mentioned tend to merely extend the regulation-innovation cycle. Each time regulations are changed innovations take place which lead to circumvention of the new regulations.

Statement of Hypotheses

Given the complexity of evaluating the impact of changes in regulation and the differences of opinion about the desirability of LBOs, it is of interest to focus on a few of the perceived issues. Two factors that are likely to determine how well a firm will be able to perform after a buyout are its cyclicalities and the level of competition within the firm's industry.

The first objective of this study is to determine if the LBOs that occurred in the U.S. during the study period from 1980 through 1990 reflected the cyclicalities of the firms. A firm with substantial interest obligations needs to maintain its cash flows in all possible states of the

economy. If it is able to do so, concerns about the banking system, insurance companies, pension funds, and the economy in general being devastated by an economic downturn may be ameliorated. It is anticipated that cyclicalities will be a factor in determining both the premium paid in a buyout and the reaction of the bought-out firm's stock price upon announcement of the buyout proposal.

A second objective of this study is to examine the LBOs in the sample with respect to the level of competition that the target firm faces. The degree of competition within a firm's industry is a proxy for the relative amount of economic rents earned by the firm. The lower the competition, in general, the higher the rents and the better able the firm is to survive. Thus, industry concentration of the acquired firm should also have an influence on premium paid and stock price reaction.

If the prices paid for bought-out firms and the resulting debt loads reflect payment obligations that are likely to be met in recessionary as well as expansionary and stable periods, then cyclicalities and industry concentration are being considered, at least implicitly, when the LBO prices are determined. The firm's cash flows must be strong enough throughout economic cycles to service the debt acquired during the LBO. If firms' cash flows are likely to decrease substantially during a recession, then there is a greater likelihood of bankruptcy if a recession occurs. As noted previously, this is a cause for concern

not only for individual firms, but for the economy as a whole because of the potential multiplier effects.

Other researchers have examined several other variables with respect to LBO premiums. These include ownership concentration (DeAngelo, DeAngelo, and Rice, 1984b; Grammatikos and Swary, 1986); whether the buyout was management-led or third-party-led (Amihud, 1989; DeAngelo, DeAngelo, and Rice, 1984b; Easterwood, Hseih, and Singer, 1988; Kieschnick, 1988; Travlos and Cornett, 1990; Grammatikos and Swary, 1986); whether the firms had high or low effective tax liabilities (Lehn and Poulsen, 1989); whether there were competing offers for the bought-out firm (Easterwood, Hseih, and Singer, 1988; Lowenstein, 1985); the price-to-earnings ratio for the firm relative to that of the firm's industry (Travlos and Cornett, 1990); the presence or absence of managerial disputes (Travlos and Cornett, 1990); firm risk as measured by the standard deviation of returns on the firm's stock (Grammatikos and Swary, 1986), and the firm's level of undistributed cash flow (Lehn and Poulsen, 1989).

A third objective of this study is to combine the variables examined by these researchers, together with the cyclical and industry concentration variables proposed in this study, and to determine the relative importance of their influence on the movement of stock prices on announcement of an intended buyout and on the amount of the premium paid for a bought-out firm. Amihud (1989), in

particular, has recognized the need for this kind of synthesis of previous LBO studies.

If LBO premiums and debt levels leave a cushion of safety for times of economic difficulty then the cyclicalities of the firm and the industry concentration ratio should be significant even in the presence of the other explanatory variables. This study combines the previously examined variables with the two hypothesized variables to evaluate whether an economic margin of safety is recognized.

CHAPTER II

LITERATURE REVIEW

Two types of studies have been done with respect to the impact of financial and managerial variables on LBO firms. The first type of study concerns the reaction of a firm's stock price to the announcement of an intended leveraged buyout. The empirical results of these studies are discussed in the first section below. The second type of study pertains to the size of the premium, or the amount above the firm's market value before the buyout was proposed, that is paid for the firm upon completion of the buyout process. The empirical results of these studies are discussed in the second section below.

Studies concerning the two new variables examined by this research are reviewed next. The third section below concerns the impact of cyclicity on firms' operations. The fourth section relates to the level of concentration within an industry and its impact upon firms.

The fifth section contains a discussion of the features of the 1986 Tax Reform Act that are relevant to a buyout situation. The sixth section reviews least squares regression techniques. Finally, the last section discusses event study methodology.

Stock Price Reactions at the
Announcement of a Buyout

Positive abnormal returns to stockholders of the target firm at the announcements of proposed LBOs have been measured by several researchers (Amihud, 1989; DeAngelo, DeAngelo, and Rice, 1984b; Grammatikos and Swary, 1986; Lehn and Poulsen, 1989; Marais, Schipper, and Smith, 1987; Torabzadeh and Bertin, 1987; Travlos and Cornett, 1990). They ranged from the 13.00 percent found by Marais, Schipper, and Smith (1987) using an event period from -1 to 0 days to 28.05 percent in the DeAngelo, DeAngelo, and Rice (1984b) study, with an event period of -10 to +10 days.

Maupin (1987) developed a multiple discriminant function to identify firms that would be potential management buyout targets. Variables such as concentration of ownership, the firm's (cash flow/net worth) ratio, the (price/earnings) ratio, the (cash flow/total debt) ratio, the (price/book value) ratio, the (book value of depreciable assets/original depreciable asset cost) ratio, and the dividend yield were used for classification of these firms. Some of these variables have been tested in relation to stock price movements and premiums offered during leveraged buyouts.

Several researchers have addressed the question of what factors might account for differences in stock price reactions to proposed buyout announcements. A low

price/earnings (P/E) ratio relative to industry standards is associated with greater price increases (Travlos & Cornett, 1990). That is, the market appraises the increase in firm value as larger for those firms with lower P/E ratios relative to their industries. The perception seems to be that the firm with a low relative P/E ratio is underpriced prior to the buyout proposal announcement, and that the buyout will rectify the situation.

Travlos and Cornett (1990) found a negative relationship between the degree of a stock's price increase and the presence of managerial disputes. If managerial dissention was publicized during the buyout process, the increase in stock price was not as great as if there was general agreement among managers. This may reflect the public's perception of the likelihood of the bid's success, with that likelihood increasing as there is more agreement among managers.

Amihud (1989) presents a model of firm value for a buyout situation. His model regards the price of a firm that has been acknowledged to be a buyout candidate as a function of the value of the firm going on as is, the expected final offer price, and the probability of the bid's success. Amihud depicts the relationship as

$$\text{Price} = (V_f \times P_s) + (V_g \times P_f)$$

where Price is the value of the stock at any time before the buyout date

V_f is the expected final offer price

P_s is the probability of the bid's success

V_g is the price of the firm going on as is

P_f is the probability of the bid's failure

The expected final offer price is assumed to be greater than the price of the firm continuing as is. This is due to evidence from previous buyouts regarding shareholders' gains. The probability of success is assessed by the market based on the results of past situations that are comparable. The impact of managerial disputes on stock price is one example of a factor that would be likely to affect the probability of a bid's success. Another example would be the market's assessment of the long-term viability of the firm if the buyout bid succeeds.

The firm's risk, as measured by the standard deviation of its stock returns, was determined to be inversely related to stock price increases at the buyout proposal announcement, especially in the case of nonmanagement bids (Grammatikos and Swary, 1986). Lower-risk firms' stock prices increased 4.69 percent more net-of-market than higher risk firms' prices. Low-risk firms may more easily increase leverage and enjoy the corresponding tax shields (Amihud, 1989). The market rewarded lower risk firms with greater stock price increases than higher risk firms.

In cases where management owned over 50 percent of a firm's stock, DeAngelo, DeAngelo, and Rice (1984b) found an average net-of-market stock price increase at announcement 20 percent higher than for firms with management ownership of less than 50 percent. Travlos and Cornett (1990) found ownership concentration to be insignificant as an explanatory factor of cumulative abnormal returns at announcement of a buyout offer. Thus the findings on this variable are inconclusive.

The relationship between management ownership of a firm and the degree of stock price increase at announcement may be influenced by several factors. Amihud's (1989) model of firm value shows one of the elements involved. The greater a firm's pre-buyout management ownership is, the more likely the buyout will be successful if it is led by management or by non-hostile third parties. Second, there is the possibility that management suppressed firm performance in the period before the buyout offer, and the price increase reflects "artificially high" gains that would occur if the firm were properly functioning (Kieschnick, 1989; Maupin et al., 1984). The buyout would then be the solution to an efficiency problem which had been compounded by asymmetric information. Third, management costs for initiating or allowing a friendly third-party buyout would be low relative to third-party costs for carrying out a hostile buyout. The cost savings may be shifted toward the shareholders in these cases.

Empirical results do not support the underperformance hypothesis. DeAngelo (1986) found no evidence that management understated reported earnings in the period before the buyout offer. Maupin et al. (1984) noted that firms involved in management-led buyouts had above-industry dividend yields, on average; and Amihud (1989) found no significant difference between firm performance during the prior period for buyouts led by management and those led by third parties. The results of Grammatikos and Swary, which are discussed below, indicate that there may be an interaction between the degree of management ownership and whether the buyout is management or third-party led.

The existence of management buyouts is a question in itself. Why would this form of corporate reorganization arise when most of its benefits seem to be attainable through other, less complicated, types of activity? For example, the increase in firm leverage and the accompanying tax benefits could be emulated by public companies. So could an increase in managerial control through stock repurchases. The registration, listing, and other monetary costs pertaining to regulation of a public company are low relative to total corporate costs. Thus their elimination is not a likely factor in going private.

Amihud (1989) proposes that the factors of fewer regulatory constraints and the ability to retain property rights on firm information are the chief motivations for management buyouts (MBOs). The costs of these are

difficult to measure and may be significant. When managers think they can run the firm more efficiently without regulators or stockholders monitoring their decisions, it makes sense for them to function as a private concern.

LBOs in which members of management are involved as leaders result in significantly higher stock price increases than LBOs carried out by third parties (DeAngelo, DeAngelo, and Rice, 1984b; Grammatikos & Swary, 1986; Travlos & Cornett, 1990). Reasons for this might include a higher expectation that the LBO will be completed, the fact that greater premiums are offered to shareholders by management parties, and the assessment that the firm's managers are taking advantage of information that is not publicly available. In contrast, Amihud (1989) found no significant difference in the degree of stock price increase at the announcement of a buyout bid whether the bid was made by management or by third parties. His sample consisted of only fifteen firms and was confined to include very large buyouts. Therefore, the results on this variable are not conclusive.

Grammatikos and Swary (1986) found that if the buyout was proposed by a third-party, the increase in stock price at announcement was positively related to the percent of the firm's stock owned by management. That is, the price increases were higher for high management ownership than for low management ownership. However, if the buyout was proposed by management, the increase in stock price was

negatively related to the percent of management ownership. The stocks of firms for which MBOs were proposed had greater price increases for lower management ownership percentages. There was an average positive increase in stock price of 3.15 percent for buyout bids of firms with high management ownership when the buyouts were initiated by parties other than management. For low management ownership and buyouts led by management groups, the average increase in stock price was 4.69 percent. It is possible that higher premiums are offered in those cases where the market perceives a higher probability of the LBO failing. This would include situations of nonmanagement bids for firms with high management ownership and management bids for firms with low management ownership (Amihud, 1989).

There seems to be an important interaction between ownership concentration and who leads or proposes the buyout. There have been conflicting results in other studies when these two variables are considered individually; and the Grammatikos and Swary findings indicate different outcomes for the subgroups of management led and third-party led buyouts. Therefore, this study will include both variables individually as well as an interaction term to capture the possible relationship between them. The investigation of this joint effect was recommended by Amihud (1989).

Factors that had no significant effect on firms' stock prices at the time of an LBO announcement include the

transaction size (Travlos and Cornett, 1990), the extent of the increase in debt after the buyout (Travlos and Cornett, 1990), and whether the buyout plan was contested by minority stockholders (Travlos and Cornett, 1990). The same authors also examined the impact of assorted firm debt ratios and the relative annual listing costs, but found no significant relationship between these and the degree of stock price movement at the announcement of a buyout bid.

Table 1 gives a summary of the results relating to the variables tested for their influence on firms' stock prices at the announcement of an intended buyout.

Premiums Offered for Firms Involved in Leveraged Buyouts

For a sample of 15 very large buyouts, Amihud (1989) found a premium of 31.1 percent (29.0 percent net-of-market) on announcement of an LBO attempt and a premium of 42.9 percent (26.0 percent net of market) at the final offer. The premiums were measured relative to stock prices 20 days prior to the announcement of the buyout offer. The initial premiums offered for larger firms were lower than those for firms of all sizes combined. There was a 19.6 percent increase in stock prices for Amihud's sample. This is similar to results from other studies which included firms of all sizes. Several studies have sought to identify factors that may be related to these premiums.

TABLE 1

VARIABLES THAT HAVE BEEN TESTED FOR AN EFFECT
ON STOCK PRICES AT THE ANNOUNCEMENT OF A
PROPOSED LEVERAGED BUYOUT

Independent Variable	Relationship to Stock Price Increase	Study

SIGNIFICANT VARIABLES		
relative P/E ratio	significantly lower for higher ratios	T&C
managerial disputes	significantly lower if disputes publicized	T&C
firm risk (std. dev.)	significantly lower for high risk firms	G&S

INCONCLUSIVE VARIABLES		
% management ownership	significantly lower for high management ownership if buyout led by management	G&S
% management ownership	significantly higher for high management ownership if buyout led by 3rd party	G&S
% management ownership	significantly higher if management owns > 50% of the firm's stock	DD&R
% management ownership	insignificant	T&C
buyout leadership	significantly higher if led by management	G&S,
DD&R,		
buyout leadership	insignificant	T&C A

INSIGNIFICANT VARIABLES		
transaction size	insignificant	T&C
size of debt increase	insignificant	T&C
minority reaction	insignificant	T&C
listing cost	insignificant	T&C
assorted debt ratios	insignificant	T&C

Key to Authors:

T&C Travlos and Cornett, 1990
G&S Grammatikos and Swary, 1986
DD&R DeAngelo, DeAngelo, and Rice, 1984b
A Amihud, 1989

Jensen's (1986) free cash flows hypothesis, which was discussed above, links high free cash flows to firms' agency cost inefficiencies which may be reduced through a reorganization. Lehn and Poulsen (1987) measured premiums relative to firms' stock prices 20 days before the buyout bid announcements. They found higher offered premiums for firms with higher undistributed cash flows relative to their total market equity, which is consistent with Jensen's proposition.

Firms which have higher effective tax liabilities relative to equity would benefit from a reduction of these tax liabilities as the result of a management buyout. Lehn and Poulsen's (1987) results of higher offered premiums when tax liabilities were higher are consistent with this reasoning, since there would be a greater potential for tax savings for firms with higher tax liabilities.

Lowenstein (1985) discovered higher premiums in situations where firms received three or more competing bids. The premiums were measured relative to stock price 30 days before the buyout offer. Amihud (1989) found similar results using the criterion of one or more competing offers. Significantly lower premiums were offered for firms which later drew competing offers relative to premiums for firms which received a single buyout bid (Easterwood, Hsieh, and Singer, 1988). They measured premiums relative to stock price 40 days before announcement. This contradicts the findings of the other

two studies above (Amihud, 1989 and Lowenstein, 1985). But after adjusting for several other factors, Easterwood, Hseih, and Singer found no difference in the results for firms which had competing offers and those which had a single bid. Thus the evidence concerning the relationship between premium size and the existence of competing bids is inconclusive.

With regard to ownership structure of the firm and premiums offered to outside stockholders, there have been conflicting empirical results. DeAngelo, DeAngelo, and Rice (1984b) found an insignificant difference between average premiums for over-50 percent and under-50 percent management-owned firms although, as previously stated, they found a significant increase in stock prices at announcement of a buyout proposal. They measured premiums based on stock prices 40 days before the buyout offer announcement. The Easterwood, Hseih, and Singer (1988) results indicate significantly lower premiums offered for the stock of firms with higher ownership concentration. This may reflect the anticipation of reduced agency costs as a motive for buyouts. Firms with high management ownership would be apt to have lower agency costs before a buyout. Thus their premiums would be lower because the reduction in agency costs for these firms would not be as great as for firms with low management ownership.

There was an insignificant difference between premiums offered for management-led vs. third-party-led buyouts in

the Amihud (1989), the DeAngelo, DeAngelo, and Rice (1984b), the Easterwood, Hsieh, and Singer (1988), and the Kieschnick (1988) studies. It does not appear that firms' shareholders are taken advantage of, in terms of the premium offered to shareholders, when management advances a buyout bid relative to when third parties advance the bid. Note that the insignificant difference in premiums between the management-led buyouts and the third party-led buyouts is a different result than the significantly higher increase in the stock price for management-led buyouts. The most reasonable explanation for this would be the higher expectation of success for those buyouts led by management.

A summary of these results is given in Table 2.

Cyclicalities

Some other studies have addressed the question of the potential economic stability of bought-out firms by looking at the resulting debt ratios, such as the debt-equity ratio and the interest coverage ratio (Faust, 1990; Travlos and Cornett, 1990). Debt ratios which measure equity based on book values are admittedly measures of a firm's past capacity. Although debt ratios which measure equity based on market values make allowance for expectations about a firm's future profitability, they may not be the most fitting elements to consider. If expectations are not

TABLE 2
 VARIABLES THAT HAVE BEEN TESTED FOR AN EFFECT ON
 PREMIUMS OFFERED IN LEVERAGED BUYOUTS

Independent Variable	Relationship to Premium Offered	Study

SIGNIFICANT VARIABLES		
undistributed free cash flows	significantly higher for higher free cash flows	L&P
effective tax liability	significantly higher for higher tax liabilities	L&P

INCONCLUSIVE VARIABLES		
presence of competing offers	significantly lower for more than one offer (but insignificant after adjusting for other factors)	EH&S
presence of competing offers	significantly higher for 3 or more competing offers	L
% management ownership	significantly lower for firms with higher management ownership	EH&S
% management ownership	insignificant	DD&R

INSIGNIFICANT VARIABLES		
buyout leadership	insignificant	A, K, DD&R EH&S

Key to Authors:

L&P Lehn and Poulsen, 1989
 L Lowenstein, 1990
 EH&S Easterwood, Hseih, and Singer, 1988
 A Amihud, 1989
 DD&R DeAngelo, DeAngelo, and Rice, 1984b
 K Kieschnick, 1988

borne out, a firm with heavy debt liabilities may find itself insolvent.

Evidence from these studies indicates that increased corporate debt increases firms' bankruptcy risk and that the probable increase in bankruptcies will worsen future recessions. The use of high-risk debt instruments such as junk bonds has been at the center of the debate over the desirability of leveraged buyouts. The main concern is the ability of bought-out firms to service the debt in a recessionary economy.

Simulation studies offer some evidence about the effects of debt burdens during recessions. Bernanke and Campbell (1988) examined a sample of 643 large firms with varying debt loads under conditions resembling the severe recessions of 1973-1975 and 1981-1982. Their results indicated problems for about 10 percent of the firms which would necessitate additional borrowing and/or rescheduling of payments to avoid insolvency.

Although adverse effects are indicated for a relatively small percentage of firms, the overall economic impact is potentially large. For each firm experiencing problems several other firms are likely to be affected. The troubled firm's suppliers, for example, might experience reduced demand for their materials. These suppliers would presumably react by reducing their own stocks of inventory, affecting additional firms. The economy is prone to such "ripple effects" that can

translate initially small problems into major concerns. Therefore the ability of bought-out firms to operate successfully in various economic cycles needs to be considered. The present study entails an evaluation of whether this factor is appraised at the time of the buyout.

Warshawsky (1990) extended Bernanke and Campbell's work to consider the rise in debt burdens in 1987 and 1988 and found an even greater percentage of firms would be distressed during a recession. As Faust (1990) indicates, the simulations do not allow for firms' reactions to the dilemma and do not reflect past and possible future changes in the financial environment that may be relevant.

Previous studies have shown an empirical relationship between stock prices, and thus firm value, and the business cycle (Moore, 1983; Zarnowitz, 1990). Seth (1990) uses the regression coefficient of the percentage change in gross national product (GNP) when the ratio of firm earnings to firm assets is regressed on GNP to represent a "coefficient of cyclicalilty". The purpose of Seth's research is to assess the impact of increased leverage on firms' interest burdens in alternative economic states. A similar measure will be used in this study to determine whether cyclicalilty is an important factor with regard to buyout premiums and stock price reactions.

Industry Concentration

Another factor that is relevant in determining a firm's capacity to operate under varying economic conditions is how much competition exists for the industry(ies) in which the firm operates. If a firm operates in a relatively noncompetitive environment then it should be able to weather a difficult period more easily than otherwise. As the level of competition rises, managing a firm with a heavy debt load will become more difficult.

In a relatively concentrated market, there are fewer firms conducting business, or there is a small number of firms that dominate the industry. In this case, the dominant firms would command higher economic rents than in a less concentrated market. The higher economic rents would be more likely to sustain cash flows for the firm throughout business cycle fluctuations.

Several studies within in the industrial organization field have established a positive empirical relationship between a concentrated market structure and cash flows (Shepherd, 1990; Ravenscraft and Scherer, 1986; Shepherd, 1972; Bain, 1951). Shepherd (1990) states that increased market power leads to increased control over prices and the firm's ability to command a higher profit margin on sales. Price discrimination is also a possibility. The full

effect of these depends on the elasticity of demand for the firm's products.

Shepherd (1990, 1972) found significant positive empirical relationships between firms' market shares and industry concentration relative to firms' profit rates. Bain (1951) provided the basis for using concentration ratios to measure market power.

The best known concentration ratio is the Herfindahl Index, calculated by adding together the squared market share percentages for all firms in an industry (Copeland and Weston, 1988). A lower Herfindahl Index indicates less market power and a higher Herfindahl Index indicates more market power. The index is sensitive to both market shares of the firms within an industry and to inequality in the distribution of the market shares. It is frequently used as a guide in administering U.S. Department of Justice anti-trust guidelines in merger cases.

The higher a target firm's Herfindahl index, the less competitive the industry, and the higher the premium that may be offered for access to the firm's economic rents. This hypothesis is analogous to the theory that one motivation for mergers is an attempt to increase access to market power (Copeland and Weston, 1988). In addition, a firm which has high cash flows to begin with would be better able to sustain those cash flows during a recession. Firms with higher market concentration tend to have higher cash flows (Shepherd, 1990; Ravenscraft and Scherer, 1986;

Shepherd, 1972; Bain, 1951). This ability to sustain cash flows during a recession should be priced. Therefore, a significant positive relationship is expected between the Herfindahl index and the premium paid for a firm acquired through a leveraged buyout.

The 1986 Tax Reform Act

Some of the controversy surrounding leveraged buyouts has been due to the fact that there are tax consequences resulting from the transaction. The U.S. tax code has favored corporate debt financing by allowing the deductibility of interest payments. This reduces corporate tax liability and has caused some concern regarding the level of tax collection from the corporate sector of the economy. One view, offered by Lowenstein (1985), is that the profits arising from LBO's are "gifts from the IRS" due to the accompanying interest and depreciation deductions.

Grundfest (1989) acknowledges that LBO's tend to reduce corporate tax liability for a period of years after the buyout occurs. However, he explains that it would be incorrect to conclude that this causes an overall loss of revenue for the U.S. Treasury. Several factors have offsetting influences.

The original stockholders of a bought-out firm are likely to experience a premium which must be recognized as a gain, and this is taxable. Some LBO's result in a sale of some firm assets. Any gain due to a market value

greater than the assets' book value would be taxable. Of course, a loss due to a market value less than the assets' book value would provide a tax benefit. In cases where the company is resold after a period of time, a taxable gain would result. Finally, the interest paid to bondholders by the bought-out corporation is taxable for the recipients.

Therefore the total effect of buyouts on tax collections is not clear. What has been clearly documented is that the corporate tax benefits from LBO's are positively correlated with the size of the premium paid to stockholders (Kaplan, 1989; Lehn and Poulsen, 1987). Most of the benefit is passed on to the original stockholders and is not retained by the new owners of the firm. Tax considerations are seen not as a driving force in LBO activity, but the tax savings are important (Kaplan, 1989; Lehn and Poulsen, 1987).

Given the significance of the role of taxes in LBO's, it is important to examine the impact of major changes in the U.S. tax code. The Tax Reform Act of 1986 involved several of these. The implementation of this act in 1987 affected both personal and corporate taxes (Martin, 1991; Gordon and MacKie-Mason, 1990; Prentice-Hall, 1986; Warren, Gorham, and Lamont, 1986).

Before the Tax Reform Act of 1986 there were eleven different marginal tax brackets for individuals, ranging from 11% to 50%. After the Act there were just two marginal brackets, with a maximum rate of 28%. Since the

premiums paid to individuals in LBO's are taxed as personal income to the extent that they represent gains to the stockholders, individuals were affected by this change. It seems likely that shareholders would be more receptive to LBOs after the Tax Reform Act than before. This effect could emerge in the form of lower required premiums.

Several changes were enacted that affected corporate taxation. Prior to the Tax Reform Act the maximum marginal corporate tax bracket was 46%. After the Tax Reform Act it was 39%, with a maximum average rate of 34%. The impact of this change would be a reduction in the income tax shelter from interest expense and other LBO expenses such as the use of loss carryforwards from the acquired firm. The result of this change would be to make LBOs less attractive to acquirers.

Before the Tax Reform Act, the tax basis of the assets acquired in an LBO could be increased. Afterward, it could not. This removed one of the potential income shelters for the acquirers, making LBOs less attractive.

Other changes included a decrease in the amount of tax liability in excess of \$25,000 that could be reduced by business tax credits; the elimination of lower rates for capital gains income; a reduction in the deduction allowance for dividend income; and new restrictions on the handling of net operating losses when there is more than a 50% change in the ownership of a loss corporation over a three year period (Martin, 1991; Gordon and MacKie-Mason,

1990; Prentice-Hall, 1986; Warren, Gorham, and Lamont, 1986). The potential gain from buyouts was decreased by all of these factors. Buyouts became less attractive following the enactment of the 1986 Tax Reform Act (Gordon and MacKie-Mason, 1990).

The total impact of the Tax Reform Act changes on the attractiveness of target firms is difficult to assess accurately. This may be especially true for investors who have only public information available to them. A firm's managers would have an advantage in this regard, since they would have inside information on which to base their opinions. That is, the information needed to evaluate firm value properly after the 1986 Tax Reform Act would be more readily available to insiders such as management.

Due to the potential for changes in relationships among the factors viewed as important in determining stock premiums paid and the movement of stock prices at the announcement of a buyout bid, the sample in this study is considered in three ways. First a full sample period is used to estimate the effects. Then two subsamples are considered. The first includes buyouts with announcement dates up to and including 1986. The second includes buyouts announced after 1986.

Least Squares Regression

As established by previous similar studies, a multiple regression methodology is appropriate for examining the

relationships between each dependent variable (buyout premium and stock price reaction) and the independent variables being examined (Lowenstein, 1990; Travlos and Cornett, 1990; Amihud, 1989; Lehn and Poulsen, 1989; Easterwood, Hsieh, and Singer, 1988; Kieschnick, 1988; Grammatikos and Swary, 1986; DeAngelo, DeAngelo, and Rice, 1984b). The general form of the ordinary least squares (OLS) regression model may be stated as

$$Y = a + b_1X_1 + b_2X_2 + \dots + b_nX_n + e$$

where Y is the dependent variable, the X_i 's are the independent variables, and e is a residual term (Judge, Griffiths, Hill, Lutkepohl, and Lee, 1985; Johnston, 1984; Johnson and Wichern, 1982; Pindyck and Rubinfeld, 1981).

In the current study there are two dependent variables of interest: the premium paid for the bought-out firm's stock and the stock price reaction. Independent variables include the two previously unexplored factors (the correlation coefficient between the firm's cash flows and the level of GNP, and the firm's Herfindahl index) and the eight factors found by previous studies to have an effect on the dependent variables (listed in Tables 1 and 2 above).

The assumptions of the multivariate regression model are that the residual terms are identically and independently distributed, with mean zero and variance σ^2 . The X 's are assumed to be measured without error. Under

these conditions, the OLS estimators b_1, b_2, \dots, b_n are best linear unbiased estimators (Johnston, 1984).

Because of the cross-sectional nature of the data, heteroscedasticity is likely to occur because of differences in firm size, nature of business, etc. (Pindyck and Rubinfeld, 1981). That is, a violation of the OLS assumption of equal variances for all residual terms is probable. To adjust for this, a generalized least squares (GLS) is used to estimate the models.

Specifically, the Glesjer (1969) procedure is used to correct for heteroscedasticity. This entails generating residuals from an ordinary least squares (OLS) regression, the absolute values of which are then regressed by an OLS procedure on the explanatory variables. The squared reciprocals of the predicted residuals from this regression are the weights that are used to transform the data for the final OLS regression. The GLS estimators b_1, b_2, \dots, b_n are best linear unbiased estimators (Johnston, 1984).

Event Study Methodology

Brown and Warner (1985) have established procedures for measuring the extent of stock price reactions to events which affect them. They tested the mean adjusted returns model and the market adjusted returns model which are used in this study and found them to be robust in determining excess returns.

Both the mean adjusted returns model and the market adjusted returns model estimate the cumulative abnormal return as the sum of the firm's excess returns during the event period. The event period extends from five days before the buyout announcement to five days after the announcement.

For the mean adjusted returns model, the excess return on security i for day t is measured as:

$$A_{i,t} = R_{i,t} - \text{RBAR}_i$$

where $A_{i,t}$ is the excess return on security i for day t

$R_{i,t}$ is the return of firm i 's stock on day t

RBAR_i is the average return on firm i 's stock over the 239-day period that begins 244 trading days before the announcement of the initial buyout bid and ends 6 trading days before that announcement.

Day 0 is the date of the buyout bid announcement. For the market adjusted returns model of excess returns, the excess return on a security is measured relative to the return on the CRSP equally weighted market index for day t ($R_{m,t}$):

$$A_{i,t} = R_{i,t} - R_{m,t}$$

where $A_{i,t}$ and $R_{i,t}$ are defined as stated above for the mean adjusted returns model.

CHAPTER III

METHODOLOGY AND DATA

As stated in the introduction, one purpose of this study is to investigate whether the prices paid for LBOs and the emerging debt issues reflect the cyclicalities and the competitive environment of the firms taken over. That is, it examines whether the market considers the likelihood of the firm remaining financially sound throughout expansionary and recessionary economic states. The prices paid are reflected in both the premium offered at the buyout date and the stock price reaction at the announcement of the buyout. A second purpose of this study is to extend previous studies by combining those factors which they demonstrated to be of importance with the two new factors - cyclicalities and industry concentration.

A multiple regression methodology is used. Three alternative models are estimated, based on the results of previous empirical studies and the two new variables introduced by this study.

Measurement of Dependent Variables

A firm's stock price reaction at the announcement of the buyout intention and the premium eventually paid upon

completion of the buyout are interrelated according to Amihud's (1989) model. Amihud depicts the relationship as

$$\text{Price} = (V_f \times P_s) + (V_g \times P_f)$$

where Price is the value of the stock at any time before the buyout date

V_f is the expected final offer price

P_s is the probability of the bid's success

V_g is the price of the firm going on as is

P_f is the probability of the bid's failure

Because the premium eventually paid would be reflected in the expected final offer price, both premium at buyout and stock price reaction at announcement are examined as dependent variables.

In the first model the annualized premium paid over the firm's market value prior to announcement of the intention to pursue a buyout, as a percentage of that market value, is the dependent variable. The announcement date is the date on which the publication of the news appeared in the Investment Dealers' Digest. The premium is defined as:

$$\text{PREMIUM} = (MV_{BO} - MV_{-30}) / (MV_{-30})$$

where MV_{BO} is the market value of the firm at the time of the buyout

MV_{-30} is the market value of the firm 30 days prior to announcement of the buyout attempt

This premium is then annualized to account for differing lengths of time between announcement of the LBO and its

completion:

$$\text{ANUPREM} = \text{PREMIUM} \times (365/\text{NDAYS})$$

where NDAYS is the number of days from the buyout announcement to the buyout completion

The second model uses a mean adjusted returns model (Brown and Warner, 1985) to estimate the excess returns dependent variable. The dependent variable for this model is the cumulative abnormal return based on the mean adjusted returns model (CARMEAN). CARMEAN is the sum of the firm's excess returns during the event period from five days before the buyout announcement to five days after announcement.

Following Brown and Warner's procedure, the excess return on security i for day t is measured as:

$$A_{i,t} = R_{i,t} - \text{RBAR}_i$$

where $A_{i,t}$ is the excess return on security i for day t

$R_{i,t}$ is the return of firm i 's stock on day t

RBAR_i is the average return on firm i 's stock over the 239-day period that begins 244 trading days before the announcement of the initial buyout bid and ends 6 trading days before that announcement.

Day 0 is the date of the buyout bid announcement in the Investment Dealers' Digest.

The third model is based on a market adjusted returns model of excess returns (Brown and Warner, 1985). Here the excess return on a security is measured relative to the

return on the CRSP equally weighted market index for day t ($R_{m,t}$):

$$A_{i,t} = R_{i,t} - R_{m,t}$$

where $A_{i,t}$ and $R_{i,t}$ are defined as before. The dependent variable for this model is the cumulative abnormal return based on the market adjusted returns model (CARMKT). CARMKT is the sum of the firm's excess returns during the event period from five days before the buyout announcement to five days after announcement.

Independent Variables

As stated above, other studies have identified the several significant factors in relation to stock price reactions and premiums offered. The significant factors were ownership concentration (Easterwood, Hseih, and Singer, 1988; Grammatikos and Swary, 1986; DeAngelo, DeAngelo, and Rice, 1984b), whether the buyout is management led or third party led (Travlos and Cornett, 1990; Grammatikos and Swary, 1986; DeAngelo, DeAngelo, and Rice, 1984b), whether the firm had competing buyout offers (Lowenstein, 1990; Easterwood, Hseih, and Singer, 1988), the firm's relative P/E ratio (Travlos and Cornett, 1990), firm risk in terms of the standard deviation of returns on its stock (Grammatikos and Swary, 1986), the firm's undistributed free cash flow (Lehn and Poulsen, 1989), its effective tax liability (Lehn and Poulsen, 1989), and the presence of managerial disputes during the buyout process (Travlos and Cornett, 1990). Each

of these factors is included as an independent variable in the regression models in this study.

The cyclical factor is introduced in this study by using a measure that relates the nature of a firm's reaction to business cycles in general (CORRL). This measure is similar to Seth's (1990) coefficient of cyclicity. CORRL is constructed by calculating the correlation coefficient between the firm's cash flows and the level of nominal gross national product (GNP) for the United States economy. Nominal GNP is used because cash flow data are also in nominal terms. A period of ten years before the announcement of the buyout bid is used, with cash flows and GNP measured on an annual basis.

This correlation implicitly considers the cash flows of the industry(ies) in which a firm is operating and the proportion of resources devoted to each industry, since the firm's cash flows will be affected by these factors. The higher the correlation between a firm's cash flows and nominal GNP, the greater the expected increase in its cash flows during market upswings and the more its cash flows are expected to fall during market downswings.

A significant negative relationship between this correlation and the LBO premium is expected. That is, the less cyclical the firm is (i.e., the lower the correlation between its historical cash flows and GNP), the higher the premium that would be paid because the firm's cash flows are relatively stable with respect to the occurrence of economic

downturns. Likewise, the more cyclical the firm is, the higher this correlation will be, and the lower the premium that may be prudently paid.

The second factor introduced by this study is the degree of competition a firm faces. This is commonly measured by the Herfindahl index. Several studies, discussed above, have established empirical relationships between market structure and cash flows (Shepherd, 1990; Shepherd, 1972; Bain, 1951; Ravenscraft and Scherer, 1986). Shepherd (1972) in particular finds that both risk, as measured by yearly profit variation, and market structure have important effects on firms' profit rates and cash flows.

A significant positive relationship is expected between the Herfindahl index (HERF) and the premium paid. The higher a firm's Herfindahl index, the less competitive the industry, and the higher the premium that may be offered for access to the firm's economic rents.

If the cyclicality of the firm is implicitly considered during the buyout process, then CORRL should be significant as an independent variable even in the presence of those variables which produced significant results in other studies. Likewise, HERF should be significant if the competitive environment of the firm is evaluated.

Regression Models

As discussed above, a generalized least squares (GLS) procedure is used to regress each of the dependent variables on the independent variables. The Glesjer (1969) procedure is used to correct for heteroscedasticity due to the cross-sectional nature of the data. First the regressions are run using only the two new variables CORRL and HERF. Next the full regressions are run with all variables from previous studies and the two new variables introduced by this study.

The form of the regression equation for each full model is given below:

MODEL ONE

$$\begin{aligned} \text{ANUPREM} = & A_0 + A_1*\text{CORRL} + A_2*\text{HERF} + A_3*\text{RELPE} + A_4*\text{DISP} + \\ & A_5*\text{MGMTOWN} + A_6*\text{LED} + A_7*\text{CFLOW} + A_8*\text{TAXLIAB} + \\ & A_9*\text{COMPBID} + A_{10}*\text{OWNLED} + e \end{aligned}$$

MODEL TWO

$$\begin{aligned} \text{CARMEAN} = & A_0 + A_1*\text{CORRL} + A_2*\text{HERF} + A_3*\text{RELPE} + A_4*\text{DISP} + \\ & A_5*\text{MGMTOWN} + A_6*\text{LED} + A_7*\text{CFLOW} + A_8*\text{TAXLIAB} + \\ & A_9*\text{COMPBID} + A_{10}*\text{OWNLED} + e \end{aligned}$$

MODEL THREE

$$\begin{aligned} \text{CARMKT} = & A_0 + A_1*\text{CORRL} + A_2*\text{HERF} + A_3*\text{RELPE} + A_4*\text{DISP} + \\ & A_5*\text{MGMTOWN} + A_6*\text{LED} + A_7*\text{CFLOW} + A_8*\text{TAXLIAB} + \\ & A_9*\text{COMPBID} + A_{10}*\text{OWNLED} + e \end{aligned}$$

where

ANUPREM = the annualized premium paid over the firm's market value prior to announcement of the initial buyout bid as a percentage of that market value

- CARMEAN = the cumulative abnormal returns measure calculated using a mean adjusted returns model
- CARMKT = the cumulative abnormal returns measure calculated using a market adjusted returns model
- CORRL = the correlation coefficient between the firm's cash flows and the level of GNP for a period of ten years before the announcement of the buyout bid
- HERF = the firm's Herfindahl index, calculated as

$$HERF = \left[\sum_{i=1}^n S_i^2 \right]$$
 where
 S_i is the market share, in terms of sales, of the i^{th} largest firm in the industry
 n is the number of firms in the industry, as determined by the buyout firm's 3-digit major SIC code
- RELPE = the P/E ratio of the firm at the end of the fiscal year prior to the announcement of the buyout, divided by the average P/E ratio of the industry as defined by the firm's 3-digit major SIC code
- DISP = a dummy variable which indicates the presence or absence of publicized managerial disputes:
 DISP = 1 if disputes were publicized
 DISP = 0 if there were no publicized disputes
- MGMTOWN = the percentage of stock owned by management on the last proxy statement date prior to the buyout bid announcement
- LED = a dummy variable which indicates who led the buyout:
 LED = 1 if the buyout was led by a group which included management
 LED = 0 if the buyout was third-party led, with no management participation
- CFLOW = the firm's undistributed free cash flow as a percentage of equity for the year immediately preceding the leveraged buyout, defined as in the Lehn and Poulsen (1989) study:

$$CFLOW = \frac{(INC - TAX - INTEXP - PFDDIV - COMDIV)}{(EQUITY)}$$

where

INC = operating income before depreciation
(COMPUSTAT item #13)

TAX = total income taxes minus the change in
deferred taxes from the previous year
to the current year
(COMPUSTAT item #16 minus the change in
COMPUSTAT item #35)

INTEXP = gross interest expense on short- and
long-term debt (COMPUSTAT item #15)

PFDDIV = total amount of preferred dividend
requirement on cumulative preferred
stock and dividends paid on
noncumulative preferred stock
(COMPUSTAT item #19)

COMDIV = total dollar amount of dividends
declared on common stock
(COMPUSTAT item #21)

EQUITY = the market value of common equity at
the end of the firm's fiscal year
immediately preceding the
transaction

TAXLIAB = the firm's effective tax liability as a
percentage of equity for the year immediately
preceding the leveraged buyout, defined as in
the Lehn and Poulsen (1989) study: $TAXLIAB = TAX / EQUITY$, where TAX and EQUITY are
defined as above

COMPBID = a dummy variable which indicates the presence
or absence of competing offers for the firm:
COMPBID = 1 if there was at least one
competing offer for the firm during
the buyout period
COMPBID = 0 if there were no competing offers
for the firm during the buyout
period

OWNLED = an interaction term to account for a possible
relationship between the degree of management
stock ownership and who leads the buyout:
 $OWNLED = MGMTOWN \times LED$

Tables 3, 4, and 5 show the expected results for each of the regressions. The expected results are based on the outcomes of previous studies and on the theoretical basis for each variable, as discussed above.

Data Sources

A list of companies involved in going private transactions from 1980 through 1987 is given by Lehn and Poulsen (1989). They generated the sample by searching the Wall Street Journal Index corporate entries for announcements of going private transactions for each year in the study period.

This study covers the period 1980 through 1990. The Lehn and Poulsen (1989) firm list is supplemented with firms which went private during 1988, 1989, and 1990. There are 82 firms from the Lehn and Poulsen (1989) study for which all required data were available. Another 33 firms from the 1988 through 1990 period supplemented these, yielding a total of 115 firms for the current study. The LBO firms for 1988, 1989, and 1990 were determined by searching the DISCLOSURE CD-ROM data base for firms which filed Form 13E-3 with the SEC during the period. This filing is required when a buyout is proposed. Each of the buyouts was confirmed by checking the Investment Dealers' Digest (IDD) for details of the transaction. The IDD was accessed through the LEXIS/NEXIS on-line data base.

TABLE 3
EXPECTED RESULTS FOR MODEL ONE

MODEL ONE

$$\begin{aligned} \text{ANUPREM} = & A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} \\ & + A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} \\ & + A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e \end{aligned}$$

<u>COEFFICIENT</u>	<u>EXPECTED SIGN</u>	<u>COMMENTS</u>
A ₁	negative	new variable
A ₂	positive	new variable
A ₃	negative	T&C result for stock prices
A ₄	negative	T&C result for stock prices
A ₅	negative	EH&S: negative DD&R: inconclusive
A ₆	positive	was positive for stock prices, inconclusive for premium in other studies (A, K, DD&R, EH&S)
A ₇	positive	L&P result
A ₈	positive	L&P result
A ₉	positive	L: positive EH&S: insignificant
A ₁₀	negative	new variable - interaction term

TABLE 4
EXPECTED RESULTS FOR MODEL TWO

MODEL TWO

$$\begin{aligned} \text{CARMEAN} = & A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} \\ & + A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} \\ & + A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e \end{aligned}$$

<u>COEFFICIENT</u>	<u>EXPECTED SIGN</u>	<u>COMMENTS</u>
A ₁	negative	new variable
A ₂	positive	new variable
A ₃	negative	T&C result
A ₄	negative	T&C result
A ₅	positive	G&S: interaction DD&R: positive T&C: insignificant
A ₆	positive	T&C, G&S, DD&R: positive A:insignificant
A ₇	positive	L&P result for premium
A ₈	positive	L&P result for premium
A ₉	positive	Lowenstein result for premium
A ₁₀	positive	new variable - interaction term

TABLE 5
 EXPECTED RESULTS FOR MODEL THREE

MODEL THREE

$$\begin{aligned} \text{CARMKT} = & A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} \\ & + A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} \\ & + A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e \end{aligned}$$

<u>COEFFICIENT</u>	<u>EXPECTED SIGN</u>	<u>COMMENTS</u>
A ₁	negative	new variable
A ₂	positive	new variable
A ₃	negative	T&C result
A ₄	negative	T&C result
A ₅	positive	G&S: interaction DD&R: positive T&C: insignificant
A ₆	positive	T&C, G&S, DD&R: positive A: insignificant
A ₇	positive	L&P result for premium
A ₈	positive	L&P result for premium
A ₉	positive	Lowenstein result for premium
A ₁₀	positive	new variable - interaction term

Daily returns data for each stock during the buyout period were obtained from the Center for Research in Security Prices (CRSP) tape containing daily data through December 1990. Each firm's major SIC code was also obtained from the CRSP tape.

The Wall Street Journal Index, also accessed through LEXIS/NEXIS, was searched for information about each firm that concerned whether there were competing bids, managerial disputes, or managers involved in the buyout.

Details for cash flows, sales, P/E ratios, and tax liabilities were obtained from each relevant year's Standard and Poor's COMPUSTAT tape. Industry sales and industry P/E ratios were also constructed from information contained on the COMPUSTAT tapes, by aggregating firms according to 3-digit SIC codes. That is, all firms with the same 3-digit SIC codes were identified and their sales figures were added to derive the value of sales for the industry. An industry P/E ratio was calculated by taking a weighted average of the P/E ratios of all firms with a given 3-digit SIC code, with weights equal to the proportion of industry sales that each firm generates. The firm and industry sales data are also used to calculate the Herfindahl Index as previously defined.

For some firms, cash flow data and tax information were not available on COMPUSTAT. In this case the firms' annual reports from the DISCLOSURE microfiche collection were used to collect the data. The annual reports also provided the

date of each firm's fiscal year end, which is used to determine the balance sheet and income statement dates from which data are secured. Similarly, when a firm's P/E ratio was absent from the COMPUSTAT data base it was obtained from Standard and Poor's Security Owner's Stock Guide.

Annual GNP for years 1969 through 1980 was found in the February 1992 issue of the Survey of Current Business. Concentration of management ownership in the firm was collected from firms' proxy statements filed prior to the transaction announcement. The proxy statements were available through the SEC File microfiche collection.

The market value of common equity at the end of the firm's fiscal year immediately preceding the transaction is from the Standard and Poor's Daily Stock Price Record.

A very small number of firms in the sample (4) could be classified as having publicized managerial disputes during the buyout process. Therefore the dummy variable DISP was eliminated from the regressions due to a lack of a statistically reasonable number of dispute occurrences.

The total number of firms for which all of the data were available was 105. Ten additional firms for which a small subset of the data were unavailable were used for reduced model regressions.

Sample Characteristics

Table 6 below provides information concerning the timing of announcements and completions of buyouts for the

TABLE 6
DESCRIPTION OF SAMPLE FIRMS:
TIMING OF BUYOUTS

<u>YEAR</u>	<u>NUMBER OF FIRMS WITH BUYOUT ANNOUNCEMENTS</u>	<u>NUMBER OF FIRMS WITH BUYOUT COMPLETIONS</u>
1980	3	0
1981	4	3
1982	9	9
1983	12	7
1984	14	21
1985	14	10
1986	18	20
1987	22	12
1988	9	16
1989	8	11
1990	2	6

sample firms. The pattern of the sample firms is typical of the overall pattern of buyout activity, which began in the early 1980's, peaked around the middle of the decade, then declined toward the end of the decade.

Table 7 below presents summary statistics concerning the mean, standard deviation, minimum, and maximum values for the variables. NDAY5 denotes the number of trading days from the first announcement of a buyout bid to completion of the buyout. All other variables are as defined in the regressions.

The quickest buyout occurred 51 days after its announcement, and the most prolonged buyout took 533 days. The average length of time between announcement and completion was 155.3 days, with a standard deviation of 81.7 days. The value of NDAY5 was used to annualize the premium paid as described in the Methodology section of this paper.

Annualized premiums paid for the common stock of bought out firms ranged from -70.4% to 430.4%, with an average premium of 106.6% and a standard deviation of 84.4%. Cumulative abnormal returns as measured by CARMEAN and CARMKT were as low as -29.2% and as high as 68.1%, with a standard deviation of about 16%.

All of the dependent variables demonstrate a wide variety of values within their possible ranges. CORRL, for example, ranges from -0.98, which would indicate a counter-cyclical firm, to 0.98, which represents a firm whose cash flows closely follow the overall pattern of the United

TABLE 7
SUMMARY STATISTICS FOR DEPENDENT
AND INDEPENDENT VARIABLES

Variable Name	Mean Value	Standard Deviation	Minimum Value	Maximum Value
NDAYS	155.30	81.69	51.00	533.00
ANUPREM	1.066	0.844	-0.704	4.304
CARMEAN	0.182	0.166	-0.292	0.681
CARMKT	0.185	0.158	-0.184	0.681
CORRL	0.308	0.541	-0.981	0.984
HERF	0.219	0.126	0.037	0.600
RELPE	0.171	0.393	-0.921	2.839
MGMTOWN	18.30	18.33	0.60	70.96
CFLOW	28.64	59.74	-76.12	339.36
TAXLIAB	0.091	0.272	-0.420	2.772
LED	0.487	0.502	0	1
COMPBID	0.336	0.475	0	1
OWNLED	9.194	15.27	0	70.96

States economy as measured by GNP. HERF ranges from 0.037, which indicates a relatively competitive market situation, to 0.6, representing a much less competitive market. RELPE takes on values from -0.92 to 2.84. Some of the firms or the industries had negative P/E ratios due to net losses. MGMTOWN varies from a very low 0.6% of total common shares outstanding to 70.96% of the shares.

CFLOW and TAXLIAB are expressed as percentages of the firm's equity, and range from very low negative percentages to very high positive percentages. CFLOW is negative for some firms because by definition it involves relationships between such things as operating income, the change in deferred taxes, and interest expense. TAXLIAB may also be negative because its calculation involves the change in deferred taxes from one year to another.

The mean of the LED variable indicates that the sample is about evenly split between firms whose buyouts were led by a group which included management (48.7%) and those led by a third-party group (51.3%). The average value of COMPBID is 33.6%, which means that this percent of firms in the sample experienced at least one other competing bid during the buyout period. A majority of the sample firms (66.4%) did not have competing bids.

Table 8 below shows the distribution of the sample firms according to industry, grouped by 2-digit SIC codes. Although 3-digit SIC codes are used for determining firms' industry classifications in this study, the 2-digit code

TABLE 8

DESCRIPTION OF SAMPLE FIRMS:
INDUSTRY DISTRIBUTION

<u>SIC CODE</u>	<u>INDUSTRY DESCRIPTION</u>	<u>NUMBER OF FIRMS</u>
1300	OIL AND GAS EXTRACTION	1
1600	HEAVY CONSTRUCTION, NOT BLDG.	1
1700	CONSTRUCTION, SPECIAL TRADE	1
2000	FOOD AND KINDRED PRODUCTS	7
2200	TEXTILE MILL PRODUCTS	5
2300	APPAREL AND OTHER FINISHED PRODUCTS	5
2400	LUMBER AND WOOD PRODUCTS, EX. FURN.	2
2500	FURNITURE AND FIXTURES	2
2600	PAPER AND ALLIED PRODUCTS	8
2700	PRINTING, PUBLISHING, AND ALLIED	3
2800	CHEMICALS AND ALLIED PRODUCTS	1
3000	RUBBER AND MISC. PLASTICS PRODUCTS	3
3200	STONE, CLAY, GLASS, CONCRETE PRODUCTS	4
3300	PRIMARY METAL INDUSTRIES	3
3400	FABRICATED METAL, EX. MACH., TRANS EQ.	5
3500	IND. AND COMM. MACHINERY, COMPUTER EQ.	6
3600	ELECTRIC EQUIPMENT, EXCEPT COMPUTER	7
3700	TRANSPORTATION EQUIPMENT	3
3800	MEAS. INSTR., PHOTO. GOODS, WATCHES	3
3900	MISCELLANEOUS MANUFACTURING INDUSTRIES	1
4000	RAILROAD TRANSPORTATION	1
4200	MOTOR FREIGHT TRANS., WAREHOUSE	1
4800	COMMUNICATIONS	5
5000	DURABLE GOODS - WHOLESALE	1
5100	NONDURABLE GOODS - WHOLESALE	2
5200	BLDG MATL, HARDWARE, GARDEN - RETAIL	3
5300	GENERAL MERCHANDISE STORES	1
5400	FOOD STORES	2
5600	APPAREL AND ACCESSORY STORES	4
5700	HOME FURNITURE AND EQUIPMENT STORE	1
5800	EATING AND DRINKING PLACES	6
5900	MISCELLANEOUS RETAIL	6
6000	DEPOSITORY INSTITUTIONS	2
6500	REAL ESTATE	1
6700	HOLDING, OTHER INVEST. OFFICES	2
7200	PERSONAL SERVICES	1
7300	BUSINESS SERVICES	2
7800	MOTION PICTURES	1
8000	HEALTH SERVICES	1
8200	EDUCATIONAL SERVICES	1
8900	SERVICES, NEC.	1

grouping displayed gives an overall view of the general nature of the firms' industries. A total of 41 different industries are represented in the sample, which provides good diversity. The industry experiencing the most buyouts was paper and allied products (SIC 2600), with 8 sample firms. This is followed by food and kindred products (SIC 2000) and electric equipment, except computer (SIC 3600), which each have 7 bought-out firms. There are many industries for which 1 or 2 firms are represented in the sample. The sample is representative of the overall pattern of LBO's during the decade with respect to industries.

CHAPTER IV

RESULTS

Regression Results for the Buyout Premium Models

The results for Model 1, which has the annualized premium paid for bought-out firms as a dependent variable, are presented in Tables 9 through 14. Tables 9 through 11 present regressions which contain only the two new variables introduced by this study as independent variables. Tables 12 through 14 contain these two variables as well as the significant variables from other studies for which data were available.

The full sample regression shown in Table 9 includes firms which experienced buyouts both before and after the 1986 Tax Reform Act. The results for this regression show a significant negative relationship between market concentration (HERF) and the annualized premium (ANUPREM) paid for the firms. This is the opposite of the hypothesized positive relationship. The more concentrated the market in which the firm operates, the lower the premium that is paid. The cyclicity of the firm's cash flows (CORRL) is not a significant variable.

TABLE 9
REGRESSION OF ANUPREM ON TWO INDEPENDENT
VARIABLES: THE FULL SAMPLE

$$\text{ANUPREM} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	1.218 (8.472)***
CORRL	0.154 (1.268)
HERF	-1.013 (-2.393)**
N	105
R-Squared	0.0710
F Value	3.898**

*** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

Regression results for firms for which the buyout was announced before 1986 are shown in Table 10. Neither CORRL nor HERF were significant during this time period, indicating that acquirers were not considering cash flow cyclicity or market concentration in determining the premiums paid during the 1980-1986 interval.

After 1986, however, both CORRL and HERF were significant in determining the premiums paid. Table 11 shows these results. The sign of each regression coefficient is the opposite of the hypothesized sign. The coefficient of CORRL is positive, indicating that the premium paid was higher for firms with greater cyclicity of cash flows relative to nominal GNP. The coefficient of HERF is negative, indicating that the premium paid was lower for firms operating in industries with greater market concentration.

Table 12 shows the regression results for the full sample of firms, with dependent variable ANUPREM and all nine independent variables. In this regression, market concentration (HERF) and the percentage of management ownership (MGMTOWN) are significant variables. The sign of the HERF coefficient is the opposite of what was expected, and indicates an inverse relationship between the premium paid and market concentration. The sign of MGMTOWN's coefficient is negative. This is consistent with what was expected, and confirms the Easterwood, Hsieh, and Singer (1988) result. The more of the bought-out firm's stock

TABLE 10

REGRESSION OF ANUPREM ON TWO INDEPENDENT
 VARIABLES: TAX GROUP ONE - FIRMS WITH
 ANNOUNCEMENT DATES BEFORE 1986

$$\text{ANUPREM} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	1.043 (6.474)***
CORRL	-0.153 (-1.022)
HERF	0.060 (0.107)
N	52
R-Squared	0.0218
F Value	0.547

*** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

TABLE 11

REGRESSION OF ANUPREM ON TWO INDEPENDENT
VARIABLES: TAX GROUP TWO - FIRMS WITH
ANNOUNCEMENT DATES 1986 AND AFTER

$$\text{ANUPREM} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	1.904 (5.585)***
CORRL	0.430 (1.820)*
HERF	-1.789 (-2.321)**
N	53
R-Squared	0.6186
F Value	40.555

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

TABLE 12
REGRESSION OF ANUPREM ON NINE INDEPENDENT
VARIABLES: THE FULL SAMPLE

$$\text{ANUPREM} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	1.423 (6.134)***
CORRL	0.008 (0.055)
HERF	-0.883 (-1.806)*
RELPE	0.246 (1.282)
MGMTOWN	-0.008 (-1.724)*
LED	0.080 (0.351)
CFLOW	-0.00006 (-0.492)
TAXLIAB	0.031 (0.123)
COMPBID	-0.140 (-0.764)
OWNLED	-0.003 (-0.366)
N	105
R-Squared	0.1021
F Value	1.200

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

management owned prior to the buyout announcement, the lower the premium that was paid.

The regression results for the Tax Group One subsample and all nine independent variables are in Table 13. The premium paid is significantly and negatively related to CORRL and to COMPBID. For firms whose buyouts were announced prior to 1986, the premiums paid increased as the cyclicity of their cash flows decreased. This is consistent with the hypothesized relationship. Premiums paid for firms which had one or more competing buyout bids were lower than for firms which did not have competing bids. This is the opposite of the expected result.

The Tax Group Two subsample results in Table 14 indicate significance for CORRL, HERF, and MGMTOWN. Firms with buyout announcement dates after 1986 had premiums that were positively related to cash flow cyclicity, negatively related to market concentration, and negatively related to percentage management ownership prior to the buyout announcement. The cyclicity and concentration relationships are the opposite of those hypothesized. The percent management ownership sign is consistent with the expected result, and confirms the Easterwood, Hsieh, and Singer (1988) result.

TABLE 13

REGRESSION OF ANUPREM ON NINE INDEPENDENT
VARIABLES: TAX GROUP ONE - FIRMS WITH
ANNOUNCEMENT DATES BEFORE 1986

$$\text{ANUPREM} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	1.090 (3.835)***
CORRL	-0.286 (-1.846)*
HERF	0.016 (0.029)
RELPE	0.096 (0.628)
MGMTOWN	-0.003 (-0.637)
LED	0.174 (0.606)
CFLOW	0.003 (1.460)
TAXLIAB	0.980 (0.963)
COMPBID	-0.395 (-1.719)*
OWNLED	-0.009 (-0.986)
N	52
R-Squared	0.2057
F Value	1.209

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

TABLE 14

REGRESSION OF ANUPREM ON NINE INDEPENDENT
VARIABLES: TAX GROUP TWO - FIRMS WITH
ANNOUNCEMENT DATES 1986 AND AFTER

$$\text{ANUPREM} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	1.904 (5.585)***
CORRL	0.430 (1.820)*
HERF	-1.789 (-2.321)**
RELPE	0.040 (0.143)
MGMTOWN	-0.017 (-2.738)***
LED	-0.369 (0.143)
CFLOW	-0.002 (-1.654)
TAXLIAB	-0.179 (-0.793)
COMPBID	-0.114 (-0.362)
OWNLED	0.011 (0.857)
N	53
R-Squared	0.3025
F Value	2.072

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

Regression Results for the Stock Price Reaction Models

Tables 15 and 16 contain the regression results for the full sample of firms, for the stock price reaction models based on the CORRL and HERF variables. The dependent variable in Table 15 is CARMEAN, the cumulative abnormal returns measure calculated using a mean adjusted returns model. The dependent variable in Table 16 is CARMKT, the cumulative abnormal returns measure calculated using a market adjusted returns model.

For the regression which used CARMEAN as the measure of stock price reaction neither CORRL nor HERF was significant. The CARMKT regression, however, shows significance for CORRL, which is positively related to the stock price reaction. That is, the greater the correlation between a firm's cash flows and nominal GNP, the greater its positive stock price reaction at the announcement of a buyout. This is the opposite of the relationship expected between these two variables. HERF was not significant in this regression.

When the firms in Tax Group One (those which had buyout announcements before 1986) are considered separately, the results are similar for the CARMEAN regression. These results are presented in Table 17 below. Neither CORRL nor HERF proved to be significant in determining stock price reaction as measured by CARMEAN

TABLE 15
REGRESSION OF CARMEAN ON TWO INDEPENDENT
VARIABLES: THE FULL SAMPLE

$$\text{CARMEAN} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.177 (5.705)***
CORRL	0.029 (1.006)
HERF	-0.049 (-0.429)

N	105
R-Squared	0.1226
F Value	0.556

*** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

TABLE 16
 REGRESSION OF CARMKT ON TWO INDEPENDENT
 VARIABLES: THE FULL SAMPLE

$$\text{CARMKT} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.180 (6.290)***
CORRL	0.044 (1.666)**
HERF	-0.067 (-0.655)
N	105
R-Squared	0.1385
F Value	1.499

*** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

TABLE 17

REGRESSION OF CARMEAN ON TWO INDEPENDENT
VARIABLES: TAX GROUP ONE - FIRMS WITH
ANNOUNCEMENT DATES BEFORE 1986

$$\text{CARMEAN} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.205 (5.612)***
CORRL	0.018 (0.469)
HERF	-0.017 (-0.117)
N	52
R-Squared	0.0045
F Value	0.110

*** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

during this time period.

Table 18 shows results for the Tax Group One firms based on the CARMKT measure. These results are similar to the full sample regression results in that HERF is insignificant. They are dissimilar in that CORRL is insignificant for this tax group, whereas it was significantly positive for the full sample of firms.

For firms whose buyouts were announced after 1986, neither CORRL nor HERF played a significant role in determining stock price reaction. The results of these regressions are presented in Table 19 for dependent variable CARMEAN and Table 20 for dependent variable CARMKT.

The results of the regression of the full sample of firms for all nine independent variables are presented in Table 21 for the CARMEAN measure of stock price reaction and in Table 22 for the CARMKT measure of stock price reaction. Only COMPBID is significant with respect to both dependent variables, and its coefficient is negative. This indicates that firms which had at least one competing bid during the buyout period experienced smaller stock price reactions when the buyout was first announced than firms for which no competing bids were received. None of the other independent variables are significant in either the CARMEAN regression or the CARMKT regression.

When the firms are broken into subsamples, however, the results are different. Tables 23 and 24 show that the

TABLE 18
 REGRESSION OF CARMKT ON TWO INDEPENDENT
 VARIABLES: TAX GROUP ONE - FIRMS WITH
 ANNOUNCEMENT DATES BEFORE 1986

$$\text{CARMKT} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.217 (6.060)***
CORRL	0.024 (0.642)
HERF	-0.060 (-0.425)
N	52
R-Squared	0.0103
F Value	0.255

*** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

TABLE 19

REGRESSION OF CARMEAN ON TWO INDEPENDENT
VARIABLES: TAX GROUP TWO - FIRMS WITH
ANNOUNCEMENT DATES 1986 AND AFTER

$$\text{CARMEAN} = A_0 + A_1 * \text{CORRL} + A_2 * \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.203 (3.909)***
CORRL	0.029 (0.684)
HERF	-0.195 (-1.035)
N	53
R-Squared	0.0372
F Value	0.965

*** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

TABLE 20

REGRESSION OF CARMKT ON TWO INDEPENDENT
VARIABLES: TAX GROUP TWO - FIRMS WITH
ANNOUNCEMENT DATES 1986 AND AFTER

$$\text{CARMKT} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.207 (4.235)***
CORRL	0.038 (0.983)
HERF	-0.242 (-1.492)
N	53
R-Squared	0.0881
F Value	2.417*

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

TABLE 21
REGRESSION OF CARMEAN ON NINE INDEPENDENT
VARIABLES: THE FULL SAMPLE

$$\begin{aligned} \text{CARMEAN} = & A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ & A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ & A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e \end{aligned}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.225 (5.201)***
CORRL	0.024 (0.830)
HERF	-0.090 (-0.705)
RELPE	0.046 (1.020)
MGMTOWN	-0.001 (-0.874)
LED	0.052 (1.275)
CFLOW	0.000065 (0.257)
TAXLIAB	0.025 (0.834)
COMPBID	-0.094 (-2.995)***
OWNLED	-0.001 (-0.791)
<hr/>	
N	105
R-Squared	0.1226
F Value	1.476

*** statistically significant at the 1% level
 ** statistically significant at the 5% level
 * statistically significant at the 10% level

TABLE 22
REGRESSION OF CARMKT ON NINE INDEPENDENT
VARIABLES: THE FULL SAMPLE

$$\text{CARMKT} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.212 (5.201)***
CORRL	0.028 (1.030)
HERF	-0.105 (-0.909)
RELPE	0.051 (1.165)
MGMTOWN	-0.00078 (-0.709)
LED	0.041 (1.099)
CFLOW	0.00015 (0.634)
TAXLIAB	0.043 (1.531)
COMPBID	-0.085 (-2.951)***
OWNLED	-0.00057 (-0.343)
N	105
R-Squared	0.1385
F Value	1.696

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

TABLE 23

REGRESSION OF CARMEAN ON NINE INDEPENDENT
VARIABLES: TAX GROUP ONE - FIRMS WITH
ANNOUNCEMENT DATES BEFORE 1986

$$\text{CARMEAN} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.178 (3.284)***
CORRL	-0.040 (-1.312)
HERF	0.170 (1.046)
RELPE	0.055 (0.716)
MGMTOWN	-0.00034 (-0.269)
LED	0.025 (0.501)
CFLOW	0.00025 (0.921)
TAXLIAB	0.553 (2.607)**
COMPBID	-0.132 (-3.080)***
OWNLED	-0.00082 (-0.385)
N	52
R-Squared	0.5227
F Value	5.111***

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

TABLE 24

REGRESSION OF CARMKT ON NINE INDEPENDENT
VARIABLES: TAX GROUP ONE - FIRMS WITH
ANNOUNCEMENT DATES BEFORE 1986

$$\begin{aligned} \text{CARMKT} = & A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ & A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ & A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e \end{aligned}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.177 (3.255)***
CORRL	-0.046 (-1.419)
HERF	0.116 (0.734)
RELPE	0.047 (0.691)
MGMTOWN	-0.00038 (-0.303)
LED	0.032 (0.654)
CFLOW	0.00026 (0.881)
TAXLIAB	0.516 (2.439)**
COMPBID	-0.11176 (-2.633)**
OWNLED	-0.00036 (-0.177)
N	52
R-Squared	0.4212
F Value	3.396

*** statistically significant at the 1% level

** statistically significant at the 5% level

* statistically significant at the 10% level

results of the stock price reaction regressions for firms with buyout announcements occurring before 1986 are similar for the CARMEAN and CARMKT measures. During this period the firms' effective tax liabilities (TAXLIAB) and the presence or absence of competing bids (COMPBID) played a significant role with respect to stock price reactions at announcement.

TAXLIAB is positively related to CARMEAN and CARMKT, indicating that firms with greater effective tax liabilities experienced greater increases in stock price at the announcement of a buyout bid than firms with lesser effective tax liabilities. This is consistent with the expected result. The TAXLIAB variable had not been examined previously with regard to stock price reaction. Lehn and Poulsen (1987) found a significant positive relationship between TAXLIAB and the buyout premium paid.

Firms in Tax Group One which received competing bids during the buyout period had lower stock price reactions at the initial announcement of a buyout. This is the opposite result of what was expected.

The stock price reactions for firms in Tax Group Two were significantly affected by the percentage of management ownership prior to the buyout announcement. Tables 25 and 26 show that for both the CARMEAN and the CARMKT measures of stock price reaction, firms with higher management ownership experienced smaller stock price reactions than firms with lower management ownership. The negative

TABLE 25

REGRESSION OF CARMEAN ON NINE INDEPENDENT
VARIABLES: TAX GROUP TWO - FIRMS WITH
ANNOUNCEMENT DATES 1986 AND AFTER

$$\begin{aligned} \text{CARMEAN} = & A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ & A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ & A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e \end{aligned}$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.248 (3.598)***
CORRL	0.014 (0.300)
HERF	-0.175 (-1.012)
RELPE	0.043 (0.703)
MGMTOWN	-0.00451 (-2.366)**
LED	0.021 (0.315)
CFLOW	-0.000019 (-0.052)
TAXLIAB	0.0129 (0.229)
COMPBID	-0.0574 (-1.057)
OWNLED	0.00185 (0.628)
N	53
R-Squared	0.3084
F Value	2.130*

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

TABLE 26

REGRESSION OF CARMKT ON NINE INDEPENDENT
VARIABLES: TAX GROUP TWO - FIRMS WITH
ANNOUNCEMENT DATES 1986 AND AFTER

$$\text{CARMKT} = A_0 + A_1 \cdot \text{CORRL} + A_2 \cdot \text{HERF} + A_3 \cdot \text{RELPE} + A_4 \cdot \text{DISP} + \\ A_5 \cdot \text{MGMTOWN} + A_6 \cdot \text{LED} + A_7 \cdot \text{CFLOW} + A_8 \cdot \text{TAXLIAB} + \\ A_9 \cdot \text{COMPBID} + A_{10} \cdot \text{OWNLED} + e$$

Independent Variable	Coefficient (t-statistic)
INTERCEPT	0.257 (4.111)***
CORRL	0.0114 (0.276)
HERF	-0.271 (-2.158)**
RELPE	0.037 (0.720)
MGMTOWN	-0.00353 (-3.166)***
LED	-0.00077 (-0.014)
CFLOW	0.000095 (0.284)
TAXLIAB	0.0445 (1.940)*
COMPBID	-0.0483 (-1.022)
OWNLED	0.0025 (1.114)
N	53
R-Squared	0.8752
F Value	33.511***

*** statistically significant at the 1% level
** statistically significant at the 5% level
* statistically significant at the 10% level

regression coefficient on this variable is the opposite result of what was expected.

There is a difference between the CARMEAN and the CARMKT measures in regard to the significance of the other variables. For firms in Tax Group Two, only MGMTOWN is significant in its relationship to stock price change as measured by CARMEAN. For the same firms, HERF and TAXLIAB are significant in addition to MGMTOWN when the stock price reaction is measured by CARMKT.

The regression coefficient for HERF in Table 26 is negative. This indicates that firms operating in industries which are more concentrated experienced smaller stock price reactions at announcement as measured by CARMKT. This is the opposite of the result that was expected.

The positive regression coefficient for TAXLIAB in Table 26 indicates a direct relationship between effective tax liability and stock price reaction at the announcement of a buyout. That is, firms with higher effective tax liabilities experienced greater stock price reactions at the announcement of a buyout than firms with lower effective tax liabilities. This is consistent with the result that was expected.

CHAPTER V

SUMMARY AND CONCLUSIONS

The objectives of this research are threefold. The first purpose of this study is to evaluate whether the LBOs that occurred during the study period reflected the cyclical nature of the firms, as quantified by the correlation coefficient between the firm's cash flows and the gross national product of the United States economy. The second purpose is to examine the LBOs in the sample with respect to the level of competition that each firm faces as measured by the Herfindahl Index.

The third purpose is to combine the variables examined by other researchers with the cyclical nature and industry concentration variables that are unique to this study. The importance of these two variables is evaluated when they are integrated with the other variables, and their strength with regard to influence on buyout premiums and stock price reactions is measured. Amihud (1989), in particular, has recognized the need for this kind of synthesis of previous LBO studies.

Interpretation of Results:

Premiums Paid

A review of the premium regression results for the full sample and for tax groups 1 and 2 is displayed in Table 27 below. It appears that the tax group breakdown aided the determination of variable effects which were masked in the full sample regressions. A confounding of variable effects is possible if an independent variable is negatively related to the dependent variable during one subperiod and positively related to the dependent variable during another subperiod. In this case, combining firms from both subperiods for a full sample regression may yield an insignificant regression coefficient. The individual subsample effects are free to emerge in the subperiod regressions.

Only the degree of market concentration (HERF) was significant in the premium regression for the full sample of firms. Firms with a higher Herfindahl index, which indicates greater market concentration, had lower buyout premiums. It was hypothesized that the opposite relationship would hold, based on the likelihood of an inverse relationship between market concentration and competitiveness within the industry. Firms operating in concentrated markets would presumably face less competition and have greater ability to maintain their market shares after the buyout.

TABLE 27
SIGNIFICANT VARIABLES FOR THE
FULL SAMPLE AND THE SUBSAMPLE
REGRESSIONS: PREMIUMS PAID

Sample Coefficient	Dependent Variable	Independent Variable	Sign of
Full	ANUPREM	HERF	negative
Tax Group 1	ANUPREM	CORRL	negative
Tax Group 1	ANUPREM	COMPBID	negative
Tax Group 2	ANUPREM	CORRL	positive
Tax Group 2	ANUPREM	HERF	negative
Tax Group 2	ANUPREM	MGMTOWN	negative

HERF did not prove to be significant for firms with buyout announcements before 1986. Firms with announcements during and after 1986 had the same significant negative relationship between market concentration and the buyout premium paid as the full sample had. This indicates that the competitive environment in which the firms were operating became more important to consider after the 1986 Tax Reform Act was passed.

It is likely that each firm's competitive position within its market was perceived with reasonable accuracy and priced by the market prior to the buyout bid. The HERF variable in the regressions measures the impact of market concentration on the value of the firm with specific regard to the buyout. One possible explanation for a negative coefficient for HERF would be the ease with which firms in less concentrated industries can be monitored, and their proper market value assessed before a buyout bid is announced.

It is often the case that information not previously available about a firm which is a buyout target is revealed to the market during the buyout process. The amount of asymmetric information available to the market may depend on the market structure of the industry. This factor may have confounded the results of this study.

Roll's hubris hypothesis (1986) may also apply to a buyout situation. If there is more limited information available about firms in one market structure versus

another, then investors could be overoptimistic about the potential rewards of a buyout in some cases relative to others. Premiums for these firms would therefore be higher than premiums for firms for which more information concerning the true rewards is available.

Another factor which may have some influence is whether or not the buyout leads to a merger which would increase market concentration within an industry. If the acquirer is a firm in the same industry as the bought-out firm an increase in overall market concentration will result from the merger. The firms in this study were analyzed with regard to access to market power without regard to the target and acquiring firms' industries.

The measure of the cyclicalness of a firm's cash flows relative to nominal U. S. GNP (CORRL) was significant in both of the premium subsample regressions. A negative relationship was hypothesized. This was the result for the tax group one firms, which had buyouts announced before 1986. But the tax group two regression produced the opposite result.

It is possible that by the mid-1980's, when the country was well into an expansionary economic period, investors were more confident regarding the stability of cash flows. "Down-side" cyclicalness may not have been as big a concern as it was earlier in the decade when the country was recovering from the 1981-82 recession. The coefficients of CORRL in the subsample regressions may

reflect investors' myopic views based on recent experience, biasing their evaluation of the cyclical nature of firms' cash flows.

The regressions indicate a significant negative relationship between the presence of one or more competing bids (COMPBID) and the premiums paid for firms whose buyouts were announced before 1986. A positive relationship had been hypothesized, based on the likelihood that competing acquirers would interact to bid up the final buyout price.

The COMPBID variable was not significant for firms which had buyout announcements during or after 1986.

Lowenstein (1985) found a significant positive relationship between the presence of competing bids and the size of the buyout premium. Easterwood, Hsieh, and Singer (1988) tested this variable and did not find significance.

It may be that information regarding the firm's true value was unearthed to a greater degree when more than one bidder was involved. As more information became available investors would be less likely to be overoptimistic, resulting in lower premiums paid. This would be especially true before the Tax Reform Act changes took effect.

As pointed out in the literature review above, several facets of the Tax Act had the potential to affect firms' buyout values. Some of the anticipated effects were likely to produce lower required premiums for bought-out firms. For example, there were lower maximum personal tax rates,

lower maximum corporate tax rates, restrictions on adjusting the tax basis of assets acquired, and changes in the handling of operating losses. Much of the information needed to evaluate the full impact of the tax code change on the value of a firm would be difficult to obtain. This might explain why COMPBID is not a significant factor after 1986.

The percentage of the firm's common stock owned by managers prior to buyout announcement (MGMTOWN) proved to be significant and negatively related to the premium paid for the firms in Tax Group Two. This is the opposite of the expected positive relationship. However, this result would be consistent with the notion that the information needed to assess firm value after the Tax Act was more readily available to insiders such as management. The more of an ownership interest managers had, the more information they had, and the less likely they were to be overoptimistic about firm value. This factor was not as important before the Tax Act, when the tax consequences of a buyout were more easily assessed by competing bidders.

Easterwood, Hsieh, and Singer (1988) found a significant negative relationship between premium paid and the level of management ownership. DeAngelo, DeAngelo, and Rice (1984b) found inconclusive results for this variable with regard to premium, but found positive results for it with regard to stock price reaction.

Interpretation of Results:

Stock Price Reactions

Table 28 below shows the results for the full sample and the subsample stock price reaction regressions. Two measures were used to evaluate stock price reactions. These are the cumulative abnormal returns measure based on a mean adjusted returns model (CARMEAN), and the cumulative abnormal returns measure based on a market adjusted returns model (CARMKT).

The only variable that shows significance for the full sample of firms is whether or not there was at least one competing bid for a firm (COMPBID). COMPBID has a significant negative relationship with both measures of cumulative abnormal returns. There was a smaller price reaction during the event period from five days before to five days after the buyout announcement for firms which received at least one competing bid during the buyout process.

It is interesting to note that this factor is significantly related to the stock price reaction, when in fact the competing bid or bids may not have been received until after the end of the event period. Evidently, expectations regarding the likelihood of a competitive bid being received are playing a role in affecting stock prices.

TABLE 28
SIGNIFICANT VARIABLES FOR THE
FULL SAMPLE AND THE SUBSAMPLE
REGRESSIONS: STOCK PRICE
REACTIONS

Sample Coefficient	Dependent Variable	Independent Variable	Sign of
Full	CARMEAN	COMPBID	negative
Tax Group 1	CARMEAN	COMPBID	negative
Tax Group 1	CARMEAN	TAXLIAB	positive
Tax Group 2	CARMEAN	MGMTOWN	negative
Full	CARMKT	COMPBID	negative
Tax Group 1	CARMKT	COMPBID	negative
Tax Group 1	CARMKT	TAXLIAB	positive
Tax Group 2	CARMKT	HERF	negative
Tax Group 2	CARMKT	MGMTOWN	negative
Tax Group 2	CARMKT	TAXLIAB	positive

As Amihud's (1989) model indicates, the price of a buyout target at any given time during the buyout process is a function of both the probability of a successful buyout and the anticipated final buyout price. Both of these factors will also influence the stock price reaction at the initial announcement of a buyout bid. As investors evaluate the likelihood of competing bid occurrences they are also likely to shift their expectations regarding the probability of success and the final price. The separate effects of these two factors on firm value are difficult to determine. This is an area for possible future exploration.

COMPBID also emerges as a significant variable for the Tax Group One subsample regression, with the same negative relationship to CARMEAN and CARMKT as in the full sample regression. When Tax Group Two is considered, COMPBID is no longer significant for either measure of cumulative abnormal return. This result is similar to the one discussed above regarding the premium regressions. There appears to have been a shift away from the use of competing bid information or expectations to value the buyout firms.

The other variable that is significant in determining stock price reactions for CARMEAN and CARMKT before 1986 is the firm's effective tax liability (TAXLIAB). The sign of the regression coefficient is positive, as was expected. The greater the firm's effective tax liability, the more

beneficial would be the deductibility of interest payments and losses incurred through a buyout.

TAXLIAB is also significant for the CARMKT measure after 1986, but not for CARMEAN. The market adjusted measure of abnormal returns may be more sensitive to detecting the effect of TAXLIAB than the mean adjusted measure. The mean adjusted measure relies on past data from the firm itself, which may not be as likely to reflect the impact of the tax code changes as the overall market.

Effective tax liability did not play a significant role in determining the premiums paid for buyout firms in this study. Lehn and Poulsen (1987), whose sample included buyouts which occurred between 1980 and 1987, found a significant positive relationship between effective tax liability and the premium paid.

Both the CARMEAN and the CARMKT dependent variables were significantly negatively related to MGMTOWN for buyout announcements occurring after the Tax Reform Act. The sign is the opposite of what was expected. The greater the percentage of stock owned by management prior to the buyout bid announcement, the lower was the stock price reaction at announcement.

This is similar to the results of this study for buyout premiums in regard to MGMTOWN. If management already owns a significant proportion of the stock, it is likely that the firm is more accurately valued prior to the buyout bid. Under these circumstances, the announcement of

a buyout would not be as likely to trigger overoptimism on the part of the investors. The value of managerial knowledge about true firm value is especially important after the tax changes, as discussed above.

DeAngelo, DeAngelo, and Rice (1984b) found a significant positive relationship between the percentage of management ownership and the stock price reaction at the announcement of buyout bids. Their sample consisted of firms which experienced announcements prior to the change in the tax code. In contrast, in the current study, MGMTOWN was significant after the tax changes, but not before.

Market concentration as measured by HERF was significant only during the after-1986 period in relationship to cumulative abnormal returns, and only when the abnormal returns were measured by CARMKT. It may be the case, as it was with TAXLIAB, that the market adjusted measure is more sensitive to the influence of market concentration than the firm's mean adjusted measure.

The sign of the regression coefficient is negative, which is the opposite of the sign that was expected. Firms in more concentrated industries had lower stock price reactions at announcement of a buyout bid. The sign is consistent with the results which were obtained for the premium regression. Market concentration also had a significant negative effect on the premium paid for firms in the Tax Group Two subsample.

Market concentration and the competitive environment in which firms operate appear to have become more important after the tax changes. The same reasons as discussed above concerning premiums would also apply here. The accuracy of firm valuation prior to the buyout bid, Roll's (1986) hubris hypothesis, differences in the ability to monitor firms in markets which have different degrees of concentration, and the possibility of the buyout itself influencing market concentration are all possible explanations for the significant negative relationship.

Future Research

Several issues remain to be examined. One of the most prominent regression results is the significance of the intercept terms. It is likely that one or more variables that are important in relation to buyout premiums is being omitted from the regression. Research on some of the factors discussed below may prove to be fruitful in identifying these factors.

One possibility is that an alternative measure of cyclicity would be better in identifying the recession-resistance of firms. If firms are valuing stability rather than counter-cyclicity, then the absolute value of CORRL would be the preferred measure. However, preliminary results do not support this. In addition, Seth (1990) described several alternative measures of cyclicity which could be tested in relation to buyouts.

A dummy variable or a subsample breakdown in reference to the nature of acquiring firms' businesses might also provide insight. It may be that there are different effects on premiums and stock prices in situations depending on whether or not the acquiring firm's nature of business is closely related to the target firm's business.

A similar breakdown which measures the arrival pattern of competing bids may also be appropriate. Whether a competing bid arrives during the event period, after the event period, or not at all may have an effect on the premium and/or the stock price increase at announcement.

Follow-up studies will also be possible. Many of the firms that went private through leveraged buyouts in the 1980's are now being taken public again. Also, study of the factors involved in failure and survival for the sample firms would also provide information now that the economy has experienced an economic downturn.

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APPENDIX

The SAS System

OBS	NAME	NDAYS	ANNDAT	BUYDAT
1	A P L CORP	55	860926	861030
2	AFTER 6 INC	118	840514	840926
3	AMERACE CORP	92	840619	841112
4	AMERICAN BAKERIES CO	61	861022	861204
5	AMSTAR CORP	121	830929	840208
6	AXIA CORP	207	840218	841030
7	BECOR WESTERN INC	276	870217	880204
8	BLUE BELL INC	175	840503	841128
9	C C I CORP	113	820924	830120
10	CAPITOL FOOD INDS INC	131	820827	830120
11	CARROLS CORP	92	860925	861222
12	CELLU CRAFT INC	165	830908	840322
13	CENTRAL SOYA INC	70	850314	850509
14	CHADWICK MILLER INC	120	840525	841004
15	CHURCHS FRIED CHICKEN INC	261	881024	890921
16	CLEVEPAK CORP DE	219	850701	860501
17	CONDEC CORP	194	831114	840701
18	CONNELLY CONTAINERS INC	191	890417	891201
19	CONTINENTAL GROUP INC	135	840606	841101
20	COOK INTERNATIONAL INC	90	841109	850717
21	COX COMMUNICATION INC	134	850405	850830
22	CUNNINGHAM DRUG STORES INC	110	801027	810220
23	DALLAS CORP	69	891113	900108
24	DAN RIVER INC	192	821004	830524
25	DENNYS INC	198	840530	850129
26	DEVON GROUP INC	141	820715	821228
27	DILLINGHAM CORP	115	821116	830317
28	DURO TEST CORP	181	870821	880325
29	DYNCORP	276	870922	880902
30	EASCO CORP	406	850102	860627
31	ECKERD JACK CORP	169	851011	860430
32	FIRST CITY BANCORPORATION TX	242	870618	880419
33	FORT HOWARD CORP	117	880622	881024
34	FRUEHAUF CORP	219	860326	861223
35	GENERAL REFRACTORIES CO	403	870306	880824
36	GIFFORD HILL & CO INC	51	860909	861007
37	GOLDEN WEST HOMES	139	851113	860422
38	HARTE HANKS COMMUNICATIONS I	145	840328	840911
39	HESSTON CORP	111	870123	870519
40	HORIZON CORP	203	890425	891228
41	HOSPITAL CORP AMER	157	880915	890316
42	INSILCO CORP	68	880805	880928
43	INTERNATIONAL CONTROLS CORP	62	870423	870803
44	INTERSTATE BAKERIES CORP NEW	212	870811	880215
45	JEWELCOR INC	175	871023	880519

The SAS System

OBS	NAME	NDAYS	ANNDAT	BUYDAT
46	KAISER STEEL CORP	231	830510	840229
47	KANE MILLER CORP	113	831031	840228
48	LEAR SIEGLER INC	94	861024	870126
49	LEHIGH PRESS INC	72	861020	861218
50	LESLIE FAY INC	154	811030	820428
51	LEVI STRAUSS & CO	67	850711	850830
52	LEVITZ FURNITURE CORP	247	840601	840604
53	LOEHMANN INC	100	800925	810107
54	LYNCH COMMUNICATIONS SYS INC	114	860825	861223
55	MACY R H & CO INC	215	851021	860715
56	MAIONE & HYDE INC	54	840608	840712
57	MARINE MIDLAND BKS INC	140	870713	871215
58	MAXXAM GROUP INC	282	870526	880520
59	METROMEDIA INC	167	831206	840621
60	MIDLAND GLASS INC	121	831018	840228
61	MIDLAND ROSS CORP	84	860701	860916
62	MORSE SHOE INC	134	870217	870715
63	MOUNT VERNON MLS INC	98	820128	820511
64	NATIONAL GYPSUM CO	137	851125	860429
65	NATIONAL MINE SVC CO	53	900312	900411
66	NATIONAL SPINNING CO	123	800821	810105
67	NIAGARA FRONTIER SVCS INC	100	830125	830504
68	OHIO MATTRESS CO DE	121	890306	890809
69	PANTASOTE INC	136	890418	890915
70	PAPERCRAFT CORP	173	850409	851030
71	PARAMOUNT PACKAGING CORP	105	850122	850509
72	PARGAS INC	230	830217	831202
73	PARSONS CORP	69	840905	841029
74	PAYLESS CASHWAYS INC	115	880609	881007
75	PLANTRONICS INC	175	880804	890301
76	PONDEROSA INC	71	861124	870122
77	PURITAN FASHIONS CORP	61	831114	831228
78	QUESTOR CORP	174	820322	820928
79	RELIANCE GROUP INC	154	810714	820108
80	RESEARCH COTTRELL INC	54	870608	870710
81	RESTAURANT ASSOCIATES INDS I	83	870825	871120
82	RESCO D S INC	235	860310	861229
83	REVERE COPPER & BRASS INC	211	860320	861204
84	RIEGEL TEXTILE CORP	100	850620	850930
85	ROYAL CROWN COS INC	150	840111	840629
86	SAFEMART STORES INC	116	860727	861124
87	SAGE ENERGY CO	145	881205	890518
88	SCOTTYS INC	176	890410	891102
89	SELIGMAN & LATZ INC	197	850409	851204

The SAS System

OBS	NAME	NDAYS	ANNDAT	BUYDAT
90	SERVO CORP AMER	336	871211	890228
91	SHAKLEE CORP	60	890303	890414
92	SHELLER GLOBE CORP	111	860214	860611
93	SIGNODE CORP	157	820301	820827
94	SOO LINE CORP	533	880128	900123
95	SOUNDESIGN CORP	74	811123	820126
96	SOUTHLAND CORP	146	870702	871215
97	STORER COMMUNICATIONS INC	212	870916	880217
98	SUSQUEHANNA CORP	137	870916	880217
99	SYBRON CORP	57	860120	860226
100	TAFT BROADCASTING CO	179	870306	871006
101	TELEX CORP	214	871008	880629
102	TOPPS CHEWING GUM INC	95	831116	840221
103	TRI STATE MTR TRAN CO DE	378	880906	900124
104	TRIANGLE INDUSTRIES INC	208	871023	880707
105	TRIANGLE PACIFIC CORP	53	860304	860404
106	UNIROYAL INC	148	850409	850924
107	VALLES STEAK HOUSE	254	811120	821012
108	VERNITRON CORP	263	860926	870731
109	VOLUME MERCHANDISE INC	101	840611	841116
110	WALTER JIM CORP	152	870716	880105
111	WARNER COMMUNICATIONS INC	172	890619	900109
112	WEIMAN INC	108	900424	900815
113	WILLIAMHOUSE REGENCY INC	148	820708	821222
114	WOMETCO ENTERPRISES INC	172	830922	840412
115	ZALE CORP	260	860218	870114

The SAS System

OBS	NAME	ANUPREM	CARMEAN	CARMKT
1	A P L CORP	0 56025	0.11855	0 10743
2	AFTER 6 INC	1 16693	0 23296	0 26470
3	AMERACE CORP	-0.01016	0.01688	0.04080
4	AMERICAN BAKERIES CO	1 82990	0 29716	0 30205
5	AMSTAR CORP	1 39208	0 42720	0 45366
6	AXIA CORP	0 59877	0 18206	0 20008
7	BECOR WESTERN INC	0 08228	0 10055	0 07973
8	BLUE BELL INC	0 67344	0 28489	0 26392
9	C C I CORP	2 15784	0 45214	0 44906
10	CAPITOL FOOD INDS INC	1 40696	0 49712	0 39343
11	CARROLS CORP	0 66146	0 06308	0 06048
12	CELLU CRAFT INC	0 02508	0 13614	0 15817
13	CENTRAL SOYA INC	1 47576	0 10942	0 14375
14	CHADWICK MILLER INC	0 91840	0 23543	0 27607
15	CHURCHS FRIED CHICKEN INC	0 07862	0.13443	0 14442
16	CLEVEPAK CORP DE	-0 24579	0 03822	0 01311
17	CONDEC CORP	0 60721	-0 07834	-0 07632
18	CONNELLY CONTAINERS INC	0 46183	0 31109	0 28364
19	CONTINENTAL GROUP INC	1 63943	0 13338	0 13005
20	COOK INTERNATIONAL INC	0 75160	0 21823	0 24420
21	COX COMMUNICATION INC	0 86814	0 23722	0 23965
22	CUNNINGHAM DRUG STORES INC	1 85814	0 33319	0 36280
23	DALLAS CORP	2 94953	0 68124	0 68099
24	DAN RIVER INC	1 57159	-0 06892	-0 10107
25	DENNYS INC	0 50965	0 18543	0 20096
26	DEVON GROUP INC	1 68220	0 10375	0 09015
27	DILLINGHAM CORP	2 09023	0 27569	0 29228
28	DURO TEST CORP	0 53495	0 24193	0 23355
29	DYNCORP	0 60816	-0 01561	0 01023
30	EASCO CORP	0 27600	0 11541	0 12024
31	ECKERD JACK CORP	0 23348	0 00233	-0 00391
32	FIRST CITY BANCORPORATION TX	-0 67216	-0 04477	-0 09619
33	FORT HOWARD CORP	1 46335	0 40288	0 37641
34	FRUEHAUF CORP	2 32057	0 02338	0 03482
35	GENERAL REFRACTORIES CO	0 33326	-0 17902	-0 18414
36	GIFFORD HILL & CO INC	3 33212	0 45145	0 51455
37	GOLDEN WEST HOMES	1 27055	0 30756	0 24344
38	HARTE HANKS COMMUNICATIONS I	1 19465	0 33056	0 33998
39	HESSTON CORP	0 91531	0 21207	0 19197
40	HORIZON CORP	0 69928	0 01328	-0 00654
41	HOSPITAL CORP AMER	0 92979	0 27037	0 24578
42	INSILCO CORP	2 62129	0 41989	0 42786
43	INTERNATIONAL CONTROLS CORP	3 31041	0 26057	0 27582
44	INTERSTATE BAKERIES CORP NEW	-0 31138	0 25777	0 25741
45	JEWELCOR INC	0 31717	-0 29236	0 00956

The SAS System

OBS	NAME	ANUPREM	CARMEAN	CARMKT
46	KAISER STEEL CORP	0 04429	0 05321	0 03188
47	KANE MILLER CORP	1 18484	0 27209	0 30066
48	LEAR SIEGLER INC	1 96926	0.21387	0 21751
49	LEHIGH PRESS INC	1 40943	0.27722	0 27351
50	LESLIE FAY INC	0 67001	0 04886	0 03773
51	LEVI STRAUSS & CO	1 89809	0 31866	0 30072
52	LEVITZ FURNITURE CORP	0 60346	0.17658	0 14799
53	LOEHMANN'S INC	0 67290	0.03767	0 07576
54	LYNCH COMMUNICATIONS SYS INC	0 84199	0 03138	0 02688
55	MACY R H & CO INC	0 72027	0 45847	0 43703
56	MAIONE & HYDI INC	2 31257	0 32031	0 30020
57	MARINE MIDLAND BKS INC	1 71463	0.25528	0 22970
58	MAXXAM GROUP INC	0 21758	-0 08663	-0 08529
59	METROMEDIA INC	0 96510	0 55067	0 54266
60	MIDLAND GLASS INC	0 98707	0 10495	0 16018
61	MIDLAND ROSS CORP	2 27159	0.43240	0 46505
62	MORSE SHOE INC	1 18603	0 15237	0 14792
63	MOUNT VERNON MLS INC	1 35901	0 33855	0 36841
64	NATIONAL GYPSUM CO	2 10340	0 16502	0 17053
65	NATIONAL MINE SVC CO	1 02708	0 01114	0 03364
66	NATIONAL SPINNING CO	1 79456	0 22911	0 21997
67	NIAGARA FRONTIER SVCS INC	1 28320	0 26857	0 28384
68	OHIO MATTRESS CO DE	0 71938	0.14045	0 15818
69	PANTASOTE INC	0 61728	0 05893	0 04918
70	PAPERCRAFT CORP	0.40784	0 05030	0 06178
71	PARAMOUNT PACKAGING CORP	1 19953	0.15387	0 10545
72	PARGAS INC	0 32790	0 04914	0 05648
73	PARSONS CORP	1 75974	0 07264	0 08164
74	PAYLESS CASHWAYS INC	1 46574	0 05437	0 01572
75	PLANTRONICS INC	0 37527	0 32251	0 33735
76	PONDEROSA INC	2 38660	-0 12501	-0 08946
77	PURITAN FASHIONS CORP	-0 70383	0 24816	0 20793
78	QUESTOR CORP	1 07903	0 38823	-0 35749
79	RELIANCE GROUP INC	0 66460	0 02899	0 05112
80	RESEARCH COTTRELL INC	2 33955	0.17076	0 15416
81	RESTAURANT ASSOCIATES INDS I	1 35707	0.20910	0 21782
82	REVCO D S INC	0 61934	0.08663	0 04582
83	REVERE COPPER & BRASS INC	0 91065	0 03198	0 02039
84	RIEGEL TEXTILE CORP	0 75767	0.09117	0 08385
85	ROYAL CROWN COS INC	1 17727	0.25380	0 23168
86	SAFEWAY STORES INC	1 05687	0 17587	0 22702
87	SAGE ENERGY CO	0 29288	-0 00019	-0 01257
88	SCOTTYS INC	0 59490	0 25874	0 22698
89	SELIGMAN & LATZ INC	0 94600	0.32583	0 30633

The SAS System

NBS	NAME	ANUPREM	CARMEAN	CARMKT
90	SERVO CORP AMER	0 57587	0.23780	0 18623
91	SHAKLEE CORP	4 30443	0 03732	0 04526
92	SHELLER GLOBE CORP	1 44289	0 25097	0 21525
93	SIGNODE CORP	1 05517	0 21010	0 24912
94	SOO LINE CORP	0 35473	0.15753	0 11858
95	SOUNDESIGN CORP	1 85569	0 30432	0 31926
96	SOUTHLAND CORP	1 24843	0 16401	0 16688
97	STORER COMMUNICATIONS INC	1 01314	0 19272	0 23832
98	SUSQUEHANNA CORP	1.38482	0.27616	0 28880
99	SYBRON CORP	1 73209	0.20338	0 19029
100	TAFT BROADCASTING CO	0 73695	0 18194	0 16854
101	TELEX CORP	-0 04923	0.31084	0 34498
102	TOPPS CHEWING GUM INC	1 06943	0 53192	0 51524
103	TRI STATE MTR TRAN CO DE	0 52925	-0 00925	-0 02601
104	TRIANGLE INDUSTRIES INC	-0 17716	-0 27414	0 02160
105	TRIANGLE PACIFIC CORP	2 77668	0 12468	0 10274
106	UNIROYAL INC	0 89612	0 23498	0 24132
107	VALLES STEAK HOUSE	0 45753	0 26312	0 25779
108	VERNITRON CORP	0 13486	0 04820	0 04121
109	VOLUME MERCHANDISE INC	-0 14616	0 14102	0 12955
110	WALTER JIM CORP	1 11106	0 31973	0 31501
111	WARNER COMMUNICATIONS INC	0 54270	0 01649	0 03645
112	WEIMAN INC	2 07256	0 47642	0 50936
113	WILLIAMHOUSE REGENCY INC	1 43547	0 32881	0 31742
114	WOMETCO ENTERPRISES INC	0 59674	0 03338	0.05854
115	ZALE CORP	0 91236	0 03662	0 00036

The SAS System

OBS	NAME	CORRL	HERF	RELPE	MGMTOWN	LED
1	A P L CORP	0 03255	0 06038	0 57671	11 70	0
2	AFTER 6 INC	-0 69745	0 08006	0 40663	29 50	1
3	AMERACE CORP	-0.06883	0. 18020	0 00749	26.10	1
4	AMERICAN BAKERIES CO	0 91552	0 28133	0 18900	12 50	1
5	AMSTAR CORP	0 40976	0 28395	0 14912	5 11	1
6	AXIA CORP	-0 62758	0. 28159	0 04633	5 34	1
7	BECOR WESTERN INC	-0 20933	0. 18536	0 24102	1 60	1
8	BLUE BELL INC	0 52596	0.08006	0 01623	1 61	1
9	C C I CORP	0 96842	0 20729	-0 05398	5 13	1
10	CAPITOL FOOD INDS INC	-0 39871	0 10162	0 04703	8.30	1
11	CARROLS CORP	0 74889	0 15624	0 11868	32 90	1
12	CELLU CRAFT INC	0 89967	0 14302	-0 34294	42 74	1
13	CENTRAL SOYA INC	-0 56000	0 08996	0 09434	2 90	0
14	CHADWICK MILLER INC	0 83443	0. 26328	0 06289	59 50	1
15	CHURCHS FRIED CHICKEN INC	-0 41228	0 18265	0 03923	5 80	0
16	CLEVEPAK CORP DE	-0 16584	0 11893	-0 00096	33.90	0
17	CONDEC CORP	0.06339	0. 14959	0 17063		1
18	CONNELLY CONTAINERS INC	0 78959	0.50000	0 57432	9 05	1
19	CONTINENTAL GROUP INC	0 39600	0 28004	0 08519	1 42	0
20	COOK INTERNATIONAL INC	0 05821	0.08573	-0 06855	43 45	0
21	COX COMMUNICATION INC	0 98024	0 36365	0 35151	16 24	0
22	CUNNINGHAM DRUG STORES INC	0 89596	0. 15426	0 05727	14 70	0
23	DALLAS CORP	0. 15674	0. 16382	0 09390	9 80	0
24	DAN RIVER INC	0 74552	0 10847	0 03991	2.64	0
25	DENNYS INC	0 94875	0. 15624	0 11868	10.00	1
26	DEVON GROUP INC	0. 93439	0. 46530	0 06300	4 60	1
27	DILLINGHAM CORP	0 30693	0. 23453	0 05395	2 60	0
28	DURO TEST CORP	0 42433	0. 26222	0 18161	7 40	0
29	DYNCORP	0. 71372	0. 30425	0 20550		1
30	EASCO CORP	0 36082	0. 18607	0 15708	3 69	0
31	ECKERD JACK CORP	0 96243	0 20625	0 09408	9 00	1
32	FIRST CITY BANCORPORATION TX	-0 96550	0 03743	-0 00041	10 73	0
33	FORT HOWARD CORP	0 92988	0 09404	0 08628	6 50	1
34	FRUEHAUF CORP	-0 36292	0. 20729	-0 05398		1
35	GENERAL REFRACTORIES CO	-0 00820	0. 28264	0 58966	42. 10	1
36	GIFFORD HILL & CO INC	0. 67581	0 14974	2 83879	15.50	0
37	GOLDEN WEST HOMES	-0. 70358	0. 19615	0 09397	32 70	0
38	HARTE HANKS COMMUNICATIONS I	0. 95604	0. 13077	0 07543	28 28	1
39	HESSTON CORP	-0 68488	0. 29410	-0 01247	11 60	0
40	HORIZON CORP	-0 51945	0. 06378	-0 00244	61 80	0
41	HOSPITAL CORP AMER	0. 98038	0. 16407	0 04266	2.60	1
42	INSILCO CORP	0. 26526	0. 21713	0. 11836	1.25	0
43	INTERNATIONAL CONTROLS CORP	0. 85352	0. 15745	0 09522	19.00	1
44	INTERSTATE BAKERIES CORP NEW	-0. 73838	0. 38402	0 23877	29 90	1
45	JEWELCOR INC	0. 79608	0. 20475	0 07105	31.50	1

The SAS System

OBS	NAME	CORRL	HERF	RELPE	MGMTOWN	LED
46	KAISER STEEL CORP	-0.16556	0.08525	0.41371	3.50	0
47	KANE MILLER CORP	-0.63556	0.17160	0.06443	.	.
48	LEAR SIEGLER INC	0.88843	0.11046	0.00963	3.88	0
49	LEHIGH PRESS INC	0.69078	0.31277	0.05480	27.40	1
50	LESLIE FAY INC	-0.13593	0.07106	0.01087	30.00	1
51	LEVI STRAUSS & CO	0.04978	0.11137	0.03779	20.00	1
52	LEVITZ FURNITURE CORP	0.58142	0.59618	1.11580	3.60	0
53	LOEHMANN'S INC	0.82636	0.19763	0.25229	.	.
54	LYNCH COMMUNICATIONS SYS INC	0.43977	0.11046	0.01510	3.20	0
55	MACY R H & CO INC	0.98438	0.23263	0.04255	2.90	1
56	MAIONI & HYDE INC	0.76155	0.17224	0.16071	15.10	1
57	MARINE MIDLAND BKS INC	-0.98103	0.03743	0.00834	0.70	0
58	MAXAM GROUP INC	-0.81148	0.59150	-0.92094	37.50	0
59	METROMEDIA INC	0.96991	0.36365	0.39545	27.41	1
60	MIDLAND GLASS INC	0.21014	0.31567	1.89628	67.73	0
61	MIDLAND ROSS CORP	-0.09805	0.11944	0.03614	2.35	0
62	MORSE SHOE INC	-0.46039	0.45466	0.68551	13.29	1
63	MOUNT VERNON MLS INC	0.38654	0.08853	0.01821	59.92	0
64	NATIONAL GYPSUM CO	0.50630	0.27493	0.13568	1.10	1
65	NATIONAL MINE SVC CO	0.44585	0.13538	0.00797	1.00	0
66	NATIONAL SPINNING CO	0.00401	0.08520	0.01857	30.10	1
67	NIAGARA FRONTIER SVCS INC	0.92995	0.08537	0.00776	26.10	0
68	OHIO MATTRESS CO DE	0.77565	0.23028	0.10722	20.67	1
69	PANTASOTE INC	0.26615	0.19567	0.02913	54.38	0
70	PAPERCRAFT CORP	0.47911	0.57476	0.10728	14.00	1
71	PARAMOUNT PACKAGING CORP	-0.67863	0.40481	0.51230	65.20	0
72	PARGAS INC	0.92558	0.25857	0.10207	13.85	0
73	PARSONS CORP	0.07890	0.17710	-0.29246	3.37	1
74	PAYLESS CASHWAYS INC	0.96085	0.29043	0.09992	1.57	1
75	PLANTRONICS INC	-0.02821	0.11242	0.01461	3.20	1
76	PONDEROSA INC	0.26252	0.15624	0.30427	2.00	0
77	PURITAN FASHIONS CORP	0.61709	0.08006	0.01192	12.00	0
78	QUESTOR CORP	0.32633	0.16053	0.52026	51.00	0
79	RELIANCE GROUP INC	0.29067	0.21129	0.16289	42.23	1
80	RESEARCH COTTRELL INC	0.45400	0.14252	-0.03494	4.77	0
81	RESTAURANT ASSOCIATES INDS I	0.91064	0.15624	0.07303	29.01	1
82	REVCO D S INC	0.98197	0.20625	0.25087	3.90	1
83	REVERE COPPER & BRASS INC	-0.01247	0.18607	0.05078	3.50	1
84	RIEGEL TEXTILE CORP	0.46813	0.13423	0.05114	6.48	0
85	ROYAL CROWN COS INC	0.64801	0.15094	0.05411	17.01	0
86	SAFEWAY STORES INC	-0.33018	0.11735	0.07919	0.60	0
87	SAGE ENERGY CO	0.71360	0.29862	-0.01091	70.96	1
88	SCOTTYS INC	0.25256	0.42876	0.39513	1.51	0
89	SELIGMAN & LATZ INC	0.61605	0.35861	0.31862	13.70	0

The SAS System

OBS	NAME	COPRL	HERF	RELPE	MGMTOWN	LED
90	SERVO CORP AMER	0.69846	0.30178	0 04928	38 80	1
91	SHAKLEE CORP	-0 05599	0 06437	0 00344	28 90	1
92	SHELLER GLOBE CORP	-0 59393	0 20729	-0 05398	3.90	1
93	SIGNODE CORP	0 92896	0 07770	0 01865	9 00	1
94	SOD LINE CORP	0 59199	0 13895	-0 10412	1 01	0
95	SOUNDFSIGN CORP	-0 26075	0 13872	0 15456	28 60	1
96	SOUTHLAND CORP	0.84895	0 08537	0 02098	4 10	0
97	STORER COMMUNICATIONS INC	0 93560	0 36365	0 19772	4.60	0
98	SUSQUEHANNA CORP	-0 01604	0 12998	0 02673	1 00	0
99	SYBRON CORP	0 26800	0 24608	0 06210	2.20	0
100	TAFT BROADCASTING CO	-0.06721	0 36365	1 19732		1
101	TELEX CORP	0 66633	0 22874	0 01313		0
102	TOPPS CHEWING GUM INC	0.06942	0 28395	0 12277	20 19	0
103	TRI STATE MTR TRAN CO DE	0 59510	0 24730	-0 05116	9 83	0
104	TRIANGLE INDUSTRIES INC	0 05925	0 25658	0 08870	30 10	0
105	TRIANGLE PACIFIC CORP	0.37911	0.37401	0 05376	7 90	0
106	UNIROYAL INC	0.31194	0 20133	0 07650	1 58	1
107	VALLES STEAK HOUSE	0 07669	0 12395	0 18313	58 60	1
108	VERNITRON CORP	0 04977	0 30770	0 08627	7 00	0
109	VOLUME MERCHANDISE INC	0 73741	0 50974	0 41474	54 30	0
110	WALTER JIM CORP	0 25326	0 12998	0 02154	2 66	1
111	WARNER COMMUNICATIONS INC	0 30935	0 35522	1 14946	2 00	0
112	WFIMAN INC	-0 54503	0 25148	0 01438	38 30	1
113	WILLIAMHOUSE REGENCY INC	0.86259	0 60024	0 09238	26 64	0
114	WOMETCO ENTERPRISES INC	0.95361	0 15094	0 07981	33 00	0
115	ZALE CORP	0.57771	0.37064	0 44335	37 95	0

The SAS System

OBS	NAME	CFLOW	TAXLIAB	COMPBID	OWNLED	TAXGRP
1	A P L CORP	4 743	-0 04220	1	0 00	1
2	AFTER 6 INC	-0.031	0.04654	0	29 50	1
3	AMERACE CORP	3.665	0 05810	0	26 10	1
4	AMERICAN BAKERIES CO	16.836	0 06184	0	12 50	1
5	AMSTAR CORP	28.706	0 21840	0	5 11	1
6	AXIA CORP	-2.390	0 10176	1	5 34	1
7	BECOR WESTERN INC	-26.280	0.11630	1	1 60	2
8	BLUE BELL INC	32.607	0.13131	0	1 61	1
9	C C I CORP	15.786	0.19549	0	5 13	1
10	CAPITOL FOOD INDS INC	0 326	0.16452	0	8 30	1
11	CARROLS CORP	4.778	0.12116	0	32.90	1
12	CELLU CRAFT INC	3.291	0.23633	0	42 74	1
13	CENTRAL SOYA INC	10 884	0 03826	1	0 00	1
14	CHADWICK MILLER INC	0.823	0 09598	0	59 50	1
15	CHURCHS FRIED CHICKEN INC	.	0.01193	1	0 00	2
16	CLEVEPAK CORP DE	-0 780	0 05466	1	0 00	1
17	CONDEC CORP	0 242	-0 01646	1		1
18	CONNELLY CONTAINERS INC	3 279	0 09822	0	9 05	2
19	CONTINENTAL GROUP INC	188 802	0 01882	1	0 00	1
20	COOK INTERNATIONAL INC	-5 144	0 18401	0	0 00	1
21	COX COMMUNICATION INC	64 406	0 06425	0	0 00	1
22	CUNNINGHAM DRUG STORES INC		0 03726	0	0 00	1
23	DALLAS CORP	10 366	0 06174	0	0 00	2
24	DAN RIVER INC	22 544	0 03870	1	0 00	1
25	DENNYS INC	43 527	0 09101	0	10 00	1
26	DEVON GROUP INC	7 171	0 09840	0	4 60	1
27	DILLINGHAM CORP	16 488	0 05946	0	0 00	1
28	DURO TEST CORP	2 886	0 09167	1	0 00	2
29	DYNCORP		0.04099	1		2
30	EASCO CORP	13 027	0 03536	1	0 00	1
31	ECKERD JACK CORP	55 054	0 08169	0	9 00	1
32	FIRST CITY BANCORPORATION TX	-62 580	0 00223	0	0 00	2
33	FORT HOWARD CORP	185 850	0 07900	0	6 50	2
34	FRUEHAUF CORP	-11 863	0 06281	1		1
35	GENERAL REFRACTORIES CO	12 807	0 10079	0	42 10	2
36	GIFFORD HILL & CO INC	64 670	0 03961	0	0 00	1
37	GOLDEN WEST HOMES	0 000	-0 04325	0	0 00	1
38	HARTE HANKS COMMUNICATIONS I	24 969	0 12475	1	28 28	1
39	HESSTON CORP	-41 775	-0 01173	0	0 00	2
40	HORIZON CORP	-26 367	-0 42023	0	0 00	2
41	HOSPITAL CORP AMER	114 936	0.21372	1	2 60	2
42	INSILCO CORP	80 569	0 05518	1	0 00	2
43	INTERNATIONAL CONTROLS CORP	9 808	0 16728	1	19 00	2
44	INTERSTATE BAKERIES CORP NEW	4 232	-0 00665	0	29 90	2
45	JEWELCOR INC	3 048	0 05864	1	31 50	2

The SAS System

OBS	NAME	CFLOW	TAXLIAB	COMPBID	OWNLED	TAXGRP
46	KAISER STEEL CORP	-10.222	-0 18105	1	0.00	1
47	KANE MILLER CORP	9.737	0 02083	.	.	1
48	LEAR SIEGLER INC	105 738	0 11189	1	0.00	1
49	LEHIGH PRESS INC	7 342	0 01760	0	27 40	1
50	LESLIE FAY INC	0 000	0 10173	0	30 00	1
51	LEVI STRAUSS & CO	67 095	0 17301	0	20 00	1
52	LEVITZ FURNITURE CORP	13 856	0 02052	1	0 00	1
53	LOFHMANNS INC	3 863	0.22870	.	.	1
54	LYNCH COMMUNICATIONS SYS INC	3 656	0.07947	0	0 00	1
55	MACY R H & CO INC	114 048	0 12510	0	2 90	1
56	MALONE & HYDE INC	20 278	0 14899	0	15. 10	1
57	MARINE MIDLAND BKS INC	-65 505	0 02900	0	0 00	2
58	MAXXAM GROUP INC	-76.117	-0 01141	0	0 00	2
59	METROMEDIA INC	57.852	-0 17905	0	27 41	1
60	MIDLAND GLASS INC	9.546	-0 04052	0	0 00	1
61	MIDLAND ROSS CORP	1.010	0.15134	0	0.00	1
62	MORSE SHOE INC	8.422	0.02893	1	13 29	2
63	MOUNT VERNON MLS INC	4.029	0 07042	0	0 00	1
64	NATIONAL GYPSUM CO	126.459	0.05747	1	1 10	1
65	NATIONAL MINE SVC CO	0.000	0.03713	0	0 00	2
66	NATIONAL SPINNING CO	4 059	0 04349	0	30 10	1
67	NIAGARA FRONTIER SVCS INC	9.525	0.15942	0	0.00	1
68	OHIO MATTRESS CO DE	33 421	0.00127	0	20 67	2
69	PANTASOTE INC	7 764	0 28701	0	0 00	2
70	PAPERCRAFT CORP	5.750	0 11956	0	14 00	1
71	PARAMOUNT PACKAGING CORP	-0.298	0 05548	0	0 00	1
72	PARGAS INC	20.218	0 11377	1	0 00	1
73	PARSONS CORP	6.787	0.21903	1	3 37	1
74	PAYLESS CASHWAYS INC	18 389	0.06783	0	1 57	2
75	PLANTRONICS INC	8.849	0.12516	0	3 20	2
76	PONDEROSA INC	20.299	0.00049	0	0 00	1
77	PURITAN FASHIONS CORP	10 134	0 29932	0	0 00	1
78	QUESTOR CORP	21.214	0 06404	0	0 00	1
79	RELIANCE GROUP INC	141.920	-0.13371	0	42 23	1
80	RESEARCH COTTRELL INC	16 023	0 05949	0	0 00	2
81	RESTAURANT ASSOCIATES INDS I	3.089	0 02108	1	29 01	2
82	REVCO D S INC	46.203	0 05209	1	3.90	1
83	REVERE COPPER & BRASS INC	60 759	0 04166	1	3 50	1
84	RIEGEL TEXTILE CORP	34.846	-0.00865	0	0 00	1
85	ROYAL CROWN COS INC	19 965	0.09601	1	0 00	1
86	SAFEWAY STORES INC	307.201	0 07538	0	0.00	1
87	SAGE ENERGY CO	11.111	-0 01474	0	70 96	2
88	SCOTTYS INC	15.181	0 03065	0	0.00	2
89	SELIGMAN & LATZ INC	3.846	0.05891	0	0 00	1

The SAS System

OBS	NAME	CFLOW	TAXLIAB	COMPBID	OWNLED	TAXGRP
90	SERVO CORP AMER	0.577	-0.02705	0	38.80	2
91	SHAKLEE CORP	38.389	0.12567	1	28.80	2
92	SHELLER GLOBE CORP	14.924	0.11710	0	3.90	1
93	SIGNODE CORP	32.429	0.10297	0	9.00	1
94	SOD LINE CORP	29.728	0.03835	1	0.00	2
95	SOUNDESIGN CORP	1.870	0.02389	0	28.60	1
96	SOUTHLAND CORP	124.235	0.02728	1	0.00	2
97	STORER COMMUNICATIONS INC	39.026	2.77214	1	0.00	2
98	SUSQUEHANNA CORP	4.588	-0.01858	0	0.00	2
99	SYBRON CORP	22.863	0.13443	0	0.00	1
100	TAFT BROADCASTING CO	22.255	-0.14467	1		2
101	TELEX CORP	17.807	0.21873	1		2
102	TOPPS CHEWING GUM INC	4.442	0.27152	0	0.00	1
103	TRI STATE MTR TRAN CO DE		0.08531	1	0.00	2
104	TRIANGLE INDUSTRIES INC	-4.965	0.44714	0	0.00	2
105	TRIANGLE PACIFIC CORP	14.774	0.09854	0	0.00	1
106	UNIROYAL INC	136.889	0.04677	1	1.58	1
107	VALLES STEAK HOUSE	1.868	0.02973	0	58.60	1
108	VERNITRON CORP	1.225	0.05264	0	0.00	1
109	VOLUME MERCHANDISE INC	1.814	-0.06727	1	0.00	1
110	WALTER JIM CORP	159.148	0.05345	0	2.66	2
111	WARNER COMMUNICATIONS INC	339.358	0.06688	0	0.00	2
112	WTIMAN INC	-0.718	0.01702	0	78.30	2
113	WILLIAMHOUSE REGENCY INC	9.917	0.13886	0	0	1
114	WOMETCO ENTERPRISES INC	30.916	0.03160	0	0	1
115	ZALE CORP	33.978	0.03235	0	0	1

The SAS System

Correlation

CORR	CORRL	HERF	RELPE	MGMTOWN	LED
CORRL	1 0000	0 1187	0.0737	-0 0856	0.1403
HERF	0 1187	1 0000	0 1810	0 0923	-0 0209
RELPE	0 0737	0 1810	1.0000	0 0863	-0 1513
MGMTOWN	-0 0856	0 0923	0 0863	1 0000	0 0492
LED	0 1403	-0 0209	-0.1513	0 0492	1 0000
CFLOW	0 2599	-0 0499	0 1752	-0 2814	0 0459
TAXLIAB	0.1751	0 0843	-0.0551	-0 1324	-0 0463
COMPBID	0.1058	-0.0498	-0.0117	-0 2614	-0 0442
OWNLED	0 0594	-0 0222	-0.0895	0 5282	0 6344
ANUPREM	0 0646	0 1452	0 1114	-0 1911	0 0233

CORR	CFLOW	TAXLIAB	COMPBID	OWNLED	ANUPREM
CORRL	0 2599	0 1751	0 1058	0 0594	0 0646
HERF	-0 0499	0.0843	-0 0498	-0 0222	-0 1452
RELPE	0.1752	-0.0551	-0 0117	-0 0895	0 1114
MGMTOWN	-0 2814	-0 1324	-0 2614	0 5282	-0 1911
LED	0 0459	-0 0463	-0 0442	0 6344	0 0233
CFLOW	1 0000	0.0182	0.1002	-0 1032	0.1219
TAXLIAB	0 0182	1 0000	0 1228	-0 0857	0 0172
COMPBID	0 1002	0 1228	1 0000	-0 1636	0 0227
OWNLED	-0 1032	-0 0857	-0 1636	1 0000	-0 0626
ANUPREM	0 1219	0 0172	0 0227	-0 0626	1 0000

The SAS System

TAXGRP=1

Correlation

CORR	CORRL	HERF	RELPE	MGMTOWN	LED
CORRL	1 0000	0 2320	0 0233	-0 0627	0 0729
HERF	0 2320	1 0000	0 1873	0 0704	-0.0742
RELPE	0 0233	0 1873	1 0000	0 1930	-0 2659
MGMTOWN	-0 0627	0 0704	0 1930	1 0000	-0.0381
LED	0 0729	-0 0742	-0.2659	-0.0381	1.0000
CFLOW	0.0941	-0 0407	0 0162	-0 2800	0.0287
TAXLIAB	0 1183	-0 1169	-0 3465	-0 1688	0 1486
COMPBID	-0.0260	-0 0153	-0.0245	-0 2883	-0 1355
OWNLED	0 0283	-0 1284	-0 1506	0 4509	0 6332
ANUPREM	-0 0190	-0 0186	0 2103	-0 2251	0 0001

CORR	CFLOW	TAXLIAB	COMPBID	OWNLED	ANUPREM
CORRL	0 0941	0 1183	-0 0260	0 0283	-0 0190
HERF	-0 0407	-0 1169	-0 0153	-0 1284	-0 0186
RELPE	0 0162	-0 3465	-0 0245	-0 1506	0 2103
MGMTOWN	-0 2800	-0 1688	-0 2883	0 4509	-0 2251
LED	0 0287	0 1486	-0 1355	0 6332	0 0001
CFLOW	1 0000	-0 1290	0 1245	-0 0983	0 1209
TAXLIAB	-0 1290	1 0000	-0 2049	-0 0586	0.1002
COMPBID	0.1245	-0 2049	1 0000	-0 2678	-0.1581
OWNLED	-0.0983	-0 0586	-0 2678	1 0000	-0 1214
ANUPREM	0.1209	0 1002	-0 1581	-0 1214	1.0000

The SAS System

TAXGRP=2

Correlation

CORR	CORRL	HERF	RELPE	MGMTOWN	LED
CORRL	1 0000	-0 0367	0 1551	-0 1360	0 2596
HERF	-0 0367	1 0000	0 1934	0 1368	0 0766
RELPE	0 1551	0 1934	1 0000	-0 2030	0 1619
MGMTOWN	-0 1360	0 1368	-0 2030	1 0000	0 2124
LED	0 2596	0 0766	0 1619	0 2124	1 0000
CFLOW	0 4364	-0 0605	0 4983	-0 2963	0 0717
TAXLIAB	0 2649	0 1817	0 0734	-0 1646	-0 1392
COMPBI	0 3285	-0 1193	0 0418	-0 2103	0 1179
OWNLED	0 1245	0 1405	0 0650	0 6622	0 6415
ANUPREM	0 1541	-0 3190	-0 0745	-0 1528	0 0575

CORR	CFLOW	TAXLIAB	COMPBI	OWNLED	ANUPREM
CORRL	0 4364	0 2649	0 3285	0 1245	0 1541
HERF	-0 0605	0 1817	-0 1193	0 1405	-0 3190
RELPE	0 4983	0 0734	0 0418	0 0650	-0 0745
MGMTOWN	-0 2963	-0 1646	-0 2103	0 6622	-0 1528
LED	0 0717	-0 1392	0 1179	0 6415	0 0575
CFLOW	1 0000	0 0618	0 0784	-0 1065	0 1216
TAXLIAB	0 0618	1 0000	0 2709	-0 1301	0 0029
COMPBI	0 0784	0 2709	1 0000	-0 0139	0 2646
OWNLED	-0 1065	-0 1301	-0 0139	1 0000	0 0100
ANUPREM	0 1216	0 0029	0 2646	0 0100	1 0000

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VITA

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