# Three Essays on Going Private Transactions: Management Buyouts versus Leveraged Buyouts

by

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**Abstract**

This dissertation consists of three essays that examine differences between two different forms of going-private transactions: leveraged buyouts (LBOs) and management buyouts (MBOs). My main focus is to look at what separates MBOs and LBOs in terms of motivations and outcomes. I argue that the desire for decision-making control of the firm is what drives both the choice of an MBO over an LBO and many strategic decisions leading up to the transaction itself. The first essay surveys the literature and develops testable hypotheses that distinguish between MBOs and LBOs. Using control to differentiate between these two types of transactions is important because I wish to examine how decision-making control of the firm motivates each participant in the transaction. This leads to hypotheses about pre-buyout ownership structure, which affects the probability of choosing either an MBO or LBO.

The second essay examines the determinants of LBOs and MBOs, and the effects of financing conditions and firm characteristics in a sample of U.S. firms that went private through LBOs and MBOs from 2000 to 2011 relative to the firms that were public during this period. I find significant differences between the LBO and MBO samples. Tighter lending conditions decrease the probability of an LBO but increase the probability of an MBO. In addition, while liquidity and growth opportunities are negatively correlated with the probability of going private for both LBOs and MBOs, the latter plays a stronger role for MBOs.

The third essay analyzes differences in the determinants of the premiums paid when taking a firm private. Since the choice between an MBO and an LBO is one of self-

selection, the empirical methodology must take this into account. I use a two-stage regression model to control for this selection bias. The first-stage probit model shows that ownership is the main determinant of the selection of the transaction type. The second-stage model shows that the determinants of MBO and LBO premiums are substantially different. The level of insider ownership has a large negative effect on MBO premiums, but no effect on LBO premiums.

Overall, this dissertation contributes to the existing literature by examining heterogeneity among firms that go private. I test this heterogeneity and find significant differences between MBO and LBO firms, both in terms of the motivations for taking the firm private and the premiums paid in the transaction.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

# CHAPTER 1

# GENERAL INTRODUCTION

Firms that go private overcome one of the key conflicts in corporate finance, first identified by Berle and Means (1932): the separation of ownership and control leads to managers using firm resources to their advantage, at the expense of outside shareholders. For transactions in which the incumbent management participates, the unification of ownership and control eliminates this problem. However, the process of the transaction itself leads to a conflict of interests for managers, since they have both a fiduciary duty to shareholders to obtain fair value for their shares and an incentive to minimize the price paid in the transaction. Early research on going private transactions in the 1980s focused on management buyouts (MBOs). DeAngelo et al. (1984), argued that managers were not simply exploiting shareholders by taking the firm private, but that there were productive gains to be achieved through going private that could be shared with the pre-buyout shareholders. The elimination of registration and reporting costs, combined with improved incentives through the full alignment of interests between owners and managers could result in substantial savings for the firm. They found that the premiums paid in management buyouts were consistent with the hypothesis that wealth gains were being shared with pre-buyout shareholders. Lowenstein (1985) found that the gains achieved in MBOs were not the result of productive efficiencies, but were instead generated from tax savings, opening up a further area of research just as leveraged buyouts (LBOs) were beginning to increase in both size and number. Subsequent research

explored the determinants of LBOs. In particular, Lehn and Poulsen (1989) and Opler and Titman (1993) found that LBO firms had higher free cash flows (consistent with Jensen's (1986) free cash flow hypothesis) and lower growth opportunities than control samples of firms that remained public. Evidence for the free cash flow hypothesis is mixed, however, as Kieschnick (1998) retested Lehn and Poulsen's (1989) sample and found no support. Halpern, Kieschnick, and Rotenberg (1999) argue that the reason for this mixed evidence is that since the population of going private firms is heterogeneous, the determinants of going private are also likely to be heterogeneous. They test and confirm their heterogeneity hypothesis in a sample of firms from 1981-1985, finding that firms that go private differ along several dimensions when separating the sample into high and low ownership categories.

Although the number of going private transactions declined substantially during the 1990s, interest in going private transactions returned following the introduction of the Sarbanes-Oxley Act (SOX) in 2002. SOX substantially increased the reporting costs for public firms, and these costs were of particular importance for small firms on the margin of staying public or going private. Engel, Hayes and Wang (2007) found a significant rise in the number of firms going private when the cost of being public increased following SOX. Leuz, Triantis and Wang (2008), however, attributed this rise mainly to an increase in the number of firms going dark (delisting) rather than going private, as their going private sample exhibits no significant changes following the passage of SOX. More recently, going private research has focused on the rise of LBO transactions since 2004.

The surge in LBOs prior to the financial crisis has been attributed mainly to cheap credit conditions and the rise of private equity firms (Axelson et al 2010, Shivdasani and Wang, 2011). Other recent studies model the going private decision as a reversal of the going private decision. Benninga, Helmantel and Sarig (2005), and Boot, Gopalan and Thakor (2008) develop models of going private timing that are motivated by the public/private tradeoff. Bharath and Dittmar (2010) empirically examine the public/private tradeoff over the entire life-cycle of the firm, finding that information and liquidity considerations are not only important determinants of the likelihood of going private, but that these factors are noticeable at the time of the IPO. In a similar study, Mehran and Peristiani (2010) highlight the importance of financial visibility, finding that firms with declining analyst coverage and institutional ownership, along with low stock turnover, are more likely to go private than a comparison sample of IPO firms.

This thesis provides an in depth examination of the differences between MBOs and LBOs, from the pre-buyout period and the determinants of going private, to the premiums paid in the transaction and their determinants. I extend the work of Halpern et al. (1999) by testing the heterogeneity hypothesis in a more recent period in which cheap credit conditions and collateralized loan instruments became the dominant form of financing and private equity firms are the major players in going private transactions. I model the going private decision as the reverse of the going public decision (IPO) that allows me to incorporate motivations of going public from the IPO literature as well as changes in the financing and market conditions that may influence going private

transactions over time. In this thesis, I define MBOs as transactions in which the existing management has majority control of the private firm, and LBOs as transactions in which a private equity firm (or group of private equity firms) has majority control of the surviving firm. This comparison allows me to test that financing conditions and control considerations are the main sources of heterogeneity. My thesis also contributes to the international literature on going private transactions. In a recent study, Fidrmuc et al. (2013) examine UK public firms that went private between 1997 and 2003 and find that financing constraints are the primary reason for management to invite participation by private equity investors. Renneboog et al. (2007) use the same sample to examine the determinants of going private transaction premiums. My thesis complements and extends their studies in three ways. First, they assume that private equity investors are passive participants. I do not make this assumption, and consider private equity as active players and include financing conditions that affect the demand-side factors in my analysis. I also include the desire to maintain/gain control of the firm as an important factor in my analysis since it could also influence firm variables, including the level of financial constraint and leverage. Second, the literature suggests that there are differences in legal and institutional structures and IPO motivations, between the US and UK that could influence the determinants of going private transactions. For example, Brau, Ryan and Degraw (2006) find that most US managers do not view an IPO as a vehicle to relinquish control whereas Bancel and Mittoo (2009) find that most UK managers reduce their ownership after going public. My study will contribute to this literature by providing

some insights into different factors that may affect firms' decisions to choose between MBOs and LBOs as vehicles to exit their public status. I also contribute to the literature on buyout premiums. I argue that transaction choice and premiums paid are jointly determined, and I control for self-selection and its effects on the buyout premiums.

My thesis consists of 5 chapters. Chapter 1 provides a general introduction. Chapter 2 extends the literature by developing testable hypotheses about whether the determinants of the choice to go private differ between MBOs and LBOs. I assume that decision-making control by existing managers is the major difference between the two types of transactions. Using control to differentiate between MBOs and LBOs is important because the corporate governance literature suggests that ownership structure matters. Control considerations are key for MBOs, for example, since vertical agency problems are likely to be lower in MBOs because of the alignment of interests between managers and shareholders, while horizontal agency problems, in the form of conflicts between majority and minority shareholders, will be higher. In contrast, vertical agency problems are likely to be higher in LBOs due to the separation of ownership and control. This leads to hypotheses about pre-buyout ownership structure, which affects the probability of choosing either an MBO or LBO. While some determinants of the probability of an MBO may be common amongst all going private firms, other determinants will be different. For example, in an MBO, owners will be trading off the private benefits of control with the benefits of remaining public, which are shared by all shareholders. This may be less important for LBOs if they have lower pre-buyout

ownership, and MBOs, because they have more decision-making control, have more flexibility in choosing the timing of the transaction. Based on prior studies by Bharath and Dittmar (2010) and Mehran and Peristiani (2010), firms will go private when public benefits are lower than the costs of staying public. Mehran and Peristiani (2010) find that firms that go private are characterized by high share price volatility and low liquidity. Bharath and Dittmar (2010) confirm these results, and also show that going-private firms already have many differences at the time of the IPO from firms that stay public. From these distinguishing features, and studies of firms that go private, I develop the following hypotheses: 1) pre-buyout decision-making control of the firm: insider ownership will be higher for MBOs, and lower for LBOs in the pre-buyout period; 2) financial flexibility: MBO firms will have more financial flexibility than LBO firms (higher cash levels, higher cash flows, lower dividends); 3) market timing: MBO firms will be better able to time the transaction than LBO firms; 4) financing conditions: while the cost of debt of will be important for both types of transactions, it will be more important for LBOs and less for MBOs.

Chapter 3 examines the effects of financing conditions and firm characteristics in a sample of U.S. firms that went private through LBO and MBO transactions from 2000 to 2011 relative to the firms that were public during this period. I find significant differences between the LBO and MBO samples. Tighter lending conditions decrease the probability of an LBO but increase the probability of an MBO. In addition, while liquidity and growth opportunities are negatively correlated with the probability of going

private for both LBOs and MBOs, the latter plays a stronger role for MBOs. My results are robust to different estimation models, including multinomial logit, the Cox proportional hazard model, and competing risks regression models. My paper extends the going private literature by comparing the determinants of going private decisions for LBOs and MBOs.

Chapter 4 examines the determinants of the premiums paid when going private. As discussed in Chapter 2, ownership is the major difference between MBO and LBO transactions. I go into depth about the differences between the two types of transaction and how these differences affect the premiums paid. Since the choice between an MBO and an LBO is one of self-selection, the empirical framework must take this into account. I use a two-stage regression model to control for this selection bias. The first stage is a probit model to determine the probability of choosing an MBO versus an LBO. The second stage is an OLS regression model for transaction premiums, which includes a correction term calculated from the estimates of the first-stage probit model. The first-stage probit model shows that ownership is the main determinant of the selection of the transaction type. As ownership levels increase, the likelihood of choosing an MBO increases substantially. I interpret this as an indication that the choice of an MBO instead of an LBO transaction is driven by the desire to maintain decision-making control. The second-stage model shows that the determinants of MBO and LBO premiums are substantially different. The level of insider ownership has a large negative effect on MBO premiums, but no effect on LBO premiums. My main conclusion is that the determinants

of MBO and LBO premiums are different and my main contribution is that I control for selection bias while most prior studies use a simple OLS regression model.

Chapter 5 presents the general conclusions.

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# CHAPTER 2

# MOTIVATIONS FOR GOING PRIVATE: DIFFERENCES BETWEEN MBOS AND LBOS

## Section 2.1: Introduction

There exists a large IPO literature examining the motivations for going public, in which the decision to undertake an IPO is made by trading off its costs and benefits. More recently, this analysis has been applied to firms which choose to go private. For example, Bharath and Dittmar (2010) show that the going private decision can be looked at as a reversal of the going public decision. In this framework, a firm continuously evaluates its tradeoff between the costs and benefits of staying public, and decides to go private when the costs exceed the benefits. The empirical evidence supports this view, and shows that firms that have less financial visibility (interest from analysts and investors) are more likely to go private (Mehran and Peristiani (2010), Bharath and Dittmar (2010)). Mehran and Peristiani (2010) also find that firms that go private are characterized by high share price volatility and low liquidity. Bharath and Dittmar (2010) confirm these results, and also show that going private firms already have many differences from firms that stay private at the time of the IPO. However, these studies do not distinguish between MBOs and LBOs,[1] and their conclusions are based primarily on the analysis of leveraged buyouts (LBOs) that comprise a majority of going private transactions. The theoretical literature suggests that other forms of going private

1 Bharath and Dittmar (2010) separately analyze MBOs and LBOs as part of their robustness checks. They compare each group of firms to a control sample of public firms, but do not compare them directly with each other to analyze the differences in depth. Mehran and Peristiani (2010) separately consider LBO and non-LBO transactions, with MBOs included in the LBO category.

transactions could be driven by different factors. For example, owners choosing management buyouts (MBOs) are likely to have more inside information about firm value, compared to LBOs that are mostly taken private by private equity funds. In this chapter, I examine the factors that influence the probability of each type of transaction. I focus mainly on MBO and LBO transactions to develop hypotheses, primarily because these are the two main types of going private transactions that are distinguished by control considerations. The loss of control is cited as one of the major costs of going public and is a major reason why firms stay private (Brau, Ryan and Degraw (2006)). In addition, pre-buyout decision-making control is important because it is related to two strands of literature: the first is that firms whose managers have high ownership stakes have lower vertical agency problems (conflicts between owners and managers), but larger horizontal agency problems (conflicts between majority and minority shareholders). The second is that management will have inside information and will thus have a conflict of interests when taking the firm private, since they have both a duty to obtain fair value for shareholders and an incentive to minimize the price paid in the transaction (DeAngelo et al. (1984)). I define MBOs as transactions in which the existing management has majority control of the private firm, while LBOs are defined as transactions in which a private equity firm (or group of private equity firms) has majority control of the surviving firm. This distinction allows me to develop the different factors that may be more (less) important for predictions for either MBOs or LBOs. I examine whether one factor or the other will be more or less important for each type of transaction, as well as comparing the

different firm characteristics between the two groups.

I contribute to the literature by analyzing MBOs and LBOs separately and I develop testable hypotheses for both transaction types. My main theoretical assumption is that management's desire for decision-making control of the firm is the driving factor for MBOs. The timing of an MBO transaction, being at the discretion of the firm's managers, will occur following a decline in the firm's share price. LBOs, however, will depend on demand-side factors, and private equity demand will be driven by the interaction of cheap credit conditions and attractive target prices. This chapter is organized as follows: section 2.2 defines MBOs and LBOs, describes the differences between them, and provides illustrative examples, section 2.3 develops testable hypotheses, and section 2.4 summarizes and concludes.

**2.2 Management buyouts (MBOs) and leveraged buyouts (LBOs)**

I draw upon prior literature to define a going private transaction and then MBOs and LBOs separately. DeAngelo et al. (1984) define a going private transaction as one in which a small group of investors, including current managers, seeks to acquire all publicly owned shares. They define a pure MBO as a going private transaction in which incumbent management seeks complete equity ownership of the surviving corporation. LBOs are transactions in which management proposes to share equity ownership in the surviving private firm with third-party investors who provide financing for the transaction in exchange for substantial equity and debt interests. Management may either

increase or decrease its equity interest, but usually receives some (not controlling) equity participation in the private firm as well as long-term employment contracts. Using these definitions as a starting point, I define MBOs as transactions in which the existing management obtains majority control of the private firm.[2] LBOs are defined as transactions in which a private equity firm (or a group of private equity firms) obtains majority control of the surviving firm. The going private transactions that do not fall into either of these categories are defined as non-LBO/MBO transactions, which include, for example, private operating firms that purchase a public company. I focus on MBOs and LBOs since control features are the main focus of my thesis.

Differences between firms that go private have previously been examined by Halpern, Kieschnick and Rotenberg (1999), who develop and test a heterogeneity hypothesis that argues that not all LBOs are created equal, and therefore, the determinants of going private transactions vary even across LBOs. They divide the population of LBOs into two broad categories: (i) firms with high managerial ownership (who then undertake MBOs, by our definition), and (ii) firms with low managerial ownership (who are bought by outsiders, which are LBOs by our definition). Consistent with the heterogeneity hypothesis, they find that while both types of firms exhibit poor stock performance in comparison to firms that remain public, MBO firms in their sample also made greater use of debt financing, while LBO firms used a lower amount of debt financing prior to the going private transaction. Easterwood et al. (1994) also note differences between

2 The literature on management buyouts uses other definitions as well. Some define MBOs as any transaction that includes management as part of the bidding group (Cain and Davidoff, 2011; Fidrmuc et al., 2013; Harlow and Howe, 1993; Kaplan, 1989; Lowenstein, 1985, Renneboog et al., 2007; Weir et al., 2005), while others require management to initiate or lead the buyout (Elitzur et al., 1998).

transactions with different managerial ownership levels. They document that pre-buyout stockholders receive a higher return on their holdings when managerial ownership is small, since larger managerial holdings discourage bidder competition, thus reducing the abnormal returns. In addition, Harlow and Howe (1993) distinguish between MBOs and LBOs in their examination of pre-buyout insider trading. They find an increase in trading and stock accumulation by insiders (which is the result of a decline in insider selling, rather than an increase in insider buying) prior to the announcement of an MBO, while third-party buyout offers exhibit no abnormal trading prior to their announcement. They also find a positive correlation between the pre-announcement insider trading and the offer premium, which they interpret as shareholders demanding higher premiums for firms with higher levels of information asymmetry. Fidrmuc et al. (2013) examine the manager's choice between going it alone in an MBO or inviting the participation of private equity in the going private transaction. They argue that firms are less likely to invite private equity participation when they are less financially constrained, and also relate the likelihood of an MBO to high managerial ownership.

[Insert Figure 2.1 here]

Figure 2.1 illustrates how I define MBOs and LBOs. In order to identify which transactions are MBOs and which are LBOs, the first step is to search SEC EDGAR filings for a press release confirming that the going private transaction has been completed. This press release will often contain some details as to who is leading the buyout, whether it be management or a third party. After confirming that the firm has

gone private, the next step is to check the proxy filing informing shareholders of the details of the transaction. This statement contains information about the acquiring parties and the financing of the transaction. The going private transaction is often undertaken by the creation of a shell company (eg. "Merger Holdings") that is then merged with the firm that goes private. The proxy statement will describe the ownership of this shell company. I divide my sample into MBOs and LBOs according to who has control of the post-buyout firm. MBOs are controlled by existing management following the buyout, while LBOs are controlled by a private-equity firm following the buyout. Each of these is divided into two subgroups. Case 1 is a pure MBO, in which the surviving firm is wholly owned by the incumbent management. Case 2 is an MBO with a PE sponsor, in which management invites private-equity participation, but still maintains majority ownership of the surviving firm. Case 3 is a pure LBO, where a private-equity firm (or group of firms) obtains complete ownership of the surviving firm, and management sells their entire stake. Finally, Case 4 is an LBO with management participation, where a private-equity firm or group has majority control of the surviving firm, but members of management continue as shareholders. It is necessary to separate the firms into different cases because each type of transaction can be motivated by different reasons, and in some instances, private equity may initiate the buyout discussions rather than management. The following examples illustrate how motivations can differ among the different transaction types.

**Example 1: Pure MBO**

An example of a pure MBO is Reeds Jewelers, a family-owned jewelry chain based in North Carolina. Founded by William Zimmer in 1946, the company went public in 1986, and the firm's shares traded on the AMEX. Mr. Zimmer was still Chairman of the Board in 1995, and his son Alan Zimmer was President and CEO. Together, the Zimmer family owned 84% of the firm, and two thirds of the board were members of the Zimmer family. After William Zimmer died in 2002, his family continued to control approximately 88% of the firm. In December 2003, the firm announced a tender offer to acquire all of the outstanding shares of the firm not already owned by the Zimmer family for $1.85 per share. The day prior to the announcement, the firm's shares closed at $1.09. The proxy filing detailing the reasons behind the decision to take the firm private gave a typical rundown of the tradeoff between the costs and benefits of being public: the elimination of public reporting costs, both in terms of the actual financial cost and the time required by management to fulfill reporting duties, particularly in light of the changes brought about by Sarbanes-Oxley, as well as the firm's declining share price and trading volume. In addition, the filing mentioned the conflict between management's desire for long-term planning and the market's focus on short-term results. To finance the $2 million transaction, the Zimmer family borrowed directly from a bank, eliminating the need for private equity participation. The surviving firm was 100% controlled by the existing management. At no point in its public life did the family owners give up control of the firm, however, they did still have a fiduciary duty to act for the benefit of minority shareholders. Once private, they no longer had this responsibility, and could make

decisions without this constraint. This provides anecdotal evidence that the Sarbanes-Oxley Act (SOX), which tightened corporate governance requirements, imposed a substantial burden on smaller firms, and this firm in particular, with its lack of independent directors, would have had substantial costs associated with SOX compliance.

**Example 2: MBO with PE sponsor**

Insight Communications, a cable company founded in 1985, provides an example of an MBO with a PE sponsor, in which management maintains a controlling interest of the post-transaction firm, but, faced with a financing constraint, must undertake the transaction with outside help. The firm announced that it was going private in early 2005 during the LBO boom. While the tradeoff between the costs and benefits of being public is mentioned, the conflict between management and shareholders was paramount. From the proxy filing: "As a privately held company, Insight would have increased flexibility to make decisions that may negatively affect quarterly results but that may, over the long term, increase Insight's value. In contrast, as a publicly traded company, Insight currently faces public stockholder and investment analyst pressure to make decisions that may produce better short-term results, but which may over the long term lead to a reduction in the per share price of its publicly traded equity securities." Further, the controlling shareholders indicated in a letter to the board of directors that they would not consider a transaction in which they would be asked to give up their controlling stake. However, given the size of the transaction (in excess of $700 million), it was necessary for them to

invite private equity participation to help finance the transaction, which in this case came in the form of an investment from the Carlyle Group.

**Example 3: Pure LBO**

Some LBO transactions provide the final step in an exit strategy for the firm's current owners. For example, Claire's Stores was a family-owned firm in which the family retained control through a dual-class share structure that announced that it was going private in December 2006, at the height of the LBO boom. Founded by Rowland Schaefer in 1961, the company began trading publicly in 1976, and the Schaefer family maintained control of the firm up until the buyout. The proxy filing mentioned the desire of the current ownership to transition away from active management. Unlike many going private transactions, this was not a poorly performing firm. Instead, the proxy filing stated the following: "...the combination of these factors, together with the Company's strong cash flow and the strength of the credit and financial markets, suggested to senior management that this might be an opportune time to realize substantial value through a strategic alternative. Senior management of the Company also believed that this was an opportune time to explore strategic alternatives because the Company would be doing so from a position of strength." This suggests that LBO transactions involving owner exits will have significantly different motivations than MBOs, and these firms may have relatively higher levels of performance prior to the buyout.

**Example 4: LBO with management participation**

Vertrue Inc. announced its going private transaction shortly after Claire's Stores, at the beginning of 2007. Founded in 1989, its founder had served as CEO and President since its inception. He owned 11.1% of Vertrue prior to the transaction, and was expected to own 10.3% of the post-buyout firm. In this instance, the initial desire to take the firm private came from outside the firm, as the board received an unsolicited offer from private-equity investors to purchase the firm and take it private. In both of these cases, neither of the firms had managers that were interested in controlling the post-buyout firm. Instead, the LBO allowed management to cash out some or all of their equity stake in the firm. This also serves to illustrate that some LBO transactions will be driven by third-party interest.

These examples show that there are many differences between MBOs and LBOs, and between the subgroups of each transaction type. While both ownership groups in the MBO examples were unwilling to give up control of the firm, not all firms will have the financial means to undertake the transaction themselves, and are forced to invite a PE sponsor to help finance the transaction. LBOs may have even more heterogeneity. The above examples illustrate that owners may initiate the transaction in order to cash out and give up control of the firm, or it may be the case that a private equity firm senses an opportunity to make a profit, and approaches the firm about the possibility of taking the firm private.

## 2.3 Hypotheses and Empirical Predictions for LBOs versus MBOs

I draw on both the IPO literature and the going private literature to develop testable hypotheses regarding the determinants of the probability to go private as an MBO or LBO, and test these in Chapter 3. I examine the determinants of premiums of MBO and LBO transactions in Chapter 4, and develop and test further hypotheses regarding buyout premiums. Theoretical models of going public typically compare only one IPO benefit and cost, but survey evidence shows that firms seek multiple benefits that cannot be captured by modelling a single benefit or cost of going public (Bancel and Mittoo (2009)). Brau, Ryan and DeGraw (2006), in their survey of US firms that went public, provide evidence that, while financing for growth is a primary concern when going public, managers have a strong desire to maintain control of the firm even after going public. I argue that decision-making control of the firm is a major difference between MBOs and LBOs. Many studies also show that MBOs tend to have decision-making control even in the pre-buyout period (DeAngelo et al. (1984); Elitzur et al. (1998); Halpern et al. (1999) and (2005)). This will affect the probability of choosing an MBO. In addition, pre-buyout decision-making control provides the owner with the power to make financing and strategic decisions that can affect the value of the firm. I also argue that since MBOs will require the firm to obtain financing on its own, owners will make corporate decisions that will lead to maintaining a higher degree of financial flexibility relative to LBOs, which are financed by private equity and debt. Pre-buyout decision-making control will also allow managers to have greater flexibility in choosing

the timing of the transaction, relative to LBOs, whose timing depends on third-party interest. Interest from outside parties, in turn, will depend on debt market conditions, due to the large amount of debt financing required to complete LBOs. Below I discuss the theoretical literature and empirical evidence in detail for each of these hypotheses about 1) pre-buyout decision-making control of the firm 2) financial flexibility and 3) market timing. I develop these using the IPO framework (as in Bharath and Dittmar (2010)). In addition I develop a fourth hypothesis on financing conditions, which are likely to have a higher impact on LBOs, relative to MBOs.

### 2.3.1 Hypothesis 1: Pre-Buyout Decision-Making Control of the Firm

Several IPO models use control as a major motivation for going public. One view is that owners use the IPO to gain control of the firm. For example, Black and Gilson (1998) examine the IPO as being an opportunity for the venture capitalists to cash out, and simultaneously for the entrepreneur to reacquire control of the firm. Their model predicts that while venture capitalists cash out, the entrepreneur retains a controlling stake following the IPO. Control is also an important feature of models of firm ownership and the public/private tradeoff. Elitzur et al. (1998) develop a model in which many firms that undertake MBOs already have high managerial ownership, and managers are able to increase their share of the surviving firm's common stock while at the same time reducing their wealth invested in the firm. They conclude that an MBO may allow managers to diversify their portfolios while retaining control of the firm and model the decision to go

private as a game between managers and new outside shareholders (say, a private equity firm), with both attempting to maximize their post-buyout wealth. Bolton and von Thadden (1998) model the tradeoff between liquidity and control for both private and public firms. The advantage of maintaining a controlling block is that management is likely to be better supervised (owners and managers are separate), but the cost is in terms of a less liquid stock. The advantage of dispersed ownership is that the firm reduces its cost of capital, however, management is not adequately supervised. The tradeoff still exists for public firms which have large blockholders. Boot, Gopalan and Thakor (2006 and 2008) analyze a firm's choice between private and public ownership, with the decision being a choice between liquidity and control. Private firms have concentrated, but illiquid, ownership, while public firms have the advantage of liquidity, but investors may exert control over the entrepreneur. Under private ownership, the entrepreneur has more autonomy, but pays a higher cost of capital. Public ownership lowers the cost of capital, but at the cost of giving up autonomy. Other models are built on the assumption that the IPO is part of a multi-stage exit strategy. Zingales (1995) and Mello and Parsons (1998) model the IPO as an opportunity for owners to eventually sell the firm, and the IPO acts as the first step in their exit strategy. As seen in the examples in the previous section, both of these theories can be applied to firms that go private. Some owners value control, and use a going-private transaction to obtain or maintain control of the firm. Others use the going-private transaction to sell the firm to an outside buyer as the final stage in their exit strategy.

Easterwood et al. (1994) and Halpern, Kieschnick and Rotenberg (1999) document the high ownership levels of MBO firms, as do Brau and Fawcett (2006), who survey CFOs of both private and public firms. Looking specifically at firms that remained private over their sample period, they find that the majority of firms had no interest in an IPO, and only 20% of private firms indicated any interest in an IPO. Private firms in the U.S. thus have a strong desire to remain private. Among firms that chose not to attempt an IPO, the top reason for staying private was the desire to maintain decision-making control. These results indicate that control is a very important consideration for firms that stay private. Other studies that support this finding include Helwege and Packer (2009), who use a dataset of private U.S. firms with SEC filings to examine why private firms stay private, finding that maintaining private benefits of control is a significant factor in the choice of staying private. Similarly, Boehmer and Ljungqvist (2004), in their study of privately-held German firms, find that firms with controlling shareholders who have large private benefits of control (for which they use family firms as a proxy) are less likely to go public.

The above discussion demonstrates that control considerations play an important role in choosing between an MBO and an LBO. The choice of an MBO shows that the manager wants to control and run the firm, and the evidence shows that the manager is likely to own a larger percentage of the firm in the pre-buyout period. In contrast, control considerations are likely to be less important in LBOs. Management are either interested in sharing control with an institutional investor or wish to sell some or all of their stake as

part of an exit strategy. This leads to my first hypothesis:

**H1:** Firms going private via an MBO will have a higher concentration of ownership in the pre-buyout period compared to firms going private via an LBO, all else equal.

The next two hypotheses follow from owners having pre-buyout decision-making control. I argue that if managers have decision-making control in the pre-buyout period, they can make decisions that affect the value of the firm, whereas managers of LBO firms may not be in a position to do so. In particular, MBO firms would like to maintain more financial flexibility to allow them to take the firm private without using a PE sponsor. Financial flexibility is defined as the ability of the firm to respond effectively to unanticipated shocks to its cash flows or its investment opportunities (Bancel and Mittoo, 2011). The theoretical literature and empirical evidence also suggest that financial flexibility is the major determinant of firms' capital structure decisions (Graham and Harvey (2001); Bancel and Mittoo (2004); DeAngelo and DeAngelo (2007); and Gamba and Triantis (2008)).

### 2.3.2 Hypothesis 2: Financial Flexibility

Traditional capital structure theories do not incorporate financial flexibility, but some recent models, such as DeAngelo and DeAngelo (2007) extend Myers and Majluf's (1984) pecking-order theory of capital structure by incorporating financial flexibility

considerations into their model of capital structure decisions. Their model predicts that firms will choose a capital structure that allows them to have financial flexibility. Firms will maintain low leverage since obtaining the tax benefits of debt will come at the cost of giving up financial flexibility. Gamba and Triantis (2008) develop a model to analyze the effect of financial flexibility on firm value, in which financial flexibility depends on the costs of external financing, tax rates, growth opportunities, and the cost of holding cash.

Survey evidence shows that financial flexibility is the key determinant of firms' capital structure decisions. Graham and Harvey (2001) ask US CFOs whether they restrict debt in order to have enough internal funds on hand for new projects, and 59% of respondents consider this an important or very important consideration when choosing debt levels, which is the largest factor. Bancel and Mittoo's (2004) survey of European CFOs confirm the importance of financial flexibility for capital structure decisions. Further, lack of financial flexibility can severely impact firms' investment choices. Campello, Graham and Harvey (2010) survey CFOs around the world, finding that a majority of them were forced to bypass attractive investment opportunities during the financial crisis due to the difficulty of accessing credit. Bancel and Mittoo (2011) complement these results using a sample of French firms, and find that firms with higher financial flexibility suffer a lower impact from the financial crisis.

I extend the financial flexibility argument and apply it to going private transactions. Pure management buyouts require current owners to finance the transaction

themselves. If managers place a high value on decision-making control and are continuously evaluating the public/private trade-off, they will wish to maintain sufficient financial flexibility to be able to take the firm private when the costs of being public exceed the benefits, without having to rely on private equity involvement. Firms going private through an MBO will value financial flexibility more than LBOs because they may eventually need to borrow funds to take the firm private. This means they will maintain more cash in order to be able to buyout the other shareholders, and may have lower dividends as a result. This leads to my second hypothesis:

**H2:** Firms going private via an MBO will have higher financial flexibility relative to the LBOs in the pre-buyout period, all else equal.

### 2.3.3 Hypothesis 3: Market timing

A large number of studies show that managers can use market timing to their advantage. Lucas and Macdonald (1990) use an asymmetric information framework that leads a firm to be undervalued by the market. The firm will thus choose to delay issuing equity until this undervaluation is corrected. Since, on average, firms are more likely to be undervalued during a bear market, owners will delay issuing equity until a bull market corrects this undervaluation. The implication is that there will be a larger number of IPOs following a rise in the market. Extending the analysis to MBOs, firms that see themselves as being undervalued by the market may not simply delay issuing equity, but take the

more extreme path of going private. Choe, Masulis and Nanda (1993) note that equity issues are more common during expansionary phases of the business cycle, and develop a model in which improving economic conditions lead to more firms choosing to issue equity, and worsening economic conditions lead to greater adverse selection effects, and more firms will choose to issue debt. In contrast, Pastor and Veronesi (2005) model the IPO timing decision as a tradeoff between the profits obtained from the production resulting from the financing of the IPO, and the option to wait for improving market conditions. Improving market conditions lead to a number of firms going public in the same period. Their model also implies that IPO volume is more closely related to changes in stock prices than to the level of stock prices, since improving market conditions also lead to increases in stock prices as well as an increase in IPO volume. Finally, Benninga, Helmantel and Sarig (2005) model the tradeoff between the entrepreneur's private benefits and the gains from diversification, which they use to represent the general tradeoff between the costs and benefits of going public. Their model allows firms to time the IPO, but it is also allows the firm to reverse the IPO decision and go private. Thus, the firm considers the costs and benefits of being public or private in every period, allowing firms to respond to changes in the incentives to go public over time. Their model implies that there will be firms that fluctuate between the two types of ownership structure.

Empirical evidence supports the view that market timing is prevalent. Ritter (1991) finds that periods of underperformance following IPOs coincide with periods

following a high volume of IPOs, and concludes that firms are taking advantage of windows of opportunity and timing the market to obtain the lowest cost of capital. Further, Loughran and Ritter (1995) find that returns for issuing firms are lower in each of the five years following an IPO or SEO issue than for non-issuing firms and conclude that firms are taking advantage of windows of opportunity, successfully timing the market by issuing shares when they are overvalued. Lowry (2002) looks at fluctuations in IPO volume over time, attributing these fluctuations to firms' demand for capital and the level of investor sentiment. Brau and Fawcett (2006) provide survey evidence regarding the timing of the IPO. More than 80% of responding CFOs listed overall stock market conditions as being important or very important in influencing the timing of the IPO. Also important were industry conditions (70%), and the need for capital to fund growth opportunities (66%). All of these support the hypothesis that firms time the IPO in response to improving economic, market, or industry conditions. Taken together, the above studies indicate that managers are carefully considering the optimal time to go public, and it follows that they will also carefully consider the optimal time to go private, if they are already on the margin of whether to remain public or go private.

Much like how many of the motivations for going private can be obtained by reversing the motivations for going public, the influence of equity market conditions on the decision to go private is closely related to their influence on the timing of an IPO. IPO timing theories examine the firm's choice of the right moment to go public. This decision must obviously be made in light of the firm's motivations for going public. Again, there

are costs and benefits associated with the timing of the IPO. If the firm is using the IPO to fund immediate growth opportunities, then there is not much room to manoeuvre in terms of the exact timing of the issue.

For firms wishing to go private, the desire will be to minimize the cost of the transaction. This leads to the conflict of interests argument that managers will use their inside information to time the buyout for when it is most advantageous for them, at the expense of outside shareholders. Further, because fair value in the transaction is assessed using earnings-based valuation methods, managers have an incentive to engage in earnings management to reduce the price paid to take the firm private (DeAngelo (1986)). Management is also in a position to influence the buyout process by reducing the number of bidders (Cain and Davidoff (2011)). Therefore we will expect that managers who have decision-making control will not only use market timing for IPO and capital structure decisions, but also when choosing to take the firm private. This leads to my third hypothesis:

**H3:** Firms going private via an MBO will be more likely to use market timing than LBOs, all else equal.

### 2.3.4 Hypothesis 4: Financing conditions

Previous studies have found that LBOs tend to be more common when debt market conditions are more favourable, since, due to the high amount of debt required to

finance the transaction, private equity firms will be more active when debt is cheap and less active when debt is costly. Kaplan and Stein (1993) find that the 1980s LBO boom was related to the increase in the use of junk bonds, while Shivdasani and Wang (2011) attribute the 2004-2007 LBO boom to the use of collateralized debt obligations (CDOs) and other forms of securitization, which increased the supply of credit and lowered the cost of LBO financing. Axelson et al. (2010) find that the number of LBOs increases when credit is cheap, as does the price paid for acquired firms, while Demiroglu and James (2010) find that reputable private equity firms are more active in the LBO market when credit risk spreads are low and lending standards in the credit markets are lax, which is consistent with buyout specialists capitalizing on favourable credit market conditions. Finally, Kaplan and Stromberg (2009) observe that there is cyclicality in the buyout market and provide evidence that private equity firms are taking advantage of market timing between debt and equity markets in their buyout activity, and Ljungqvist, Richardson and Wolfenzon (2008) find that established funds increase their investment when credit market conditions are looser.

LBOs are led by outsiders, and while management is sometimes a participant and even initiates discussions with private equity sponsors, their equity stake in the transaction is minimal and the private benefits of control are no longer an important factor. As our examples illustrated, LBOs can be initiated by private-equity firms, and thus many LBOs will be driven by demand-side factors. Whether a firm wishes to go private through an LBO, or whether it is subject to an unsolicited takeover bid from a

private equity firm, it must still attract an outside party that is interested in acquiring some or all of the firm. While the cost of debt will be important for both LBOs and MBOs, the type of debt, and the state of the private equity industry, are more important for LBO firms. This leads to my fourth hypothesis:

**H4:** Debt conditions will be more important for LBOs relative to MBOs in the pre-buyout period, all else equal.

### 2.4 Summary and Conclusions

I examine the differences between MBOs and LBOs, and how firm heterogeneity will lead to differing likelihoods of being taken private through one of these mechanisms. I survey the theoretical and empirical literature and argue that managerial control will be the key factor influencing firms which decide to go private through an MBO, while demand-side factors will be the driving force behind LBOs. I develop testable hypotheses for both transaction types. In particular, MBOs will be largely motivated by the desire of insiders to maintain or regain control of the firm, and the timing of an MBO transaction, being at the discretion of the firm's managers, will occur when the benefits of being public no longer outweigh the private benefits of control. LBOs, however, will depend on demand-side factors, and private equity demand will be driven by the interaction of cheap credit conditions and attractive target prices. In Chapter 3, I test these hypotheses regarding the likelihood of choosing an MBO instead of an LBO. The differences in

decision-making control in the pre-buyout period are also likely to affect the offer premiums for MBOs and LBOs. I develop and discuss these hypotheses and test them in Chapter 4.

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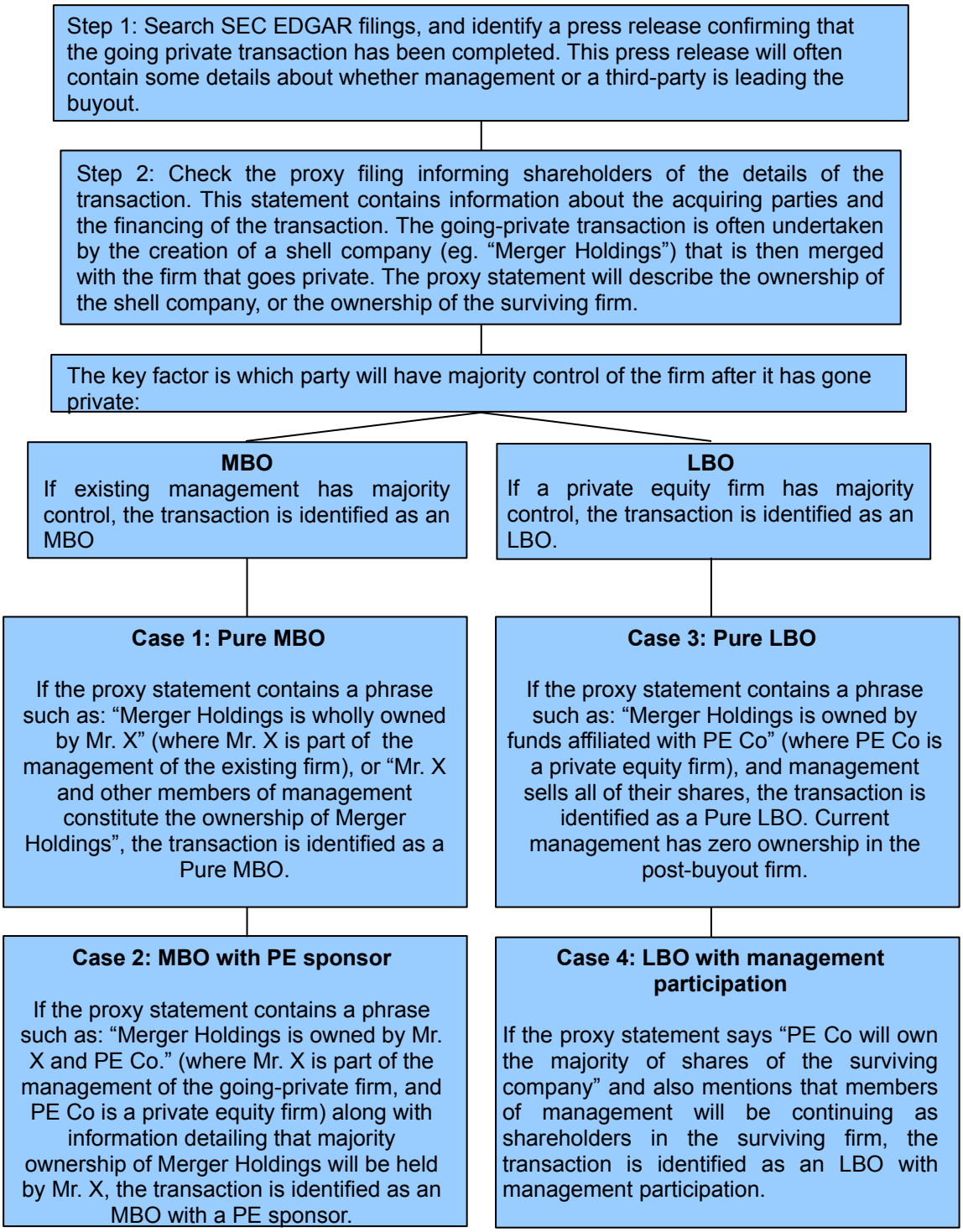
**Figure 2.1: Is it a Management Buyout (MBO) or a Leveraged Buyout (LBO)?**



# CHAPTER 3

# FINANCING CONDITIONS, CONTROL CONSIDERATIONS AND GOING PRIVATE DECISIONS: LEVERAGED BUYOUTS (LBOS) VERSUS MANAGEMENT BUYOUTS (MBOS)

## Section 3.1: Introduction

The dramatic surge in public-to-private transactions in the last decade has attracted substantial attention from researchers regarding the factors that are driving this phenomenon. Most studies conclude that cheap credit conditions combined with the growth of private equity funds and collateralized debt instruments fuelled the recent surge in going private transactions (e.g, Shivdasani and Wang (2011), Axelson et al. (2010), Demiroglu and James (2010), Kaplan and Stromberg (2009)). This conclusion, however, is based primarily on the analysis of leveraged buyouts (LBOs) that comprised a majority of these transactions in the last decade. Little attention has been paid to other forms of going private transactions that could be driven by different factors. The IPO literature suggests that the motivations for going public are likely to be different across firms. For example, while financing for growth is a common factor for all firms going public, control considerations are likely to vary across firms: some owners may use the IPO as an exit strategy, whereas others value decision-making control. I expect that this heterogeneity would be reflected in the going private decision as well. Several studies show that managers in firms that exit public markets through management buyouts (MBOs) are likely to have higher ownership compared to LBOs that are mostly taken

private by outsiders (DeAngelo et al., 1984; Elitzur et al., 1998; Halpern et al., 1999 and 2005). Another source of differences could be financing conditions and the types of outside buyers that could change over time. For example, private equity firms have become major players in the last decade in going private transactions. They also tend to have different capital structures than that of a typical non-financial firm (Axelson et al. (2010)) and therefore, may be interested in firms with different characteristics (e.g. lower leverage). Moreover, while easy debt market conditions might play an important role for all going private transactions, the role of financing instruments and buyers might be different in MBOs and LBOs. Despite these differences, few studies have examined whether factors driving firms to opt out of the public markets differ between buyers who take the firms private. In this paper, I fill this gap in the literature by investigating this issue for two types of U.S. going private transactions from 2000 to 2011: leveraged buyouts (LBOs), and management buyouts (MBOs).

Following Bharath and Dittmar (2010), I model the going private decision as the reverse of the going public decision (IPO). In this framework, a firm continuously evaluates its trade-off between the costs and benefits of staying public, and decides to go private when the costs exceed the benefits. I develop empirical implications about how differences in control considerations as well as changes in financing and market conditions interact with fundamental factors to influence the probability of going private. I empirically test these predictions in a sample of U.S. firms that went private between 2000 and 2011 relative to the firms that were public during this period in a cross-sectional

and time-varying framework using several empirical methods, including the Cox proportional hazard, and competing risks regression models. The main advantage of competing risks regression is that, unlike the Cox model, it estimates separate hazard rates for each exit type. It also allows me to directly compare the effects of my regression variables on the hazard rate for each type of going private transaction. In addition, each exit type is treated as a competing outcome rather than censored data, providing more accurate estimates than the Cox model. I find that the major determinants of the going private decisions are significantly different between LBOs and MBOs. Looser debt market conditions and financial visibility are the major factors for LBOs but do not increase the likelihood of MBOs, whereas the firm's growth opportunities is a common factor for both groups but plays a stronger role for MBOs.

My study extends the going private literature in several ways. First, most recent U.S. studies focus on LBOs or do not distinguish between different types of going private transactions.[3] Halpern, Kieschnik and Rotenberg (1999) is one of the few studies that develops and tests a heterogeneity hypothesis that argues that since the population of LBOs is heterogeneous, we should expect that the determinants of going private transactions will also vary across these transactions. To test their hypothesis, they divide the population of LBOs into two broad categories: (i) firms with high managerial ownership (who then typically undertake MBOs), and (ii) firms with low managerial

3 Bharath and Dittmar (2010) separately analyze MBOs and LBOs as part of their robustness checks, but do not include debt market conditions. Mehran and Peristiani (2010) separately consider LBO and non-LBO transactions, with MBOs included in the LBO category. Fidrmuc et al. (2013) examine a sample of UK MBOs and LBOs that went private from 1997 to 2003, before the recent LBO boom, finding that financially constrained firms choose LBOs instead of MBOs.

ownership (who are typically bought by outsiders and third parties). Consistent with the heterogeneity hypothesis, they find that while both types of firms exhibit poor stock performance in comparison to firms that remain public, there are also several major differences in pre-transaction characteristics between the two groups. For example, MBOs display higher managerial stock ownership, poorer stock performance, greater use of debt, and higher expenditures on taxes whereas LBOs exhibit lower managerial stock ownership, less use of debt, and poorer stock performance than companies that remain public corporations. My study extends their work in several ways. First, they test the heterogeneity hypothesis in a sample of firms that went private in the 1980s when junk bond funding was the dominant form of financing in going private transactions. My study tests this hypothesis in a more recent period in which cheap credit conditions and collateralized loan instruments became the dominant form of financing and private equity firms are the major players in going private transactions. Second, I model the going private decision as the reverse of the going public decision (IPO). This allows me to incorporate motivations of going public from the IPO literature as well as changes in the financing and market conditions that may influence going private transactions over time. Third, I construct my MBO sample similar to that in Halpern et al. (1999), but restrict my LBO sample to going private transactions by private equity firms (excluding acquisitions by private operating firms). I define MBOs as transactions in which the existing management has majority control of the private firm, and LBOs as transactions in which a private equity firm (or group of private equity firms) has majority control of the

surviving firm. This comparison allows me to test that financing conditions and control considerations are the main sources of heterogeneity. Finally, my study also contributes to the international literature on going private transactions. In a recent study, Fidrmuc et al. (2013) examine UK public firms that went private between 1997 and 2003 and find that financing constraints are the major factor why management decides to invite participation by private equity investors. My paper complements and extends their study in three ways. First, they assume that private equity investors are passive participants. I do not make this assumption, and consider private equity as active players and include financing conditions that affect the demand-side factors in my analysis. I also include the desire to maintain/gain control of the firm as an important factor in my analysis since it could also influence firm variables, including the level of financial constraints and leverage. Second, the literature suggests that there are differences in legal and institutional structures and IPO motivations between the US and UK that could influence the determinants of going private transactions. For example, Brau, Ryan and Degraw (2006) find that most US managers do not view an IPO as a vehicle to relinquish control whereas Bancel and Mittoo (2009) find that most UK managers reduce their ownership after going public. My study will contribute to this literature by providing some insights into different factors that may affect firms' decisions to choose between MBOs and LBOs as vehicles to exit their public status.

The rest of the chapter is organized as follows. The next section reviews the literature and develops testable hypotheses for MBOs and LBOs. Section 3.3 outlines my

data and sample and in section 3.4 I conduct a univariate analysis. Section 3.5 presents the empirical methodology and section 3.6 gives the empirical results. Finally, section 3.7 adds robustness checks while section 3.8 summarizes and concludes the chapter.

## Section 3.2: Related Literature and Hypotheses

In this section, I discuss the main differences between LBOs and MBOs and develop testable hypotheses about the implications of these differences on the relative importance of the major determinants of going private between the two groups. I argue that while most factors apply to all types of going private transactions, the importance of these factors is likely to be different between different types of transactions. Since MBOs involve the current management obtaining complete ownership of the firm, the private benefits of control and the reduction of agency costs are likely to be major considerations. Since LBOs require large amounts of debt financing, demand side factors such as debt market conditions will be a significant determinant. I summarize the prior literature and the predictions for the major factors, as well as the variables commonly used as proxies for these factors in Table 3.1.[4]

[Insert Table 3.1 here]

### 3.2.1 LBOs vs. MBOs

Most prior studies do not differentiate between different types of transactions. My

4 For a detailed discussion of these factors see Bharath and Dittmar (2010), Mehran and Peristiani (2010), and Halpern, Kieschnick and Rotenberg (1999).

main hypothesis is motivated by Halpern et al. (1999) who develop a heterogeneity hypothesis that argues that since the population of going private firms is heterogeneous, the motivations and determinants of going private transactions are also likely to be different. They define their heterogeneity hypothesis as an alternative hypothesis to agency costs (free cash flow hypothesis) and test them in a sample of high-ownership and low-ownership firms from 1980 to 1986. Consistent with the heterogeneity hypothesis, they find that while both types of firms exhibit poor stock performance in comparison to firms that remain public, high-ownership firms in their sample (mostly MBOs) also made greater use of debt financing, while low-ownership firms (mostly LBOs) used a lower amount of debt financing prior to the going private transaction.

I extend this heterogeneity hypothesis by drawing from the IPO literature as well as the recent literature that highlights the importance of financing and market conditions on going private transactions. The IPO literature suggests that financing for growth and control considerations are the two most important motivations of firms in going public. However, while financing for growth is a common factor for all firms, control considerations are likely to vary across firms: some firms may have concentrated ownership structures after the IPO, whereas others might have more dispersed ownership. Going private theories also emphasize control considerations (Bolton and von Thadden (1998); Boot, Gopalan and Thakor (2006 and 2008)), but the recent focus has been on the role of financing and market conditions, especially for LBOs (Shivdasani and Wang (2011); Axelson et al. (2010); Demiroglu and James (2010); Kaplan and Stromberg

(2009)). Based on this literature, I argue that control considerations and financing conditions are likely to be the major difference between MBOs and LBOs. Below, I develop testable hypotheses regarding the determinants of the probability to go private as an MBO or LBO based on these two sources of heterogeneity.

### A. Control Considerations

I argue that since MBOs involve the current management obtaining complete ownership of the firm, the private benefits of control are likely to be a major consideration. Brau, Ryan and DeGraw (2006), in their survey of US firms that went public, provide evidence that, while financing for growth is a primary concern when going public, managers have a strong desire to maintain control of the firm even after going public. I argue that decision-making control of the firm is a major difference between MBOs and LBOs. In contrast, control considerations are likely to be less important in LBOs. Management are either interested in sharing control with an institutional investor or wish to sell some or all of their stake as part of an exit strategy. These differences will lead to some factors being more (less) important for LBOs than MBOs.

Many studies document that the manager of an MBO firm is likely to own a larger percentage of the firm in the pre-buyout period (DeAngelo et al., 1984; Elitzur et al., 1998; Halpern et al., 1999 and 2005). A number of studies (see, for example, Mikkelson, Partch, and Shah 1997; Helwege, Pirinsky, and Stulz 2007) show that a large number of

IPO firms have concentrated ownership in the U.S. and they become widely held very gradually, with the average level of insider holdings falling to below 20% only after ten years. Mehran and Peristiani (2010) find that the average level of insider ownership for firms choosing to go private is 33.2%, and is significantly higher than the 23.1% ownership of the control group of surviving IPO companies that stay public. This evidence suggests that MBO firms are likely to have higher ownership in the pre-buyout period and even at the time of the IPO. Since these firms value ownership control, they are likely to value the private benefits of control more than LBO firms that typically have lower ownership concentration. They decide to go public when the private benefits of control are lower than the extra value of the firm which comes from growth through external financing, and owners will relinquish control of the firm through an IPO in order to benefit from higher growth. After going public, they are likely to constantly evaluate the trade-offs between the private benefits of control and the benefits of financing growth opportunities in staying public that are shared by all shareholders. If financing benefits are not realized or growth opportunities disappear, a firm will choose to go private again. By contrast, LBOs are led by outsiders and are likely to be influenced more by demand side considerations and less by control considerations because while management is sometimes a participant and even initiates discussions with private equity sponsors, their equity stake in the transaction is minimal. Moreover, LBOs are likely to also include many firms that have high growth opportunities but owners want to relinquish control as an exit strategy. This leads to my first hypothesis:

**H1: Low Growth opportunities will be a more important factor for MBOs relative to LBOs, all else equal.**

Another difference between MBOS and LBOs is in the types of agency costs facing the firm. Agency problems arise when managers or controlling shareholders can consume corporate resources for their own benefits rather than for maximizing firm value. Firms face two types of agency problems: vertical agency problems between owners and managers (Jensen and Meckling (1976)) and horizontal agency problems between majority and minority shareholders (Shleifer and Vishny (1997)). Since owners/insiders/managers in MBOs are more likely to have a majority ownership compared to LBO firms, they are likely to face more severe agency costs between majority and minority shareholders. By contrast, LBOs are more likely to have agency problems between managers and shareholders. Prior studies argue that free cash flow is a proxy for the vertical agency costs and therefore, a determinant of the firm's going private decision. The evidence is mixed. Halpern et al. (1999) do not find support for this hypothesis whereas Bharath and Dittmar (2010) find that it affects the likelihood of going private in the 1980s, but not in the later part of their sample. Mehran and Perstiani (2010) find support for the free cash flow hypothesis in their sample from 1990 to 2007.

For MBOs, free cash flow is likely to be important because it enhances managers' financial flexibility in taking the firm private. Financial flexibility is the ability of the

firm to arrange financing at reasonable terms in the event of unanticipated shocks to its cash flow or investment opportunities.[5] I argue that financial flexibility will be a more important determinant for MBOs since it requires current owners to finance the transaction themselves. If managers place a high value on decision-making control and are continuously evaluating the public/private trade-off, they will wish to maintain sufficient financial flexibility to be able to take the firm private when the costs of being public exceed the benefits, without having to rely on private equity involvement. Consistent with this argument, Fidrmuc et al. (2013) find that financing constraints are a major factor why management seeks private equity support in going private. MBOs are also likely to maintain lower leverage and pay low dividends to maintain their financial flexibility compared to LBOs. This leads to the following hypotheses:

**H2A: Free cash flow to assets will be a more important factor in going private for MBOs relative to LBOs, all else equal.**

**H2B: Financial flexibility will be a more important factor for MBOs relative to LBOs, all else equal.**

Another difference between MBOs and LBOs is likely to be the ability to use market timing for their going private decisions. A large number of studies also show that managers use market timing and windows of opportunity to make IPO and financing

5 Survey evidence shows that managers around the world consider financial flexibility as the key determinant of the firm's capital structure decision (Graham and Harvey (2001), Bancel and Mittoo (2004)), and that lack of financial flexibility can severely impact firms' investment choices (Campello, Graham and Harvey (2010), Bancel and Mittoo (2011)).

decisions (Lucas and Macdonald (1990); Choe, Masulis and Nanda (1993); Pastor and Veronesi (2005)). Empirical evidence supports the view that managers use market timing and windows of opportunity for going public decisions (Ritter (1991); Loughran and Ritter (1995); Lowry (2002); Brau and Fawcett (2006)).

I expect that managers and insiders will also use windows of opportunity in their going private decisions. However, MBOs are likely to have more flexibility in choosing their timing because they tend to have higher managerial ownership in the pre-buyout period relative to LBOs. By contrast, LBOs depend on several demand side factors such as finding a private equity firm who is interested in the buyout and therefore is in a weaker position to select market timing. In particular, MBO firms will also be able to time the transaction when the firm is more undervalued because they would have to arrange less financing to buyout the remaining shareholders.[6] Thus, while all firms are likely to use market timing opportunistically, MBOs are likely to be in a better position to choose the timing of the transaction compared to LBOs who have to look for an active partner and hence have less control over market timing. This line of reasoning leads to the following hypotheses:

6 In an asymmetric information framework in which a firm's management has superior information, managers may perceive the share price to be undervalued. When a firm is undervalued, the cost of going private decreases, while at the same time, the benefit of being public also decreases. This dual effect should lead to an increase in the likelihood of going private. Stephens and Weisbach (1998) find that share repurchases are negatively related to prior stock price performance and conclude that firms increase their purchasing depending on the degree of perceived undervaluation. It could be that firms are simply repurchasing equity when shares are cheap, or that they are engaging in earnings management. Further, managers are likely to use their inside information to time the buyout for when it is most advantageous for them, at the cost of outside shareholders. For example, management is also in a position to influence the buyout process by reducing the number of bidders (Cain and Davidoff, 2011).

**H3: Market timing will be more important for firms going private via an MBO compared to an LBO, all else equal.**

### B. Financing and Debt Conditions

There is general consensus in the literature that financing conditions are an important determinant of going private for all transactions, especially for LBOs. Several studies show that LBOs tend to be more common when debt market conditions are more favourable, since, due to the high amount of debt required to finance the transaction, private equity firms will be more active when debt is cheap and less active when debt is costly. Shivdasani and Wang (2011) attribute the 2004-2007 LBO boom to the use of collateralized debt obligations (CDOs) and other forms of securitization, which increased the supply of credit and lowered the cost of LBO financing. Axelson et al. (2010) emphasize demand side factors and find that the number of LBOs increase when credit is cheap, as does the price paid for acquired firms. Demiroglu and James (2010) find that reputable private equity firms are more active in the LBO market when credit risk spreads are low and lending standards in the credit markets are lax, which is consistent with buyout specialists capitalizing on favourable credit market conditions. Kaplan and Stromberg (2009) observe that there is cyclicality in the buyout market and provide evidence that private equity firms are taking advantage of market timing between debt and equity markets in their buyout activity, and Ljungqvist, Richardson and Wolfenzon (2008) find that established funds increase their investment when credit market

conditions are looser. While the cost of debt will be important for both LBOS and MBOs, as discussed above, MBOs are likely to rely more on debt as well as maintain financial flexibility since they are more interested in decision making control. This leads to my next hypothesis:

**H4: Financing and debt market conditions will be more important determinants for LBOs relative to MBOs, all else equal.**

### Section 3.3: Sample, Data and Variables

In this section, I describe how I construct my going private and control samples and then make comparisons to recent going private studies. I then define MBO and LBO transactions, and give an overview of how these transactions have fluctuated over my sample period. Next, I explain the variables used to test my hypotheses.

#### 3.3.1 Sample and Data

To construct my going private sample, I start by taking all U.S. firms trading on the NYSE, AMEX, or NASDAQ, that have delisted from CRSP between January 1, 2000 and December 31, 2011. Starting with these firms ensures that my final sample has two important characteristics. First, it only involves firms that have trading data available on CRSP, and does not include firms that traded OTC before going private. Second, it automatically eliminates firms that continue trading publicly after a Schedule 13E3

filing.[7] Firms must file a Schedule 13E3 with the SEC when initiating a going private transaction, and will continue trading publicly if the transaction is not completed. Delistings that CRSP identifies as occurring for reasons of liquidation, bankruptcy, or not meeting the exchange's listing requirements, are eliminated. The remaining 2186 firms either go private, go dark (that is, delist from a major exchange to trade over-the-counter, see Leuz, Triantis and Wang (2005)), or are acquired by another public firm. From this list, I scrutinize firms' 8-K and Schedule 13E3 SEC filings, as well as press releases and proxy statements, to identify which firms go private, and their method of going private (MBO or LBO). I check my final sample against the firms filing Schedule 13E3 forms with the SEC during my sample period to confirm that no going private firms are missed. As in Bharath and Dittmar (2010) I eliminate utilities (two-digit SIC code 49) and financial firms (one-digit SIC code 6). Finally, I eliminate transactions in which public firms are acquired by private operating firms, although I reintroduce these firms in a separate analysis as part of my robustness checks. My final sample consists of 320 firms, with 71 MBOs and 229 LBOs. I obtain firm financial data from Compustat, and market data from CRSP. IPO dates are collected from two main sources, the SDC New Issues database, and if dates are still missing, I use Jay Ritter's database provided on his webpage (http://bear.cba.ufl.edu/ritter/ipodata.htm). If the date is not available from either of these sources, I use the date the firm was first listed on CRSP (this is consistent with both Bharath and Dittmar (2010) and Mehran and Peristiani (2010)).

7 See Bharath and Dittmar (2010), and Bartlett (2009) for a more detailed discussion of Schedule 13E3 filings and the legal process for going private.

I report the yearly breakdown of firms in my sample versus other recent going private studies in Table 3.2.

[Insert Table 3.2 here]

Differences between my sample and that of Bharath and Dittmar (2010) are due to two factors. First, my sample is grouped by the announcement date of the going private transaction, whereas Bharath and Dittmar (2010) group their sample by the date the transaction is completed. Second, I focus on MBOs and LBOs only, and thus eliminate transactions in which firms are acquired by a private operating firm. Bharath and Dittmar's sample contains 1023 firms from 1980-2004. Other studies use different data sources to construct their samples. Axelson et al. (2010) use the Capital IQ database to identify going private transactions, and they note that this skews their sample towards larger deals, hence their smaller sample size. Mehran and Peristiani (2010) use the SDC M&A and New Issues databases to identify IPO firms that went public after 1988 and subsequently go private. Between 1990 and 2007, they identify 262 of these firms that have financial information available. Bartlett's (2009) sample construction methods are similar to my own, and his larger sample can be attributed to three factors. First, I eliminate utilities from my sample. Second, I also eliminate firms that keep reporting due to a subsequent equity issue rather than a debt issue that is used to finance the going private transaction. Third, I focus on MBOs and LBOs only, and thus eliminate transactions in which firms are acquired by a private operating firm.

My focus in this study is on distinguishing between MBOs and LBOs. The main

difference between the two types of transactions is the ownership structure of the post-buyout firm. I define an MBO as a transaction in which the current owners/managers gain majority control of the post-buyout firm. Transactions for which a private equity firm (or group of private equity firms) gains majority control of the post-buyout firm are labelled LBOs. In the LBO category I include buyouts in which management participates but the majority control is obtained by a private equity sponsor. The management stake in these buyouts is typically very small (managers end up owning less than 5% of the surviving firm). This definition is more appropriate for my analysis since control considerations are the distinguishing feature in my empirical predictions. I define MBOs and LBOs in this manner in order to be able to test my control-related hypotheses.

In Figure 3.1 I plot the trend in going private transactions from 2000 – 2011.

[Insert Figure 3.1 here]

The number of MBOs is relatively steady from 2000 to 2003 and they are the most popular type of going private transaction in 2001 and 2002. LBOs start to overtake MBOs in 2003, and maintain that position through 2011. Figure 3.1 also illustrates that two things occur simultaneously: the number of MBOs declines after reaching a peak in 2003 while at the same time LBOs increase dramatically up to 2007 before falling. Post-2007 LBO numbers are still much higher, however, than the number of LBOs in the first half of the decade. Note that the LBO and MBO numbers represent all of those transactions over the sample period, and there were significantly more LBOs than MBOs over this time period. A number of significant events may have influenced the frequency

of LBOs and MBOs, including the bursting of the tech bubble, the introduction of the Sarbanes-Oxley Act (SOX), and the financial crisis. In particular, SOX increased the costs of being a public firm, which drove a number of firms to leave the public market and go dark (see Leuz et al., 2005). Given that the managers of MBO firms can control the timing of the transaction to a greater degree than LBO firms, there may have been an increase in MBO transactions surrounding SOX. Further, LBOs have to rely on private equity financing, which increased substantially starting in 2003 (see Axelson et al., 2010; Shivdasani and Wang, 2011), when LBO transactions began to increase in frequency.

For the control sample, I follow both Bharath and Dittmar (2010) and Mehran and Peristiani (2010). I construct a control sample of IPO firms, since the intent is to examine the tradeoff between being public and being private over the public life-cycle of the firm. All of the going private sample firms went public before 2008, and thus the comparison sample only contains firms that went public before 2008. The starting point for my sample is 1975, and I use all IPOs on SDC from 1975 – 2008, as well as all firms from CRSP that are not on SDC that have start dates from 1975-2008.[8] The control sample includes firms that exit public markets through other means, such as bankruptcy or merger. As in the going private sample, all firms in the control sample must have information available on Compustat and CRSP.

### 3.3.2 Variables

8 Starting with 1975 eliminates the distortion in starting dates caused by the founding of the NASDAQ market. CRSP coverage of the NASDAQ begins in 1972, and thus there is a very large spike in the number of firms with CRSP start dates in 1972.

To remain consistent with previous going private studies, I include a number of variables also used by Bharath and Dittmar (2010) and Mehran and Peristiani (2010). In addition, I draw on the LBO boom literature for measures of debt market conditions (Axelson et al. (2010), Demiroglu and James (2010)). All variables and their expected signs are summarized in Table 3.1, along with my hypotheses. I include the firm's ratio of capital expenditures to sales and the market-to-book ratio as proxies for growth opportunities. Firms with fewer growth opportunities should be more likely to go private, and I expect both of these variables to be negatively related to the likelihood of going private, in addition to having a larger impact on MBO firms. I use share turnover, stock volatility, and dummy variables for NYSE and AMEX listed firms as proxies for financial visibility. Since less visible firms should be more likely to go private, I expect negative signs for turnover and the NYSE dummy, and positive signs for volatility and the AMEX dummy. I also use firm size measured by ln(sales), and the number of common shareholders,[9] as these firms tend to have more analyst coverage and attract more investor interest, with the expectation of negative signs for both variables, and more importance for LBO firms relative to MBOs. Jensen (1986) argues that firms with higher free-cash flows are likely to have a larger conflict between managers and outside shareholders and are thus more likely to go private. However, I believe that a firm's free cash flow will also contribute to its financial flexibility. I define free-cash flow as after-tax operating income

9 This variable is not a precise estimate of the number of common shareholders of a firm, since, as noted in Leuz, Triantis and Wang (2008), many shareholders have their shares held for them by financial institutions, who in turn count as only one holder of record of the firm's common shares. Since this applies to all firms, however, this variable should still be a good indicator of which firms have more shareholders than others.

before depreciation, minus taxes and dividends paid, and then divide by total assets, and expect that while this variable may be positive for both transaction types, it will have a larger effect for MBO firms. As an additional test of the financial flexibility hypothesis, I use firm leverage, measured by the ratio of long-term debt to equity, and a dummy variable for whether the firm paid a dividend in the previous year (Dividend dummy). I expect that firms wishing to go private will maintain low leverage ratios to be in a better position to access financing for the transaction, and that these firms will also conserve cash by not paying any dividends. Thus, both of these variables are expected to have a negative relationship with the likelihood of going private, and the impact will be greater for MBOs than for LBOs. To test the financing conditions hypothesis, I use the net percentage of domestic banks reporting tighter loan standards from the Federal Reserve Board's Survey of the Terms of Bank Lending (see Lown and Morgan (2006). Axelson et al. (2010) and Demiroglu and James (2010) also use this as a measure of debt market conditions). Looser lending standards allow going private firms to more easily obtain financing for the transaction, and I thus expect a negative relationship between this measure and the likelihood of going private. In addition, since LBO transactions have larger financing needs, I expect the effect to be larger for LBO firms relative to MBO firms. For my market timing hypothesis, I use the firm's market-adjusted return against the CRSP equally-weighted index.[10] I expect that managers whose firms experience poor stock price performance will be more likely to perceive their firms as being undervalued, and thus will be more likely to take their firms private. Again, my expectation is for a

10 Results are unchanged in unreported estimations using the CRSP value-weighted market return.

negative relationship between the market-adjusted return and the likelihood of going private, with a larger effect expected for MBO firms than LBOs firms. In addition, I use the number of IPOs in the previous year as a measure of equity market conditions. When conditions are favourable for firms to go public, it follows that conditions are less favourable for firms to go private. I expect the likelihood of going private to be negatively related to the number of IPOs in the previous year, and that the impact will be larger for MBO firms relative to LBO firms.

**Section 3.4: Univariate analysis of my sample**

In this section, I start by looking at sample characteristics through a univariate analysis of the variables of interest. I find several significant differences between my sample of going private firms and my comparison sample of public firms. For example, going private firms tend to be smaller, hold less cash, and have higher leverage than firms that remain public. Going private firms also experience poorer market-adjusted share price returns, and have fewer growth opportunities than public firms. I also find significant differences between MBO and LBO firms along several dimensions, in particular, insider ownership levels are significantly higher for MBO firms. Fewer MBO firms pay dividends, and they also experience larger share price declines in the year before going private relative to LBO firms. MBO firms are smaller, less visible, and have fewer growth opportunities than LBO firms.

Many of my hypotheses are based on the assumption that MBO firms have higher

ownership levels than LBO firms. To see if this is the case in my sample, I examine insider ownership levels for MBO and LBO firms in each of the 5 years before going private. Insider ownership is defined as the total percentage of voting control held by officers, directors, and their family members. Insider ownership levels are reported in Table 3.3 Panel A.

[Insert Table 3.3 Panel A here]

Mean and median ownership for MBO firms are both close to 50% for every one of the five years leading up to the going private transaction. LBO firms, by contrast, have much lower ownership levels. Mean ownership ranges between 21%-23%, while median ownership ranges between 14%-16%, and there appears to be a slight decline in ownership levels over the 5 years leading up to the buyout. P-values for tests of differences between mean and median ownership levels for MBO and LBO firms are reported in the final two columns of Table 3.3 Panel A. All differences are significant at the 1% level, confirming that MBO firms have higher pre-buyout ownership than LBO firms in each year before the transaction. Table 3.3 Panel B reports additional summary statistics for insider ownership, including the percentage of firms in the MBO and LBO samples for which insiders control more than 50% of the votes.

[Insert Table 3.3 Panel B here]

More than 50% of the MBO firms in my sample already have control of the firm prior to the buyout. Thus, more than half of MBO firms in my sample choose to maintain control of the firm over the 5 years leading up to the decision to finally take the firm private and

gain complete control of the firm. The percentage of LBO firms that have control of the firm prior to the buyout ranges between 11% and 15%. Most LBO firms in my sample already have dispersed ownership, and only a small fraction consist of owners who give up control of the firm through the LBO.

Table 3.4 Panel A shows the sample characteristics of both the going private sample and the control sample, comparing all firm-year observations.

[Insert Table 3.4 Panel A here]

Variables are divided according to my hypotheses, and all financial variables are adjusted for inflation using the GDP deflator with base year 2005. The first set of variables relate to the financial flexibility hypothesis. Going private firms have significantly lower mean and median cash/asset ratios and higher leverage relative to firms that stay public. In addition, fewer going private firms pay dividends than those that stay public. The market-adjusted return is significantly lower for going private firms. The mean going private firm is significantly smaller over the sample period than the mean control sample firm, whether size is measured by total assets, net sales, or market value, while the median going private firm is larger than the median control sample firm by total assets and net sales. In addition, a smaller percentage of going private firms pay dividends. Mean and median share turnover and stock volatility are both significantly lower for going private firms, an indication that these firms have less liquidity for their shares and have riskier returns. Although there are no significant differences in the mean number of shareholders or the percentage of firms trading on the AMEX, the percentage of firms that trade on the

NYSE is slightly higher than that of the control sample. Overall, these results highlight the influence of financial visibility and investor recognition on the public/private tradeoff.

With respect to the growth opportunities hypothesis, going private firms have significantly lower mean and median market-to-book ratios, supporting my hypothesis, however, there is no difference in the mean capex-to-sales ratio. Leverage is significantly higher for going private firms, the opposite of my expectation. It may be the case that since going private firms suffer from low financial visibility and investor recognition, the cost of equity financing through a seasoned equity offering is relatively higher for these firms. As a result, they may be more likely to turn to forms of debt financing, increasing firm leverage. I find support for Jensen's free cash flow hypothesis, as the mean and median free cash to assets ratios are higher for going private firms.

Table 3.4 Panel B compares MBO and LBO firms in the fiscal year before going private.

[Insert Table 3.4 Panel B here]

While for the majority of variables, MBO and LBO firms share many of the same characteristics, there are also some key differences. MBO firms experience significantly larger declines in their share prices in the year before going private. Mean (median) market-adjusted returns for MBO firms are -37% (-40%) versus -24% (-16%) for LBO firms. Share turnover is lower for MBOs, while stock volatility is higher, and it would appear that financial visibility and investor recognition matter more for MBO firms, supporting the argument that MBO firms will be more concerned with the costs and

benefits of being public. In addition, the mean number of shareholders and mean stock turnover are both relatively lower than the means for all firm-year observations from Table 3.4 Panel A, so that in the year before going private these variables are below their mean levels from the other years in my sample. Going-private firms thus experience a deterioration in their financial visibility and investor recognition by the time they choose to go private.

The market-to-book ratio is lower for MBO firms, as is the taxes-to-sales ratio. One possible explanation is that what makes a firm an attractive LBO target is that it would benefit significantly from the reorganization of the firm and its capital structure that result from such a buyout. Thus, firms that are underperforming but that could still benefit from increased debt levels (low market-to-book, high taxes-to-sales) would make for desirable targets for private equity firms.

**Section 3.5: Methodology**

In this section, I outline the empirical methodology used to test my hypotheses. I conduct my analysis in several stages. In the first stage, I estimate a logit model to determine which firm characteristics affect the likelihood of going private. Since I am interested in comparing LBO and MBO firms, I also estimate a multinomial logit model that allows us to compare both types of going private firms with the control sample. In the second stage, I estimate a Cox proportional hazard model comparing my going private sample with the control sample. The Cox model allows us to examine how firm

characteristics and the likelihood of going private change over time. Finally, to again distinguish between the different determinants for LBO and MBO firms in a time-varying framework, I estimate a competing risks regression.

The first stage of my analysis starts with a logit model to estimate the effects of different firm characteristics on the probability of going private. I use it to provide initial insights into the determinants of the choice of going private or staying public. However, since my preliminary univariate analysis indicates significant differences between LBOs and MBOs, I also estimate a multinomial logit model, which allows for comparisons between the transaction types. My dependent variable now has three categories: the control sample, firms that go private through an LBO, and firms that go private through an MBO. Probabilities are now calculated with respect to a reference category, which in my analysis is the control sample of IPO firms.

The logit models are limited in that they cannot estimate the effects of changes in both firm characteristics and market conditions over time. In the second stage of my analysis, I turn to a duration model, which estimates the effects of my variables on the length of time it takes for a firm to go private. I start by estimating a Cox proportional hazard model, using Efron's method for ties. The Cox model provides us with a benchmark for comparison with the results of Bharath and Dittmar (2010) and Mehran and Peristiani (2010). The model controls for the fact that my data has both left truncation (some firms go public before the sample start date) and right censoring (some firms are still public by the end of the sample). The model to be estimated is:

$$h(t, X(t)) = h_0(t) e^{(X(t)\beta)}$$

where $h(t, X(t))$ is the hazard rate at time $t$ for a firm with covariates $X(t)$. The Cox model is a semi-parametric model that does not impose any restrictions on the baseline hazard function $h_0(t)$.

The Cox model has two major limitations in this context. First, all exit types are treated as having the same underlying hazard rate. Given the variation in the frequency of MBOs and LBOs in different years (see Figure 3.1), and the significant differences between these firms, there are good reasons to believe that the hazard rate will differ between these transaction types. For example, the LBO boom of 2004-2007 came in a period of cheap credit and the explosion of CDOs as a form of financing. In comparison, MBOs maintained a relatively low annual frequency during this time period. It is thus likely that easy debt market conditions increased the hazard rate of an LBO, while leaving the hazard rate of an MBO unchanged. Second, firms that exit through bankruptcy or merger are treated as censored data rather than as firm exits. These types of exits prevent the event of interest (going private) from occurring, and changes in their hazard rates can also affect the hazard rate of going private. For instance, if a recession leads to an increase in bankruptcies, these firms exit the sample. Since I believe that poorly performing firms are more likely to go private, it is likely that firms that go bankrupt had a higher probability of going private than the general population of public firms. Thus, an increase in bankruptcies may lead to a decrease in the hazard rate of going private for the remaining firms, and this must be accounted for.

Since I expect the baseline hazard rate to vary between exit types, and to properly account for firms that leave the public market through other exit types, I estimate a competing risks regression[11] using the method of Lunn and McNeil (1995). The main advantage of competing risks regression is that it estimates separate hazard rates for each exit type. While we could employ the Cox proportional hazard model to separately analyze MBO and LBO firms against the control sample, we would not be able to directly compare the effects of each variable on the hazard rate of each transaction type. Competing risks regression, however, allows us to directly compare the effects of my regression variables on the hazard rate for each type of going private transaction. In addition, each exit type is treated as a competing outcome rather than censored data, providing more accurate estimates than the Cox model. Lunn and McNeil's (1995) method involves duplicating the data so that there are three entries per observation, one for each failure type (LBO, MBO, other exit type). The Cox model is then estimated by interacting each variable with each failure type and then stratifying by failure type.

**Section 3.6: Results**

In this section, I present and discuss the results for each of my models in turn. First, the logit model finds that firms that are less financially visible, that have fewer growth opportunities, that generate larger free cash flows, and that are more undervalued, all have a higher likelihood of going private. Second, the multinomial logit model finds

11 Competing risks regression has also been used to model CEO turnover (Gregory-Smith et al. (2009)) and bankruptcy (Kwon and Hahn (2010)).

that there is some heterogeneity among going private firms, as there are important differences between MBOs and LBOs. For example, financial visibility is a more important factor for MBOs relative to LBOs. Third, I estimate a Cox proportional hazard model, and here I introduce economic factors such as debt market conditions. Again, firms with less financial visibility and fewer growth opportunities are more likely to go private. Finally, I estimate the competing risks regression, allowing me to test my hypotheses for differences between LBOs and MBOs in a time-varying framework.

### 3.6.1 Logit Results

To examine the firm characteristics that influence whether or not a firm goes private, I first use a logit model that compares all firm-year observations in the going private sample with all firm-year observations in the control sample from 1999-2010 (since I use the most recent fiscal year before going private for firm financial data, for many firms that go private in 2000, the most recent fiscal year available is 1999, which I use as the starting point for my data. Year dummies are included in the estimation and in each of the models that follow. Industry dummies were included in a separate analysis but had no material effect on the variables of interest. In addition, the inclusion of industry dummies makes the competing risks regression model quite cumbersome to estimate and thus they are not included in the final model). The primary limitation of this method is that it does not recognize that many observations will come from the same firm, albeit in different years. It does, however, provide a useful starting point from which we can

garner some additional insight into the differences between the going private firms and the control sample. The logit model has a dependent variable that is equal to one if the firm goes private, and 0 otherwise, and results are shown in Table 3.5 Panel A.

[Insert Table 3.5 Panel A here]

Higher capex-to-sales and market-to-book ratios both reduce the probability of going private, highlighting the importance of growth opportunities. In addition, firms with more investor recognition and financial visibility are less likely to go private, as the turnover coefficient is negative and significant, as are the coefficients for the NYSE and dividend dummies, although the coefficient for firm size (log of sales) is positive and significant. The ratio of free cash flow to assets and the market-adjusted return are both significantly different from zero in the logit model, thus providing support for the free cash flow and market timing hypotheses.

### 3.6.2 Multinomial Logit Results

Given my interest in identifying the differences in the factors that drive MBO and LBO firms private, I next estimate a multinomial logit model comparing three different groups: MBOs, LBOs, and the control sample. Again, this method suffers from the same limitation as the logit model, since each firm can have multiple observations. Table 3.5 Panel B shows the results.

[Insert Table 3.5 Panel B here]

The market-to-book ratio is significant and negative across both transaction types,

providing support for the growth opportunities hypothesis. There are some differences between MBO and LBO firms, in particular, some financial visibility variables are significant for both MBO and LBO firms, but have a larger effect on the likelihood of an MBO (turnover, dummy variable for firms that trade on the NYSE), or significantly affect the likelihood of an MBO and not an LBO (the number of common shareholders). Thus, it would appear that financial visibility and investor recognition matter more for MBO firms. In addition, the free cash flow variable is positive and significant for both MBO and LBO firms, supporting the free cash flow hypothesis. Leverage is positive and significant for MBO firms but insignificant for LBOs, but the dividend dummy coefficient is significant and negative for both transaction types. This provides mixed support for the financial flexibility hypothesis. The market-adjusted return is insignificant for both MBOs and LBOs, and thus the market timing hypothesis is not supported by this model.

### 3.6.3 Hazard Model Results

Table 3.6 Panel A reports the results of the Cox proportional hazard model estimation.

[Insert Table 3.6 Panel A here]

I estimate three separate models: one for the full going private sample against the control sample, the second for MBO firms against the control sample, and the third for LBO firms against the control sample. The first column for each sample shows the estimated

coefficients, which indicate the effect on the risk of going private as a result of a change in the independent variable. For ease of interpretation, I also include the hazard ratios in the second column for each sample. The hazard ratios tell us how much the risk of going private changes for a one unit increase in the independent variable. A number greater than one indicates the hazard rate of going private increases, while a number less than one indicates the hazard rate of going private decreases.

Many of my findings are consistent with the hazard model results of Bharath and Dittmar (2010) and Mehran and Peristiani (2010). I summarize the signs and significance of each variable in my model alongside their main hazard model estimations in table 3.6 Panel A. For instance, firms with lower market-to-book ratios and lower share turnover have a higher hazard rate of going private, consistent with both studies. Both variables are statistically significant at the 1% level across all three of my samples. The market-to-book ratio is intended to capture the firm's growth prospects. One component of the public/private tradeoff is that firms require access to public markets to obtain financing for growth opportunities. When those growth opportunities dry up, the benefits of being a public firm decrease. A similar argument follows for share turnover. Another component of the public/private tradeoff is the benefit of a liquid market for the firm's shares. If the firm's shares are thinly traded, the firm is not realizing this benefit. Thus, I interpret these results as support for the tradeoff theories that low-growth and thinly traded firms will choose to go private due to a shift in the costs and benefits of being public.

I also find that firms with higher free cash flows have a higher risk of going

private, again consistent with both Bharath and Dittmar (2010) and Mehran and Peristiani (2010). Free cash flow is significant across all three samples, although only at the 10% level for the LBO sample. This result supports Jensen's (1986) free cash flow hypothesis, and highlights the influence of agency costs on the decision to go private. Firms with high free cash flows are expected to have higher agency costs, which can be eliminated by the incentive realignment that occurs when going private. I also find that firms with higher leverage have a higher risk of going private, consistent with Mehran and Peristiani (2010), although the leverage variable is insignificant in Bharath and Dittmar's (2010) estimation. While leverage is significant in the all going private firms model, when I split into the MBO and LBO subsamples, it only remains significant for MBO firms. Bharath and Dittmar's (2010) going private sample exhibits higher leverage at the time of the IPO than the control sample firms, and Mehran and Peristiani (2010) suggest that since going private firms remained closely held after going public, they had less proceeds from the IPO with which to retire debt, resulting in higher leverage ratios. Given the high insider ownership of my MBO sample relative to my LBO sample, my results appear to support this conjecture.

Some differences exist between my results and those of prior studies. For instance, I find that dividend-paying firms in all samples have a lower risk of going private, the opposite of Bharath and Dittmar's (2010) finding. They interpret their result as an indication that financially constrained firms are less likely to go private. My interpretation is that firms choose not to pay dividends with the knowledge that they may

go private at some future date. This allows them to conserve cash within the firm, either to help finance the going private transaction or to avoid sharing it with the outside shareholders. My size variable, log(Sales), is insignificant when all going private firms are considered together, but positive and significant at the 5% level when the LBO sample is considered separately. In addition, I find that firm size has a negative impact on the risk of an MBO (at the 10% level). Bharath and Dittmar (2010) also find that larger firms are at higher risk for going private, while Mehran and Peristiani (2010) find the opposite result. In this case, it may simply be that larger firms are more visible targets for private equity investors, while at the same time, the financing requirements for taking a large firm private make an MBO more difficult to execute without a private equity sponsor.

Firms with higher stock volatility have a lower risk of going private. This result is counterintuitive, since we would expect that high volatility firms will be more likely to go private, but it is consistent with the findings of Mehran and Peristiani (2010). This may be related to the result that many going private firms experience low share turnover. With less frequent trading of the firm's shares and less interest from investors, going private firms may experience fewer price changes. Finally, I find that the market-adjusted return, financing conditions, and the number of IPOs are all insignificant in my model, and thus my hazard model does not support the market timing and financing conditions hypotheses.

### 3.6.4 Competing Risks Regression Results

In my primary analysis, I estimate a competing risks regression. The competing risks regression allows us to estimate separate hazard rates for each type of exit. I distinguish between three different exit types: MBOs, LBOs, and other exits (for example, bankruptcy, liquidation, delisting, acquisition by another firm). I report the results in Table 3.7 for MBOs and LBOs (I leave the other exit results unreported).

[Insert Table 3.7 here]

The hazard ratios have the same interpretations as in a Cox model, but one of the advantages of the competing risks model is that we are now able to directly compare the size of the effects between transaction types. My going private sample of 320 firms is now compared with 2342 firms that leave the sample through a different type of exit, and 2126 firms that are still public at the end of the sample period (censored).

Many of my results are similar to those from the hazard model estimation. For example, a higher market-to-book ratio decreases the hazard rate of going private and this result is robust across both MBOs and LBOs. Now, however, we are able to determine that there is a much larger impact on the hazard rate of an MBO relative to that of an LBO, consistent with hypothesis H1A. If the market-to-book ratio falls from 1.5 to 1, the hazard rate of an MBO is 41% higher, while the hazard rate of an LBO is only 17% higher. While the hazard model results imply that the public/private tradeoff is a consideration for all going private firms, the competing risks model provides additional insight by showing that a lack of growth opportunities has a larger effect on the

likelihood of an MBO. This is consistent with my hypothesis that the owners of MBO firms are constantly evaluating the public/private tradeoff, and will thus take the firm private when the benefits of being public decline. A second comparison made possible by the competing risks regression is the difference in the effect of paying dividends on the hazard rates of MBOs and LBOs. As in the hazard model, dividend-paying firms have a lower hazard rate of going private, in the competing risks framework, the effect is larger for MBO firms, consistent with hypothesis H2B. A firm that pays dividends has a 66% lower hazard rate of an MBO, and a 30% lower hazard rate of an LBO. Again, I interpret this as a deliberate choice by owners to conserve funds in preparation for the possibility of taking the firm private.

The free cash flow variable provides another similarity between the two models. Free cash flow was significant and positive in all subsamples for the hazard model, although only marginally significant for LBO firms. Now, however, higher free cash flows increase the likelihood of an MBO, but have no effect on the hazard rate of an LBO, consistent with hypothesis H2B. I interpret this result as an indication that MBO firms maintain financial flexibility prior to going private. I again find that leverage is only significant for MBO firms, and firm size only significantly affects the hazard rate of LBO firms, contrary to hypothesis H2B.

There are also differences between the hazard model results and the competing risks regression results. For instance, financing conditions had no significant effect in the hazard model, but are significant for both MBO and LBO firms with competing risks. A

10 percentage point increase in the number of banks tightening their lending terms results in a 20% decrease in the risk of an LBO, but a 20% increase in the risk of an MBO. The effect on LBOs is consistent with my financing and debt market conditions hypothesis H4 that the likelihood of an LBO would be negatively affected by tighter lending standards, however, the MBO result is surprising. One possible explanation is that since private equity firms are more active when financing conditions are more favourable, MBO owners will avoid taking their firms private during these times, since there will be increased bidder competition coming from private equity firms, which will drive up the price of taking the firm private. Instead, they will go private when financing conditions are less favourable, since they will have fewer competing bids. The benefit of paying a lower price exceeds the extra cost of financing the transaction. A second difference is that hot IPO markets reduce the hazard rate of an LBO, but have no effect on the hazard rate of an MBO ( this variable was insignificant for all samples in the hazard model). This variable was meant to capture market timing by managers, but contrary to my expectations, it is a more important factor for LBOs relative to MBOs. It is possible that this is a result of private equity firms responding to poorly performing equity markets by acquiring cheaper targets.

**Section 3.7: Robustness Checks**

In this section, I consider a separate category of firms that go private and repeat my previous competing risks analysis as a robustness check. Not all firms that go private

fall into the categories of MBO or LBO. Some public firms are acquired by private operating firms, and they have been included in prior studies of firms that go private (Bharath and Dittmar (2010); Mehran and Peristiani (2010)). I label these firms as non-LBO/MBO firms, and I expect that these firms have motivations that are largely unrelated to those of MBO and LBO firms. As part of my robustness checks, I add this group of firms to my competing risk analysis. Figure 3.2 plots the annual number of each type of transaction over the sample period.

[Insert Figure 3.2 here]

Non-LBO/MBOs remain relatively constant over the entire sample period, averaging approximately 10 transactions per year. Unlike MBOs and LBOs, we do not see any large spikes or declines in the number of transactions. Table 3.8 reports the competing risks model with non-LBO/MBO firms included as a separate category.

[Insert Table 3.8 here]

There are some similarities with other firms that go private, as firms with higher market-to-book ratios, higher volatility, and those paying dividends are all less likely to be acquired in a non-LBO/MBO transaction. As for LBOs, the number of IPOs decreases the hazard rate of a non-LBO/MBO.

**Section 3.8: Summary and Conclusions**

This paper examines the interaction of control considerations, financing conditions and firm fundamental factors and their effect on MBO and LBO transactions. I

draw on the IPO literature, recent going private studies and the recent literature on LBO financing and test the relative importance of each of these factors by comparing a sample of going private firms with a control sample of firms that were public over the same time period. Consistent with recent studies, I find support for the hypothesis that going private firms suffer from a lack of financial visibility and investor recognition, and also experience a decline in growth opportunities prior to going private.

Most studies focus on LBOs to examine factors driving the surge in going private transactions in the last decade. My main contribution to the literature is to distinguish between LBOs and MBOs, as these transactions have different goals and motivations. I find that the major determinants of the going private decisions are significantly different between LBOs and MBOs. Tighter debt market conditions and increased financial visibility reduce the likelihood of LBOs relative to MBOs and other firms. More importantly, while LBOs come in waves, MBOs are little affected little by external factors such as financing and market conditions. Whereas the firm's growth opportunities is a common factor for both groups, it plays a stronger role for MBOs. My results support the notion that agency costs are more severe for MBOs than for LBOs.

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**Table 3.1**
**Summary of Hypotheses and Regression Variables**

| Hypothesis | Description | Regression Variable | Expected Sign |
|---|---|---|---|
| **H1A: Growth Opportunities** | Low growth opportunities will be a more important factor for MBOs relative to LBOs, all else equal. | Capex/Sales | - |
| | | Market-to-book | - |
| **H2A: Agency Costs** | Free cash flow to assets will be a more important factor in going private for MBOs relative to LBOs , all else equal. | Free cash flow/assets | + |
| **H2B: Financial Flexibility** | Financial flexibility will be a more important factor for MBOs relative to LBOs pre-buyout, all else equal. | Leverage | - |
| | | Dividend dummy | - |
| **H3: Market timing** | Market timing will be more important for firms going private via an MBO compared to an LBO, all else equal. | # of IPOs | - |
| | | Market-adjusted stock return | - |
| **H4: Financing conditions** | Financing and debt market conditions will be a more important determinant for LBOs relative to MBOs, all else equal. | Financing Conditions | - |

This table summarizes our hypotheses and our expectations for the variables used to test these hypotheses. Capex/Sales = the ratio of capital expenditures to net sales. Market-to-book = market-to-book value of equity. Free cash flow/assets = operating income before depreciation minus taxes and dividends, divided by total assets. Leverage = long-term debt divided by total assets. Dividend dummy = 1 if the firm paid a dividend during the fiscal year, and 0 otherwise. # of IPOs is the total number of IPOs in the previous calendar year. Market-adjusted stock return = firm's annualized stock return minus the CRSP equally-weighted index return (including dividends). Financing conditions is the net percentage of domestic banks tightening standards for commercial and industrial loans.

**Table 3.2 Panel A: Sample Comparisons**

| Year | Bartlett (2009) Going-private | Bartlett (2009) Still reporting | Bharath and Dittmar (2010) Going-private | Axelson et al. (2010) Public-to-private | My sample Total | MBO | LBO |
|---|---|---|---|---|---|---|---|
| 1998 | 33 | 29 | 35 | 18 | | | |
| 1999 | 47 | 22 | 54 | 32 | | | |
| 2000 | 61 | 17 | 54 | 21 | 29 | 14 | 15 |
| 2001 | 41 | 11 | 48 | 16 | 18 | 11 | 7 |
| 2002 | | | 36 | 10 | 18 | 11 | 7 |
| 2003 | 47 | 10 | 37 | 18 | 37 | 14 | 23 |
| 2004 | 35 | 12 | 11 | 17 | 19 | 3 | 16 |
| 2005 | 27 | 10 | | 25 | 27 | 1 | 26 |
| 2006 | 47 | 19 | | 38 | 43 | 4 | 39 |
| 2007 | | | | 42 | 37 | 2 | 35 |
| 2008 | | | | 11 | 14 | 2 | 12 |
| 2009 | | | | | 23 | 8 | 15 |
| 2010 | | | | | 36 | 1 | 35 |
| 2011 | | | | | 19 | 0 | 19 |
| Total | 338 | 130 | 275 (1023) | 248 (368) | 320 | 71 | 249 |

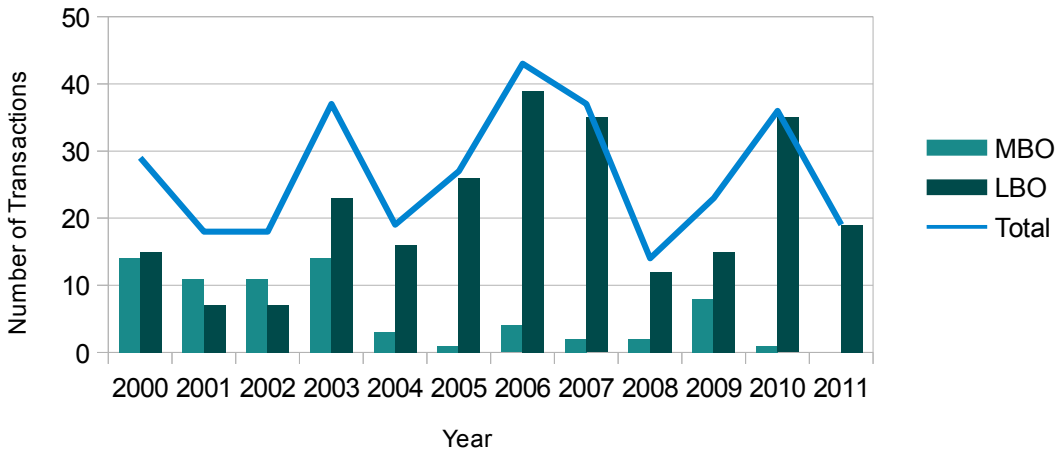
This table compares our sample of going-private firms with other recent studies. For ease of comparison, I limit the comparison period to 1998-2011 (Bharath and Dittmar (2010) and Axelson et al. (2010) both have samples beginning in 1980. I provide their full sample numbers in parentheses next to the sub-sample totals. Note that Bartlett (2009) differentiates between firms that go private and cease reporting to the SEC, and firms that go private but remain reporting companies). I define a management buyout (MBO) as a transaction in which the current owners/managers are the main acquiring party in the transaction. Transactions for which a private equity firm (or group of private equity firms) is the main acquiring party are labelled leveraged buyouts (LBOs). In the LBO category I include buyouts in which management participates but the majority of funds are provided by a private equity sponsor. The management stake in these buyouts is typically very small (managers end up owning less than 5% of the surviving firm).

**Table 3.2 Panel B: Industry distribution of going private and control samples**

| | LBO firms | | MBO firms | | Public Firms | |
|---|---|---|---|---|---|---|
| Variable | Observations | Percentage of total | Observations | Percentage of total | Observations | Percentage of total |
| Consumer nondurables | 14 | 5.62% | 3 | 4.23% | 237 | 5.08% |
| Consumer durables | 3 | 1.20% | 5 | 7.04% | 120 | 2.57% |
| Manufacturing | 16 | 6.43% | 5 | 7.04% | 385 | 8.25% |
| Energy | 5 | 2.01% | 1 | 1.41% | 207 | 4.43% |
| Chemicals | 4 | 1.61% | 1 | 1.41% | 96 | 2.06% |
| Business equipment | 63 | 25.30% | 13 | 18.31% | 1431 | 30.66% |
| Telecom | 7 | 2.81% | 3 | 4.23% | 209 | 4.48% |
| Utlilities | 0 | 0.00% | 0 | 0.00% | 0 | 0.00% |
| Shops | 59 | 23.69% | 19 | 26.76% | 518 | 11.10% |
| Healthcare | 28 | 11.24% | 3 | 4.23% | 723 | 15.49% |
| Money | 0 | 0.00% | 0 | 0.00% | 0 | 0.00% |
| Other | 50 | 20.08% | 18 | 25.35% | 740 | 15.85% |
| Total | 249 | | 71 | | 4666 | |

This table shows the industry distribution of the LBO and MBO going private samples, alongside the control sample of public firms

Figure 3.1: Going Private Transactions 2000-2011




This graph plots the annual number of going private transactions over the 2000-2011 sample period (solid line). The bars represent the total number of each type of transaction (MBO and LBO) per year. Data sources: CRSP; SEC EDGAR.

**Table 3.3 Panel A: Insider Ownership by transaction type**

| Years before | MBO | | | | LBO | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|
| private | Obs | Mean | Median | Std Dev | Obs | Mean | Median | Std Dev | Means | Medians |
| -1 | 71 | 51.00% | 53.00% | 18.31% | 249 | 21.53% | 15.00% | 19.54% | 0.00*** | 0.00*** |
| -2 | 71 | 49.34% | 51.00% | 19.63% | 247 | 22.01% | 14.00% | 19.83% | 0.00*** | 0.00*** |
| -3 | 69 | 49.07% | 52.00% | 19.83% | 238 | 22.87% | 16.00% | 20.01% | 0.00*** | 0.00*** |
| -4 | 63 | 48.84% | 54.00% | 19.77% | 216 | 22.35% | 16.00% | 19.39% | 0.00*** | 0.00*** |
| -5 | 53 | 49.42% | 53.00% | 20.94% | 201 | 23.35% | 16.00% | 19.89% | 0.00*** | 0.00*** |

This table shows the summary statistics for levels of insider ownership for the five years leading up to the going private transaction. Years before private indicates the number of years prior to the going private transaction. We calculate separate statistics from MBO and LBO firms. Differences reports P-values for tests of differences in means and medians between the two groups. ***, **, * indicate significance at the 1%, 5% and 10% levels respectively.

**Table 3.3 Panel B: Insider Ownership by transaction type**

| Years before | MBO | | | | LBO | | | |
|---|---|---|---|---|---|---|---|---|
| private | Obs | Min | Max | ≥ 50% | Obs | Min | Max | ≥ 50% |
| -1 | 71 | 10.00% | 91.00% | 52.11% | 249 | 1.00% | 88.00% | 11.65% |
| -2 | 71 | 7.00% | 88.00% | 53.52% | 247 | 1.00% | 91.00% | 12.55% |
| -3 | 69 | 9.00% | 89.00% | 52.17% | 238 | 1.00% | 91.00% | 13.45% |
| -4 | 63 | 7.00% | 87.00% | 55.56% | 216 | 1.00% | 91.00% | 11.11% |
| -5 | 53 | 6.00% | 87.00% | 56.60% | 201 | 1.00% | 91.00% | 14.93% |

This table shows additional summary statistics for levels of insider ownership for the five years leading up to the going private transaction. Years before private indicates the number of years prior to the going private transaction. We calculate separate statistics from MBO and LBO firms. ≥ 50% indicates the percentage of MBO/LBO firms whose insider ownership is greater than or equal to 50% of the firm's equity.

**Table 3.4 Panel A**

**Comparison of going private firms with the control sample**

| Variable | Going-private sample | | | | | Control Sample | | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Std. Dev. | Min | Max | Mean | Median | Std. Dev. | Min | Max | Means | Medians |
| **Financial Flexibility** | | | | | | | | | | | | |
| Cash/Assets | 0.17 | 0.085 | 0.20 | 0.00 | 1.00 | 0.25 | 0.16 | 0.26 | 0.00 | 1.00 | 0.00*** | 0.00*** |
| Leverage | 0.20 | 0.14 | 0.24 | 0.00 | 2.31 | 0.16 | 0.06 | 0.23 | 0.00 | 4.39 | 0.00*** | 0.00*** |
| Dividend dummy | 0.23 | 0.00 | 0.42 | 0.00 | 1.00 | 0.26 | 0.00 | 0.44 | 0.00 | 1.00 | 0.00*** | 0.00*** |
| **Undervaluation** | | | | | | | | | | | | |
| Market-adjusted return | -6.63% | -6.08% | 68.76% | -135.06% | 988.81% | -1.17% | -3.28% | 89.61% | -162.62% | 3313.27% | 0.01*** | 0.00*** |
| **Financial Visibility and Investor Recognition** | | | | | | | | | | | | |
| Assets | 946.49 | 264.21 | 2575.41 | 6.36 | 34250.81 | 1300.17 | 196.45 | 6856.56 | 0.05 | 262170.5 | 0.03** | 0.00*** |
| Sales | 855.70 | 304.69 | 1921.97 | 0.00 | 24456.65 | 1165.19 | 164.63 | 4984.93 | -6.81 | 114218.1 | 0.01*** | 0.00*** |
| Market Value | 938.47 | 205.40 | 2736.95 | 0.07 | 35340.48 | 1646.20 | 235.70 | 10260.90 | 0.72 | 533273.00 | 0.00*** | 0.01*** |
| Common shareholders | 21.66 | 0.87 | 611.61 | 0.00 | 26342.63 | 32.61 | 0.76 | 2935.13 | 0.00 | 484157.90 | 0.87 | 0.69 |
| Turnover | 6.27 | 3.79 | 8.58 | 0.00 | 105.57 | 8.30 | 4.70 | 19.59 | 0.00 | 2016.72 | 0.00*** | 0.00*** |
| Volatility | 0.04 | 0.04 | 0.02 | 0.01 | 0.16 | 0.05 | 0.04 | 0.02 | 0.00 | 0.28 | 0.00*** | 0.00*** |
| AMEX | 0.08 | 0.00 | 0.28 | 0.00 | 1.00 | 0.08 | 0.00 | 0.28 | 0.00 | 1.00 | 0.90 | 0.90 |
| NYSE | 0.25 | 0.00 | 0.43 | 0.00 | 1.00 | 0.22 | 0.00 | 0.42 | 0.000 | 1.000 | 0.03** | 0.03** |
| **Growth opportunities and access to capital** | | | | | | | | | | | | |
| Capex/Sales | 0.08 | 0.03 | 0.24 | 0.00 | 5.10 | 1.16 | 0.04 | 63.41 | 0.00 | 7826.20 | 0.46 | 0.00*** |
| Market-to-Book | 1.71 | 1.34 | 1.54 | 0.26 | 36.90 | 2.46 | 1.62 | 7.48 | 0.23 | 982.84 | 0.00*** | 0.00*** |
| **Free Cash Flow** | | | | | | | | | | | | |
| Free cash flow/assets | 0.08 | 0.10 | 0.15 | -1.91 | 0.67 | -0.03 | 0.07 | 0.89 | -134.29 | 1.70 | 0.00*** | 0.00*** |
| Firm-year observations | 2062 | | | | | 29461 | | | | | | |

This table compares all firm-year observations for the going-private firms with all firm-year observations for the control sample of public firms over the 2000-2011 sample period. All financial variables are adjusted for inflation using the GDP deflator (base year = 2005). Cash/Assets = Cash & Equivalents/Total Assets. Leverage = long-term debt divided by total assets. Dividend dummy = 1 if the firm paid a dividend during the fiscal year, and 0 otherwise. Market-adjusted stock return = firm's annualized stock return minus the CRSP equally-weighted index return (including dividends). Assets = total assets ($ millions). Sales = net sales ($ millions). Market value = market value of equity ($ millions). Common shareholders the total number of common shareholders (thousands). Turnover = average daily share turnover, divided by the number of shares outstanding. Volatility = the standard deviation of the firm's stock return over the year. AMEX = 1 if the firm is listed on the AMEX, and 0 otherwise. NYSE = 1 if the firm is listed on the NYSE, and 0 otherwise. Capex/Sales = the ratio of capital expenditures to net sales. Market-to-book = market-to-book value of equity. Taxes/sales = total taxes paid divided by net sales. Free cash flow to assets = operating income before depreciation minus taxes and dividends, divided by total assets. Differences reports P-values for tests of differences in means and medians. ***, **, * indicate significance at the 1%, 5% and 10% levels respectively.

**Table 3.4 Panel B**
**Comparison of MBO firms and LBO firms in the year before going private**

| | MBOs | | | | | LBOs | | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Mean | Median | Std. Dev. | Min | Max | Mean | Median | Std. Dev. | Min | Max | | |
| **Financial Flexibility** | | | | | | | | | | | | |
| Cash/Assets | 0.15 | 0.06 | 0.21 | 0.00 | 0.90 | 0.18 | 0.11 | 0.20 | 0.00 | 0.92 | 0.42 | 0.06* |
| Leverage | 0.22 | 0.18 | 0.22 | 0.00 | 0.93 | 0.19 | 0.11 | 0.23 | 0.00 | 1.03 | 0.39 | 0.15 |
| Dividend dummy | 0.09 | 0.00 | 0.29 | 0.00 | 1.00 | 0.22 | 0.00 | 0.42 | 0.00 | 1.00 | 0.01** | 0.01** |
| **Undervaluation** | | | | | | | | | | | | |
| Market-adjusted return | -37.01% | -39.52% | 46.05% | -159.24% | 69.95% | -23.72% | -15.57% | 53.09% | -341.45% | 107.61% | 0.00*** | 0.00*** |
| **Financial Visibility and Investor Recognition** | | | | | | | | | | | | |
| Assets | 392.23 | 72.39 | 847.96 | 6.36 | 3895.34 | 1086.27 | 315.14 | 3104.29 | 11.50 | 33383.02 | 0.06* | 0.00*** |
| Sales | 307.13 | 105.28 | 482.73 | 4.57 | 3073.57 | 991.04 | 312.07 | 2219.54 | 7.05 | 24456.65 | 0.01*** | 0.00*** |
| Market Value | 170.72 | 27.60 | 554.99 | 2.92 | 4165.65 | 953.20 | 239.47 | 2395.18 | 3.92 | 21085.83 | 0.00*** | 0.00*** |
| Common shareholders | 1.20 | 0.60 | 1.95 | 0.01 | 13.50 | 7.52 | 0.73 | 65.90 | 0.00 | 1035.89 | 0.49 | 0.00*** |
| Turnover | 3.70 | 1.59 | 6.69 | 0.00 | 40.50 | 6.13 | 3.99 | 8.93 | 0.00 | 105.57 | 0.00*** | 0.00*** |
| Volatility | 0.05 | 0.05 | 0.02 | 0.02 | 0.12 | 0.03 | 0.03 | 0.02 | 0.01 | 0.12 | 0.00*** | 0.00*** |
| AMEX | 0.11 | 0.00 | 0.31 | 0.00 | 1.00 | 0.08 | 0.00 | 0.27 | 0.00 | 1.00 | 0.53 | 0.52 |
| NYSE | 0.09 | 0.00 | 0.29 | 0.00 | 1.00 | 0.27 | 0.00 | 0.44 | 0.00 | 1.00 | 0.00*** | 0.00*** |
| **Growth opportunities and access to capital** | | | | | | | | | | | | |
| Capex/Sales | 0.06 | 0.03 | 0.11 | 0.00 | 0.70 | 0.06 | 0.03 | 0.15 | 0.00 | 1.32 | 0.69 | 0.41 |
| Market-to-Book | 1.04 | 0.92 | 0.49 | 0.48 | 3.71 | 1.51 | 1.29 | 0.74 | 0.52 | 7.12 | 0.00*** | 0.00*** |
| **Free Cash Flow** | | | | | | | | | | | | |
| Free cash flow/assets | 0.07 | 0.08 | 0.11 | -0.28 | 0.30 | 0.07 | 0.10 | 0.19 | -1.91 | 0.45 | 0.97 | 0.29 |
| Observations | 71 | | | | | 249 | | | | | | |

This table compares MBO firms with LBO firms in the year before going-private over the 2000-2011 sample period. All financial variables are adjusted for inflation using the GDP deflator (base year = 2005). Cash/Assets = Cash & Equivalents/Total Assets. Leverage = long-term debt divided by total assets. Dividend dummy = 1 if the firm paid a dividend during the fiscal year, and 0 otherwise. Market-adjusted stock return = firm's annualized stock return minus the CRSP equally-weighted index return (including dividends). Assets = total assets ($ millions). Sales = net sales ($ millions). Market value = market value of equity ($ millions). Common shareholders the total number of common shareholders (thousands). Turnover = average daily share turnover, divided by the number of shares outstanding. Volatility = the standard deviation of the firm's stock return over the year. AMEX = 1 if the firm is listed on the AMEX, and 0 otherwise. NYSE = 1 if the firm is listed on the NYSE, and 0 otherwise. Capex/Sales = the ratio of capital expenditures to net sales. Market-to-book = market-to-book value of equity. Taxes/sales = total taxes paid divided by net sales. Free cash flow to assets = operating income before depreciation minus taxes and dividends, divided by total assets. Differences reports P-values for tests of differences in means and medians. ***, **, * indicate significance at the 1%, 5% and 10% levels respectively.

**Table 3.5 Panel A**
**Logit model results**

| Independent variable | Coefficient | P-value |
|---|---|---|
| ln(sales) | 0.141*** | 0.000 |
| Capex/Sales | -0.352** | 0.012 |
| Taxes/sales | -0.137 | 0.569 |
| Market-to-book | -0.136*** | 0.000 |
| Leverage | 0.235** | 0.047 |
| Free cash flow/assets | 1.866*** | 0.000 |
| NYSE | -0.316*** | 0.000 |
| AMEX | 0.122 | 0.208 |
| Turnover | -0.028*** | 0.000 |
| Volatility | -0.002 | 0.166 |
| Market-adjusted Return | -0.072* | 0.067 |
| Common Shareholders | 0.000 | 0.901 |
| Dividend dummy | -0.292*** | 0.000 |
| Constant | -2.64*** | 0.000 |
| | | |
| Firm-year observations | 29195 | |
| Pseudo R-squared | 0.0652 | |

This table reports the logit model results comparing going-private firms with the control sample. The dependent variable is a dummy variable that equals 1 if the firm goes private, and 0 otherwise. ln(sales) = ln(net sales) ($ millions). Capex/Sales = the ratio of capital expenditures to net sales. Taxes/sales = total taxes paid divided by net sales. Market-to-book = market-to-book value of equity. Leverage = long-term debt divided by total assets. Free cash flow/assets = operating income before depreciation minus taxes and dividends, divided by total assets. NYSE = 1 if the firm is listed on the NYSE, and 0 otherwise. AMEX = 1 if the firm is listed on the AMEX, and 0 otherwise. Turnover = average daily share turnover, divided by the number of shares outstanding. Volatility = the standard deviation of the firm's stock return over the year, scaled by 1000. Market-adjusted stock return = firm's annualized stock return minus the CRSP equally-weighted index return (including dividends). Common shareholders the total number of common shareholders (thousands). Dividend dummy = 1 if the firm paid a dividend during the fiscal year, and 0 otherwise. Year dummies are included. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 3.5 Panel B**
**Multinomial Logit model results**

| | MBO vs. Control | | LBO vs. Control | |
|---|---|---|---|---|
| Independent variable | Coefficient | P-value | Coefficient | P-value |
| ln(sales) | 0.072 | 0.184 | 0.155*** | 0.000 |
| Capex/Sales | -0.216 | 0.436 | -0.369** | 0.019 |
| Taxes/sales | -0.161 | 0.605 | -0.108 | 0.728 |
| Market-to-book | -0.485*** | 0.000 | -0.096*** | 0.000 |
| Leverage | 0.868*** | 0.001 | 0.108 | 0.409 |
| Free cash flow/assets | 1.968*** | 0.000 | 1.758*** | 0.000 |
| NYSE | -0.636*** | 0.002 | -0.266*** | 0.000 |
| AMEX | 0.064 | 0.744 | 0.106 | 0.331 |
| Turnover | -0.079*** | 0.000 | -0.021*** | 0.000 |
| Volatility | 0.006** | 0.033 | -0.005*** | 0.004 |
| Market-adjusted Return | -0.115 | 0.248 | -0.056 | 0.189 |
| Common Shareholders | -0.063*** | 0.007 | 0.000 | 0.929 |
| Dividend dummy | -0.566*** | 0.001 | -0.253*** | 0.000 |
| Constant | -3.249*** | 0.000 | -2.952*** | 0.000 |
| | | | | |
| Observations | 29195 | | | |
| Pseudo R-squared | 0.07 | | | |

This table reports the multinomial logit model results where the dependent variable has three categories: control, MBO, and LBO. The dependent variable in column (1) is the log-odds ratio of the probability of going-private through an MBO vs. staying public. The dependent variable in column (3) is the log-odds ratio of the probability of going-private through an LBO vs. staying public. ln(sales) = ln(net sales) ($ millions). Capex/Sales = the ratio of capital expenditures to net sales. Taxes/sales = total taxes paid divided by net sales. Market-to-book = market-to-book value of equity. Leverage = long-term debt divided by total assets. Free cash flow/assets = operating income before depreciation minus taxes and dividends, divided by total assets. NYSE = 1 if the firm is listed on the NYSE, and 0 otherwise. AMEX = 1 if the firm is listed on the AMEX, and 0 otherwise. Turnover = average daily share turnover, divided by the number of shares outstanding. Volatility = the standard deviation of the firm's stock return over the year, scaled by 1000. Market-adjusted stock return = firm's annualized stock return minus the CRSP equally-weighted index return (including dividends). Common shareholders the total number of common shareholders (thousands). Dividend dummy = 1 if the firm paid a dividend during the fiscal year, and 0 otherwise. Year dummies are included. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 3.6 Panel A**
**Hazard Model**

| | All Going-Private firms | | | MBO firms | | | LBO firms | | |
|---|---|---|---|---|---|---|---|---|---|
| Independent Variable | Coef. | Hazard Ratio | P-value | Coef. | Hazard Ratio | P-value | Coef. | Hazard Ratio | P-value |
| ln(sales) | 0.063 | 1.065 | 0.204 | -0.187* | 0.829 | 0.088 | 0.123** | 1.131 | 0.025 |
| Capex/Sales | -0.607 | 0.545 | 0.139 | -1.002 | 0.367 | 0.298 | -0.530 | 0.589 | 0.246 |
| Taxes/sales | -0.006 | 0.994 | 0.990 | -0.274 | 0.761 | 0.618 | 0.061 | 1.063 | 0.858 |
| Market-to-book | -0.599*** | 0.549 | 0.000 | -1.974*** | 0.139 | 0.000 | -0.411*** | 0.663 | 0.000 |
| Leverage | 0.527* | 1.694 | 0.055 | 1.394** | 4.032 | 0.028 | 0.410 | 1.507 | 0.185 |
| Free cash flow/assets | 1.539*** | 4.662 | 0.004 | 2.171** | 8.765 | 0.039 | 1.164* | 3.204 | 0.065 |
| NYSE | -0.394** | 0.674 | 0.016 | -0.643 | 0.525 | 0.147 | -0.357** | 0.700 | 0.044 |
| AMEX | 0.060 | 1.062 | 0.772 | -0.247 | 0.781 | 0.530 | 0.153 | 1.166 | 0.534 |
| Turnover | -0.056*** | 0.945 | 0.000 | -0.123*** | 0.884 | 0.012 | -0.048*** | 0.954 | 0.001 |
| Volatility | -0.012*** | 0.988 | 0.004 | -0.007 | 0.993 | 0.298 | -0.018*** | 0.982 | 0.001 |
| Market-adjusted Return | -0.247* | 0.781 | 0.083 | -0.230 | 0.795 | 0.395 | -0.238 | 0.789 | 0.168 |
| Common Shareholders | 0.000 | 1.000 | 0.849 | -0.066 | 0.936 | 0.289 | 0.000 | 1.000 | 0.761 |
| Dividend dummy | -0.511*** | 0.600 | 0.001 | -1.220*** | 0.295 | 0.010 | -0.427** | 0.653 | 0.011 |
| Financing conditions | -0.002 | 0.998 | 0.854 | -0.003 | 0.997 | 0.919 | 0.001 | 1.001 | 0.924 |
| # of IPOs | 0.002 | 1.002 | 0.444 | 0.002 | 1.002 | 0.632 | 0.003 | 1.003 | 0.475 |
| | | | | | | | | | |
| Firms Going Private | 320 | | | 71 | | | 249 | | |
| Control Firms | 4487 | | | 4487 | | | 4487 | | |

This table reports the results of Cox proportional hazard models with failure defined as going private. Results are presented for the full going private sample against the control sample, the sample of MBO firms against the control sample, and the sample of LBO firms against the control sample. The analysis time is the number of years since the firm started public trading. The control sample includes all surviving firms along with firms that left the sample through a merger, negative delisting, or liquidation. Ln(sales) = ln(net sales) ($ millions). Capex/Sales = the ratio of capital expenditures to net sales. Taxes/sales = total taxes paid divided by net sales. Market-to-book = market-to-book value of equity. Leverage = long-term debt divided by total assets. Free cash flow/assets = operating income before depreciation minus taxes, dividends and interest, divided by total assets. NYSE = 1 if the firm is listed on the NYSE, and 0 otherwise. AMEX = 1 if the firm is listed on the AMEX, and 0 otherwise. Turnover = average daily share turnover, divided by the number of shares outstanding. Volatility = the standard deviation of the firm's stock return over the year, scaled by 1000. Market-adjusted stock return = firm's annualized stock return minus the CRSP equally-weighted index return (including dividends). Common shareholders the total number of common shareholders (thousands). Dividend dummy = 1 if the firm paid a dividend during the fiscal year, and 0 otherwise. Financing conditions is the net percentage of domestic banks tightening standards for commercial and industrial loans. # of IPOs is the total number of IPOs in the previous calendar year. Year dummies are included. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 3.6 Panel B**
**Hazard model comparisons**

| Independent Variable | Bharath and Dittmar (2010) | Mehran and Peristiani (2010) | Ng (2014) |
|---|---|---|---|
| Market-to-book | negative | negative | negative |
| Free cash/assets | positive | positive | positive |
| Turnover | negative | negative | negative |
| Capex/Sales | insignificant | insignificant | insignificant |
| leverage | insignificant | positive | positive |
| log(sales) | positive | negative | insignificant |
| Market-adjusted return | insignificant | insignificant | negative |
| Dividend dummy | positive | | negative |
| Number of IPOs | negative | | insignificant |
| NYSE dummy | | negative | negative |
| AMEX dummy | | insignificant | insignificant |
| Taxes/Sales | | insignificant | insignificant |
| Stock volatility | | negative | negative |
| Financing conditions | | | insignificant |
| number of shareholders | | | insignificant |
| analyst coverage | negative | negative | |
| R&D/sales | insignificant | insignificant | |
| merger count | negative | negative | |
| institutional ownership | negative | negative | |
| cash/assets | positive | | |
| net fixed assets/assets | insignificant | | |
| KZ index (financial constraint) | negative | | |
| Illiquidity | insignificant | | |
| SEO dummy | | negative | |

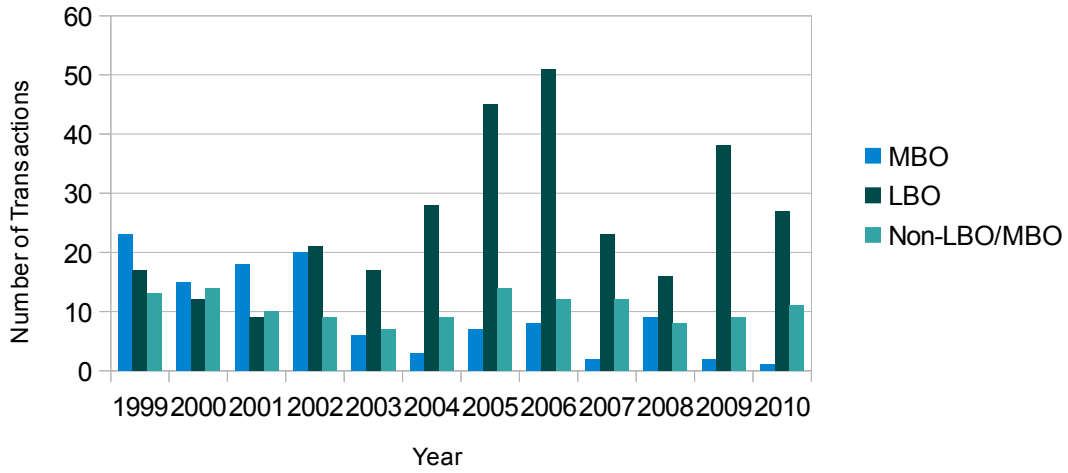
This table compares the signs and significance of the coefficients on the independent variables for the main estimated hazard model of our study with those of Bharath and Dittmar (2010) and Mehran and Peristiani (2010). Column entries are: negative, for when a unit change in the independent variable reduces the risk of going private; positive, for when a unit change in the independent variable increases the risk of going private; and insignificant, when the coefficient is not statistically different from zero. Blank entries indicate that the variable was not included in the model specification. Please see Table 6A for our variable definitions, and Bharath and Dittmar (2010) and Mehran and Peristiani (2010) for their respective variable definitions.

**Table 3.7**
**Competing Risks Model**

| | MBO firms | | | LBO firms | | |
|---|---|---|---|---|---|---|
| Independent Variable | Coef. | Hazard Ratio | P-value | Coef. | Hazard Ratio | P-value |
| ln(sales) | -0.123 | 0.884 | 0.180 | 0.160*** | 1.174 | 0.000 |
| Capex/Sales | -0.634 | 0.530 | 0.255 | -0.454 | 0.635 | 0.277 |
| Taxes/sales | -0.145 | 0.865 | 0.403 | 0.125* | 1.133 | 0.066 |
| Market-to-book | -1.720*** | 0.179 | 0.000 | -0.398*** | 0.671 | 0.000 |
| Leverage | 1.236** | 3.441 | 0.018 | 0.204 | 1.227 | 0.486 |
| Free cash flow/assets | 2.092*** | 8.103 | 0.009 | 1.126 | 3.082 | 0.236 |
| NYSE | -0.522 | 0.593 | 0.243 | -0.123 | 0.884 | 0.505 |
| AMEX | -0.293 | 0.746 | 0.495 | 0.386 | 1.470 | 0.110 |
| Turnover | -0.041 | 0.960 | 0.291 | -0.003 | 0.997 | 0.633 |
| Volatility | -0.019*** | 0.981 | 0.000 | -0.027*** | 0.973 | 0.000 |
| Market-adjusted Return | 0.348 | 1.417 | 0.167 | 0.235 | 1.265 | 0.198 |
| Common Shareholders | -0.081 | 0.922 | 0.185 | 0.000 | 1.000 | 0.827 |
| Dividend dummy | -1.068** | 0.344 | 0.018 | -0.355** | 0.701 | 0.042 |
| Financing Conditions | 0.021*** | 1.022 | 0.003 | -0.019*** | 0.981 | 0.000 |
| # of IPOs | 0.001 | 1.001 | 0.531 | -0.005*** | 0.995 | 0.000 |
| | | | | | | |
| Firms Going Private | 320 | | | | | |
| Competing Failures | 2342 | | | | | |
| Censored | 2126 | | | | | |

This table reports the results of a competing risks regression according to the method of Lunn and McNeil (1995). The different failure events are MBO, LBO, and competing failure (i.e. bankruptcy, delisting etc.). Censored observations are public firms that survive until the end of the sample period. The analysis time is the number of years since the firm started public trading. The control sample includes all surviving firms. Ln(sales) = ln(net sales) ($ millions). Capex/Sales = the ratio of capital expenditures to net sales. Taxes/sales = total taxes paid divided by net sales. Market-to-book = market-to-book value of equity. Leverage = long-term debt divided by total assets. Free cash flow/assets = operating income before depreciation minus taxes, dividends and interest, divided by total assets. NYSE = 1 if the firm is listed on the NYSE, and 0 otherwise. AMEX = 1 if the firm is listed on the AMEX, and 0 otherwise. Turnover = average daily share turnover, divided by the number of shares outstanding. Volatility = the standard deviation of the firm's stock return over the year, scaled by 1000. Market-adjusted stock return = firm's annualized stock return minus the CRSP equally-weighted index return (including dividends). Common shareholders the total number of common shareholders (thousands). Dividend dummy = 1 if the firm paid a dividend during the fiscal year, and 0 otherwise. Financing conditions is the net percentage of domestic banks tightening standards for commercial and industrial loans. # of IPOs is the total number of IPOs in the previous calendar year. Year dummies are included. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

Figure 3.2: MBOs, LBOs and non-LBO/MBOs by year




This graph plots the annual number of each type of going-private transaction (MBO, LBO, and non-LBO/MBO) over the 2000-2011 sample period. Data sources: CRSP; SEC EDGAR.

**Table 3.8**
**Competing Risks Model including non-LBO/MBO Firms**

| | MBO firms | | LBO firms | | Non-LBO/MBO Firms | |
|---|---|---|---|---|---|---|
| Independent Variable | Hazard Ratio | P-value | Hazard Ratio | P-value | Hazard Ratio | P-Value |
| ln(sales) | 0.943 | 0.500 | 1.204*** | 0.000 | 0.925 | 0.227 |
| Capex/Sales | 0.506 | 0.214 | 0.664 | 0.325 | 0.673 | 0.374 |
| Taxes/sales | 0.832 | 0.298 | 1.150** | 0.039 | 0.972 | 0.783 |
| Market-to-book | 0.193*** | 0.000 | 0.702*** | 0.000 | 0.608*** | 0.003 |
| Leverage | 2.778* | 0.072 | 1.161 | 0.600 | 0.955 | 0.937 |
| Free cash flow/assets | 6.428** | 0.031 | 2.908 | 0.263 | 1.882 | 0.359 |
| NYSE | 0.698 | 0.397 | 0.888 | 0.521 | 0.792 | 0.436 |
| AMEX | 0.859 | 0.695 | 1.290 | 0.291 | 0.393** | 0.041 |
| Turnover | 0.883** | 0.032 | 0.966** | 0.047 | 0.968 | 0.323 |
| Volatility | 0.983*** | 0.000 | 0.973*** | 0.000 | 0.979*** | 0.000 |
| Market-adjusted Return | 1.334 | 0.309 | 1.276 | 0.186 | 0.658* | 0.095 |
| Common Shareholders | 0.933 | 0.219 | 1.000 | 0.825 | 0.974 | 0.211 |
| Dividend dummy | 0.297*** | 0.008 | 0.710** | 0.042 | 0.563** | 0.045 |
| Financing Conditions | 1.021*** | 0.001 | 0.987*** | 0.000 | 1.001 | 0.810 |
| # of IPOs | 1.000 | 0.749 | 0.995*** | 0.000 | 0.998** | 0.047 |
| | | | | | | |
| Firms Going Private | 448 | | | | | |
| Competing Failures | 2140 | | | | | |
| Censored | 2200 | | | | | |
| Firm-year observations | 29195 | | | | | |

This table reports the results of a competing risks regression according to the method of Lunn and McNeil (1995). The different failure events are MBO, LBO, non-LBO/MBO, and competing failure (i.e. bankruptcy, delisting etc.). The analysis time is the number of years since the firm started public trading. The control sample includes all surviving firms. Ln(sales) = ln(net sales) ($ millions). Capex/Sales = the ratio of capital expenditures to net sales. Taxes/sales = total taxes paid divided by net sales. Market-to-book = market-to-book value of equity. Leverage = long-term debt divided by total assets. Free cash flow/assets = operating income before depreciation minus taxes, dividends and interest, divided by total assets. NYSE = 1 if the firm is listed on the NYSE, and 0 otherwise. AMEX = 1 if the firm is listed on the AMEX, and 0 otherwise. Turnover = average daily share turnover, divided by the number of shares outstanding. Volatility = the standard deviation of the firm's stock return over the year, scaled by 1000. Market-adjusted stock return = firm's annualized stock return minus the CRSP equally-weighted index return (including dividends). Common shareholders the total number of common shareholders (thousands). Dividend dummy = 1 if the firm paid a dividend during the fiscal year, and 0 otherwise. Financing conditions is the net percentage of domestic banks tightening standards for commercial and industrial loans. # of IPOs is the total number of IPOs in the previous calendar year. Year dummies are included. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

# CHAPTER 4

# DOES OWNERSHIP STRUCTURE AFFECT THE DETERMINANTS OF PREMIUMS IN MBO AND LBO TRANSACTIONS?

## Section 4.1: Introduction

A number of US and UK studies have examined premiums paid and shareholder gains in going-private transactions, providing insight into their determinants. Factors that have been found to affect premium size include undervaluation, tax benefits from increased leverage, and the level of managerial ownership. As noted in Chapters 2 and 3, going private studies will typically put LBOs and MBOs in one category, despite the significant differences between these two transaction types. Some studies correct for this by including dummy variables in the premiums regressions to control for the transaction type, but this method fails to address the fundamental issue of selection bias. I argue in chapter 2 that the desire to maintain decision-making control is a key factor separating MBOs and LBOs. While some studies have found that the level of managerial ownership affects the transaction premium (DeAngelo, DeAngelo and Rice (1984); Lehn and Poulsen (1989); Lee et al. (1992); Halpern, Kieschnick and Rotenberg (1999); Renneboog, Simons and Wright (2007)), others have found that the level of managerial ownership also influences the choice of transaction type (Maupin et al. (1984); Maupin (1987); Weir, Laing and Wright (2005a); Fidrmuc et al. (2013). Prior studies estimating the determinants of the premiums for going-private firms have found differences between MBOs and LBOs, and also attribute some of the variation in premiums to levels of managerial ownership and undervaluation. A major factor in my analysis is that current

management can choose whether they would like to acquire complete control of the firm, or whether they would like to invite private equity participation. I argue that managers who place a high value on control of the firm will be more likely to choose an MBO, and at the same time will use their controlling position to pay a lower premium for the firm. Managers who do not place a high value on control of the firm will be more likely to choose an LBO, and the premium paid will be higher.

I control for self-selection using a two-stage switching regressions model with endogenous switching (Maddala, 1983). The first-stage probit model shows that ownership is the main determinant of the selection of transaction type. As ownership levels increase, the likelihood of choosing an MBO increases substantially. For example, as insider holdings increase from 10% to 50% of the firm's equity, the likelihood of an MBO increases from 6% to 35%, holding all other explanatory variables at their means. Importantly, ownership by itself explains 29% of the probability of selecting an MBO. I interpret this as an indication that the choice of an MBO rather than an LBO transaction is driven by the desire to maintain decision-making control. I include several financial characteristics in the analysis. I find that firms with higher market-to-book ratios are more likely to select an LBO, as are firms with lower leverage. The second-stage model shows that the determinants of MBO and LBO premiums are substantially different. The level of insider ownership has a large negative effect on MBO premiums, but no effect on LBO premiums. A 10% increase in insider ownership reduces MBO premiums by 16-18 percentage points. LBO premiums are impacted by the firm's performance, as measured

by return on assets, as well as IPO market conditions, measured by the number of IPOs over the last quarter. If a firm's ROA is 10 percentage points higher, the premium is approximately 3-5 percentage points lower, while at the mean level of 49 IPOs in the last quarter, the effect is to lower premiums by approximately 29 percentage points. Neither of these variables has an effect on MBO premiums. Finally, an increase in the interest rate spread of high-yield debt over LIBOR leads to lower LBO offer premiums, but does not affect MBO offer premiums. My main conclusion is that the determinants of MBO and LBO premiums are significantly different.

The rest of the chapter is organized as follows. The next section reviews the literature and develops testable hypotheses for MBO and LBO premiums. Section 4.3 outlines my sample and data, section 4.4 conducts a univariate analysis, and section 4.5 goes through the methodology used in the main analysis. In section 4.6 I present empirical results, while section 4.7 goes through robustness checks. Section 4.8 summarizes and concludes the chapter.

**Section 4.2: Related literature and hypotheses**

In this section, I first review the theoretical literature on the main determinants of premiums paid in going private transactions and summarize the main evidence on these determinants. Then, I discuss the impact of decision-making control on offer premiums, and develop testable hypotheses. I divide the determinants of going private into four categories: 1) ownership; 2) undervaluation; 3) financing conditions; and 4) financial

flexibility. I summarize the related literature on premiums paid in going private transactions and their determinants in Table 4.1.

[Insert Table 4.1 here]

### 4.2.1 Related Literature

#### 4.2.1.1 US studies

Early US studies of public-to-private transactions concentrated on whether shareholders earned significant abnormal returns as a result of the transaction (DeAngelo et al. (1984); Torabzadeh and Bertin (1989)), while later studies examined the determinants of offer premiums. For instance, Lehn and Poulsen (1989) test Jensen's (1986) free cash flow hypothesis, that firms with large undistributed free cash flows will have larger conflicts between managers and shareholders, investigating this and other sources of shareholder gains. They find that free cash flow significantly affects premiums for firms with low levels of insider ownership. However, the literature is not unanimous in its support for the free cash flow hypothesis. In particular, Kieschnick (1998) reexamines Lehn and Poulsen's (1989) methodology, and, using the same sample, finds instead that free cash flow has an insignificant effect on premiums, and instead, firm size and the firm's potential for reducing taxes are the main determinants of transaction premiums. A number of other factors have been found to affect offer premiums, including tax benefits (Kaplan (1989)), agency costs (Travlos and Cornett (1993)) the presence of independent directors on the board (Lee et al. (1992); Cain and Davidoff (2011)) and

bidder competition (Easterwood et al. (1994)). Finally, Halpern et al. (1999) find that premiums are related to both undervaluation and managerial ownership. Undervalued firms with either very low or very high managerial ownership pay higher premiums to take the firm private, highlighting the importance of managerial ownership in determining transaction premiums.

#### 4.2.1.2 UK studies

Several UK studies examine both the likelihood of going private and the offer premiums. Higher levels of managerial ownership and a higher degree of undervaluation are found to increase the likelihood of going private (Weir et al. (2005a, 2005b)), and these factors are more important for MBO firms, as is the degree of financial constraint (Fidrmuc et al. (2013)). The UK evidence on offer premiums supports that found in prior US studies, as Renneboog et al. (2007) find that the main determinants of offer premiums are undervaluation and tax benefits, and that firms with low managerial ownership have higher premiums. My paper differs from these UK studies in several important ways. Both Renneboog et al. (2007) and Fidrmuc et al. (2013), the papers closest to my study, use UK samples from 1997-2003, whereas my US sample, from 2000-2011, includes significant events such as Sarbanes-Oxley, the LBO boom, and the financial crisis. While Fidrmuc et al. (2013) argue that the main driver of the choice between an MBO and LBO is financial constraint, I argue that control is the most important factor, and the desire to maintain/gain control of the firm will also influence other firm variables such as the level

of financial constraint. Owners wishing to maintain control will also maintain sufficient financial flexibility in order to go private if they so choose. That is, financial constraint is an outcome of the desire for control of the firm. There are significant differences in how MBO and LBO firms are defined between each study. Since I focus on the effect of ownership, I define MBOs and LBOs according to who obtains control of the surviving firm. Fidrmuc et al. (2013) use only pure MBOs in their definition, that is, firms that go private without any private equity participation. Renneboog et al. (2007) label any transaction in which management retains an equity stake as part of the bidding group after the buyout as an MBO, accounting for the large number of MBOs in their sample. My study complements these studies, providing further insight into the differences between MBO and LBO transactions, and contributing to research in this area.

### 4.2.2 Hypotheses: Major determinants of MBO and LBO offer premiums

I extend the framework of chapters 2 and 3 to develop hypotheses regarding MBO and LBO offer premiums. In chapters 2 and 3, I draw on Halpern et al.'s (1999) heterogeneity hypothesis as well as the recent going private literature on financing conditions to formulate my main theoretical predictions. The heterogeneity hypothesis argues that since the population of going private firms is heterogeneous, the motivations and determinants of going private transactions are also likely to be different, while the going private literature emphasizes the role of financing and market conditions, especially for LBOs. Based on this literature, I argue that control considerations and

financing conditions are likely to be the major difference between MBO and LBO offer premiums.

#### 4.2.2.1 Control Considerations

In chapters 2 and 3 I argue that decision-making control of the firm is the main distinguishing factor between MBOs and LBOs. Some managers place a high value on decision-making control, and this will be evident in the firm's strategic decisions, including both the going public decision and the going private decision. The IPO literature has two opposing views of control, one being that owners wish to keep control of the firm when going public (Black and Gilson (1998)), the other being that owners are interested in using the IPO as an exit strategy (Zingales (1995); Mello and Parsons (1998)). As seen in the examples in Chapter 2, the final step in their exit strategy could be an LBO. These models imply that going private firms will be heterogeneous, as some owners will wish to maintain control of the firm while others will wish to sell their controlling stake. Managers who value control will maintain a high level of ownership following the IPO, allowing them to retain control of the firm. Since managers have control of the firm, they can choose at any point to take the firm private if the benefits of being a public firm disappear. Managers who do not value control will instead reduce their ownership stakes in the IPO, and will eventually cash out. While their firm may still be taken private, it will be by third party investors, and the going private decision will be unrelated to the desire for control of the firm. As with the IPO literature, models focusing

on firms that go private use control as a major motivation (Elitzur et al. (1998); Bolton and von Thadden (1998); Boot, Gopalan and Thakor (2006 and 2008)). In addition, empirical evidence supports the importance of control considerations in the choice of being public or private (Brau and Fawcett (2006); Halpern et al. (1999)).

Taken together, the above theoretical models and the empirical evidence suggest that control considerations matter during both the IPO process and the going private process. It follows that if managers are interested in control of the firm in the pre-IPO period, they will maintain control following the IPO, and throughout the public life of the firm. These firms will be characterized by high levels of insider ownership, and, if they go private, will select an MBO transaction. If managers have no desire for control of the firm prior to the IPO, they will relinquish decision-making control following the IPO. These firms will be characterized by low levels of insider ownership, and, if they go private, will undertake an LBO transaction. Here, I extend this argument to the premiums paid in the transaction. Control considerations are expected to affect offer premiums along two channels: 1) the direct effect of ownership structure on the offer premium and 2) the indirect effect through undervaluation and the ability to time the transaction.

DeAngelo et al. (1984) argue that since there will be an increase in management's equity ownership percentage as a result of going private, there will be wealth gains due to the reduction in management's incentive to shirk. Firms with low insider ownership levels will be able to achieve larger wealth gains, and should thus have larger premiums. Firms with higher ownership levels, on the other hand, may use their position to influence the

process of the transaction and even reduce the number of bidders (Cain and Davidoff (2011)). The lack of competition for control of the firm will lead to lower prices paid, since prior studies have found that bidder competition leads to higher offer premiums (See, for example, Lowenstein (1985); Easterwood et al. (1994); Halpern et al. (1999)). To counteract management's ability to manipulate the transaction, corporate law has evolved to protect minority shareholders. Transactions involving management, while they may result in fewer competing bids, are often affected by shareholder lawsuits that can increase offer premiums (Gogineni and Puthenpurackal, 2013). The above literature suggests that firms with high insider ownership levels should, on average, pay lower premiums. I argue that while this may apply to MBO firms, the level of insider ownership may have the opposite effect on LBO premiums. By definition, the LBO firms in our sample result in majority control of the firm being held by a third party investor. Thus, for LBO firms with high levels of insider ownership, in this case more than 50 percent of the firm, the LBO results in current owners relinquishing control of the firm by selling some or all of their stake. Rather than attempting to manipulate the transaction to reduce the premium paid, managers of such firms will have the incentive to maximize the value received in the buyout. They will thus encourage, rather than stifle, bidder competition. In addition, they will use their voting control to reject any bids that are too low. This leads to the following hypotheses regarding MBO and LBO ownership and offer premiums:

**H1A: MBO firms with high levels of insider ownership in the pre-buyout period will**

**pay lower premiums than those with low levels of insider ownership, all else equal.**

**H1B: LBO firms with high levels of insider ownership in the pre-buyout period will pay higher premiums than those with low levels of insider ownership, all else equal.**

Buyouts in which management is involved in the bidding group will be affected by the information asymmetry between management and outside shareholders. Managers have inside information regarding the firm's investment opportunities, and may be taking the firm private to take advantage of this information without sharing the benefits with outside shareholders. In addition, management has a conflict of interests, since they have an incentive to time the buyout for when it is most advantageous to them, and any reduction in price will necessarily come at the expense of outside shareholders, to whom managers have a fiduciary duty to obtain fair value for their shares. Further, because fair value in the transaction is assessed using earnings-based valuation methods, managers have an incentive to engage in earnings management to reduce the price paid to take the firm private (DeAngelo, 1986). Therefore, we expect that managers who have decision-making control will not only use market timing for IPO and capital structure decisions, but also when choosing to take the firm private.[12] Managers will choose to go private when the cost of doing so is low. When they perceive that the firm's shares are significantly undervalued by the market, manifested by a large decline in the firm's share price, they will execute the buyout in order to capture larger gains. For LBO firms, the

12 For a more detailed discussion of undervaluation, market timing, and their relationship with going private firms, please see Chapter 3.

majority of which have low managerial ownership, the ability to time the buyout is greatly reduced. LBO firms require a private equity sponsor to partner with them in the transaction, and thus the timing of the buyout will depend on demand-side factors. The buying groups in LBO transactions will have a reduced ability to wait for a large decline in the firm's share price before executing the buyout, relative to MBO buyers. This leads to my next hypothesis:

**H2: Undervaluation will have a larger effect on MBO offer premiums relative to LBO offer premiums, all else equal.**

#### 4.2.2.2 Financing conditions

Detailed discussion of the effect of financing conditions on going private transactions is found in Chapter 3, and is briefly summarized here. Previous studies have found that LBOs tend to be more common when debt market conditions are more favourable, since, due to the high amount of debt required to finance the transaction, private equity firms will be more active when debt is cheap and less active when debt is costly (Kaplan and Stein (1993); Shivdasani and Wang (2011); Axelson et al. (2010); Demiroglu and James (2010); Kaplan and Stromberg (2009); Ljungqvist et al. (2008)). As our examples in Chapter 2 illustrated, LBOs can be initiated by private-equity firms, and thus many LBOs will be driven by demand-side factors. When the cost of debt is low, firms are able to pay interest on a higher principal from the same cash flows. This allows

private-equity firms to undertake larger buyouts, but also to make higher bids for buyout targets. MBO firms, on the other hand, are less reliant on debt to finance the transaction. Given their higher levels of insider ownership, MBO managers need to purchase a smaller percentage of the firm's shares to take the firm private, relative to LBOs. The cost of debt will thus be a relatively smaller factor in the decision to go private through an MBO. In addition, since the private equity industry as a whole is more active when debt is cheap, this could lead to an increase in bidder competition, further driving up LBO offer premiums. MBO managers would prefer to avoid bidder competition since they have no desire to sell their controlling stake. They wish to pay a lower price for the firm, and thus may avoid taking the firm private when the cost of debt is cheap so as not to face competing bids from private equity firms. This leads to the following hypothesis:

**H3: Cheap credit conditions will lead to higher offer premiums for LBO firms, all else equal.**

**Section 4.3: Sample and Data**

In this section I briefly summarize the construction of my sample.[13] As described in chapter 3, the identification of MBO and LBO firms starts by looking through the SEC filings of firms delisted from CRSP. After eliminating financial firms and utilities, the sample contains 76 MBO firms and 245 LBO firms. I lose observations due to missing

13 A more detailed description of the sample construction can be found in Chapter 3. The sample of LBO and MBO firms used in this chapter is identical to the sample of LBO and MBO firms used in Chapter 3.

share price data prior to the first announcement date, which can sometimes be a year or more before the transaction is executed. The final two-stage regressions involve 65 MBO firms and 229 LBO firms. I collect ownership data from SEC proxy filings for the going-private year and the five years leading up to the transaction announcement. Announcement dates are identified from background information provided in SEC proxy filings associated with the transaction. This information contains dates for the first market rumours surrounding an impending transaction, press release dates for when the firm has received a letter from management or an outside party interested in acquiring the firm, or press release dates announcing that the firm is considering a going private transaction.

**Section 4.4: Univariate Analysis**

In this section I compare the summary statistics for MBO and LBO firms and conduct a univariate analysis. Summary statistics for a selection of firm financial variables are presented in Table 4.2 Panel A.

[Insert Table 4.2 Panel A here]

The comparison shows that MBO and LBO firms differ along many dimensions. MBO firms are smaller, have significantly higher levels of insider ownership, pay less taxes, and have lower market-to-book ratios. Fewer MBO firms pay dividends, and they experience larger share price declines in the year before going private than LBO firms.

**4.4.1 Ownership Structure**

I measure ownership as the percentage of voting control held by insiders (directors and family members of directors), to better capture the actual control of the firm and to account for dual-class share structures. The pre-buyout level of insider ownership differs significantly between MBO and LBO firms. In the year before the transaction, the mean (median) insider ownership for MBO firms is 49% (49%), compared to 22% (14%) for LBO firms. The differences in both mean and median ownership levels between the two groups are significant at the 1% level.

To see how ownership changes in the years leading up to the transaction, Table 4.2 Panel B compares the levels of insider ownership for each of the 5 years leading up to the MBO or LBO transaction (data is graphed in Figure 4.1).

[Insert Table 4.2 Panel B here]

[Insert Figure 4.1 here]

Mean and median ownership for MBO firms are both approximately 50% for every one of the five years leading up to the going private transaction. In addition, approximately 50% of the MBO firms in my sample already have control of the firm prior to the buyout (greater than 50% of the votes). Thus, approximately half of MBO firms in my sample choose to maintain control of the firm over the 5 years leading up to the decision to finally take the firm private and gain complete control of the firm. LBO firms, by contrast, have much lower ownership levels. Mean ownership ranges between 21%-23%, while median ownership ranges between 14%-16%, and there appears to be a slight decline in ownership levels over the 5 years leading up to the buyout. The percentage of

LBO firms that have control of the firm prior to the buyout ranges between 11% and 15%. Thus, most LBO firms in my sample already have dispersed ownership, and only a small fraction consist of owners who give up control of the firm through the LBO.

In addition to insider ownership, I also create a dummy variable for the presence of an outside institutional investor with a greater than 5% stake in the firm. 55% of MBO firms have such an institutional investor, compared to 94% of LBO firms, significantly different at the 1% level. Thus, MBO firms have much more concentrated ownership structures than LBO firms, and control tends to be in the hands of insiders.

### 4.4.2 Firm Characteristics

Several firm characteristics differ between the two transaction types. The most striking difference is in firm size. LBO firms are considerably larger than MBO firms, whether size is measured by assets or sales. LBO firms have mean (median) assets of $1.1 billion ($315 million) compared to MBO firms with mean (median) assets of $392 million ($72 million): means (medians) are significantly different at the 10% (1%) level. Mean (median) sales for LBO firms are $991 million ($312 million) compared to only $307 million ($105 million) for MBO firms. Both mean and median sales are significantly different between the two groups at the 1% level. LBO firms also have significantly higher mean taxes-to-sales ratios (0.018 for LBOs, versus 0.006 for MBO firms), but median taxes-to-sales ratios are not significantly different. Finally, approximately 27% of LBO firms trade on the NYSE, compared to 9% of MBO firms.

Roughly the same percentage of MBO and LBO firms trade on the AMEX (with the remainder trading on the NASDAQ).

I also examine the nature of each type of MBO, since I divide them into 2 types: pure MBOs (with no private equity participation) and PE-backed MBOs (with private equity participation). 10% of the MBOs in my sample involve a private-equity sponsor, and thus the remaining 90% are pure MBOs. For LBO firms, I am interested in whether the transaction was an exit strategy for the owner. 4% of LBOs in our sample are owner exits. LBO firms have higher mean and median market-to-book ratios than MBO firms, and seem to be performing better than MBO firms by this measure, although the difference in ROA is not significant.

### 4.4.3 Ownership and Other Variables

As discussed in Chapters 2 and 3, the higher pre-buyout ownership and decision-making control in MBOs could lead to decisions that benefit the dominant shareholder, since the manager anticipates the transaction in advance of it becoming public. To measure this effect, I examine financial flexibility and undervaluation.

#### 4.4.3.1 Financial Flexibility

A variety of cash measures are compared, and while LBO firms have higher median cash and equivalents/assets and cash and equivalents/sales ratios, MBO firms have significantly higher cash/transaction value ratios. This last measure is meant to

capture the ability of the firm to self-finance the transaction, but is also an outcome of MBO firms having much higher insider ownership, and thus they have to purchase a much smaller fraction of the firm's shares in order to take the firm private. LBO firms may be holding more cash than MBO firms, but MBO firms are still holding, on average, enough cash and equivalents to cover 50% of the cost of taking the firm private. In addition, 22% of LBO firms pay dividends in the year before going private, versus only 9% of MBO firms. There is no indication that MBO and LBO firms have significantly different capital structures, as differences in the measures of debt levels (leverage, measured by long term debt/assets; debt/equity ratio; long term debt/equity ratio; total debt/assets ratio) are not statistically significant.

#### 4.4.3.2 Undervaluation

Undervaluation captures the degree to which the firm's share price performance is below expectation. Expected performance is measured by comparing the firm's stock price returns with the market index returns. Table 4.3 Panels A and B compare the share price returns and market-adjusted returns for various windows ending 20 trading days before the first announcement or rumour of an MBO or LBO.[14]

[Insert Table 4.3 Panel A here]

[Insert Table 4.3 Panel B here]

I measure both the actual stock price return and the market-adjusted stock price return by

14 Note that we begin to lose observations the further back in time we go, since some firms do not have CRSP data extending far enough before the announcement date

subtracting the firm's stock return from the market return. I use the CRSP equally weighted index as a measure of the market index, and estimate returns over windows ranging from 1 month to one year. Two main observations follow from these tables. First, both MBOs and LBOs experience negative mean returns over the majority of the time periods considered, but MBOs have more negative returns. With the exception of the mean two-month stock price return, all of the means and medians are significantly different between the two transaction types. Second, the size of these negative returns becomes increasingly larger the longer the time period (although LBOs have positive median share price returns, they have negative median market-adjusted returns). In particular, MBO returns experience a sharper fall as the time period is increased. For example, the mean (median) one-month return for the MBO sample is -6% (-5%) but it declines to -37% (-40%) when we extend the time period to one year. This evidence supports the notion that while both MBOs and LBOs experience poor returns leading up to the decision to go private, MBO firms have a persistently large negative share price performance leading up to the announcement of the transaction, relative to LBOs. This could be an indication of market timing, with managers choosing to take the firm private when the price is low, or perhaps the poor returns push firms to leave the public market as they feel the market undervalues their shares.

**Section 4.5 Estimating Offer Premiums and CARs**

Prior studies use two measures for estimating shareholder gains in going private

transactions: offer premiums and cumulative abnormal returns (CARs). In this section, I describe how I estimate both premiums and CARs, and compare the estimates of premiums and CARs for MBO and LBO firms.

### 4.5.1 Offer premiums

The offer premium compares the final offer price or trading price with the pre-announcement stock price. I measure offer premiums as: (final offer price – trading price x days before the announcement)/trading price x days before the announcement, using 1, 3, 5 and 10-days before the announcement to account for information leakage prior to the first announcement.[15]

### 4.5.2 Cumulative abnormal returns (CARs)

CARs are calculated using the market model estimated with trading data for the one year ending 20 days before the first announcement or rumour of the transaction. They are measured using 1, 3, 5 and 10 day windows prior to and following the announcement.[16] The parameters of the market model are estimated as follows:

$$r_{it} = \alpha + \beta r_{mt} \text{ for t = 1, 2, .., T}$$

where $r_{it}$ is the return on stock $i$ in period $t$ and $r_{mt}$ is the return on the CRSP equally-weighted index in period $t$. After estimating $\alpha$ and $\beta$ using OLS, we calculate expected

15 This is similar to prior studies. Halpern et al. (1999) use a 5-day window, for instance. In addition, they use the final trading price rather than the final offer price, in order to account for deals involving cash and securities. All deals in my sample involve all cash, however, and I use the final offer price.

16 Renneboog et al (2007) report results using [-2,2] and [-10, 10], but also mention that results are not significantly different for different windows

returns using the following equation:

$$E[r_{it}] = \hat{\alpha} + \hat{\beta} r_{mt}$$

Finally, cumulative abnormal returns are calculated by subtracting expected returns from actual returns, and summing over the length of the event window.

### 4.5.3 Estimates for Premiums and CARs

Table 4.4 Panels A and B shows the premiums and CARs for each transaction type surrounding the first indication of interest or market rumours of a going private transaction.

[Insert Table 4.4 Panel A here]

[Insert Table 4.4 Panel B here]

Mean offer premiums are only significantly different at the 5% level using a 1-day window, and mean CARs are not significantly different over any window. By contrast, median premiums and CARs are significantly different over every window considered. Median premiums are higher for MBO firms, ranging from 32%-40% over the different windows, while LBO median premiums are lower, ranging from 27%-28%. Median MBO CARs are higher for windows longer than 1 day, ranging from 18%-24%, and LBO medians range from 20% to 21%.

## Section 4.6: Empirical Methodology

In this section I explain what motivates my choice of the two-stage regression

model and how it is estimated. As in Chapters 2 and 3, ownership structure is the most important determinant of the choice between an MBO and an LBO. The results in Chapter 3 support this hypothesis. In this chapter I hypothesize that ownership structure is also likely to be a major determinant of the offer premiums. However, since MBO firms are more likely to have decision-making control and can choose the timing of the transaction, it is a joint decision. This is likely to be less of a factor for LBOs due to the lack of decision-making control. Thus, the empirical methodology should control for the endogeneity of the choice to go private and the offer premiums. Prior studies that estimate the determinants of offer premiums for going private firms have found differences between MBO and LBO offer premiums. They also attribute some of the variation in premiums to the levels of ownership and undervaluation. I argue that the decision to go private and the transaction premiums are jointly determined, especially for MBOs, and this needs to be factored into the analysis. These studies do not account for the fact that firms self-select an MBO or an LBO. To fix ideas, suppose we have two groups of firms:

1) Firms whose owners place a high value on control.
2) Firms whose owners do not value control.

Estimating a model without taking into account the differences between the two groups may result in a selection bias, since the underlying firm characteristics, such as how owners value control, may lead to both a higher probability of taking the firm private through an MBO and a lower premium.

Note that although we observe, on average, that MBO firms have higher ownership than LBO firms, we cannot infer that all firms with high insider ownership also place a high value on control. For instance, many of the LBO firms in my sample involve owners who have high levels of ownership. However, these owners wish to exit and sell their controlling stake in the firm, and therefore do not value control. Rather than choose an MBO, they select an LBO. Such firms will also jointly determine the choice to go private and the offer premium. What is different between the two groups is that their actions may be different in the pre-buyout period. MBO owners are likely to take actions that might reduce the value of the firm since they gain by paying less for the remainder of the firm, at the expense of minority shareholders. By contrast, the exit strategy group may be less inclined to do so because they will receive much lower premiums. It is in their interest to maintain a high share price as a minimum support to negotiations with private equity purchasers, and they will try to maximize firm value in order to maximize the proceeds of the transaction. In sum, not controlling for ownership structure will introduce selection bias and an endogeneity problem, since the transaction type and offer premiums will be jointly determined.

### 4.6.1 Switching Regressions Model

To resolve these issues, and to control for selection bias, I use a switching regressions model with endogenous switching (Maddala, 1983), an extension of the Heckman selection model. In testing for differences between MBO and LBO firms, I

categorize firms as belonging to one of two groups, yielding two different equations for predicting transaction premiums:

Group 1: $y_i = \beta_1 X_i + u_{1i}, \textit{iff } \gamma Z_i \geq u_i$

Group 2: $y_i = \beta_2 X_i + u_{2i}, \textit{iff } \gamma Z_i < u_i$

Where $y$ is the offer premium, $\beta$ and $\gamma$ are vectors of coefficients, $X$ is a vector of independent variables affecting the offer premium, and $Z$ is a vector of independent variables affecting the choice of transaction type. Finally, $u$ is the threshold level of decision-making control separating firms that place a high value on control (group 1) from firms that place a low value on control (group 2). Note that $\gamma Z_i \geq u_i$ means that the firm's characteristics place it in group 1 and $\gamma Z_i < u_i$ means that the firm's characteristics place it in group 2. The estimation proceeds in two stages. In the first stage, although we do not observe the value management places on decision-making control, we do observe whether they choose an LBO or an MBO. When management places a high value on control, they select an MBO, otherwise they will select an LBO. Let us define a dummy, $I_i$=1, for firms that choose an MBO $(\gamma Z_i \geq u_i)$ and $I_i$=0 otherwise $(\gamma Z_i < u_i)$. With this as the dependent variable, I use probit to estimate $\gamma$.

From the estimated parameters of the probit model, I next calculate the inverse Mills ratio. It represents a conditional probability, namely, the E($u_i$) given that the firm is in group 1. Or, the expected effect on the transaction premium from selecting an MBO, given that the firm places a high value on control. As the probability of selecting an MBO increases, the inverse Mills ratio approaches zero, and the expected effect on the firm's

transaction premium is smaller. As the probability of selecting an MBO decreases, the inverse Mills ratio approaches infinity and the expected effect on the firm's transaction premium is larger. Similarly, for LBO firms, I calculate the hazard rate, which is the expected effect on the transaction premium from selecting an LBO, given that the firm places a low value on control. A set of second-stage OLS regressions are then estimated, first for all firms together, and then separately for the MBO and LBO samples. The first two regressions include the inverse Mills ratio to control for selection bias, while the LBO regression includes the hazard rate.

**Section 4.7: Empirical Results**

In this section I start by describing the variables used in my estimations and their correlations, and then go on to present my empirical results. The probit model shows that insider ownership is the most important factor in determining transaction type, and firms with higher levels of insider ownership are more likely to select an MBO. By contrast, larger firms, firms with higher market-to-book ratios, and firms with lower leverage, all have a higher probability of choosing an LBO. In the second-stage premiums regressions, I find that higher insider ownership significantly reduces the offer premiums in MBO transactions, but has no effect on LBO offer premiums. In addition, a higher degree of undervaluation leads to higher offer premiums in both types of transactions, with a larger effect on MBO offer premiums. Finally, an increase in the interest rate spread of high-yield debt over LIBOR leads to lower LBO offer premiums, but does not affect MBO

offer premiums.

### 4.7.1 Variables and correlations

Table 4.5 Panel A shows the pairwise correlations between all variables that are considered for inclusion in the first-stage probit model (including the dependent variable), along with their descriptions.

[Insert Table 4.5 Panel A here]

I find that several variables are highly correlated and significantly different from zero. The dependent variable in the probit model is an indicator variable that is equal to one if the transaction is an MBO. The strongest correlation is with insider ownership, defined as the percentage of voting control held by directors or family members of directors, with a correlation coefficient of 0.52. Other variables that have strong positive correlations with the MBO dummy include: volatility (the standard deviation of the firm's stock return in the pre-buyout year; *corr* = 0.3), loan % (the quarterly percentage of domestic banks tightening their lending standards as reported in the Federal Reserve's Senior Loan Officer Opinion Survey on Bank Lending Practices; *corr* = 0.29), and the cash/deal ratio (cash and equivalents/transaction value; *corr* = 0.19). Variables that are negatively correlated with the MBO dummy include: institution = 1 (an indicator variable that is equal to one if the firm has an institutional blockholder with at least a 5% ownership stake; *corr* = -0.44), ln(sales) (used to measure firm size, it is the natural logarithm of real sales; *corr* = -0.29), MTB ratio (the firm's market-to-book ratio, defined as (total assets –

common equity + average market value)/total assets; *corr* = -0.27), NYSE =1 (an indicator variable that is equal to one if the firm trades on the NYSE; *corr* = -0.19), Turnover (the firm's average daily share turnover over the year ending 20 days before the first announcement date, divided by the number of shares outstanding; *corr* = -0.26), and Dividend = 1 ( an indicator variable that is equal to one if the firm paid a dividend in the past year; *corr* = -0.15).

### 4.7.2 First-stage probit model results

As discussed in the methodology section, I start with a probit model in the first-stage estimation, before proceeding to an OLS regression model in the second stage. To minimize the multicollinearity problem, I build the probit model in stages, considering the tradeoff between each variable's contribution to the model's explanatory power ($R^2$) and to multicollinearity. I start with the variable insider ownership, which has the highest correlation with the dependent variable and is also the major variable required to test my hypotheses. Next, I include another variable based on this criteria, and repeat this process until the additional explanatory power of the new variable is minimal, and a final model is defined. I wish to minimize the number of variables included in the probit model, in order to reduce the number of variables in common with the second-stage OLS regressions.

Table 4.5 Panel B presents the results of the first-stage probit model. I report four different model specifications.

[Insert Table 4.5 Panel B here]

The first specification (Model 1) includes only one independent variable, insider ownership, and the results clearly show the importance of insider ownership in differentiating between MBO and LBO firms. The level of insider ownership by itself significantly increases the probability of selecting an MBO instead of an LBO, and the ownership variable remains significant at the 1% level for all specifications. Model 2 adds firm size (ln(sales)). Firm size lowers the probability of selecting an MBO, and the Pseudo-$R^2$ increases from 0.29 in Model 1 to 0.33 in Model 2. Model 3 includes the market-to-book ratio as a measure of firm performance, and a higher market-to-book ratio significantly reduces the probability of an MBO transaction, while the significance of the other variables is unaffected, with the Pseudo-$R^2$ increasing to 0.37. The final specification, Model 4, adds measures of financial flexibility: leverage and free cash/assets. Of these variables, only leverage is significant at the 5% level, and the Pseudo-$R^2$ increases to 0.39.

To examine the economic significance of insider ownership, I calculate the probability changes at different levels of insider ownership in each probit model. Table 4.5 Panel C reports the predicted probabilities from the probit model for varying levels of insider ownership, holding all other variables at their means.

[Insert Table 4.5 Panel C here]

The predicted probabilities are calculated for each of the 4 model specifications from the first-stage probit model (as shown in Table 4.5 Panel A). A firm with a 20% insider

ownership stake (above the 14% median level for LBO firms, and close to the LBO mean of 21%) has a 15.5% probability of being an MBO firm using Model 5, holding all other variables at their means. A firm with a 50% insider ownership stake (close to the mean and median levels for MBO firms) has a 34% probability of being an MBO firm using Model 5, holding all other variables at their means. Firms with greater than 70% insider ownership have a greater than 50% probability of selecting an MBO.

### 4.7.3 Second-stage OLS results

I present three second-stage regression results: first, a combined sample for MBOs and LBOs that assumes common determinants, and two separate regressions for MBOs and LBOs. The second-stage models include the inverse Mills ratio (or the hazard ratio for the LBO regression) estimated from the first-stage probit Model 4, allowing me to control for selection bias. For comparison, I also estimate models that do not include the inverse Mills ratio.

#### 4.7.3.1 All firms

Table 4.6 Panel A reports the second-stage premiums regression results for all firms, while Table 4.7 Panel A reports the second-stage CARs regression results for all firms.

[Insert Table 4.6 Panel A here]

[Insert Table 4.7 Panel A here]

I estimate four different models. Models 1 and 2 use the 5-day premium (CAR) as the dependent variable, but model 1 includes the inverse Mills ratio from the first stage whereas model 2 does not. This allows us to compare the switching regressions results with a regression model that does not account for selection bias. Similarly, models 3 and 4 use the 10-day premium (CAR), with Model 4 excluding the inverse Mills ratio. This will measure the incremental contribution of the two-stage model relative to previous studies that use a one-stage estimation.

The comparison shows that although there are several commonalities between the models, there are also significant differences in both the size and significance of the coefficients for several variables. For example, the coefficient of ownership is significant at the 5% level in Models 1 and 3 in the premiums regressions, but insignificant in Models 2 and 4 when the inverse Mills ratio is not included in the regression. Ownership is significant at the 10% level in Models 1 and 4 of the CARs regression, but insignificant in Models 2 and 3. All other results are consistent across both the premiums and CARs regressions, and we limit the discussion to the premiums regressions. The coefficient on undervaluation is roughly the same across all models, ranging from -0.46 to -0.51, indicating that a 10% increase in the firm's share price relative to the CRSP equally-weighted index leads to a premium that is approximately 5 percentage points lower. Thus, firms with better share price performance have lower premiums. Financing conditions, as measured by the high-yield spread over LIBOR, have a significantly negative effect on offer premiums. This result is robust across all models at the 1% level of significance. As

an additional measure of market conditions, I include the number of IPOs in the last quarter before the announcement date as a measure of the public/private tradeoff, with the justification being that the higher the number of IPOs, the better the conditions for staying public rather than going private. Hot IPO markets can have a substantial effect on transaction premiums. At the mean level of 49 IPOs in the last quarter, the effect is to lower premiums by approximately 15 percentage points, while a level of 100 IPOs in the last quarter (the maximum number in our sample is 124) before the announcement lowers transaction premiums by approximately 30 percentage points. Based on prior literature, I also include a number of control variables in the second-stage regression, including firm size (ln(sales)), taxes/sales, leverage, free cash flow/assets, and I use return on assets (ROA) as a measure of firm performance. Of these variables, only ROA is significant across all model specifications, and the coefficients range from -0.37 to -0.47. Thus, if ROA is 10 percentage points higher, the premium is approximately 4 percentage points lower.

#### 4.7.3.2 Separate Subsample Analysis

The previous analysis assumes that the determinants of premiums and CARs are similar for MBOs and LBOs. As discussed in chapter 3, this may not be the case, and here we relax this assumption. The switching regressions model allows us to separately estimate second-stage results for MBO and LBO firms.

#### 4.7.3.3 MBO firms

Tables 4.6B and 4.7B reports the results of the second-stage estimation for the MBO sample.

[Insert Table 4.6 Panel B here]

[Insert Table 4.7 Panel B here]

The MBO firms regressions shows that the results are strikingly different compared to the previous combined sample results. Two main differences are as follows: first, only three variables have a significant effect on MBO premiums, insider ownership, undervaluation, and taxes/sales. Insider ownership is significant at the 1% when the inverse Mills ratio is included, but insignificant in Model 2 and significant at the 10% level in Model 4 when the inverse Mills ratio is excluded. Further, the effect of ownership is much larger than in the all firms regression. For MBO firms, a 10% increase in insider ownership reduces offer premiums by 17 percentage points in model 1 and 18 percentage points in model 3. I interpret this as support for the hypothesis that MBO firms with high levels of insider ownership will pay lower premiums. The coefficients for undervaluation are slightly larger in all 4 models, ranging from 0.50-0.73 (with the higher coefficients in models 2 and 4, without the inverse Mills ratio) indicating that a 10% increase in the firm's share price relative to the CRSP equally-weighted index leads to a premium that is between 5 and 7 percentage points lower. There are also some differences between the premiums and CARs regressions for MBO firms. Insider ownership is only significant in Model 1, while the high-yield spread is significant and negative across all four models, indicating

that a lower cost of debt increases the abnormal returns for MBO firms, contrary to our expectations. However, the negative and significant coefficients for undervaluation and taxes-to-sales are consistent with the premiums regression results.

#### 4.7.3.4 LBO firms

The LBO regression results reported in Table 4.6 Panel C and 4.7 Panel C show many differences in the determinants of LBO premiums and MBO premiums.

[Insert Table 4.6 Panel C here]

[Insert Table 4.7 Panel C here]

First, ownership levels have no effect on LBO premiums, as the insider ownership coefficients are insignificant in all models, and we find no support for our hypothesis regarding ownership of LBO firms. While undervaluation is significant at the 1% level across all models, the size of the coefficients range from 0.47-0.51, lower than the coefficients for MBO firms. Thus, we find support for our hypothesis that MBO premiums will be more severely affected by undervaluation. Unlike the MBO regression, the high-yield spread over LIBOR is negative and significant across all models (at 1% for Models 1 and 2, 5% for Models 3 and 4). Again, this supports our hypothesis that cheap credit conditions will lead to higher premiums for LBO firms. IPO market conditions do not affect MBO premiums, but do affect LBO premiums. At the mean level of 49 IPOs in the last quarter, the effect is to lower premiums by approximately 29 percentage points. ROA, which is insignificant in the MBO regressions, has a significant effect on LBO

premiums. Coefficients for ROA range from -0.39 to -0.48. Thus, if ROA is 10 percentage points higher, the premium is approximately 4 or 5 percentage points lower. The hazard ratio is insignificant in models 1 and 3, indicating that selection bias may not be an issue for LBO premiums. The major difference between the LBO premiums and CARs regressions is that the high-yield spread is insignificant in the CARs regressions. Thus, we find mixed support for our financing conditions hypothesis.

### 4.7.4 Differences in Offer Premiums

Our previous analysis confirms that there are significant differences in the determinants of offer premiums between MBO and LBO transactions, but does not compare the premiums themselves. In this section I compare MBO and LBO offer premiums. Table 4.6 Panel D reports the results for single-stage OLS regressions.

[Insert Table 4.6 Panel D here]

Four models are estimated, all of which include a dummy variable for MBO transactions to measure how premiums are affected by transaction type, after controlling for other factors. Models 1 and 2 use the five-day premium as the dependent variable, and Model 2 also includes an interaction term for undervaluation and MBO firms. Models 3 and 4 use the ten-day premium as the dependent variable, and the interaction term is included in Model 4. The results, consistent across all models, indicate that there is no difference in the size of MBO and LBO offer premiums after controlling for other factors.

**Section 4.8 Robustness Checks**

Although there is no requirement in the switching regressions model that variables must be different in the two stages of estimation, having many variables in common can lead to high collinearity between the inverse Mills ratio and the second-stage regressors. We thus re-estimate the first-stage probit model using a more parsimonious specification in order to further differentiate the variables between the two stages of the model. We keep the variables significant at the 5% level from the original probit model, and re-estimate the inverse Mills ratio. In addition, since firms with very low share prices can have extreme values for premiums, we restrict our sample to transactions in which the minimum offer price is two dollars per share. This eliminates 16 MBO firms and 14 LBO firms from the analysis, which represents 10% of our total sample. The probit results are reported in Table 4.8 Panel A.

[Insert Table 4.8 Panel A here]

We include only four variables in this probit specification: insider ownership, the log of total assets, the market-to-book ratio, and leverage. All four are significant and have the same signs as in the original probit model. The second-stage regressions are estimated as before, with results reported in Tables 4.8 Panel B (all firms), 4.8 Panel C (MBO firms) and 4.8 Panel D (LBO firms).

[Insert Table 4.8 Panel A here]

[Insert Table 4.8 Panel B here]

[Insert Table 4.8 Panel C here]

The results are similar to our main analysis. Undervaluation, the high-yield spread, and ROA coefficients are all significant and negative across all models in the all firms regression. Insider ownership is significant at the 10% level for models 1, 3 and 4, but the inverse Mills ratio is not significant in any specification. When MBO and LBO firms are analyzed separately, the only difference from the main analysis is that leverage is significant and negative in the LBO regression, whereas it was insignificant in our initial estimation. Thus, these results are largely consistent with our initial analysis.

**Section 4.9: Conclusions**

This paper examines differences in the determinants of MBO and LBO transaction premiums in a sample of MBO and LBO firms from 2000-2011. I find that the level of insider ownership and the performance of the firm's share price are the most important factors affecting MBO premiums. LBO premiums are also significantly affected by the firm's share price performance, but ownership is found to have no meaningful effect. Instead, the firm's return on assets, and IPO market conditions help determine the size of LBO premiums. I conclude that control considerations are the main factor affecting MBO offer premiums. Importantly, I contribute to the literature by adjusting my model for selection bias using a two-stage regression model. Selection bias is found to have a significant effect on OLS estimates of the determinants of transaction premiums.

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**Table 4.1: CARs and premiums paid in public to private transactions from US and UK studies and their determinants**

| Study | Sample period | Deal type | N | Mean premium offered | CARs | Main determinants of premiums/CARs |
|---|---|---|---|---|---|---|
| **US studies** | | | | | | |
| DeAngelo, DeAngelo and Rice (1984) | 1973-80 | ALL | 72 | 56.30% | 22.27% | Not estimated |
| Torabzadeh and Bertin (1987) | 1982-85 | LBO | 48 | | 18.64% | Not estimated |
| Kaplan (1989) | 1980-85 | MBO | 76 | 42.30% | 26.00% | Tax savings |
| Lehn and Poulsen (1989) | 1980-87 | ALL | 257 | 36.10% | 16.30% | Free Cash Flow, Bidder Competition |
| Lee et al. (1992) | 1983-89 | MBO | 50 | | 17.84% | Ownership, Independent Directors |
| Harlow and Howe (1993) | 1980-89 | ALL | 121 | 44.90% | | Not estimated |
| Travlos and Cornett (1993) | 1975-83 | ALL | 56 | 41.90% | 16.20% | Agency Costs |
| Easterwood et al. (1994) | 1978-88 | MBO | 184 | 32.90% | | Bidder competition |
| Kieschnick (1998) | 1980-87 | ALL | 257 | 36.10% | 16.30% | Size, Tax savings |
| Halpern, Kieschnick and Rotenberg (1999) | 1981-85 | ALL | 126 | | | Ownership, Undervaluation, Tax Savings, Bidder Competition |
| Cain and Davidoff (2011) | 2003-2009 | MBO | 103 | | | Independent Directors |
| **UK studies** | | | | | | |
| Weir, Laing and Wright (2005a) | 1998-2000 | ALL | 95 | 44.90% | | Ownership |
| Renneboog, Simons and Wright (2007) | 1997-2003 | ALL | 177 | 41.00% | 22.68% | Undervaluation, Tax Savings, Agency Costs |
| | | MBO | 54 | 38.68% | 21.04% | |
| Fidrmuc et al. (2013) | 1997-2003 | LBO | 75 | 39.10% | 19.30% | Not estimated |
| | | Other | 42 | 42.75% | 21.25% | |

This table summarizes US and UK the offer premiums and CARs in US and UK going private studies and their determinants. Note that not all studies provide summary statistics for premiums and CARs, nor do all studies estimate the determinants of premiums paid.

**Table 4.2 Panel A: Summary Statistics by transaction type**

| | MBO firms | | | | | | LBO firms | | | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variables | Obs | Mean | Median | Std. Dev. | Min | Max | Obs | Mean | Median | Std. Dev. | Min | Max | Means | Medians |
| **Firm Characteristics** | | | | | | | | | | | | | | |
| Assets | 76 | 392.229 | 72.38911 | 847.958 | 6.361 | 3895.341 | 245 | 1086.272 | 315.1423 | 3104.288 | 11.49529 | 33383.02 | 0.0551* | 0.000*** |
| Sales | 76 | 307.129 | 105.2774 | 482.727 | 4.565 | 3073.568 | 245 | 991.0366 | 312.0724 | 2219.536 | 7.047831 | 24456.65 | 0.008*** | 0.000*** |
| Taxes/Sales | 76 | 0.006 | 0.007 | 0.053 | -0.423 | 0.083 | 245 | 0.018 | 0.008 | 0.028 | -0.043 | 0.229 | 0.012** | 0.124 |
| NYSE dummy | 76 | 0.092 | 0.000 | 0.291 | 0 | 1 | 245 | 0.265 | 0.000 | 0.442 | 0.000 | 1.000 | 0.002*** | 0.002*** |
| AMEX dummy | 76 | 0.105 | 0.000 | 0.309 | 0 | 1 | 245 | 0.082 | 0.000 | 0.274 | 0.000 | 1.000 | 0.525 | 0.524 |
| PE backing/Owner Exit | 76 | 0.100 | 0.000 | 0.300 | 0 | 1 | 245 | 0.040 | 0.000 | 0.197 | 0.000 | 1.000 | NA | NA |
| **Ownership** | | | | | | | | | | | | | | |
| Insider Ownership % | 76 | 0.492 | 0.49 | 0.191 | 0.100 | 0.88 | 245 | 0.215 | 0.14 | 0.196 | 0.010 | 0.910 | 0.000*** | 0.000*** |
| Institutional Ownership | 76 | 0.553 | 1 | 0.501 | 0.000 | 1 | 245 | 0.935 | 1 | 0.248 | 0.000 | 1.000 | 0.000*** | 0.000*** |
| **Capital Structure** | | | | | | | | | | | | | | |
| Leverage | 76 | 0.215 | 0.179 | 0.220 | 0.000 | 0.933 | 245 | 0.190 | 0.107 | 0.229 | 0.000 | 1.033 | 0.394 | 0.145 |
| Debt/Equity | 76 | 1.442 | 1.147 | 4.509 | -20.890 | 24.947 | 245 | -1.185 | 0.832 | 61.603 | -939.505 | 132.096 | 0.711 | 0.555 |
| Long Term Debt/Equity | 76 | 0.543 | 0.348 | 2.855 | -18.562 | 12.338 | 245 | -2.007 | 0.135 | 55.137 | -849.983 | 87.203 | 0.688 | 0.057* |
| Debt/Assets | 76 | 0.507 | 0.542 | 0.249 | 0.025 | 1.089 | 245 | 0.519 | 0.484 | 0.252 | 0.053 | 1.576 | 0.724 | 0.796 |
| **Financial Flexibility** | | | | | | | | | | | | | | |
| Cash & Eq/Assets | 76 | 0.148 | 0.058 | 0.206 | 0.000 | 0.902 | 245 | 0.178 | 0.106 | 0.202 | 0.000 | 0.917 | 0.260 | 0.020** |
| Free Cash/Assets | 76 | 0.071 | 0.085 | 0.114 | -0.275 | 0.304 | 245 | 0.072 | 0.099 | 0.188 | -1.912 | 0.446 | 0.965 | 0.294 |
| Cash/Sales | 76 | 0.189 | 0.030 | 0.566 | 0.000 | 4.245 | 245 | 0.194 | 0.079 | 0.391 | 0.000 | 4.342 | 0.937 | 0.001*** |
| Cash & Eq/Sales | 76 | 0.433 | 0.036 | 1.944 | 0.000 | 16.374 | 245 | 0.292 | 0.098 | 0.689 | 0.000 | 5.801 | 0.338 | 0.003*** |
| Cash/Deal Value | 76 | 0.374 | 0.156 | 0.641 | 0.000 | 3.173 | 245 | 0.170 | 0.075 | 0.488 | 0.000 | 7.026 | 0.004*** | 0.001*** |
| Cash & Eq/Deal Value | 76 | 0.559 | 0.204 | 0.985 | 0.000 | 5.086 | 245 | 0.221 | 0.092 | 0.623 | 0.000 | 8.427 | 0.001*** | 0.001*** |
| Dividend dummy | 76 | 0.092 | 0.000 | 0.291 | 0 | 1 | 245 | 0.220 | 0.000 | 0.415 | 0.000 | 1.000 | 0.013** | 0.013** |
| **Performance** | | | | | | | | | | | | | | |
| Market to Book | 76 | 1.037 | 0.915 | 0.488 | 0.480 | 3.708 | 245 | 1.512 | 1.285 | 0.738 | 0.523 | 7.119 | 0.000*** | 0.000*** |
| ROA | 76 | -0.016 | 0.012 | 0.115 | -0.360 | 0.187 | 245 | -0.012 | 0.031 | 0.229 | -2.019 | 1.132 | 0.903 | 0.072* |

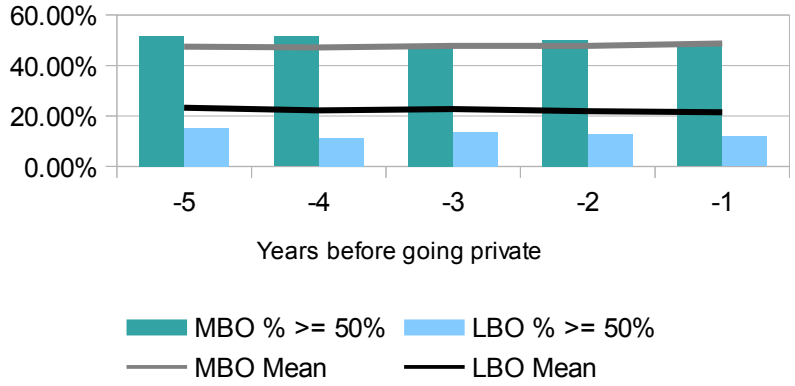
This table reports the summary statistics for firm financial variables. Assets is real assets, adjusted for inflation using using the GDP deflator. Sales is real sales, adjusted for inflation using using the GDP deflator. Taxes/Sales is total income taxes/sales. NYSE dummy is an indicator variable that is equal to one if the firm trades on the NYSE. AMEX dummy is an indicator variable that is equal to one if the firm trades on the AMEX. PE backing/Owner exit are indicator variables equal to 1 for MBO firms if they involved the aprticipation of a private equity firm, and equal to 1 for LBO firms if the transaction was used as an exit strategy by current owners. Insider Ownership % is the percentage of voting control held by directors and family members of directors. Institutional Ownership is an indicator variable that is equal to 1 if an institutional investor holds a greater than 5% stake in the firm. Leverage is defined as total long term debt/total assets. Debt/Equity is total debt/total common equity. Long term debt/equity is total long term debt/total common equity. Debt/Assets is total debt/total assets. Cash & Eq/Assets is defined as cash and equivalents/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. Cash to sales is cash/sales. Cash & Eq/Sales is defined as cash and equivalents/Sales. Cash/Deal Value is cash/value of the buyout transaction. Cash & Eq/Deal Value is cash and equivalents/value of the buyout transaction. Dividend dummy is an indicator variable that is equal to one if the firm paid a dividend in the past year. Market-to-book ratio is defined as (total assets – common equity + average market value)/total assets. ROA is net income/total assets. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.2 Panel B: Insider Ownership by transaction type**

| Years before private | MBO | | | | | | | LBO | | | | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Median | Std Dev | Min | Max | % >= .5 | Obs | Mean | Median | Std Dev | Min | Max | % >= .5 | Means | Medians |
| -1 | 76 | 48.72% | 49.00% | 19.43% | 10.00% | 91.00% | 48.68% | 245 | 21.47% | 14.00% | 19.64% | 1.00% | 88.00% | 11.84% | 0*** | 0*** |
| -2 | 76 | 47.75% | 49.00% | 20.07% | 7.00% | 88.00% | 50.00% | 243 | 21.94% | 14.00% | 19.93% | 1.00% | 91.00% | 12.76% | 0*** | 0*** |
| -3 | 74 | 47.74% | 48.00% | 20.03% | 9.00% | 89.00% | 48.65% | 234 | 22.78% | 15.50% | 20.10% | 1.00% | 91.00% | 13.68% | 0*** | 0*** |
| -4 | 68 | 47.12% | 51.50% | 20.29% | 7.00% | 87.00% | 51.47% | 212 | 22.27% | 16.00% | 19.48% | 1.00% | 91.00% | 11.32% | 0*** | 0*** |
| -5 | 58 | 47.40% | 52.50% | 20.94% | 6.00% | 87.00% | 51.72% | 197 | 23.26% | 16.00% | 19.99% | 1.00% | 91.00% | 15.23% | 0*** | 0*** |

This table shows the summary statistics for levels of insider ownership for the five years leading up to the going private transaction. %>=.5 indicates the percentage of MBO/LBO firms whose insider ownership is greater than or equal to 50%. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

Figure 4.1: Evolution of Insider Ownership




This graph shows the levels of insider ownership for MBO and LBO firms in each of the five years prior to the announcement of the going private transaction.

**Table 4.3 Panel A: Undervaluation by transaction type, measured by share price return over 1-12 months**

| Share price | MBO firms | | | | | | LBO firms | | | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Return | Obs | Mean | Median | Std. Dev. | Min | Max | Obs | Mean | Median | Std. Dev. | Min | Max | Means | Medians |
| 1 month | 74 | -4.40% | -1.32% | 21.55% | -90.40% | 49.45% | 241 | 0.76% | 1.92% | 13.42% | -67.94% | 35.82% | 0.000*** | 0.000*** |
| 2 months | 71 | -0.56% | 1.44% | 24.16% | -55.61% | 84.08% | 239 | -1.10% | 0.79% | 19.82% | -85.90% | 101.16% | 0.2502 | 0.0443** |
| 3 months | 71 | -2.44% | -2.26% | 29.27% | -81.09% | 101.41% | 230 | 0.50% | 0.35% | 23.25% | -124.32% | 70.47% | 0.000*** | 0.000*** |
| 6 months | 64 | -10.27% | -7.10% | 33.81% | -106.71% | 73.32% | 219 | -0.48% | 1.59% | 36.74% | -215.10% | 89.74% | 0.000*** | 0.000*** |
| 9 months | 63 | -11.00% | -7.41% | 43.14% | -121.73% | 93.65% | 204 | -3.14% | 2.00% | 48.02% | -295.59% | 128.97% | 0.000*** | 0.000*** |
| 1 year | 58 | -20.38% | -7.64% | 50.65% | -159.09% | 76.90% | 189 | -6.25% | 0.95% | 55.00% | -317.74% | 111.54% | 0.000*** | 0.000*** |

This table reports the share price return for windows ranging from 1 month to 1 year, ending 20 trading days before the MBO or LBO transaction. The final two columns report the P-values from tests of differences in means and medians between transaction types. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.3 Panel B: Undervaluation by transaction type, measured by market-adjusted return over 1-12 months**

| Market-adjusted | MBO firms | | | | | | LBO firms | | | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Return | Obs | Mean | Median | Std. Dev. | Min | Max | Obs | Mean | Median | Std. Dev. | Min | Max | Means | Medians |
| 1 month | 74 | -6.35% | -4.70% | 20.13% | -81.83% | 45.27% | 241 | -0.85% | -0.27% | 11.78% | -61.84% | 30.80% | 0.000*** | 0.000*** |
| 2 months | 71 | -5.18% | -5.31% | 23.87% | -56.05% | 67.59% | 239 | -3.97% | -1.85% | 18.45% | -85.48% | 79.90% | 0.000*** | 0.000*** |
| 3 months | 71 | -9.09% | -10.44% | 26.28% | -66.54% | 73.93% | 230 | -4.33% | -2.97% | 21.01% | -120.63% | 57.22% | 0.000*** | 0.000*** |
| 6 months | 64 | -19.99% | -21.12% | 32.41% | -106.18% | 52.82% | 219 | -10.44% | -7.33% | 33.75% | -237.17% | 65.89% | 0.000*** | 0.000*** |
| 9 months | 63 | -24.23% | -25.62% | 37.39% | -102.36% | 87.69% | 204 | -17.13% | -9.96% | 43.82% | -306.40% | 74.27% | 0.000*** | 0.000*** |
| 1 year | 58 | -37.01% | -39.52% | 46.05% | -159.24% | 69.95% | 189 | -23.72% | -15.57% | 53.09% | -341.45% | 107.61% | 0.000*** | 0.000*** |

This table reports the the market-adjusted return versus the CRSP equally-weighted index for windows ranging from 1 month to 1 year, ending 20 trading days before the MBO or LBO transaction. The final two columns report the P-values from tests of differences in means and medians between transaction types. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.4 Panel A: Premiums by transaction type**

| | MBO firms | | | | | | LBO firms | | | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Premiums | Obs | Mean | Median | Std. Dev. | Min | Max | Obs | Mean | Median | Std. Dev. | Min | Max | Means | Medians |
| 1 day | 74 | 52.07% | 31.59% | 56.29% | -2.14% | 288.68% | 243 | 38.75% | 26.89% | 45.46% | -45.14% | 334.21% | 0.0381** | 0.000*** |
| 3 day | 74 | 52.09% | 36.00% | 56.45% | -2.64% | 342.00% | 243 | 40.60% | 27.50% | 50.13% | -45.65% | 442.76% | 0.0965* | 0.000*** |
| 5 day | 74 | 52.99% | 40.24% | 50.84% | -7.53% | 298.20% | 243 | 40.51% | 28.30% | 49.51% | -45.97% | 493.53% | 0.0601* | 0.000*** |
| 10 day | 74 | 52.35% | 43.76% | 49.79% | -7.16% | 243.33% | 243 | 42.02% | 27.43% | 53.63% | -46.58% | 525.00% | 0.1416 | 0.000*** |

This table shows the premiums for each transaction type surrounding the first indication of interest or market rumours of a going private transaction. Premiums are measured as: (final offer price – trading price x days before the announcement)/trading price x days before the announcement, using 1, 3, 5 and 10-days before the announcement. Differences in means and medians between transaction types are tested with P-values presented in the final two columns. ***, **, * indicates significance at the 1%, 5% and 10% levels respectively.

**Table 4.4 Panel B: Cumulative abnormal returns (CARs) by transaction type**

| | MBO firms | | | | | | LBO firms | | | | | | Differences | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CARs | Obs | Mean | Median | Std. Dev. | Min | Max | Obs | Mean | Median | Std. Dev. | Min | Max | Means | Medians |
| CAR [-1 , 1] | 74 | 29.81% | 17.93% | 32.05% | -4.04% | 167.14% | 243 | 26.40% | 19.80% | 28.77% | -14.61% | 253.80% | 0.3851 | 0.021** |
| CAR [-3, 3] | 74 | 31.45% | 23.31% | 31.34% | -4.46% | 159.59% | 243 | 26.79% | 20.00% | 28.07% | -10.34% | 250.85% | 0.2257 | 0.002*** |
| CAR [-5, 5] | 74 | 33.12% | 22.86% | 35.43% | -3.11% | 206.53% | 243 | 27.78% | 21.45% | 28.98% | -18.43% | 257.81% | 0.1892 | 0.003*** |
| CAR [-10, 10] | 74 | 33.38% | 24.30% | 33.18% | -12.37% | 160.58% | 243 | 28.77% | 21.29% | 31.85% | -27.19% | 288.73% | 0.2812 | 0.000*** |

This table shows the cumulative abnormal returns (CARs) for each transaction type surrounding the first indication of interest or market rumours of a going private transaction. CARs are measured using 1, 3, 5 and 10 day windows prior to and following the announcement. Differences in means and medians between transaction types are tested with P-values presented in the final two columns. ***, **, * indicates significance at the 1%, 5% and 10% levels respectively.

**Table 4.5 Panel A: Pairwise correlations for probit model variables**

| | MBO = 1 | Insider Own. % | Institution = 1 | ln(sales) | MTB ratio | leverage | Free cash | NYSE = 1 | AMEX = 1 | Turnover | Volatility | Dividend = 1 | High-yield | Loan % | Cash/ Assets | Cash/ Deal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBO = 1 | 1.00 | 0.52*** | -0.44*** | -0.29*** | -0.27*** | 0.06 | 0.00 | -0.19*** | 0.03 | -0.26*** | 0.30*** | -0.15*** | 0.09 | 0.29*** | -0.06 | 0.19*** |
| Insider Own. % | 0.52*** | 1.00 | -0.40*** | -0.31*** | -0.17*** | -0.02 | -0.01 | -0.22*** | 0.11* | -0.43*** | 0.31*** | -0.11* | 0.16*** | 0.18*** | 0.03 | 0.26*** |
| Institution = 1 | -0.44*** | -0.40*** | 1.00 | 0.23*** | 0.12 | -0.01 | -0.02 | 0.13 | -0.04 | 0.19 | -0.18 | 0.11 | -0.12 | -0.18 | 0.06 | -0.11 |
| ln(sales) | -0.29*** | -0.31*** | 0.23*** | 1.00 | 0.11 | 0.27*** | 0.34*** | 0.56*** | -0.10* | 0.49*** | -0.43*** | 0.22*** | -0.22*** | -0.25*** | -0.44*** | -0.27*** |
| MTB ratio | -0.27*** | -0.17*** | 0.12 | 0.11 | 1.00 | -0.06 | -0.02 | 0.08 | -0.14** | 0.25*** | -0.14** | 0.17*** | -0.24*** | -0.02 | 0.20*** | 0.16*** |
| leverage | 0.06 | -0.02 | -0.01 | 0.27*** | -0.06 | 1.00 | 0.25*** | 0.16*** | 0.19*** | 0.05 | -0.01 | 0.05 | -0.01 | -0.06 | -0.43*** | -0.17*** |
| Free cash | 0.00 | -0.01 | -0.02 | 0.34*** | -0.02 | 0.25*** | 1.00 | 0.12** | 0.03 | 0.17*** | -0.24*** | -0.07 | -0.08 | -0.05 | -0.44*** | -0.46*** |
| NYSE = 1 | -0.19*** | -0.22*** | 0.13 | 0.56*** | 0.08 | 0.16*** | 0.12** | 1.00 | -0.17*** | 0.27*** | -0.35*** | 0.29*** | -0.09 | -0.15** | -0.20*** | -0.11* |
| AMEX = 1 | 0.03 | 0.11* | -0.04 | -0.10* | -0.14** | 0.19*** | 0.03 | -0.17*** | 1.00 | -0.21*** | 0.14** | -0.03 | 0.12** | 0.01 | -0.06 | 0.03 |
| Turnover | -0.26*** | -0.43*** | 0.19 | 0.49*** | 0.25*** | 0.05 | 0.17*** | 0.27*** | -0.21*** | 1.00 | -0.21*** | 0.00 | -0.09 | -0.08 | -0.04 | -0.17*** |
| Volatility | 0.30*** | 0.31*** | -0.18 | -0.43*** | -0.14** | -0.01 | -0.24*** | -0.35*** | 0.14** | -0.21*** | 1.00 | -0.20*** | 0.33*** | 0.31*** | 0.04 | 0.33*** |
| Dividend = 1 | -0.15*** | -0.11* | 0.11 | 0.22*** | 0.17*** | 0.05 | -0.07 | 0.29*** | -0.03 | 0.00 | -0.20*** | 1.00 | -0.15*** | -0.20*** | -0.02 | -0.09 |
| High-yield | 0.09 | 0.16*** | -0.12 | -0.22*** | -0.24*** | -0.01 | -0.08 | -0.09 | 0.12** | -0.09 | 0.33*** | -0.15*** | 1.00 | 0.00 | 0.09 | 0.14** |
| Loan % | 0.29*** | 0.18*** | -0.18 | -0.25*** | -0.02 | -0.06 | -0.05 | -0.15** | 0.01 | -0.08 | 0.31*** | -0.20*** | 0.00 | 1.00 | 0.05 | 0.13** |
| Cash/Assets | -0.06 | 0.03 | 0.06 | -0.44*** | 0.20*** | -0.43*** | -0.44*** | -0.20*** | -0.06 | -0.04 | 0.04 | -0.02 | 0.09 | 0.05 | 1.00 | 0.46*** |
| Cash/Deal | 0.19*** | 0.26*** | -0.11 | -0.27*** | 0.16*** | -0.17*** | -0.46*** | -0.11* | 0.03 | -0.17*** | 0.33*** | -0.09 | 0.14** | 0.13** | 0.46*** | 1.00 |

This table reports the pairwise correlations for each variable considered for use in the first-stage probit models. MBO = 1 is an indicator variable that is equal to 1 if the transaction is an MBO. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Institution = 1 is an indicator variable that is equal to one if the firm has an institutional blockholder with at least a 5% ownership stake. ln(sales) is the natural logarithm of real sales. MTB ratio is the firm's market-to-book ratio, defined as (total assets – common equity + average market value)/total assets. Leverage is defined as total long term debt/total assets. Free cash is the firm's free cash to assets ratio, defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. NYSE = 1 is an indicator variable that is equal to one if the firm trades on the NYSE. AMEX = 1 is an indicator variable that is equal to one if the firm trades on the AMEX. Turnover is the firm's average daily share turnover over the year ending 20 days before the first announcement date, divided by the number of shares outstanding. Volatility is the standard deviation of the firm's stock return over the year ending 20 days before the first announcement date. Dividend = 1 is an indicator variable that is equal to one if the firm paid a dividend in the past year. High-yield is the effective return of the Merrill Lynch high-yield index minus US LIBOR. Loan % is the quarterly percentage of domestic banks tightening their lending standards as reported in the Federal Reserve's Senior Loan Officer Opinion Survey on Bank Lending Practices. Cash/Assets is defined as cash and equivalents/total assets. Cash/Deal is defined as cash and equivalents/transaction value. ***, **, * indicates significantly different from zero at the 1%, 5% and 10% levels respectively.

**Table 4.5 Panel B: Probit Model Results**

| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| MBO = 1 | Coef. | P-value | Coef. | P-value | Coef. | P-value | Coef. | P-value |
| **Ownership** | | | | | | | | |
| Insider Ownership (%) | 3.739*** | 0.000 | 3.624*** | 0.000 | 3.460*** | 0.000 | 3.481*** | 0.000 |
| **Firm Size** | | | | | | | | |
| ln(sales) | | | -0.252*** | 0.001 | -0.246*** | 0.001 | -0.341*** | 0.000 |
| **Performance** | | | | | | | | |
| Market-to-book ratio | | | | | -0.571*** | 0.002 | -0.577*** | 0.003 |
| **Financial Flexibility** | | | | | | | | |
| leverage | | | | | | | 1.085** | 0.021 |
| Free Cash/Assets | | | | | | | 0.433 | 0.595 |
| Constant | -2.076*** | 0.000 | -0.745* | 0.074 | 0.020 | 0.967 | 0.251 | 0.635 |
| Observations | 294 | | 294 | | 294 | | 294 | |
| Pseudo R-squared | 0.29 | | 0.33 | | 0.37 | | 0.39 | |

This table reports the first-stage probit model results where the dependent variable is an indicator variable that is equal to one if the transaction is an MBO. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. ln(sales) is the natural logarithm of real sales. Market-to-book ratio is defined as (total assets – common equity + average market value)/total assets. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.5 Panel C: Probit Model Predicted Probabilities for insider ownership**

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| MBO = 1 | Coef. | Coef. | Coef. | Coef. |
| **Insider Ownership** | | | | |
| 10.00% | 0.044 | 0.048 | 0.057 | 0.059 |
| 20.00% | 0.092 | 0.092 | 0.102 | 0.103 |
| 30.00% | 0.170 | 0.162 | 0.167 | 0.167 |
| 40.00% | 0.281 | 0.258 | 0.255 | 0.252 |
| 50.00% | 0.418 | 0.378 | 0.361 | 0.353 |
| 60.00% | 0.566 | 0.510 | 0.478 | 0.466 |
| 70.00% | 0.706 | 0.642 | 0.597 | 0.580 |
| 80.00% | 0.820 | 0.758 | 0.706 | 0.686 |
| 90.00% | 0.901 | 0.850 | 0.799 | 0.778 |

This table reports the predicted probabilities for the first-stage probit models where the dependent variable is an indicator variable that is equal to one if the transaction is an MBO, and Models 1-5 are as reported in Table 1A. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. The table calculates the predicted probability of an MBO for each level of insider ownership, holding all other variables at their means.

**Table 4.6 Panel A: Second-stage OLS Regression Results: All firms**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | -0.534** | 0.026 | -0.149 | 0.270 | -0.584** | 0.019 | -0.209 | 0.136 |
| Undervaluation | -0.470*** | 0.000 | -0.461*** | 0.000 | -0.508*** | 0.000 | -0.499*** | 0.000 |
| High yield spread | -0.087*** | 0.002 | -0.085*** | 0.003 | -0.086*** | 0.003 | -0.084*** | 0.004 |
| Number of IPOs | -0.004** | 0.035 | -0.004** | 0.029 | -0.004* | 0.053 | -0.004** | 0.044 |
| ln(sales) | 0.019 | 0.537 | -0.026 | 0.220 | 0.017 | 0.593 | -0.026 | 0.223 |
| Taxes/Sales | -0.740 | 0.327 | -1.041 | 0.162 | -0.640 | 0.414 | -0.933 | 0.226 |
| leverage | -0.068 | 0.632 | 0.068 | 0.585 | -0.005 | 0.971 | 0.128 | 0.324 |
| Free Cash/Assets | 0.039 | 0.816 | 0.102 | 0.541 | 0.016 | 0.928 | 0.077 | 0.656 |
| ROA | -0.375*** | 0.008 | -0.370*** | 0.010 | -0.467*** | 0.002 | -0.462*** | 0.002 |
| Inverse Mills Ratio | -0.150 | 0.051 | | | -0.146 | 0.067 | | |
| Constant | 1.621*** | 0.000 | 1.450*** | 0.000 | 1.588*** | 0.000 | 1.421*** | 0.000 |
| | | | | | | | | |
| Observations | 294 | | 294 | | 294 | | 294 | |
| Adjusted R-squared | 0.14 | | 0.13 | | 0.15 | | 0.14 | |

This table reports the second-stage OLS model results where the dependent variable is the 5-day transaction premium for models 1 and 2, and the 10-day transaction premium in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Inverse Mills ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.6 Panel B: Second-stage OLS Regression Results: MBO Firms**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | -1.671*** | 0.012 | -0.457 | 0.181 | -1.830*** | 0.008 | -0.586* | 0.100 |
| Undervaluation | -0.553** | 0.023 | -0.726*** | 0.003 | -0.498** | 0.047 | -0.675*** | 0.007 |
| High yield spread | -0.081 | 0.130 | -0.077 | 0.165 | -0.082 | 0.138 | -0.078 | 0.174 |
| Number of IPOs | 0.002 | 0.578 | 0.001 | 0.678 | 0.003 | 0.427 | 0.002 | 0.517 |
| ln(sales) | 0.036 | 0.621 | -0.075 | 0.172 | 0.050 | 0.514 | -0.064 | 0.259 |
| Taxes/Sales | -3.140** | 0.025 | -3.222** | 0.027 | -2.976** | 0.041 | -3.060** | 0.043 |
| leverage | -0.613* | 0.055 | -0.310 | 0.294 | -0.552 | 0.095 | -0.242 | 0.429 |
| Free Cash/Assets | 0.668 | 0.393 | 0.338 | 0.672 | 0.445 | 0.584 | 0.106 | 0.898 |
| ROA | -0.497 | 0.518 | -0.038 | 0.960 | -0.371 | 0.643 | 0.099 | 0.901 |
| Inverse Mills Ratio | -0.594** | 0.032 | | | -0.609** | 0.034 | | |
| Constant | 1.931*** | 0.005 | 1.385** | 0.031 | 1.887*** | 0.008 | 1.328** | 0.046 |
| | | | | | | | | |
| Observations | 65 | | 65 | | 65 | | 65 | |
| Adjusted R-squared | 0.20 | | 0.13 | | 0.21 | | 0.14 | |

This table reports the second-stage OLS model results for MBO firms where the dependent variable is the 5-day transaction premium for models 1 and 2, and the 10-day transaction premium in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Inverse Mills ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.6 Panel C: Second-stage OLS Regression Results: LBO Firms**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | -0.065 | 0.830 | -0.045 | 0.796 | -0.129 | 0.680 | -0.109 | 0.544 |
| Undervaluation | -0.465*** | 0.004 | -0.465*** | 0.004 | -0.507*** | 0.003 | -0.507*** | 0.003 |
| High yield spread | -0.096*** | 0.005 | -0.096*** | 0.005 | -0.090** | 0.011 | -0.090** | 0.011 |
| Number of IPOs | -0.006*** | 0.007 | -0.006*** | 0.006 | -0.006*** | 0.008 | -0.006*** | 0.008 |
| ln(sales) | -0.013 | 0.617 | -0.014 | 0.572 | -0.018 | 0.510 | -0.019 | 0.464 |
| Taxes/Sales | -0.967 | 0.397 | -0.983 | 0.381 | -0.852 | 0.471 | -0.867 | 0.456 |
| leverage | 0.215 | 0.164 | 0.219 | 0.133 | 0.284* | 0.076 | 0.288* | 0.056 |
| Free Cash/Assets | 0.047 | 0.793 | 0.048 | 0.787 | 0.051 | 0.785 | 0.052 | 0.780 |
| ROA | -0.386** | 0.015 | -0.384** | 0.015 | -0.479*** | 0.004 | -0.478*** | 0.004 |
| Hazard Ratio | 0.017 | 0.935 | | | 0.016 | 0.939 | | |
| Constant | 1.519*** | 0.000 | 1.522*** | 0.000 | 1.483*** | 0.000 | 1.486*** | 0.000 |
| Observations | 229 | | 229 | | 229 | | 229 | |
| Adjusted R-squared | 0.13 | | 0.13 | | 0.14 | | 0.15 | |

This table reports the second-stage OLS model results for LBO firms where the dependent variable is the 5-day transaction premium for models 1 and 2, and the 10-day transaction premium in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Hazard ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.6 Panel D: OLS Regression Results: Comparing Premiums**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| ln(sales) | -0.050** | 0.015 | -0.050** | 0.017 | -0.048** | 0.025 | -0.047** | 0.029 |
| Taxes/Sales | -1.324* | 0.077 | -1.274* | 0.092 | -1.182 | 0.129 | -1.108 | 0.159 |
| leverage | 0.051 | 0.692 | 0.056 | 0.664 | 0.103 | 0.443 | 0.110 | 0.412 |
| Insider Ownership | -0.200 | 0.138 | -0.200 | 0.139 | -0.258* | 0.067 | -0.258* | 0.067 |
| Free Cash/Assets | 0.118 | 0.460 | 0.123 | 0.442 | 0.100 | 0.545 | 0.108 | 0.516 |
| Undervaluation | -0.471*** | 0.000 | -0.505*** | 0.000 | -0.502*** | 0.000 | -0.554*** | 0.000 |
| ROA | -0.343** | 0.013 | -0.346** | 0.013 | -0.441*** | 0.002 | -0.445*** | 0.002 |
| Number of IPOs | -0.003*** | 0.003 | -0.003*** | 0.003 | -0.003*** | 0.008 | -0.003*** | 0.006 |
| MBO | -0.011 | 0.880 | -0.001 | 0.989 | -0.005 | 0.953 | 0.011 | 0.896 |
| Undervaluation*MBO | | | 0.115 | 0.646 | | | 0.171 | 0.512 |
| Constant | 0.872*** | 0.000 | 0.867*** | 0.000 | 0.844*** | 0.000 | 0.837*** | 0.000 |
| Observations | 300 | | 300 | | 300 | | 300 | |
| Adjusted R-squared | 0.17 | | 0.17 | | 0.18 | | 0.18 | |

This table reports the OLS model results where the dependent variable is the 5-day transaction premium for models 1 and 2, and the 10-day transaction premium in models 3 and 4. All models include industry dummies. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). ROA = net income/total assets. Number of IPOs = number of IPOs in the last quarter. MBO is an indicator variable equal to one if the transaction is an MBO. Undervaluation*MBO interacts the undervaluation variable with the MBO dummy variable. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.7 Panel A: Second-stage OLS Regression Results for CARs: All firms**

| **Dependent Variable** | CAR [-5, 5] | | | | CAR[-10, 10] | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | -0.236* | 0.062 | -0.107 | 0.135 | -0.197 | 0.145 | -0.127* | 0.094 |
| Undervaluation | -0.358*** | 0.000 | -0.355*** | 0.000 | -0.446*** | 0.000 | -0.444*** | 0.000 |
| High yield spread | -0.039*** | 0.009 | -0.038*** | 0.010 | -0.049*** | 0.002 | -0.048*** | 0.002 |
| Number of IPOs | -0.002** | 0.022 | -0.002** | 0.019 | -0.003** | 0.011 | -0.003*** | 0.010 |
| ln(sales) | 0.010 | 0.532 | -0.005 | 0.664 | 0.004 | 0.799 | -0.004 | 0.758 |
| Taxes/Sales | -0.563 | 0.160 | -0.664* | 0.091 | -0.671 | 0.117 | -0.726* | 0.083 |
| leverage | -0.062 | 0.410 | -0.016 | 0.804 | -0.024 | 0.765 | 0.001 | 0.993 |
| Free Cash/Assets | 0.089 | 0.316 | 0.110 | 0.208 | 0.090 | 0.343 | 0.102 | 0.277 |
| ROA | -0.262*** | 0.001 | -0.260*** | 0.001 | -0.263*** | 0.001 | -0.262*** | 0.001 |
| Inverse Mills Ratio | -0.050 | 0.216 | | | -0.027 | 0.533 | | |
| Constant | 0.875*** | 0.000 | 0.818*** | 0.000 | 0.940*** | 0.000 | 0.909*** | 0.000 |
| | | | | | | | | |
| Observations | 294 | | 294 | | 294 | | 294 | |
| Adjusted R-squared | 0.20 | | 0.2 | | 0.23 | | 0.23 | |

This table reports the second-stage OLS model results where the dependent variable is the cumulative abnormal return over a [-5, 5]-day window for models 1 and 2, and the cumulative abnormal return over a [-10, 10]-day window in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Inverse Mills ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.7 Panel B: Second-stage OLS Regression Results for CARs: MBO Firms**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | -0.811** | 0.036 | -0.283 | 0.151 | -0.605 | 0.124 | -0.132 | 0.506 |
| Undervaluation | -0.331** | 0.021 | -0.407*** | 0.004 | -0.474*** | 0.002 | -0.542*** | 0.000 |
| High yield spread | -0.113*** | 0.001 | -0.111*** | 0.001 | -0.143*** | 0.000 | -0.141*** | 0.000 |
| Number of IPOs | -0.002 | 0.265 | -0.002 | 0.236 | -0.003 | 0.105 | -0.003* | 0.092 |
| ln(sales) | 0.041 | 0.347 | -0.008 | 0.804 | 0.033 | 0.449 | -0.010 | 0.759 |
| Taxes/Sales | -1.488* | 0.069 | -1.524* | 0.068 | -1.484* | 0.078 | -1.515* | 0.075 |
| leverage | -0.337* | 0.073 | -0.205 | 0.228 | -0.252 | 0.189 | -0.134 | 0.439 |
| Free Cash/Assets | 0.691 | 0.138 | 0.547 | 0.237 | 0.641 | 0.179 | 0.513 | 0.277 |
| ROA | -0.745 | 0.105 | -0.546 | 0.222 | -0.932** | 0.050 | -0.754* | 0.100 |
| Inverse Mills Ratio | -0.258 | 0.110 | | | -0.231 | 0.162 | | |
| Constant | 1.491*** | 0.000 | 1.253*** | 0.001 | 1.624*** | 0.000 | 1.412*** | 0.000 |
| | | | | | | | | |
| Observations | 65 | | 65 | | 65 | | 65 | |
| Adjusted R-squared | 0.36 | | 0.34 | | 0.46 | | 0.45 | |

This table reports the second-stage OLS model results for MBO firms where the dependent variable is the cumulative abnormal return over a [-5, 5]-day window for models 1 and 2, and the cumulative abnormal return over a [-10, 10]-day window in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Inverse Mills ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.7 Panel C: Second-stage OLS Regression Results for CARs: LBO Firms**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | 0.104 | 0.505 | -0.050 | 0.574 | 0.075 | 0.652 | -0.107 | 0.265 |
| Undervaluation | -0.329*** | 0.000 | -0.331*** | 0.000 | -0.398*** | 0.000 | -0.400*** | 0.000 |
| High yield spread | -0.018 | 0.309 | -0.018 | 0.308 | -0.020 | 0.278 | -0.020 | 0.277 |
| Number of IPOs | -0.002** | 0.039 | -0.002** | 0.037 | -0.003** | 0.027 | -0.003** | 0.026 |
| ln(sales) | -0.013 | 0.341 | -0.007 | 0.570 | -0.015 | 0.285 | -0.009 | 0.520 |
| Taxes/Sales | -1.138* | 0.053 | -1.018* | 0.080 | -0.953 | 0.129 | -0.812 | 0.189 |
| leverage | 0.072 | 0.365 | 0.040 | 0.591 | 0.088 | 0.299 | 0.051 | 0.527 |
| Free Cash/Assets | 0.127 | 0.169 | 0.119 | 0.196 | 0.140 | 0.155 | 0.131 | 0.184 |
| ROA | -0.225*** | 0.006 | -0.235*** | 0.004 | -0.227*** | 0.009 | -0.239*** | 0.006 |
| Hazard Ratio | -0.128 | 0.226 | | | -0.151 | 0.181 | | |
| Constant | 0.677*** | 0.000 | 0.656*** | 0.000 | 0.728*** | 0.000 | 0.704*** | 0.000 |
| | | | | | | | | |
| Observations | 229 | | 229 | | 229 | | 229 | |
| Adjusted R-squared | 0.16 | | 0.16 | | 0.19 | | 0.18 | |

This table reports the second-stage OLS model results for LBO firms where the dependent variable is the cumulative abnormal return over a [-5, 5]-day window for models 1 and 2, and the cumulative abnormal return over a [-10, 10]-day window in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Hazard ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.8 Panel A: Robustness Probit Model Results**

| MBO = 1 | Coef. | P-value |
|---|---|---|
| **Ownership** | | |
| Insider Ownership (%) | 3.404*** | 0.000 |
| **Firm Size** | | |
| ln(sales) | -0.307*** | 0.001 |
| **Performance** | | |
| Market-to-book ratio | -0.497** | 0.013 |
| **Financial Flexibility** | | |
| leverage | 1.169** | 0.014 |
| Constant | -0.017 | 0.976 |
| Observations | 270 | |
| Pseudo R-squared | 0.37 | |

This table reports the first-stage probit model results where the dependent variable is an indicator variable that is equal to one if the transaction is an MBO. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. ln(sales) is the natural logarithm of real sales. Market-to-book ratio is defined as (total assets – common equity + average market value)/total assets. Leverage is defined as total long term debt/total assets. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.8 Panel B: Robustness Second-stage OLS Regression Results: All firms**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | -0.601* | 0.055 | -0.169 | 0.225 | -0.615* | 0.057 | -0.239* | 0.098 |
| Undervaluation | -0.455*** | 0.001 | -0.463*** | 0.001 | -0.479*** | 0.001 | -0.486*** | 0.000 |
| High yield spread | -0.104*** | 0.001 | -0.103*** | 0.001 | -0.087*** | 0.008 | -0.086*** | 0.009 |
| Number of IPOs | -0.003* | 0.097 | -0.003* | 0.075 | -0.003 | 0.140 | -0.003 | 0.114 |
| ln(sales) | 0.017 | 0.635 | -0.026 | 0.232 | 0.011 | 0.767 | -0.026 | 0.240 |
| Taxes/Sales | -0.609 | 0.425 | -0.865 | 0.248 | -0.600 | 0.448 | -0.823 | 0.287 |
| leverage | -0.069 | 0.674 | 0.092 | 0.473 | -0.009 | 0.959 | 0.132 | 0.319 |
| Free Cash/Assets | 0.167 | 0.351 | 0.141 | 0.430 | 0.137 | 0.460 | 0.114 | 0.537 |
| ROA | -0.348* | 0.085 | -0.400** | 0.045 | -0.446** | 0.033 | -0.491** | 0.017 |
| Inverse Mills Ratio | -0.166 | 0.123 | | | -0.145 | 0.193 | | |
| Constant | 1.722*** | 0.000 | 1.508*** | 0.000 | 1.555*** | 0.000 | 1.369*** | 0.000 |
| | | | | | | | | |
| Observations | 270 | | 270 | | 270 | | 270 | |
| Adjusted R-squared | 0.12 | | 0.12 | | 0.11 | | 0.11 | |

This table reports the second-stage OLS model results where the dependent variable is the 5-day transaction premium for models 1 and 2, and the 10-day transaction premium in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Inverse Mills ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.8 Panel C: Robustness Second-stage OLS Regression Results: MBO Firms**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | -1.964** | 0.016 | -0.503 | 0.183 | -2.302*** | 0.007 | -0.641 | 0.109 |
| Undervaluation | -0.709** | 0.014 | -0.943*** | 0.001 | -0.568* | 0.054 | -0.834*** | 0.005 |
| High yield spread | -0.026 | 0.655 | -0.027 | 0.660 | -0.027 | 0.652 | -0.028 | 0.660 |
| Number of IPOs | 0.002 | 0.500 | 0.002 | 0.570 | 0.003 | 0.356 | 0.003 | 0.429 |
| ln(sales) | 0.085 | 0.313 | -0.039 | 0.526 | 0.111 | 0.208 | -0.031 | 0.640 |
| Taxes/Sales | -3.772*** | 0.009 | -3.837** | 0.011 | -3.529** | 0.018 | -3.603** | 0.022 |
| leverage | -0.815** | 0.026 | -0.397 | 0.197 | -0.786** | 0.038 | -0.310 | 0.336 |
| Free Cash/Assets | -0.468 | 0.619 | -0.984 | 0.304 | -0.599 | 0.541 | -1.186 | 0.240 |
| ROA | -0.504 | 0.547 | 0.099 | 0.904 | -0.687 | 0.431 | -0.001 | 0.999 |
| Inverse Mills Ratio | -0.686** | 0.042 | | | -0.780** | 0.027 | | |
| Constant | 2.637** | 0.036 | 1.633 | 0.170 | 2.912** | 0.027 | 1.771 | 0.158 |
| | | | | | | | | |
| Observations | 55 | | 55 | | 55 | | 55 | |
| Adjusted R-squared | 0.31 | | 0.24 | | 0.32 | | 0.23 | |

This table reports the second-stage OLS model results for MBO firms where the dependent variable is the 5-day transaction premium for models 1 and 2, and the 10-day transaction premium in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Inverse Mills ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

**Table 4.8 Panel D: Robustness Second-stage OLS Regression Results: LBO Firms**

| **Dependent Variable** | 5-day premium | | | | 10-day premium | | | |
|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
| Independent Variable | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value | Coefficient | P-value |
| Insider Ownership | -0.009 | 0.979 | -0.102 | 0.562 | -0.078 | 0.820 | -0.181 | 0.318 |
| Undervaluation | -0.451*** | 0.009 | -0.448*** | 0.009 | -0.461*** | 0.010 | -0.458*** | 0.010 |
| High yield spread | -0.126*** | 0.001 | -0.126*** | 0.001 | -0.091** | 0.024 | -0.091** | 0.024 |
| Number of IPOs | -0.005** | 0.023 | -0.005** | 0.022 | -0.005** | 0.031 | -0.005** | 0.030 |
| ln(sales) | -0.018 | 0.477 | -0.016 | 0.520 | -0.023 | 0.387 | -0.020 | 0.425 |
| Taxes/Sales | -0.585 | 0.606 | -0.540 | 0.631 | -0.604 | 0.606 | -0.555 | 0.632 |
| leverage | 0.284* | 0.078 | 0.263* | 0.073 | 0.322* | 0.052 | 0.299** | 0.049 |
| Free Cash/Assets | 0.108 | 0.565 | 0.113 | 0.544 | 0.120 | 0.536 | 0.126 | 0.513 |
| ROA | -0.462** | 0.037 | -0.455** | 0.038 | -0.534** | 0.019 | -0.526** | 0.020 |
| Inverse Mills Ratio | -0.078 | 0.744 | | | -0.086 | 0.727 | | |
| Constant | 1.675*** | 0.000 | 1.664*** | 0.000 | 1.427*** | 0.000 | 1.415*** | 0.000 |
| | | | | | | | | |
| Observations | 215 | | 215 | | 215 | | 215 | |
| Adjusted R-squared | 0.10 | | 0.10 | | 0.09 | | 0.10 | |

This table reports the second-stage OLS model results for LBO firms where the dependent variable is the 5-day transaction premium for models 1 and 2, and the 10-day transaction premium in models 3 and 4. All models include year dummies. Insider ownership percentage is defined as the percentage of voting control held by directors or family members of directors. Undervaluation = firm's three month stock return minus the CRSP equally-weighted index return (including dividends). High yield spread is the difference between the Merrill Lynch High Yield Index and LIBOR in the last quarter. Number of IPOs = number of IPOs in the last quarter. ln(sales) is the natural logarithm of real sales. Taxes/sales = total taxes paid divided by net sales. Leverage is defined as total long term debt/total assets. Free cash/assets is defined as (operating income before depreciation – total taxes – interest paid – dividends)/total assets. ROA = net income/total assets. Hazard ratio is calculated from the first stage probit regression. ***, **, * indicates significant at the 1%, 5% and 10% levels respectively.

# CHAPTER 5

# GENERAL CONCLUSIONS

Most prior studies of firms that go private group LBOs and MBOs together when analyzing the determinants of the going private decision and the transaction premiums. This has led to several conflicting results as to the relative importance of each of these determinants. This thesis contributes to the going private literature by separately examining LBOs and MBOs, and distinguishing between the different factors driving these transactions.

This dissertation consists of three essays. The first essay surveys the literature and develops testable hypotheses that distinguish between MBOs and LBOs. I argue that the main distinguishing factor between choosing an MBO instead of an LBO is the desire for control of the firm, while demand-side factors will be the driving force behind LBOs. I develop testable hypotheses for both transaction types. In particular, MBOs will be largely motivated by the desire of insiders to maintain or regain control of the firm, and the timing of an MBO transaction, being at the discretion of the firm's managers, will occur when the benefits of being public no longer outweigh the private benefits of control. LBOs, however, will depend on demand-side factors, and private equity demand will be driven by the interaction of cheap credit conditions and attractive target prices.

The second essay empirically examines the determinants of LBOs and MBOs, and tests the hypotheses developed in the first essay. Following Halpern et al. (1999), I argue that the population of going private firms is heterogeneous, and I examine the sources of

this heterogeneity. I contribute to the literature by analyzing MBOs and LBOs in a more recent period in which cheap credit conditions and collateralized loan instruments became the dominant form of financing and private equity firms are the major players in going private transactions. This comparison allows me to test that financing conditions and control considerations are the main sources of heterogeneity. I also contribute to the international literature on going private transactions. The literature suggests that there are differences in legal and institutional structures and IPO motivations between the US and UK that could influence the determinants of going private transactions. For example, Brau, Ryan and Degraw (2006) find that most US managers do not view an IPO as a vehicle to relinquish control whereas Bancel and Mittoo (2009) find that most UK managers reduce their ownership after going public. My study contributes to this literature by providing some insights into different factors that may affect firms' decisions to choose between MBOs and LBOs as vehicles to exit their public status. I find significant differences between the LBO and MBO samples. Tighter lending conditions decrease the probability of an LBO but increase the probability of an MBO, relative to firms that stay public. In addition, while liquidity and growth opportunities are negatively correlated with the probability of going private for both LBOs and MBOs, the latter plays a stronger role for MBOs.

The third essay focuses on the role of decision-making control as the main factor distinguishing LBOs from MBOs and uses this framework to analyze differences in the determinants of the premiums paid when taking a firm private. Since the choice between

an MBO and an LBO is one of self-selection, the empirical methodology must take this into account. I contribute to the literature through the use of a two-stage regression model to control for this selection bias. The first-stage model shows that ownership is the main determinant of the selection of the transaction type. The second-stage model shows that determinants of MBO and LBO premiums are substantially different. The level of insider ownership has a large negative effect on MBO premiums, but no effect on LBO premiums.

Overall, this dissertation contributes to the existing literature by examining heterogeneity among firms that go private. I test this heterogeneity and find significant differences between MBO and LBO firms, both in terms of the motivations for taking the firm private and the premiums paid in the transaction.