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A DISSERTATION APPROVED FOR THE
MICHAEL F. PRICE COLLEGE OF BUSINESS

BY

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DEDICATION

I dedicate this dissertation to my mother Raja Rajeswari Somavarapu and to my father Tata Rao Gogineni who made my education their primary objective and devoted significant amounts of their time, attention and resources towards the same. I also dedicate this work to my late paternal grandfather Venkata Krishnniah Gogineni, and to my maternal grandfather Chittiah Chowdary Somavarapu, both of whom believed in diligence and academic excellence. I thank my sister Sridevi Ravulapalli for her guidance and support over the years. I commend my wife Manasa Koratala for understanding and patiently putting up with many years of research and graduate student life.

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ABSTRACT

This dissertation is a collection of three essays that investigate the role and importance of corporate governance in public and private firms. Chapter 1, investigates the role of governance characteristics in determining the probability of a firm undergoing a going private transaction. Firms with greater board control are more likely to go private while firms with strong anti-takeover provisions are more likely to be acquired by other public companies. The positive relationship between greater board control and the likelihood of going private is driven by private equity backed deals. Shareholder voting restrictions do not affect firms' survival status while a higher number of state antitakeover laws reduces the likelihood of being acquired. Abnormal returns to shareholders are much lower for going private transactions than for acquisitions by public firms. The results suggest that governance provisions affect shareholder wealth during change of control transactions by playing an important role in determining the type of acquirer. Chapter 2 presents new empirical evidence on the agency costs which emerge from the vertical (ownership versus control) and horizontal (majority versus minority) agency problems. Agency costs increase as firms move from a single owner/single manager ownership structure to more complicated ownership structures. Within each ownership structure, agency costs are significantly higher when firms are not managed by owners. Agency costs are lower in firms with shared control of ownership. Horizontal agency costs are lower in firms where control is contestable. Chapter 3 examines the determinants of cash holdings in private firms. Cash

holdings in private firms support both the trade-off theory and the financing hierarchy theory. Cash holdings in private firms decrease significantly with size, firm age, net working capital and leverage. Private firms that pay dividends hold more cash and that cash holdings increase significantly with capital expenditures and cash flow volatility. Better governed private firms hold significantly more cash than private firms associated with weak governance structures.

CHAPTER 1

WHAT DO PRIVATE EQUITY FIRMS LOOK FOR IN AN INVESTMENT? TARGET GOVERNANCE PROVISIONS AND GOING PRIVATE TRANSACTIONS

I. Introduction

After cooling off in the 1990s, going private transactions (GPs) have once again become a significant part of the U.S. corporate acquisition landscape in recent years.[1] Eckbo and Thorburn (2009) note that the total value of U.S. going private transactions announced in 2006 and 2007 amounted to $450 and $410 billion, respectively. A significant fraction of these buyouts involve financial buyers such as private equity firms. Boone and Mulherin (2009) report that private equity firms accounted for 30 percent of the winning bids in the U.S. corporate takeover market in 2007. Further, Kaplan and Stromberg (2009) report that total equity capital commitments to U.S. private equity funds reached $228 billion in 2007, or 1.57% of total U.S. stock market capitalization.

The sharp increase in going private transactions (GPs) in recent years and the role of private equity firms (PE) in these deals have attracted increasing attention. Empirical evidence on GPs suggests that these transactions are typically associated with significant improvements in corporate performance.[2] The observed changes in

[1] When a listed company is acquired and subsequently delisted, the transaction is referred to as a going-private transaction. Such transactions are usually financed by borrowing substantially (60%-90%) against target firm's assets and are called leveraged buyouts (LBOs).

[2] See for example DeAngelo, DeAngelo and Rice (1984), Marais, Schipper and Smith (1989), Kaplan (1989), Lehn and Poulsen (1989), Lee (1992), Hartzell, Ofek and Yermack (2004), Guo, Hotchkiss and Song (2010) among others.

performance are generally attributed to buyout sponsors' active involvement and better governance in the post-buyout firm. Rational buyout sponsors will in principle target firms with financial and governance characteristics which maximize their chance of success. In fact, several studies find that firms that go private are associated with distinctly different financial characteristics compared to those targeted by public acquirers.[3] Along the same lines, rational buyout sponsors will in principle target firms with governance structures that facilitate a smooth deal completion process and post-buyout changes. However, surprisingly little attention has been given to the role of the governance characteristics of public firms that go private. In this paper, I focus on the crucial, but as yet little understood, role of target corporate governance characteristics on the choices made by buyout sponsors when allocating resources.

The objective of this paper is to provide evidence on the relationship between ex-ante corporate governance characteristics and the likelihood of a firm going private. With the exception of managerial and institutional ownership measures (see for example Halpern, Kieschnick and Rotenberg, 1999; Cressy, Munari and Malipiero, 2007), there is little evidence on how governance provisions affect a firm's likelihood of going private. The paucity of evidence is rather striking because one of the most prominent arguments for going private is that these transactions create value by making governance improvements in target firms (see for example

[3] The literature is extensive. Eckbo and Thorburn (2009) summarize the results of various studies by noting that firms targeted in going private transactions are generally characterized by strong cash flows and a history of profitability. In addition, these firms belong to a mature industry with low growth opportunities and limited need for additional capital expenditures.

Cornelli and Karakas, 2008). Such arguments suggest that firms that engage in GPs are associated with distinctly different, often weaker governance characteristics than other firms prior to the transaction.

This paper is also aimed at enhancing our understanding of the role played by private equity firms in GPs. As mentioned above, the recent buyout wave is characterized by the predominance of private equity firms, unlike the merger wave of the 1980s which was dominated by management buyouts (MBOs). Private equity firms have come under increased scrutiny and are the subject of an on-going heated debate over the role they play in the optimal allocation of resources.[4] While proponents argue that private equity firms help create value in target firms by mitigating the agency costs of free cash flow as well as making operating improvements, skeptics argue that major sources of gains to private equity firms are unrelated to real improvements and include activities such as securing funds at favorable terms (Demirogulu and James, 2010) and expropriation of target shareholders through lower premiums (Phalippou 2010; Officer, Ozbas and Sensoy, 2010). This paper adds to the literature by examining target characteristics that drive the choices of private equity firms to become sponsors of going private deals. More specifically, I examine the relation between a target firm's governance characteristics and the probability of the firm undergoing a private equity sponsored going private

[4] For example, the U.S. Department of Justice started an informal investigation into the anticompetitive role of private equity firms in 2006. See Andrew Sorkin, *New York Times*, October 16, 2005 for more details.

transaction (GP) as opposed to undergoing a merger with another public company, undergoing a non private equity backed GP or continuing as an independent entity.

There is now widespread recognition, as well as growing empirical evidence, that governance provisions affect firm behavior in complex ways. Consequently, interest in corporate governance has been rapidly growing, both inside and outside academia, together with recognition of its importance.[5] In an influential article, Gompers, Ishi and Metric (2003) note that a broad index based on 24 governance provisions (commonly referred as G-Index) was negatively correlated with firm value. A few more recent studies construct alternate governance indices consisting of fewer provisions (Bebchuk, Cohen and Ferrell, 2009) or more provisions (Brown and Caylor, 2006; Aggarwal and Williamson, 2006) and examine their affect on various firm related issues. In spite of a large number of papers focusing on corporate governance, no single measure has been universally accepted that captures the quality of governance provisions in firms.

Building on extant literature, I consider a firm's governance to be determined by its board characteristics, anti-takeover provisions, voting restrictions, and the state corporate governance related laws to which it is subject. Consequently, I create measures of each of these provisions. *Board Control Index* (hereafter BCI) measures a board's ability to make internal governance changes without shareholder approval. In other words, a large value of BCI means the board has more control over the

[5] For instance, Bebchuk & Wiesbach (2010) note that "the term "corporate governance" appears as a key word in the abstract of 987 papers over the past year on SSRN, and, given the huge amount of research being done in the area, SSRN in 2009 started the Corporate Governance Network (CGN) with 21 different subject-matter electronic journals".

decision making process. *Takeover Restrictions* measure the level of takeover protection adopted by firms. These provisions act as layers of defense against takeovers and discourage hostile buyers from making an offer. The right to vote on various firm-related issues is an important source of power to shareholders. *Voting Restrictions* measure the degree to which restrictions on shareholder voting rights have been instituted. Finally, *State Provisions* measure the number of state takeover-related laws that a firm is subject to.[6]

I examine the relation between a target firm's governance characteristics and the probability of the firm undergoing a going private transaction (GP) as opposed to undergoing a merger with another public company or continuing as an independent entity using governance data on more than 8,000 small and large listed companies in the U.S. during 2002-2009. I then differentiate between private equity and non private equity backed GPs in order to gain further insights into the choices made by private equity firms when allocating resources.

I find that several governance characteristics are important in determining firms' survival status. First, I document a positive relationship between the board control index (BCI) and the probability of a firm undergoing a GP. This positive relationship is entirely driven by a subset of deals that are backed by private equity firms. That is, firms where boards are dominated by insiders and have greater ability to make decisions without the consent of shareholders are more likely to undergo a private equity backed GP. As mentioned earlier, private equity firms typically initiate

[6] Please refer to Section 2 for more details on the rationale and construction of these indices.

several changes in target firms after a GP has been completed. While the target's management team is generally retained, outside board members are replaced with individuals employed by private equity sponsors (Cornelli and Karakas, 2008). Other significant changes include the introduction of high-powered managerial incentives and the pressures resulting from high leverage. The results presented here indicate that private equity firms maximize the chances of the deal going through by engaging in friendly buyouts of firms where boards are more immune to shareholder oversight. Furthermore, recent research argues that insider dominated boards are a sign of management's skill level (see for example Bhagat and Black, 2002; Coles, Daniel and Naveen, 2008; Masulis and Mobbs, 2010). To the extent this is the case, the results indicate that private equity firms pay particular attention to target management skill set.

Second, I find that firms with strong anti-takeover provisions are less likely to undergo a GP and are more likely to undergo a merger. Existing evidence suggests that anti-takeover provisions are primarily used by firms to enhance their bargaining position in the event of a takeover attempt (Comment and Schwert 1995) and that private acquirers pay lower premiums compared to public acquirers (Bargeron, Schlingemann, Stulz, Zutter 2009). My results suggest that buyout sponsors are, at least in part, able to pay lower premiums and yet complete deals by not targeting firms with strong anti-takeover provisions in place. Furthermore, the negative relationship between takeover restrictions and the likelihood of going private is primarily driven by non private equity backed deals. This finding makes intuitive

sense as private acquirers other than private equity buyers are mostly comprised of private operating companies. Compared to private equity firms who are in the business of buying firms, private operating companies are less likely to devote a large fraction of their resources to acquisitions. As such, they may be reluctant to pursue targets with strong anti-takeover provisions given the bargaining power such provisions provide to target firms.

Third, I find that voting restrictions on shareholders do not affect firms' survival status. This result is contrary to the findings of Bebchuk, Coates and Subramanian (2002, 2003) who note that such restrictions play an important role in determining whether a firm is acquired or stays independent. A possible explanation for the difference in results is that Bebchuk et al examine the effects of voting restrictions in deals involving hostile bids. The deals examined in this study do not involve hostile takeovers. To sum, my results suggest that even though voting restrictions on shareholder impact factors such as firm value (Bebchuk and Cohen 2005), and shareholder returns (Faleye 2007; Guo, Kruse and Nohel 2008), they do not play a role in determining the likelihood of a firm undergoing a GP as opposed to undergoing a merger with another public company or continuing as an independent entity. My results also suggest that when a firm is subject to a larger number of state takeover-related laws there is a reduction in the likelihood of being acquired by any type of acquirer.

Finally, I examine the wealth implications to shareholders of the GPs in the sample. Consistent with the findings of extant research (see for example Bargeron,

Schlingemann, Stulz and Zutter 2009), average abnormal returns to target shareholders are much lower for GPs than for acquisitions by public firms. The mean abnormal return of target shareholders is 25% if the acquisition is by a public firm whereas it is 21.4% if the acquisition is by a private firm. There is no systematic difference in abnormal returns between buyouts sponsored by private equity firms and other private acquirers. I find that governance provisions do not affect announcement period abnormal returns after controlling for the probability of undergoing a GP. In sum, the results suggest that governance provisions affect shareholder wealth in going private transactions (GPs) by playing an important role in determining the type of acquirer.

This paper contributes to two streams of literature. First, it adds to the body of research that examines the interaction between corporate governance mechanisms and firm value or behavior, (Bebchuk, Cohen and Ferrell 2009), investment decisions (John and Knyazeva 2006) and payout policy (Officer 2010) among others. Second, this paper enhances our understanding of the choices made by private equity firms. The role of private equity firms in our economy has skyrocketed along with a wave of research on the returns earned by private equity investment firms. However, little is known about the factors that drive the choices of private equity investors. By examining whether there are any fundamental differences between firms taken over by private equity firms and other types of acquirers, this paper sheds light on this issue.

Perhaps the paper closest in spirit to this study is a working paper by Goktan,

Kieschnick and Moussawi (2008). Those authors examine the impact of select governance characteristics on firms' survival and note that some aspects of governance influence whether a firm is acquired or goes private. My paper differs from, and extends their work in several important ways. First, unlike Goktan et al, I examine GPs backed by private equity firms separately. This distinction is important given the increasing role played by private equity firms in the current wave of going private transactions (GPs). I show governance characteristics that affect the odds of a private equity backed GP are different from those that affect the odds of a non private equity backed GP. Second, I examine all merger and GP activity through 2009 whereas Gotkan et al end their sample period in 2004. My sample therefore includes the period 2005 – 2007 which is considered the peak of the latest buyout wave. Third, I utilize governance data on nearly 8,000 publicly traded companies in the U.S. unlike the IRRC (Investor Responsibility Research Center) data used by Gotkan et al which contains governance data only on major U.S. corporations.

The reminder of the paper is organized as follows. Section 2 provides the background and rationale for the governance provisions used in the study. Section 3 describes the data. Section 4 discusses the results. Section 5 addresses potential alternate explanations and Section 6 concludes.

II. Target Governance Provisions

A. Board Control Index (BCI)

The board of directors has long been considered an important governance institution (Gillan, 2006), however the empirical literature casts doubt on board importance (Hermalin and Weisbach, 2003; Bhagat and Black, 2002). Shivdasani (1993) examines whether differences in the structure of the board contribute to the incidence of hostile takeovers and finds that neither board size nor composition have any explanatory power. Brickley, Coles and Terry (1994) find that board independence has no significant effect on bid failure rates at companies with poison pills. In a more recent paper, Bates, Becher and Lemmon (2008) note that target board classification does not change the likelihood that a firm, once targeted, is ultimately acquired. However, there are no papers examining how target board composition influences the likelihood of being targeted by different types of acquirers.

Two recent papers examine changes in board structure after firms undergo a GP. Cornelli and Karakas (2008) examine the board structure of 88 U.K. buyouts sponsored by a private equity firm over the 1998–2003 period and find that, on average, board size decreases after the buyout. Moreover, individuals representing the buyout sponsor generally replace outside directors. Acharya, Hahn and Kehoe (2010) document similar findings using deal level data from 110 private equity transactions in Western Europe. However, to my knowledge, there is no research examining the relation between *ex-ante* target board characteristics and the

likelihood of being acquired by different types of acquirers. I examine whether board independence plays a role in the likelihood of a firm being acquired. I create a board control index *(BCI)* to measure the degree of control the board of directors have over shareholders in the decision making process. The components of this index are dummy variables indicating whether, a) the board is controlled by insiders b) the board is authorized to change the board size without shareholder approval and c) the board can amend bylaws without shareholder approval. By construction, this index lies between zero and three, with zero representing open and transparent boards. A larger BCI measure indicates a board has more control over decision making. Whether more board control benefits or hurts shareholder is an empirical issue and depends in part on what Fama (1980) calls the market for directors.

B. Anti-takeover Provisions

Research examining mergers during the 1980s suggest that these provisions help deter the occurrence of takeover bids (Pound, 1987). However, Comment and Schwert (1995) find that poison pills do not significantly influence the likelihood of firms being acquired. The defense offered by these provisions is often repealed by target boards when potential acquirers increase the offer price. Hence, anti-takeover provisions may increase the bargaining power of target firms. Reinforcing these findings, Georgeson and Co. (1997) argue that there is no evidence that the presence of a pill decreases the likelihood of being acquired. Other anti-takeover provisions include super majority requirements to approve mergers and incorporation in a state

with strong anti-takeover provisions. These provisions act as an extra layer of defense against takeovers and discourage hostile buyers from making an offer. I create an index *(Takeover Restrictions)* to measure the presence of anti-takeover provisions adopted by firms. The components of this index are dummy variables indicating whether, a) there is a poison pill in place b) the poison pill has a sunset provision, c) the poison pill has a qualified offer provision[7] d) there is a super majority requirement to approve mergers and e) the firm is incorporated in a state with anti-takeover provisions. By construction, this index lies between zero and five, with zero representing firms with weak or no anti-takeover provisions in place.

C. Voting Restrictions and State Laws

The right to vote on various firm-related issues is generally granted to shareholders. For instance, shareholders typically have the right to vote on bylaw amendments and charter amendments. However, this right can be constrained. Limitations, such as super majority voting requirements for the approval of charter amendments and bylaws, make it more difficult for shareholders to approve changes (Bebchuk, Cohen and Ferrell 2009). In addition to the power to vote on charter and bylaw amendments, shareholders may vote to replace the board of directors.

[7] A sunset provision in this context requires shareholders to approve the poison pill and hence, can be viewed as a stronger anti-takeover provision. A qualified offer provision allows potential acquirers go forward without board's approval. However, for an offer to be considered a qualified offer, stringent restrictions apply. Generally, it has to be all cash, usually made to all shareholders, contain a firm financing commitment, get a fairness opinion from an investment bank and the offer should result in acquiring a majority of outstanding stock. Given these restrictions, I consider it as an anti-takeover provision. Sunset and qualified offer provisions are only present in about 3% of total firms and are unlikely to influence the results. Nevertheless, I include them for completeness.

However, this right is weakened when a staggered board is present, becuase only one class of directors is elected each year. As a result, in the presence of a staggered board shareholders cannot replace a majority of the directors in any given year. Lastly, shareholders' voting rights may be limited if the firm has dual class shares with unequal voting rights. I create an index *(Voting Restrictions)* to measure degree of voting restrictions shareholders are subject to. The components of this index are dummy variables indicating whether, a) firm has a staggered board b) there is a supermajority requirement for charter amendments, c) firm has dual class shares d) there is a super majority requirement to amend bylaws. By construction, this index lies between zero and four, with zero representing firms where shareholders' voting power is unobstructed.

Lastly, I construct an index to measure state takeover-related laws a firm is subject to, namely, control share, cash out, freeze out and fair price provisions.[8] GIM and other studies note that state laws do not appear to be highly correlated with the adoption of firm-level provisions and might have explanatory power by themselves. By construction, this index *(State Provisions)* lies between zero and

[8] Control share acquisition statutes are intended to prevent potential acquirers from building up their ownership stakes in the target company. These statutes function by stripping potential acquirers of their voting rights in the event their ownership exceeds a previously set threshold. Voting rights are restored only by the approval of a majority or supermajority of disinterested shareholders (shareholders who are not related to the acquirer). Cash out statutes give dissident shareholders the right to sell their shares to the controlling shareholder at the highest acquiring price. Therefore, an acquirer seeking partial control of a company must be prepared to purchase significantly more shares that she anticipated should the remaining shareholders exercise their option to sell. Freeze out provisions force an investor who surpasses a certain ownership threshold in a company to wait a specified period of time before gaining control of the company. Fair price provisions require that at least a majority of disinterested shareholders approve the acquisition. Source: www.governanceanalytics.com

four.

III. Data and Description of Variables

A. Governance data

I use the Riskmetrics Group governance data on all publicly traded companies during 2002 – 2009 to construct the governance indices *Board Control Index (BCI), Takeover Restrictions, Voting Restrictions, and State Provisions*.[9] This dataset provides governance data for approximately 8,000 small and large public companies trading in the U.S. Most papers use governance data for the approximately 2,500 largest firms in the U.S. provided by Investor Responsibility Research Center (IRRC). It is likely that the variation in governance characteristics in this subset of firms is limited. Furthermore, firms undergoing GPs are generally smaller and a majority of them are not included in the data provided by IRRC. It could be one of the reasons for the lack of evidence on the role played by governance provisions in determining the probability of undergoing GPs elsewhere in the literature.

There are 8,313 distinct firms and 39,433 firm-years in the corporate governance dataset. Table I presents summary statistics of the important governance provisions available in the dataset. The proportion of boards controlled by insiders and affiliated outsiders has increased slightly from approximately 25% in 2002 to 33% in 2009. During the same time, the proportion of firms with small boards has increased from

[9] I thank Carol Bowie of Riskmetrics Group for providing access to their dataset.

8% to 17.4%. Statistics also reveal that boards have become more powerful as evidenced by the increase in the proportion of boards that can change board characteristics or amend bylaws without shareholder approval. The proportion of firms with staggered boards has decreased to 46% in 2009 from 60% in 2002. Along the same lines, the incidence of poison pills has also decreased to 42% in 2009 from 60% in 2002. These statistics are comparable to those reported by Bebchuk, Cohen and Ferrell (2009) who examine governance data during 1990-2002 and document a 60% incidence of staggered boards and poison pills in 2002.

**** Insert Table I here ****

B. Takeover Sample

I collect the sample of takeovers from Securities Data Company's (SDC) U.S. Merger and Acquisition Database. I restrict the sample to all completed acquisitions with announcement dates between January 1, 2002 and December 31, 2009. I require that the acquirer own 51% or more of the target after the deal. I limit the sample to going private transactions and acquisitions made by publicly traded firms in the U.S. I exclude REITs from the sample. I further require that financial information from COMPUSTAT and stock price information from CRSP be available for each target firm for the entire sample period or until it is acquired. Finally, I require that governance data of the target firms be available for the period prior to the deal.

These criteria result in a sample of 795 target firms out of which 581 firms underwent a merger with another public firm and 214 firms which went private.[10] I code indicator variables for whether a private equity firm is involved in the deal. I do this coding by reading through the deal synopsis provided by SDC for each event and checking whether the acquirer or the acquirer's ultimate parent is a private equity firm. Of the 214 GPs, 126 are backed by at least one private equity firm. The remaining 88 transactions represent buyouts by other investor groups and private operating companies. Table II presents the distribution of these transactions over time. Consistent with the existing literature (e.g., Eckbo and Thorburn, 2009; Guo, Hotchkiss and Song, 2010), there is an increased level of takeover activity between 2005 and 2007.

**** Insert Table II here ****

B. Variable Description

I control for several firm characteristics found to affect the likelihood of a firm being acquired. Prior studies (see for example Mehran and Peristiani, 2010) show that the odds of a firm being acquired or going private are negatively correlated with its size. I calculate firm size *(Size)* as the natural logarithm of total assets. Similarly, firm profitability measures have been shown to be negatively related to the likelihood of being acquired. I measure firm profitability *(Profitability)* as the ratio of earnings before interest, tax, depreciation and amortization to total assets. Pre-offer financial leverage may enable the transfer of wealth from bondholders to equity

[10] It is important to note the actual number of deal might be higher. However, I require that governance data be available for all target firms and this reduces the sample size significantly.

holders in a GP or merger (Asquith and Wizmann 1990). I calculate leverage *(Debt)* as the ratio of long-term debt to total assets. Along the same lines, potential financial distress may also affect a firm's decision to engage in change of control transactions (Opler and Titman, 1993). I also include the Altman Z-Score *(Z-Score)* as a proxy for potential financial distress.[11]

Implications of agency conflicts and information asymmetries between principals and agents are important issues in going private transactions (GPs). A central motivating hypothesis for why GPs occur is to reduce managerial discretion over the use of free cash flow (Jensen 1986). A GP reduces free cash flow that could be abused by managers and also increases pressure on managers to operate the reorganized firm efficiently. Most empirical studies employ a variety of cash flow variables as measures of the extent to which free cash flow is available (see, for example, Lehn and Poulsen 1989; Halpern, Kieschnick, and Rotenberg 1999). I calculate free cash flow as net income after taxes plus depreciation and change in working capital less capital expenditures scaled by total assets *(FCF)*. Another argument for why firms go private is that they generate tax benefits from debt financing (see for example Kaplan 1989). I include the variable total income taxes divided by sales *(Tax Ratio).*

The extant literature suggests that firms going private have fewer growth opportunities on average (see for example Opler and Titman 1983; Eckbo and

[11] This measure is calculated as 3.3*(earnings before interest and tax/sales) + sale/assets + 1.4*(retained earnings/total assets) + 1.2*(working capital/total assets) + 0.6*(market value of equity/book value of liabilities).

Thorburn 2009). I measure the market's assessment of a firm's future growth prospects by Tobins Q *(Tobins Q)* measured as firm market value divided by the book value of assets (as of latest fiscal year). Firm risk *(Firm Risk)* is measured as the volatility of the ratio of earnings before interest, tax, depreciation and amortization to total assets based on up to 10 years of history, with a minimum of 5 years. Ambrose and Megginson (1992) document a positive relationship between a firm's percentage of total assets accounted for by tangible fixed assets and the likelihood of it being acquired. I measure a firm's asset mix *(Asset Mix)* by the ratio of its net property, plant, and equipment to total assets. All variables are calculated using data from the latest fiscal year prior to the deal year.

In addition to the governance indices described in Section 2, I also collect information on institutional and managerial ownership. I obtain data on institutional ownership *(Institutional Ownership)* from Thomson Financial's 13F Holdings database, which contains stock level holdings of institutional money managers collected from quarterly filings with the SEC. I compute the fraction of a target firm's outstanding shares owned by all institutions at the end of every quarter and compute an annual measure by averaging over the previous four calendar quarters. I obtain data on insider ownership *(Executive Ownership)* from Form 4 of TFN insider filings data. I compute the fraction of a target firm's shares held by insiders by adding the shares held by all insiders at the end of the fiscal year and dividing by the number of shares outstanding for that year.

IV. Results and Discussion

A. Univariate analysis

Panel A of Table III compares financial characteristics of firms that went private with a sample of firms that underwent a merger with other public companies and with a sample of firms that remained public. The predominantly statistically significant p-values presented in the last two columns of the table show that firms that go private are very different from both of the other groups. These firms are smaller with average total assets of $1,372.9 million. On the other hand, average total assets of merger firms and survivors are $1,797 million and $3,812.6 million respectively. Further, firms that underwent GPs tend to have lower growth opportunities as evidenced by lower Tobins' Q and a higher book to market ratio.[12] These firms exhibit larger free cash flows, a higher debt ratio and a larger tax ratio. In addition, firms that went private tend to be less risky as evidenced by lower volatility of operating income. These observations are consistent with results presented elsewhere (Eckbo and Thorburn 2009; Mehran and Peristiani 2010).

Going private firms have lower (higher) institutional ownership than firms acquired by public companies (survivors). Managerial ownership of GP firms is only marginally higher than survivors and is not significantly different from merged firms. Aggregate governance indices such as G-Index and E-Index are lower for GP firms suggesting that these firms have better overall governance mechanisms in place

[12] The majority of surviving firms are profitable, as the median profitability measure of survivors is 7.54%. The lower averages for profitability and FCF measures are due to a cluster of firms with substantial losses.

compared to the other groups. However, individual governance provisions are significantly different across these groups. More specifically, GP firms have significantly lower takeover and voting restriction indices but a high BCI when compared to firms that are acquired. When compared with survivors, GP firms have a higher BCI and are subject to fewer state takeover laws.

**** Insert Table III here ****

Panel B of Table III presents pairwise correlation coefficients among the governance indices used in the study, firm size and the two traditional governance indices, the G-Index and the E-Index. BCI, Voting and Takeover restrictions are positively correlated with each other with the magnitudes ranging from 0.11 to 0.32. State provisions are negatively correlated with the remaining three governance indices used in the study. Overall, colleanarity doesn't appear to be an issue.

B. Multivariate Analysis

B.1 Regression Methodology

I use an unordered multinomial logistic regression methodology in which multiple observations on a sample firm are included. That is, I include all firm-years for which data are available during the sample period. The dependent variable equals 0 if a firm is a going concern in a given year, 1 if a firm is acquired by another public company in a given year, 2 if a firm goes private in a given year. In tests where GPs are split into two groups, dependent variable equals 2 if a firm undergoes a PE-backed going private transaction and equals 3 if a firms undergoes a non private

equity backed GP in a given year. In this setting, data on a particular firm ceases to exist when it undergoes a merger or a GP (i.e., when the dependent variable takes a value other than 0). Estimated coefficients indicate the change in the log of the ratio of the two probabilities [i.e., P(event $x|x = 1,2,3)$/P(base-case)] for a one unit change in the independent variable. I correct the standard errors of the estimated coefficients for possible firm-level clustering effects using a robust-variance estimation methodology (Petersen 2009).

This regression methodology is adapted to address two econometric problems that are common in governance and corporate control studies. The first concern is the potential sample selection problem that arises from using a non-random, outcome based sample. Identifying and using firms that engage in a specific type of transaction, say GPs, leads to incorrect results and erroneous inferences. The second concern is the need to recognize that undergoing a merger with a public company or going private with or without the backing of a private equity firm are relevant alternatives. This concern is more relevant in recent years where hostile takeovers are virtually non-existent. Estimating a simple logistic regression leads to excluding one or more relevant alternatives and results in biased coefficient and standard error estimates.

B.2 Examining the Role of Financial Characteristics

I begin my analysis by estimating a regression in which I examine the effect of firms' financial features on their survival status. This phase is helpful in

reassessing the findings in the extant literature and it also establishes a useful baseline for examining the additional explanatory power of various governance provisions. Model I of Panel A, Table IV presents the regression results of a specification that examines the likelihood of a firm being acquired by another publicly traded company or going private against continuing as a surviving entity (base-case).

The results indicate that small firms are more likely to be targets in change of control transactions. This result suggests there are inherent impediments to acquiring larger, more complex companies. The results reveal a negative relationship between growth opportunities proxied by Tobins Q and the likelihood of being acquired. There is a positive relation between the probability of short-term financial distress proxied by the Z-score and the likelihood of being acquired. There is a negative (positive) relationship between firm profitability and the likelihood of undergoing a merger (GP). Higher institutional ownership increases the likelihood of being acquired by another publicly-traded company but it does not affect the likelihood of going private. There is a positive relationship between the proportion of tangible assets and the likelihood of going private. The coefficient on the tax ratio is positive but insignificant for GPs.[13] These results confirm earlier findings firms that go

[13] Several earlier studies highlighted various tax benefits. Tax deductibility of interest payments on corporate debt is the most direct tax benefit. Kaplan (1989) also presents evidence that many of the earlier deals sought to take advantage of a favorable tax code allowing for certain depreciation deductions related to the fair value of the buyout premium. Most of these tax advantages were eliminated with the enactment of the Tax Reform Act of 1986.8

private are generally small, profitable firms with limited growth opportunities (Eckbo and Thorburn, 2009).

**** Insert Table IV here ****

Model II of Panel A, Table IV presents results for a broader specification where GPs are separated into private equity and non-private equity deals. The latter category includes GPs primarily undertaken by private operating companies and other investor groups. This categorization helps uncover financial characteristics that differentiate private equity backed deals from other GPs. There are two notable differences. First, there is a strong positive relationship between free cash flows and the likelihood of being targeted by a private equity firm. This result demonstrates that firms with large undistributed cash flows are more likely to undergo a private equity backed GP. Second, firms with higher levels of tangible assets are more likely to undergo a non private equity backed GP. These results suggest that private equity firms and private operating firms target firms with different characteristics. This may arise because of differing sources of gains from the acquisition. In the private equity backed case, the source of gains are likely driven by increases in operating efficiency and better monitoring by the buyout sponsors. In the private operating company case, operating synergies are likely to be an important source of gains. Hence, asset mix is more likely to be an important factor for private operating acquirers rather than for private equity firms.

Coefficient estimates presented in Panel A of Table IV measure the likelihood of each outcome relative to the base-case, i.e., relative to continuing as a

surviving entity. Next, I examine whether the coefficient estimates are different among possible outcomes. Panel B of Table IV presents the differences in the raw coefficients and the associated p-values for z-test of differences. These differences can be interpreted as follows. For instance, the estimate of 0.327 for FCF in the column 'PE backed GP - Merger' indicates that, holding all other factors constant, the percent increase of relative risk (or loosely, the odds) of undergoing PE-backed going private transaction over merger is about 38% (exp(0.327)=1.38) for a one unit increase in FCF. The results presented in this Panel show that financial characteristics that affect the likelihood of undergoing a PE backed GP over merger and the financial characteristics that affect the likelihood of undergoing a PE backed GP over a Non PE backed GP are different, underscoring the validity of the regression methodology used.[14]

B. 3 Examining the Role of Traditional Governance Indices

To analyze the effects of target governance characteristics in determining the likelihood of firms being acquired by specific acquirer groups, I include governance characteristics in the base-line regression model discussed above. I begin by

[14] Several tests were conducted to further confirm the validity of the unordered multinomial regression methodology used in this study. These are a) Wald test for combining outcomes, b) LR and Wald tests for significance of independent variables and c) Small-Hsiao tests of independence of irrelevant alternatives (IIA) assumption.

examining the relevance of traditional governance indices widely used in the literature, specifically the index constructed by Gompers, Ishi and Metric (2003).[15]

Model I of Table V reports parameter estimates for a multinomial logit model that measures the odds of undergoing a merger or a GP. The coefficient estimate on the G-index is insignificant implying that on average, *ex-ante* governance characteristics do not influence the likelihood of being acquired or going private. Model II of Table V reports results for two subgroups, where GPs are split into private equity backed and other GPs. The results show that higher G-index measures are associated with a reduction in the likelihood of undergoing a non private equity backed GP. However, it is unclear which components of the G-Index are driving this result. Given these general results I now focus on a more disaggregated approach by employing the three individual governance indices discussed earlier, BCI, takeover restrictions and voting restrictions.

**** Insert Table V here ****

B.4 Examining the Role of Governance Provisions

In the analysis that follows, I replace the G-Index with the individual governance indices described in section 2. Model I of Panel A, Table VI presents results of a multinomial logistic regression which measures the likelihood of a firm undergoing a merger or a going private transaction (GP). First, there is a positive

[15] A substantial amount of subsequent research has used this index. A few more recent studies (see for example Cremers and Nair, 2005; Bebchuk, Cohen and Ferrell, 2009) argue that not all 24 governance provisions have explanatory power and came up with alternate governance indices usually comprising of a fewer provisions.

relationship between BCI and the probability of going private. This result is consistent with the argument that GPs create value by changing how the firm is governed, and governance usually starts with boards.[16] As mentioned earlier, high BCI measures are more likely to be associated with weak governance measures.

Second, the results indicate that firms with strong anti-takeover provisions are less likely to go private and are more likely to undergo a merger. Extant literature suggests that given the absence of hostile offers in recent years, anti-takeover provisions are primarily used to enhance the bargaining position of firms in the event of a takeover offer. For instance, Comment and Schwert (1995) document that antitakeover provisions such as poison pills are associated with an increased bid premium of about 13%. Others have found that public acquirers pay higher premiums for acquisitions than their private counterparts (Bargeron, Schlingemann, Stulz and Zutter 2009). The estimation results reported in Table VI are consistent with these findings. The results show that voting restrictions on shareholders do not affect the odds of undergoing a merger or a GP while a higher number of state provisions reduces the likelihood of being acquired in the first place. Firms with higher institutional ownership are more likely to undertake a merger. The significance levels for all of the variables examined in Table IV are largely unchanged.

**** Insert Table VI here ****

[16] For instance, Jensen (1989) and a host of later studies argue that active governance by buyout sponsors provides a corporate governance system and incentive structure that is superior to that of widely held public firms.

Next, I examine whether governance characteristics are important in determining the involvement of private equity firms in going private transactions (GPs). Model II of Panel A, Table VI reports results for GPs split into two groups based on whether or not private equity firms back them. A subset of deals backed by private equity firms drives the positive association between BCI and the likelihood of going private. This result makes sense because the objectives and skill set of private equity firms are likely to be different from those of other private acquirers. It is often argued that among private acquirers, private equity firms are more likely to buy relatively profitable firms with poor growth opportunities and weak governance characteristics and to then implement improvements with the intent of exiting at a future date. On the other hand, private operating firms are unlikely to buy firms with the intention of selling them off at a future date. Rather, operating synergies are more likely to be an important reason behind a buyout involving a private operating company. The importance of asset mix in non private-equity backed deals as documented in section IV.B.2 provides additional support for this line of thought. An additional explanation for this result is the evidence that target management is more likely to be retained after a private equity backed GP when compared to other types of acquisitions (see for example Bargeron, Schlingemann, Stulz and Zutter 2009). It is therefore possible that target management chooses a private equity backed deal in order to increase the odds of retaining their jobs.

The results also indicate a strong negative association between takeover restrictions and the likelihood of undergoing a non private equity backed GP. This

finding makes intuitive sense as private acquirers other than private equity firms are mostly comprised of private operating companies. These companies may be financially constrained when compared to public acquirers and private equity firms. As such, they are reluctant to pursue targets with strong anti-takeover provisions given the improved bargaining capacity such provisions provide to target firms. Next, I examine whether the coefficient estimates are different among possible outcomes. Panel B of Table VI presents the differences in the raw coefficients and the associated p-values for z-test of differences. Results suggest that a higher BCI increases the likelihood of undergoing a private equity backed GP not only relative to the base-case (i.e., continuing as a surviving entity), but also relative to the undergoing a merger or a non private equity backed GP.

Another way to interpret the results is to calculate predicted probabilities for the variables of interest. Panel A of Table VII presents the predicted probabilities of possible outcomes for various values of BCI holding the values of all other explanatory variables at their means. The results show that the probability of undergoing a private equity backed GP increases as BCI increases from 0 to 3. Panels B through D present similar statistics for the three other governance indices - takeover restrictions, voting restrictions and state provisions, respectively. Overall, results presented in Table VII support earlier findings.

**** Insert Table VII here ****

B. 5 Governance Provisions and Shareholder Wealth Effects

I now examine shareholder the shareholder wealth effects associated with the GPs in the sample and the association between value change and target corporate governance.[17] Panel A of Table VII presents summary statistics of event period abnormal returns. Consistent with the findings of previous research, average abnormal returns are much lower for going private transactions than for acquisitions by public firms. The difference in means is 3.62%. Another way to look at the difference is that the mean abnormal return of target shareholders is nearly 17% higher if the acquisition is by a public firm rather than by a private firm.[18] There is no systematic difference in abnormal returns between buyouts sponsored by private equity firms and other private acquirers.

**** Insert Table VIII here ****

Next, I examine the impact of governance characteristics on shareholder wealth in a multivariate setting. Results presented so far suggest that the choice of acquirer is endogenously determined. Therefore, coefficient estimates obtained from an ordinary least squares regression of cumulative abnormal returns on various governance provisions will be biased and inconsistent. To correct for this problem, I

[17] To calculate cumulative abnormal returns (CARs), I follow Schwert (1996) by estimating market model parameters, using CRSP value-weighted index as the market proxy, for each target firm using daily returns from *day* -379 to *day* -127 relative to the deal announcement date. I calculate CARs for the following windows: (-1, +1), (-2, +2) and (-5, +5) where day 0 is the announcement date.

[18] A legitimate concern is that two-day abnormal returns may understate the abnormal returns associated with private firm acquisitions compared to public firm acquisitions. Since targets of private firm acquisitions are smaller than those acquired by public firms, it is likely that they are treaded infrequently or they trade in less efficient markets. However, longer window abnormal returns (CAR(-5,5)) also show a similar trend.

use the Heckman two-step estimation procedure (Greene, 2002). The selection equation captures the probability of a firm going private. Results of various specifications are presented in Panel B of Table VIII. The results indicate that governance provisions do not have a direct impact on shareholder wealth. In addition, the coefficient estimate on the private equity term is insignificant suggesting that the presence of private equity firms in GPs does not have an adverse impact on shareholder wealth.

Overall, these results suggest that while governance provisions do not have a direct impact on abnormal shareholder returns, they affect shareholder wealth in an indirect way. That is, these provisions affect shareholder wealth not only during the life of a publicly listed company, but also during its death by playing an important role in determining the type of acquirer.

V. Robustness checks

A. Do firms change their governance characteristics?

It is possible that firms change their governance characteristics prior to engaging in a change of control transaction in order to increase the odds of transitioning to their desired status. However, the empirical evidence suggests that firms rarely change their governance characteristics and in fact, this is a common assumption in the empirical literature (see for example Gompers, Ishi and Metric 2003). I examine the annual changes in each firm's governance characteristics for the sample examined.

Table IX presents average annual changes in governance characteristics. The results indicate that on average there are no significant differences in governance changes between firms that go private and firms in the control groups (i.e., survivors and firms acquired by other public companies). Median annual change in governance provisions is zero across all groups of firms. Overall, the results suggest that it is unlikely that firms willfully change their governance characteristics in order to influence the odds of achieving their preferred status.

**** Insert Table IX here ****

B. Managerial incentives

There are two avenues through which target management involvement might influence the findings of this paper. First, target management might want to take the firm private in a management buyout (MBO) but are short on resources to sponsor the deal entirely by themselves. In such cases, they are more likely to partner with private equity firms who have fewer financial constraints compared to other private acquirers. To the extent that firms that undergo MBOs have a high BCI prior to the transaction, this creates a selection bias. Second, even if target managers have no intention of being a part of the bidding group, they have an incentive to choose a private equity firm over other types of acquirers. This is because private equity firms are more likely to retain target management compared to other private acquirers. To the extent managerial incentives are proportional to their ownership stake, I control for this effect in all regression specifications. Nevertheless, to remove any

confounding effects of management involvement, I exclude deals where target managers are a part of the bidding group (either by themselves or in association with private equity firms) and re-examine the effects of governance characteristics on the likelihood of undergoing a merger or going private with or without private equity backing. The results are qualitatively similar and are not reported for the sake of brevity.

VI. Conclusion

This paper provides a comprehensive investigation of the relationship between *ex-ante* corporate governance characteristics and the odds of a firm going private. Using a custom dataset provided by the Riskmetrics group which contains governance information on more than 8,000 small and large listed companies in the U.S., I find that several governance characteristics play an important role in determining the likelihood of a firm undergoing a merger or going private. More specifically, I document a positive relationship between greater board control and the probability of going private. In addition, I find that firms with strong anti-takeover provisions are less likely to go private and are more likely to undergo a merger. Among other findings, I note that voting restrictions on shareholders do not affect firms' survival status while strong state provisions reduce the likelihood of being acquired by any type of acquirer. Firms with higher institutional ownership are more likely to undergo a merger.

I examine whether governance characteristics are important in determining

the involvement of private equity firms in going private transactions (GPs). I find that the positive association between greater board control and the likelihood of undergoing a GP is entirely driven by a subset of deals backed by private equity firms. This result provides support to the view that the objectives and skill set of private equity firms are different from those of other private acquirers. In addition, I find that a subset of deals not backed by private equity firms' drive the strong negative association between takeover restrictions and the likelihood of undergoing a GP. This finding makes intuitive sense as private acquirers other than private equity firms mostly comprise of private operating companies. These companies are more likely to be financially constrained when compared to other types of acquirers. As such, they are reluctant to pursue targets with strong anti-takeover provisions given the improved bargaining capacity such provisions provide to target firms.

Lastly, I examine the wealth implications to shareholders. Consistent with the findings of previous research, I note that average abnormal returns are much lower for GPs than for acquisitions by public firms. Target shareholders receive approximately 17% more premium if the acquisition is by a public firm rather than by a private firm. There is no systematic difference in abnormal returns between buyouts sponsored by private equity firms and other private acquirers. Results suggest that while governance provisions do not have a direct impact on event period returns, they affect shareholder wealth in an indirect way. That is, these provisions affect shareholder wealth not only during the life of a publicly listed company, but also during its death by playing an important role in determining the type of acquirer.

CHAPTER 2

EMPIRICAL EVIDENCE ON OWNERSHIP STRUCTURE, MANAGEMENT CONTROL AND AGENCY COSTS[19]

I. Introduction

This study presents empirical tests of the central hypotheses regarding the relation between agency costs and the structure of ownership and control in an organization. We make use of an extensive data set on ownership and control which includes details on over 250,000 private as well as publicly traded companies. Our sample has the additional feature that the private companies and the publicly traded companies in the sample are required by law to file information compiled using the same guidelines.

The 'agency problem' is now an ingrained part of the vocabulary used when discussing the ownership, management and operation of an organization and the expropriation of resources by those who control a corporation (Jensen and Meckling, 1976; Shleifer and Vishny, 1997; Holmstrom and Kaplan, 2001, 2003; Becht, Bolton and Roell, 2003; Dennis and McConnell, 2003; Hermalin, 2005; Gillan, 2006; Tirole, 2006; Djankov, La Porta, Lopez-de-Silanes and Shleifer, 2008).[20] Yet little direct evidence exists on the magnitude and extent of the actual costs associated with the problem assessed across the entire spectrum of ownership and control. The literature generally argues that firms face two types of agency

[19] This chapter is based on collaborative work with Scott C. Linn and Pradeep K. Yadav.

[20] Of course this stream of thought stems ultimately from the seminal work of Berle and Means (1932) and reflects the significant influence of Jensen and Meckling (1976) and Ross (1973).

problems: vertical agency problems that exist between owners and managers (Jensen and Meckling, 1976), and horizontal agency problems that exist between majority and minority owners (Shliefer and Vishny, 1997, Gilson and Gordon, 2003).[21]

Our study makes several contributions to the literature. First, we focus on the entire ownership and management spectrum, from single owner, single manager firms through diffusely held publicly traded corporations.[22] While providing important insights, most studies focusing on the valuation effects of agency problems concentrate on publicly-traded companies and so are not able to address how agency costs associated with the vertical agency problem behave over the complete ownership spectrum. We present such evidence.

We find that private firms in which the owner is also the sole manager exhibit evidence of lower agency-related costs when compared to public firms as well as compared to private firms with other ownership and management structures, consistent with the theoretical predictions of Jensen and Meckling (1976). These results are robust to various control variables as well as statistical methods.

[21] The vertical agency problem emerges from the view of the firm as a nexus of contracts, where contracts are costly to enforce (Coase, 1937; Alchian and Demsetz, 1972; Ross, 1973; Jensen and Meckling, 1976; Fama and Jensen, 1983a,b). The literature on vertical agency problems deals with the causes and consequences of separation of ownership and control. In contrast, the literature on horizontal agency problems has focused on the exploitation of minority shareholders by a controlling shareholder (Grossman and Hart, 1980; Stulz, 1988; Burkart, Gromb and Panunzi, 1997, 1998; Gilson and Gordon, 2003; Dyck and Zingales, 2004; Laeven and Levine, 2008). See also the review by Roe (2005).

[22] The literature is extensive. See the survey articles of Shleifer and Vishny (1997), Dennis and McConnell, (2003), Gillan (2006) as well as Morck, Shleifer and Vishny (1988), McConnell and Servaes (1990), Himmelberg, Hubbard and Palia (1999), Demsetz and Villalonga (2001), Coles, et. al (2008). In related work Yermack (2006) , Andrews, Linn and Yi (2010) and Grinstein, Weinbaum and Yehuda (2010) conclude perquisite consumption is at least in part due to vertical agency problems.

We also find that among private firms, agency costs increase as firms move from simple ownership structures such as being owned by a single individual or a family to more complicated ownership structures such as being owned by multiple families or holding companies. This result is consistent with the hypothesis that as the number and types of shareholders increase the incentive for any individual shareholder to incur the costs of monitoring managers decreases because the benefits associated with monitoring are proportional to the shareholder's ownership stake (Shleifer and Vishny, 1986; Holderness, 2009). This in turn results in less monitoring than would arise in the case of a single owner.

The second contribution of this paper is an investigation of the costs associated with the horizontal agency problem. While both vertical and horizontal agency problems exist in private firms, legal scholars and practitioners argue that the horizontal agency problem, which manifests itself in the exploitation of minority shareholders by a controlling shareholder, is a major concern in close corporations (Gilson and Gordon, 2003; Burkart, Gromb and Panunzi, 1997, 1998; Roe, 2005; Laeven and Levine, 2008). Exploitation of minority shareholders can take several forms including higher compensation to majority shareholders, appropriation of corporate assets, and dilution of minority shareholders' interests through issuance of stock or dividends. In order to attract minority investors, the majority shareholder has an incentive to credibly convey that minority shareholders will not be exploited. Theory suggests that the controlling shareholder should transfer some control to minority shareholders as a means of providing a credible promise that minority

owners will not be exploited (Pagano and Roell, 1998; Bennedsen and Wolfenzon, 2000; Gomes and Novaes, 2005; Shleifer and Wolfenzon, 2002).

We find that firms with shared control (i.e., those where the largest shareholder owns less than 50% of the equity) have lower agency costs than firms in which the largest shareholder has enough power to extract private benefits from minority shareholders (i.e., where the largest shareholder owns between 50% and 75% of the equity). Furthermore, we find that the presence of multiple large shareholders also results in lower agency costs. We document an inverse relation between the ownership stake of the second largest shareholder and agency costs, providing support for the view that minority expropriation is lower in companies where control is more contestable.[23]

The absence of audited and verified information on close corporations is the primary reason for the lack of empirical evidence on agency costs measured across the entire ownership spectrum. A firm owned and managed by a single individual has zero agency costs. The zero agency cost firm serves as the baseline case when measuring the agency costs incurred by firms with different organizational and ownership structures. However, no publicly traded firm can be classified as a zero agency cost firm because, by definition, such firms are characterized by a separation of ownership and control. While it is relatively easy to obtain audited and verified

[23] These results are consistent with the findings of Lehmann and Weigand (2000). Those authors show that the existence of a second large owner is positively associated with profitability of German firms. In the context of publicly traded companies, Faccio, Lang and Young (2001) find that the existence of multiple large shareholders increases dividend payouts in Europe, but lowers them in Asia. Maury and Pajuste (2005) show that among Finnish firms, the holdings of large shareholders have a positive effect on corporate valuations. In a related study, Berkman, Cole and Fu (2010) examine the links between political connections and minority shareholder protection in Chinese listed firms.

financial information about public companies, such information is typically unavailable for private companies which could be classified as zero agency cost firms, in particular private U.S. companies.

We examine a unique data set composed of U.K. private and public companies. Three principal features of the financial reporting regulations for U.K. companies are substantially equivalent for private and public firms. First, the U.K. Companies Act requires all private and public companies to file annual financial statements that comply with the same accounting standards. Second, financial statements filed by both U.K. private as well as public companies must be audited.[24] Third, private and public companies are subject to the same tax laws. These standards therefore provide us with a set of comparably measured data for both public and private companies. Our dataset includes firms with a wide array of ownership structures ranging from firms with a single owner-manager to firms with multiple owners and outside managers.

Our paper is close in spirit to the work of Ang, Cole and Lin (2000). Ang, Cole and Lin examine self-reported data on small businesses collected via telephone survey methods as part of the National Survey of Small Business Finances (NSSBF). Using a sample of 1,708 domestic U.S. companies for 1992, Ang, Cole and Lin (2000) find that their proxy for agency costs is significantly higher when an outsider manages the firm and is inversely related to the manager's ownership share. Using data from the same survey, Nagar, Petroni and Wolfenzon (2010) find that firms with shared ownership are associated with a larger return on assets. Our study differs from

[24] There is an exemption for very small companies which we return to in section IV.

these two papers in several important ways. First, the data we employ are based upon the constituent firms following a common set of audited reporting guidelines. The companies represented in our sample are all domiciled in the U.K. and must comply with government mandated reporting requirements. Second, our sample includes over 250,000 private as well as public companies and the data examined cover the multiyear period 2006-2009. The cross-section of companies we examine is diverse across both industries as well as company size. Third, the NSSBF data used by the abovementioned papers contains limited measures of ownership. In contrast, our dataset contains detailed information on ownership and because we have multiyear observations we are able to utilize lagged data on ownership and management as a precaution against joint determination of these variables and agency costs.[25] We construct and use an agency cost index (ACI) based on data reported following formal reporting requirements. In defense of the index we show that for the publicly traded companies in our sample the index is related to two commonly referenced indices designed to characterize weak versus strong corporate governance in publicly traded companies (Gompers et al., 2003; Bebchuk et al., 2009) and which have been shown to be correlated with various measures of value.

Section II presents a discussion of the nature of vertical agency costs and outlines testable hypotheses. Section III presents a companion discussion on the nature of horizontal agency costs. Section IV provides a description of the sample.

[25] The NSSBF data provides four measures of ownerships structure: a) the ownership share of the primary owner; b) an indicator for firms where a single family controls more than 50 percent of the firm's shares; c) the number of non-manager shareholders and d) an indicator for firms managed by a shareholder rather than an outsider.

Section V contains a description of how we measure agency costs. Section VI describes the statistical methods and control variables used in the study. Sections VII and VIII discuss empirical results related to vertical agency costs and horizontal agency costs respectively. Section IX presents a discussion of various robustness checks. Section X presents a summary of the paper and our conclusions.

II. Vertical Agency Costs

Jensen and Meckling (1976) argue that when an owner-manager reduces his equity stake below 100%, incentives increase for the manager to consume or waste corporate resources for personal benefit because she does not bear the full cost of such excesses. Thus, if agency costs are material, these costs should vary inversely with the manager's fractional ownership. Agency costs are therefore predicted to be higher among firms that are not managed by owners compared to those managed by owners.

The simplest ownership structure is one where a single individual owns and manages the firm. Such firms represent the zero-agency cost base case. If the owner hires an outsider as the manager, it may lead to costs in the form of lost revenues or reduced profits resulting from misalignment of interests and monitoring problems. It follows that agency costs are predicted to be larger when the manager is not the owner of the enterprise. Likewise the problem is expected to worsen when there are multiple owners and the manager holds little or no equity ownership. When the sole owner bears 100 percent of any agency costs, she also receives 100 percent of the

resulting benefits from monitoring and disciplining management. This has force because she holds the right to hire or fire managers. As we move from a single owner-manager setting to structures where firms are owned by multiple shareholders we expect the magnitude of vertical agency costs to increase. As the number of shareholders increases the incentive for any shareholder to incur all of the cost of monitoring the managers decreases because the benefits associated with monitoring are limited by the shareholder's proportional ownership stake, which is less than 100%. The reduced incentive to monitor in turn may lead to higher agency costs. A potential remedy to this problem is to have simpler and more concentrated ownership structures. Shareholders with a larger stake will have a greater incentive to monitor managers and see that agency costs are kept low. Agency costs are therefore predicted to increase as firms move from the single-owner structure to more complex ownership structures. Likewise, the magnitude of vertical agency costs are predicted to increase as the proportion of shareholders managing the firm decreases.[26]

III. Horizontal Agency Costs

A fundamental feature of close corporation ownership structures is that shareholders are typically few in number, are knowledgeable about firm operations, and are involved in management. In particular, when a controlling shareholder is present, that person generally takes an active interest in running the company by

[26] Empirical evidence on the monitoring role of large shareholders while extensive is limited to publicly traded companies. Shleifer and Vishny (1988), Wruck (1989), Franks, Mayer and Renneboog (2001) and references cited in footnote 2. Research on the impact of the number and type of shareholders in mitigating agency costs in closed corporations is so far limited to theoretical models (for example Zwiebel (1995) and Bennedson and Wolfenzon (2000).

choosing the management and directly holding an executive position. While concentrated ownership helps mitigate the vertical agency problem, it is possible that a controlling shareholder will extract private benefits of control by forcing decisions which expropriate minority shareholder wealth (Grossman and Hart, 1980; Dyck and Zingales, 2004; Gilson and Gordon, 2003; Roe, 2005).

Pagano and Roell (1998) suggest that by monitoring the controlling shareholder other large shareholders play an important role in reducing horizontal agency costs. Gomes and Novaes (2005) speculate that the presence of a large number of blockholders improves firm governance in closed corporations because disagreement among shareholders prevents them from expropriating minority shareholders. In a model developed by Bennedsen and Wolfenzon (2000) no individual shareholder has sufficient votes to control the firm and consequently must form a coalition of shareholders to achieve control. Coalition formation minimizes the chance of expropriation since no individual shareholder is able to take any actions without the consent of the other coalition members. A result is that fewer choices expropriating minority shareholders are implemented and firm performance is better relative to the single controlling shareholder case. The main shareholder surrenders some control to minority shareholders in order to improve overall firm performance. The prediction is that shared control of firms helps decrease the magnitude of horizontal agency costs. [27]

[27] Empirical evidence on the role of large shareholders is limited and the few studies that examine this issue focus on listed firms. Faccio, Lang and Young (2001) examine the effect of multiple large shareholders on dividends. They find that the presence of large shareholders dampens expropriation in Europe (due to monitoring), but exacerbates it in Asia (due to collusion). Lehmann and Weigand

Pagano and Roell (1998) specify conditions under which multiple large shareholders will cross-monitor each other, reducing expropriation and improving firm performance. In their model expropriation of minority shareholders by a controlling shareholder is likely to be less severe when the ownership stake of non-controlling shareholders is more concentrated. The intuition behind the conclusion is that large non-controlling shareholders are more effective in monitoring the controlling shareholder. In a related analysis, Bloch and Hege (2001) conclude that minority expropriation will be lower in firms where control is more contestable, that is in firms where the difference in the stakes of the controlling shareholders and that of minority shareholders is smaller. An empirical implication of these theories is that the magnitude of horizontal agency costs decreases as contestability increases.[28]

IV. Data and Empirical Methods

We obtain company data from the FAME database produced by *Bureau Van Dijk*. Each yearly installment contains the latest available ownership and management structure data and 10 years of financial statement data for all public and private companies registered in the U.K. and Ireland. The data we examine are from

(2000) show that the existence of a second large owner is positively associated with the profitability of listed German firms. Maury and Pajuste (2005) investigate a sample of listed Finnish firms and conclude that a more equal distribution of votes among large blockholders has a positive effect on firm value. Gutierrez and Tribo (2008) examine Spanish firms and find that firms whose characteristics make them more vulnerable to minority expropriation tend to have controlling groups with ownership stakes that are far removed from a 50% threshold.

[28] Lehman and Weigand (2000), in a study of publicly traded German companies, report that the presence of a second large shareholder enhances profitability. In a related paper, Volpin (2002) analyzes listed Italian companies and finds that firms where control is contestable have higher valuations.

the period 2005-2009. We use current year's financial data and lagged ownership and management data in our analysis.

The U.K. Companies Act of 1967 (and subsequent revisions to the act) requires all private and public companies to file annual financial statements that comply with the same accounting standards. All accounts submitted to the Companies House must be audited and certified by an independent accountant. Some small and medium sized companies can claim exemptions from either or both of these requirements and are also allowed to file abridged financial statements.[29] We restrict our analysis to firms that are classified as private limited, public quoted, public quoted AIM, public quoted OFEX, and public not quoted.[30]

For each of the years 2006 to 2009, we identify all firms with total assets of at least £5,000 and revenues of at least £1,000 during each year. These criteria enable us to identify a broad cross-section of ownership and management structures and

[29] The definition of a "small" or "medium" company has changed over time. For accounting periods ending after 30 January 2004, a company is considered small (medium) if one of the following requirements are met: i.) annual revenues are less than 5.6 (22.8) million, ii) balance sheet total is 2.8 (11.4) million or less and iii.) number of employees is less than 50 (250). Small companies are exempt from both auditing and accountant's report requirement whereas medium companies are exempt from auditing requirements but should contain an accountants report. For more details please refer to http://www.companieshouse.gov.uk/about/gbhtml/gba3.shtml#three. Since it is possible that different types of exemptions might affect accounting quality, we control for accounting types in our multivariate analysis. In addition, we repeat our analysis using a sub-sample of firms that are not exempt from auditing requirements. Results are qualitatively similar and are available on request.

[30] Firms belonging to the public quoted category are those that are listed on the London Stock Exchange (LSE). Firms belonging to the public quoted AIM group are those that are listed on the Alternative Investment Market (AIM). OFEX is an independent public market specializing in smaller companies who do not wish to incur the expense of listing with AIM. Finally, public not quoted firms are those which have public debt outstanding but not equity. Firms with different ownership structures might differ in their accounting practices such as recognition and timing of revenues and costs because of tax considerations. All U.K. firms, both public and private, are subject to the same tax laws (Ball and Shivakumar, 2005; and Bell and Jenkinson, 2002) so tax code driven ownership structures should not be present in our sample.

industry affiliations. Likewise, the criteria mitigate concerns of possible sample selection bias from imposing the size threshold implied by the auditing requirements of the Companies House. Such a restriction might result in a sample that includes only large, successful, single owner-managed firms. The tradeoff is that our sample contains some very small firms. We show that our findings are not influenced by these size criteria.

Appendix B presents a detailed description of the sample construction. The final sample consists of 612,449 firm-year observations. More specifically, the sample consists of 161,177, 161,571, 154,739 and 134,962 firms for the years 2006, 2007, 2008 and 2009 respectively. This dataset is an unbalanced panel with 259,893 unique firms.[31] There are 89,729 firms with one observation, 56,607 firms with two observations, 44,722 firms with three observations and 68,835 firms with four observations. Table X presents the distribution of ownership structures for the sample. Column 1 of Table X lists the seven different ownership structures into which firms are categorized; (1) private firms that are owned by a single individual, (2) private firms that are owned only by a single family, (3) private firms that are owned by multiple families only, (4) private firms that are owned jointly by a combination of families and private companies including investment funds, (5) private firms that are owned exclusively by private holding companies, (6) firms that are registered as public companies but not listed on a stock exchange, and (7) public

[31] Among these, 90,855 firms are subject to mandatory auditing requirements of the Companies House. These firms represent 192,839 firm-year observations.

firms that have equity securities listed on a stock exchange.[32] The even-numbered columns of Table X present the number of firms that are owner-managed. Our classification scheme enables us to examine how the magnitude of agency costs changes as we move from one end of the ownership spectrum to the other. Of particular interest are the firms that are owned and managed by a single individual. There are approximately 30,000 such firms covering a wide-array of industries in each of the sample years. We define this group as the zero-agency cost group.

**** Insert Table X here ****

The classifications shown in Table X denoted "One Family" and "Multiple Families" contain firms that are owned by a single family and multiple families respectively. We expect little difference between firms that are owned by a single individual and those owned by a single family but separate the two groups for completeness.

The classifications denoted "Families & Companies" and "Holding Companies" contain firms that are partly and wholly owned by private industrial entities such as holding companies. These cases do not include situations in which the holding company is owned by the single individual or family. Such cases really

[32] Firms can be registered either as private companies or public companies. The most important distinction between these companies relates to their ability to raise funds in capital markets. Public companies have unrestricted right to offer shares but some public firms choose not to do so. These companies are classified as Public, Not Quoted. Such firms, though technically private firms, are larger, more transparent and have to adhere to additional legal regulations compared to firms registered as private companies. There are no private companies owned outright by public companies or public holding companies.

just amount to the firm having one-owner or being owned by one-family, and were so classified.

**** Insert Table XI here ****

Table XI presents information on the industries to which the sample firms belong. There are significant variations in how private and public firms are distributed among industry sectors. While only 6% of one owner firms belong to the manufacturing sector, nearly 32% of public quoted firms belong to this sector. On the other hand, we observe that the proportion of firms belonging to the construction and real estate sectors decrease monotonically as we move from one owner firms to public firms. Note also that a larger proportion of private firms belong to the retail trade sector and the 'other services' sector compared to public firms. In sum, these differences highlight the importance of controlling for industry effects in the analyses to follow.

**** Insert Table XII here ****

Table XII presents company-level summary statistics for firms belonging to the ownership structure groups. Private firms are typically smaller than public firms. One owner firms have average assets of £0.29 million. Median assets increase monotonically as the number of owners increases. Private firms on average are more levered consistent with the findings reported by Brav (2009) for private and public firms in the U.K. While private firms are smaller and more levered than public firms, they are associated with higher turnover and profitability ratios as measured by asset turnover (AT) and earnings before interest taxes and depreciation scaled by assets

(EBITD) respectively. Profitability decreases as ownership becomes more diffuse (moving left to right across the table). CRIF Decision Solutions Ltd. constructs a measure of the probability of company failure labeled Quiscore computed using a proprietary model and variables similar to those employed in the computation of the Altman Z-score.[33] A Quiscore can take any value within the range 0 to 100 where the following interpretations apply: 0-20 (high risk band), 21-40 (caution band), 41-60 (normal band), 61-80 (stable band) and 81-100 (secure band). The distribution of Quiscores across ownership classifications indicates the index values for the sample firms tend to fall in the normal or better regions. Firms owned by a single individual or a single family are on average younger. Finally, to mitigate the effect of outliers, we winsorize the top 1 percent and bottom 1 percent of all financial variables.

V. Measures of Agency Costs

A. A Multivariate Measure of Agency Costs

Tirole (2006) suggests that two important manifestations of agency problems are 1) inefficient investment choices, and, 2) inefficient or insufficient effort being expended by managers. The magnitude of any agency costs should therefore depend on factors such as inefficient asset utilization (in the form of poor investments),

[33] Quiscore is produced by CRIF Decision Solutions Ltd. Quiscore is a measure of the likelihood of company failure in the year following the date of calculation. In determining a Quiscore value for a company, a number of separate calculations are performed using various combinations of financial characteristics including turnover (revenue), pre-tax profit, working capital, intangibles, cash and bank deposits, creditors, bank loans and overdrafts, current assets, current liabilities, net assets, fixed assets, share capital, reserves, shareholders funds. The Altman Z-score requires the ratio of the market value of equity to the book value of equity for its computation and so cannot be computed for private companies.

excessive and unwanted production costs and perks (resulting in higher expenses), and insufficient effort exerted by management (resulting in lower revenues and earnings). As already noted, we take the position that the single-owner single-manager firm has zero agency costs. We therefore estimate a proxy for agency costs by computing the *difference* between a specific characteristic for a firm that is predicted to be influenced by the presence of an agency problem and the average of the same characteristic for the zero agency cost firms in the sample.

We measure he efficiency of asset utilization using the asset turnover ratio (sales to assets, AT) which reflects how management uses the assets under control for revenue generation (Ang, Cole and Lin 2000; Singh and Davidson III 2003). We measure production cost efficiency using operating expenses divided by sales (OPEXP) (Ang, Cole and Lin 2000; Nagar, Petroni and Wolfenzon 2010).[34] The ratio earnings before interest taxes and depreciation/total assets (EBITD) is used to capture aggregate efficiency.[35]

We compute a proxy for the agency costs of a firm by subtracting an efficiency variable's value for the firm from the average value of the efficiency variable for the zero agency cost firms operating in the same industry. We scale this difference by the average value of the variable for the zero agency cost firms. For a firm j belonging to industry group i, the agency cost proxy is calculated as follows.

[34] Singh and Davidson (2003) examine SG&A expenses.

[35] Studies examining publicly traded companies use market-based measures such as a pseudo-Tobins'Q measure or Return on Equity to infer agency costs. We chose to use accounting performance measures as a majority of our sample includes privately held firms for which market performance measures are unavailable.

$$Agency\ Cost\ Proxy_{j,i} =$$

$$\frac{Average\ Value\ of\ Efficiency\ Variable_{\ zero\ agency,i} - Efficiency\ Variable\ Value_{j,i}}{Average\ Value\ of\ Efficiency\ Variable_{zero\ agency,i}} \quad (1)$$

We recognize that each of the three agency cost proxies has some unique limitation. Therefore, we also calculate an index of agency costs based upon a multivariate factor analysis of the three proxy variables. We find a single dominant factor explains most of the non-unique variance for each agency cost proxy variable.[36] We then compute the factor score for this dominant factor for each firm in the sample for each year. These measures serve as our index of agency costs (hereafter labeled ACI).[37] More positive values of ACI represent larger agency costs.

In order to establish the credibility of the ACI index we next examine the relation between the index and measures of corporate governance that have been found to differentiate publicly traded companies. Because the corporate governance data is available only for publicly traded companies we must restrict ourselves to that subset of the sample. Extant theory tells us that firms with weaker corporate governance should be associated with higher agency costs, ceteris paribus. Gompers, Ishi and Metric (2003, GIM) find that a broad corporate governance index, for which a higher value of the index indicates weaker governance (shareholder rights), is negatively correlated with firm value as well as stockholder returns for public companies. Cremers and Nair (2005) and Bebchuk, Cohen and Ferrell (2009)

[36] See Seber (1984, Ch. 5) for a discussion of methods for identifying the number of common factors present in a covariance matrix.

[37] Factor scores are the estimated values of the unobservable common factor. For details on the computation of factor scores see Seber (1984).

argue that not all the provisions reflected in the GIM Index have explanatory power and suggest an alternative governance index made up of a subset of the factors used in the construction of the GIM index. Bebchuk et al. label the revised index the entrenchment (E) index. The findings of these studies suggest that weak governance, as reflected by weak shareholder rights, is associated with lower firm value or performance, implicitly because it reflects a situation in which greater agency costs are present.

We examine the relationship between the ACI index and the GIM and E indices for the publicly traded firms in our sample. We use the RiskMetrics governance data for firms listed on the London Stock Exchange to construct the GIM Index and the E Index for the U.K. publicly listed companies in our sample.[38] Our indices are not perfect matches for those computed for U.S. companies because some of the measures used to construct the U.S. indices are not available for U.K. companies, but they are nevertheless close substitutes. The results are presented in Table XIII. In all specifications, some of which include control variables, coefficient estimates on the governance indices are positive and statistically significant indicating that the agency cost index ACI is increasing in the two computed governance indices. Recalling that greater values of the governance indices represent weaker governance and that larger values of the ACI index indicate greater agency costs, we conclude that the ACI index is capturing agency costs for the publicly traded firms in our sample. While a corresponding analysis for private

[38] We are grateful to Carol Bowie of the Riskmetrics Group for making the detailed UK data available to us.

companies is not possible we feel comfortable concluding the ACI index is a legitimate proxy for agency costs.

**** Insert Table XIII here ***

VI. Statistical Methods and Controls

A. Statistical Methods

Our data constitute an unbalanced panel spanning 2006-2009. The agency cost index ACI is our dependent variable for the results presented in Panels A and B of Tables XIV through XIX. Panel C of Tables XIV through XIX presents results using alternate proxies for agency costs as the dependent variable . We control for company-level characteristics, industry affiliation and time, all of which are discussed more fully in the next section. All of the models are estimated using ordinary least squares. We present standard errors for tests of the hypothesis that estimated coefficients equal zero that account for heteroscedasticity and, following the recommendations in Petersen (2009), also compute coefficient standard errors based upon a clustering method to account for residual dependencies. Robustness checks including tests based upon matched samples constructing using non-parametric matching methods are discussed in Section VIII.

B. Company Ownership

An important issue in studies focusing on ownership structure is whether company ownership structure and firm performance are endogenous relative to one another. Put simply, while ownership structure may affect performance, it is possible that performance may also be one of the determinants of ownership structure. We

address this issue by first examining whether ownership for our sample is sticky, that is, we examine whether ownership tends to vary over time for our sample companies.[39] Constant ownership levels would be a sufficient condition to motivate its use as an independent variable in a performance-type regression (Smith and Watts (1992)). We first examine the private companies in our sample for changes in ownership structures and find that only 4.7% of the private firms in the sample (i.e., 12,036 out of 255,541) were associated with an ownership change between 2006 and 2009.[40] Even though we find that ownership does not tend to vary over time, we use lagged ownership and management classification data in our analysis to minimize any possibility of contemporaneous jointly determined effects.

C. Controls

We control for company-level characteristics, industry membership and time. Appendix B describes how the control variables are measured.

The company-level controls include a measure of firm size, firm age, bank borrowing, general leverage, default risk and an indicator of accounting disclosure. Company size may be associated with the extent or lack of an agency problem. Williamson (1967, 1985) for instance suggests economies of scale and other related factors influence the size of the firm but that decreasing returns to managerial

[39] While it might be possible for an owner to increase her equity investment, she will be constrained by her own personal resources (Berger and Udell, 2002; Cole, Wolken and Woodburn, 1996). In most private company settings, especially those cases involving a single owner, most of the owner's wealth is likely to already be tied up in the company she owns. As a result of this resource constraint and the fact that such ownership interests are not easily transferable investors in close corporations cannot easily adjust their ownership positions as conditions change.

[40] We also note that the proportion of firms that moved from simple to complex ownership structures (i.e., from one owner to multiple families) is approximately equal to the proportion of firms that move from complex to simple structures (i.e., public quoted to wholly owned subsidiary).

efficiency, span of control issues, may emerge in larger firms. Conversely, large firms may be those which have survived and grown due to operating efficiently. We control for the size of the firm using the log of annual sales and its square to account for any non-linear size-related effects. Older firms may be more efficient than younger firms and the fact that they have survived may suggest the agency costs for such firms are smaller. On the other hand older firms may reflect situations where investment opportunities have been largely exhausted and excess cash flow permits greater abuse of resources. We therefore also control for firm age. We calculate firm age as the number of years between the incorporation date and financial statement date.

In the absence of access to public equity markets, private firms rely on debt provided by owners and external institutions such as banks as their primary source of financing.[41] The role of monitoring has long been recognized as an important ingredient of bank lending (Diamond, 1991; Tirole, 2006). We assume that a bank's monitoring incentives are directly proportional to the level of loans they make to a firm. We include bank debt scaled by total assets as an independent variable. We also include total liabilities scaled by total assets as a control. We also control for the likelihood of company failure in the subsequent year by including dummy variables

[41] Berger and Udell (2002) and Cole, Wolken and Woodburn (1996) find that financial institutions provide roughly 27% of the dollar amount of small business credit in the US with 16% additionally coming from trade credit.

for four of the five bands (high risk, normal, stable and secure) into which the Quiscore of a company falls with the 'caution' band being the excluded group.[42]

Small and medium firms are eligible to submit abridged financial statements under UK law. We assign the firms in our sample to one of seven groups based on the type of financial statements they file: a) small company statements b) medium company statements, c) total exemption small, d) total exemption full, e) partial exemption f) full accounts and g) group accounts. We include dummy variables to control for the effects of the different levels of reporting requirements with small company statements being the excluded group. Finally we include the number of subsidiaries and number of holding companies associated with a firm as control variables.[43] We group the measures described in the preceding paragraphs together under the umbrella *Company Specific Controls*.

We include dummy variables to control for industry affiliation. The industry dummies are based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry and are grouped under the umbrella *Industry Affiliations*.[44] Lastly, we control for time using dummies for each year, with the first year indicator (2006) being the excluded dummy variable.

[42] Please refer to the discussion in Section IV and Appendix B.

[43] We redo our analysis by excluding all subsidiaries. Results do not vary significantly and are available on request.

[44] Separately we also follow the methodology of Ang, Cole and Lin (2000) and include a set of dummy variables, one for each two-digit SIC classification that accounts for more than one percent of the sample of firms. The results are qualitatively the same and so are not reported.

VII. Results – Vertical Agency Costs

A. Owner-Managed and Non-owner-managed Firms

First, recall that more positive values of ACI represent greater agency costs. The results presented in Table XIV emphasize the difference in agency costs between owner-managed and non owner-managed firms. We define a dummy variable NOM which equals 1 for a non-owner-managed firm and 0 otherwise. Panel A presents three models which each include the dummy variable NOM along with various sets of control variables. Models (1) and (2) of Panel A account for heteroscedasticy in the computation of coefficient standard errors using the methods proposed by White (1980). All models which indicate 'Firm Level Clustering' use standard errors computing using the methods proposed by Petersen (2009) to account for residual dependencies.

**** Insert Table XIV here ****

The coefficient estimate on NOM measures the incremental agency cost associated with non-owner-managed firms relative to owner-managed firms. The coefficient estimate on NOM is positive and significant in all model specifications indicating that on average, non-owner-managed firms are associated with greater agency costs relative to owner-managed firms, accounting for the controls. The results are consistent with the hypothesis that agency costs increase as firms move from the single-owner structure to more complex ownership structures. These results, along with those presented by Ang, Cole and Lin (2000), indicate that the

hypothesis is supported for firms domiciled in both the U.K. and the U.S. The results are robust to the controls we include as well as the methods we employ in the computation of coefficient standard errors.

We provide two additional sets of tests to further examine the robustness of our conclusions. Panel B presents estimated coefficients for two sub-samples. As discussed in Section IV some companies are exempt from auditing requirements or accountant certification or both when they file financial statements with the Companies House. To address potential concerns about how these exemptions might influence the quality of the financial data reported we identify sample firms that are not exempt from the aforementioned requirements. These companies constitute the first sub-sample examined. The second sub-sample includes firms that have the highest probability of financial distress as indicated by a Quiscore less than 20. These firms are selected as an extreme case as they may behave differently because of their financial status. The estimation results based upon the sample defined by the accounting quality restriction are presented as model specification (1) of Panel B. The estimation results based upon the sample defined by a higher probability of distress are presented as model specification (2) of Panel B. The dependent variable in these specifications is the agency cost index (ACI). The results presented in Panel B are similar to those presented in Panel A. The coefficient estimate on NOM is positive and significant for both models (1) and (2) of Panel B, indicating that on average, non-owner managed firms are associated with greater agency costs relative to owner-managed firms.

Panel C presents estimation results using two alternate measures of agency costs. First, we replace ACI as the dependent variable with an agency cost measure computed using only the ratio of operating expenses to sales. The agency cost estimate is computed using equation (1) where the 'Efficiency Variable' is the ratio of operating expenses to sales. The operating expenses to sales ratio has been used as a proxy for agency costs elsewhere in the literature (Ang, Cole and Lin (2000), Nagar, Petroni and Wolfenzon (2010)). Second, we construct an alternate agency cost index (ACI-2) and use this new variable as the dependent variable.. The difference between ACI and ACI-2 is that the operating expenses measure used in calculating ACI-2 includes the cost of goods sold.. Model specifications (1) and (2) of Panel C present the new results. The coefficient estimate on NOM is positive and statistically significant for both models (1) and (2), providing further corroboration for the results presented in Panels A and B.

We conclude from the results presented in Table XVI that agency costs are significantly greater for non-owner managed firms and that this conclusion is robust.

B. Ownership Structure and Agency Costs

While the results presented in Table XIV lead to the general conclusion that agency costs are larger in non-owner managed firms, the hypothesis also suggests that as we move away from the single-owner firm structure to more diffuse ownership structures that we should observe increasingly larger agency costs. We now examine how agency costs change as firms move from simple to more complex

ownership structures. We define six dummy variables. ONE FAM, MUL FAM, INDI_FAM, WO, PUBLICNQ and PUBLICQ which equal 1 if a firm is owned by a single family, owned by multiple families, owned by a combination of families and firms, owned by holding companies, firm is categorized as public, not quoted and public, quoted respectively and zero otherwise respectively, and zero otherwise. Table XV presents estimation results for models replacing the non-owner managed dummy (NOM) with the ownership dummies just mentioned. The structure of Table XV is otherwise the same as Table XIV, including the use of ACI as the dependent variable in Panels A and B, agency costs based upon the ratio of operating expenses to sales in model (1) of Panel C and ACI-2 in model (2) of Panel C. The controls are the same as those in Table XIV.

The coefficient estimates for these ownership dummy variables measure how agency costs vary across firms with complex ownership structures when compared to firms with the simplest ownership structure (i.e., firms that are owned by a single individual). In all specifications, we observe that the coefficient estimates on all dummy variables are positive and significant and generally increase monotonically from ONE FAM to PUBLICQ. The results presented in Panel B reflect the same pattern in the estimated coefficients as those presented in Panel A. However, the sizes of the estimated coefficients for model (1) of Panel B indicate that private companies exhibiting high 'accounting quality' in general tend to have lower agency costs however this does not appear to be true for public quoted companies (compare with the results for model (3) of Panel A). Likewise, firms in the high probability of

financial distress sub-sample tend to exhibit larger coefficient values than those presented for model of (3) of Panel A, except for the cases where there is a single owner or where multiple family ownership is present. The results presented in Panel C again corroborate the findings in Panel A. Overall, these results provide support for the hypothesis that the magnitude of agency costs increase as firms move from simple to complex (generally more diffuse) ownership structures.

**** Insert Table XV here ****

C. Further Multivariate Evidence

We have documented that agency costs are higher among non-owner-managed firms and in firms with complex (more diffuse) ownership structures. We conclude our analysis of vertical agency costs in private firms by now controlling for whether a firm is owner-managed or non-owner-managed.. We define the following dummy variables: ONE OWNER - NOM, ONE FAM – OM, ONE FAM – NOM, MUL FAM - OM, and MUL FAM – NOM which respectively equal 1 if a firm is owned but not managed by a single individual, owned and managed by a single family, owned but not managed by a single family, owned and managed by multiple families and owned but not managed by multiple families, respectively, and zero otherwise. The coefficient estimates on these dummy variables reflect the agency costs associated with the respective firm classifications relative to a firm that is owned and managed by a single individual (i.e., the zero agency cost firm).

The estimation results presented in Table XVI include the full set of dummy variables just defined. The control variable specifications are as in the prior tables. The dependent variable for model specifications 1 through 3 in Panel A is ACI. Firms that are owned and managed by a single individual have lower agency costs than firms with any other ownership and management structure. The presence of a non-owner manager consistently results in larger agency costs as reflected in the positive and significant coefficients on the variables ONE OWNER – NOM, ONE FAM – NOM, MUL FAM – NOM. Interestingly the coefficient on the variable MUL FAM – NOM is less positive than the coefficient on the other two variables suggesting that the presence of multiple families may reflect more efficient monitoring of non-owner managers.

We have so far relied on binary variables to indicate whether or not firms are managed by owners. In order to gain further insight into the effects of alignment of ownership and management, we introduce the continuous variable, *Concentration*, calculated as the ratio of shareholders who are also directors to the total number of directors. A *Concentration* measure of 1 indicates that a firm is entirely managed by its owners and a *Concentration* measure equal to 0 indicates that the firm is managed by outsiders. We estimate an alternative specification (model specification 4 of Table XVI, Panel A) substituting the variable *Concentration* for the dummy variables used heretofore to identify ownership/management differences. The coefficient estimate on *Concentration* is negative and significantly different from zero. The result confirms that if *Concentration* is more positive, indicating that

shareholders have a greater representation as directors, then agency costs are smaller. Results using the subsamples and alternate agency cost proxies defined earlier are presented in Panels B and C and are qualitatively similar.

**** Insert Table XVI here ****

D. Summary

The results presented in this section indicate: 1) companies managed by a non-owner exhibit larger agency costs, 2) companies which exhibit more diffuse ownership exhibit larger agency costs, 3) the marginal effect on vertical agency costs of the presence of a non-owner manager, conditional on the level of ownership, is positive. These results are broadly consistent with the basic propositions of the economic theory of agency articulated by Jensen and Meckling (1976) and others.

VIII. Results – Horizontal Agency Costs

A. Ownership Concentration

Horizontal agency costs arising from the expropriation of minority shareholders by a majority shareholder are likely to be more severe in close corporations (Roe, 2005; Gillan, 2006). In this section, we focus exclusively on private firms with multiple shareholders in our examination of this issue. We first test the proposition that horizontal agency costs are lower in firms with shared control. We classify firms into three categories based on the ownership stake of the largest shareholder: low concentration firms, medium concentration firms and high

concentration firms if the ownership stake of the largest shareholder is less than 50%, between 50% and 75% and above 75% respectively. Unlike public firms where owners can exert decision control with a relatively low ownership stake (Gillan, 2006), private firms can be controlled only by owning at least 50% of the firm.[45] Private firms are owned by few shareholders (the average number of shareholders in our sample of private firms is 2 and therefore, it would be relatively easy for shareholders to block the decisions of any owner who owns less than a 50%stake.[46]

We define two dummy variables, LOW CONC equals 1 if the ownership stake of the largest shareholder is less than 50% and HIGH CONC equals 1 if the ownership stake of the largest shareholder is greater than 75%. When included in a model with an intercept, the coefficient estimates on these dummy variables measure the agency costs of the diffusely held and highly concentrated firms relative to medium concentration firms. The intercept therefore reflects the agency costs of medium concentration firms.

We begin by testing whether greater shared control is associated with smaller horizontal agency costs. Firms in which the largest shareholder owns less than 50% of the shares in principle will be firms where control is shared to a greater extent than firms in which the largest shareholder owns more than a 75% stake. Dominant large shareholders in the high concentration category have more complete control and, thus, have a greater opportunity to engage in decisions that allow them to extract private benefits at the expense of minority shareholders. That is, to consume

[45] For evidence consistent with this view see Morck, Shleifer and Vishny (1988) and La Porta, Lopez-di-Silanes and Shleifer (1999), but also see fn 17 and the references cited therein.
[46] Dyck and Zingales (2004) also use a 50% cutoff threshold.

resources whose value exceeds the personal loss they incur as a result. Model specification 1 of Table XVII, Panel A, presents estimation results which include the dummy variables LOW CONC and HIGH CONC.[47] The results indicate that low concentration firms are associated with lower agency costs relative to medium concentration firms and this difference is significant at the 1 percent level. On the other hand high concentration firms are associated higher agency costs than medium concentration firms. The results are robust to the inclusion of control variables and accounting for residual dependencies through clustering (not reported).

**** Insert Table XVII here ****

As the results for model 1 may be influenced by whether the manager is also an owner we next define a dummy variable OM that is set to 1 if firms are entirely managed by owners and 0 if not. We then compute an interaction variable by multiplying OM times HIGH CONC. We include this interaction variable in model specifications 2 and 3 of Table XVII, Panel A. The results indicate that the greater agency costs of high concentration firms relative to medium concentration firms is driven by the subset of firms that are not entirely managed by owners. Results using the subsamples and alternate agency cost proxies examined earlier are presented in Table XVII, Panels B and C and are qualitatively similar.

[47] The model was also estimated including all control variables, with and without clustering. The results were qualitatively the same as those presented.

B. Shareholder Monitoring and Control Contestability

As discussed earlier, a complimentary hypothesis is that the magnitude of horizontal agency costs decreases as control becomes more contestable. The agency costs associated with the horizontal agency problem are predicted to be smaller when a large, non-controlling, shareholder is present to monitor and contest decisions of the controlling shareholder. We test this hypothesis using two different measures defined to capture the impact of the second largest shareholder on the level of agency costs. The first measure is the ownership stake of the second largest shareholder (SECOND) and the second is the difference between the stakes of the largest and the second largest shareholders (DIFF). Model specification 1 of Table XVIII, Panel A, presents results from a regression in which the ownership stake of the second largest shareholder (SECOND) is included as an additional explanatory variable. The dependent variable proxying for agency costs is ACI. The results reported indicate that the estimated coefficient on SECOND is negative and significantly different from zero. This result is consistent with non-controlling shareholders acting as monitors as well as acting to contest decisions which would be detrimental to minority shareholders, thus, making private benefit extraction more costly for the controlling shareholder.

**** Insert Table XVIII here ****

The extent to which the second largest shareholder can prevent private benefit extraction by the majority shareholder might depend on the size of the ownership stake of the latter. That is, if the majority shareholder has absolute control (i.e.,

owning more than 75% of the firm), it is easier for him to extract private benefits from minority shareholders if he chooses to do so. On the other hand, if the majority shareholder does not have a controlling interest (i.e., owning less than 50% of the firm), expropriation of minority shareholders is more difficult. To further investigate the impact of the second largest shareholder on the level of agency costs, we interact the stake of the second largest shareholder with the dummy variables LOW CONC, MED CONC and HIGH CONC defined earlier, and include these interaction terms in the model. Model specifications 2 and 3 of Table XVIII, Panel A, present the results. The results indicate the estimated coefficients on the interaction variables are all negative and statistically significant at conventional levels. These results suggest that the presence of a large non-controlling shareholder acts to reduce horizontal agency costs independently of ownership concentration. Results using the subsamples and alternate agency cost proxies are presented in Table XVIII, Panels B and C and are qualitatively similar.

**** Insert Table XVIII here ****

Contestability may also be a function of the difference in the sizes of the respective holdings of the largest and next largest shareholders. If the share of the largest shareholder is much larger than all other owners, the ability of smaller owners to prevent expropriation may be limited. Put differently, horizontal agency costs may be positively related to the difference in the ownership stakes of the largest and the second largest shareholders. We test this prediction by including DIFF as an explanatory variable and present the estimation results in model specification 1 of

Table XIX, Panel A. The variable DIFF equals the ownership stake of the largest shareholder minus the ownership stake of the next largest shareholder.[48] We find that the estimated coefficient on DIFF is positive and statistically significant. That is, the larger the difference between the stakes of the top two shareholders of the firm, the higher the agency cost.

**** Insert Table XIX here ****

We next define three interaction variables defined by multiplying the ownership concentration variables with DIFF. The interaction variables are included in model specification 2 of Table XIX, Panel A. Results indicate that the impact of DIFF decreases monotonically as we move form low concentration to high concentration firms. Overall the results are consistent with the model proposed by Bloch and Hege (2001). That is, minority shareholder expropriation is lower in companies where control is more contestable, companies where the difference between the stakes of the majority and minority shareholders is smaller. Results using the subsamples and alternate agency cost proxies are presented in Table XIX, Panels B and C, and are qualitatively similar.

IX. Robustness Tests

We have tested the robustness of our results in several additional ways. We first reexamine the results using a comparison of agency costs between non-owner managed firms and a matched sample of owner-managed firms. We first construct a

[48] Model estimation results (not reported) for models including all control variables and accounting for residual dependencies using clustering do not lead to qualitatively different results.

matched sample of non-owner managed firms and owner-managed firms following the non-parametric matching methods developed by Rosenbaum and Rubin (1983) and Heckman et al. (1997, 1998a, 1998b, 1998c).. We start with a "treatment group" of firms that are not owner-managed and identify a "control" group of firms that are owner-managed with identical or very similar observable characteristics for each firm in the treatment group. The final step is to compute the difference in the dependent variable between the treatment and control firms.

Propensity-score matching of the '5-nearest neighbors' (Leuven and Sianesi, 2003) is the basis for identifying the control firms. The independent variables used for matching are firm age, sets of dummy variables indicating industry affiliation, sets of dummy variables indicating firm riskiness and sets of dummy variables indicating the type of accounts submitted by firms. For all practical purposes we match exactly on these independent variables. One of the requirements for the successful implementation of the matching method is a sufficiently large overlap between the distribution of the observable characteristics of the treated and control firms – the "common support" condition. The unique cross-sectional richness and detailed ownership coverage of our data ensures that this condition is met for most of the sub-sample tests we perform. Results, not reported for the sake of brevity, are consistent with the results presented in Tables V through X.

In addition to examining the agency cost proxy based (equation (1)) based upon the operating expenses to sales ratio, we also examined t two additional agency costs proxies (again see equation (1)) based upon the asset turnover ratio and

separately operating profit scaled by total assets individually and found results consistent with those reported in the tables.

Further, we constructed a more conservative sample by by excluding firms for which book value of assets changed by over 30% from the previous year (following Ball and Shivkumar, 2005). Results based upon this restricted sample were again qualitatively the same as those presented in the tables. We also repeated the analysis by eliminating firms that experienced an ownership change during the four sample years. The results based on this restricted sample are again similar to those reported in the tables.

IX. Summary and Conclusions

The economic theory of agency differentiates between vertical agency problems and horizontal agency problems. The vertical agency problem is characterized by situations in which the managers of a firm may have incentives to use or consume resources in a fashion that is at odds with the objectives of the firm's owners. The horizontal agency problem on the other hand arises when the owners themselves vie for resources, and importantly situations in which a controlling owner has incentives to exploit minority owners. This study presents empirical tests of the central hypotheses regarding the relation between agency costs and the structure of ownership and control in an organization. We present tests of predictions regarding vertical agency costs as well as horizontal agency costs and find support for the basic tenets of both theses. Our results are based upon a unique data set containing

information on the ownership and management of private as well as publicly traded companies.

We find that private firms experience lower agency costs when compared to public firms. More importantly, we document that a firm that is owned and managed by a single individual has lower agency costs than firms with other ownership and management structures, thus providing direct confirmation of the prediction first laid out by Jensen and Meckling (1976). We also find that among private firms, agency costs increase as firms move from simple ownership structures such as being owned by a single individual or a family to complicated ownership structures such as being owned by multiple families and holding companies. This result provides direct confirmation of the free-rider hypothesis which states that as the number and type of shareholders increase, the incentive for each shareholder to incur all of the monitoring costs decreases because the benefits associated with monitoring are limited and are proportional to their ownership stake.

We present new empirical evidence on horizontal agency problems, a major concern in close corporations. We find that firms with shared control (i.e., those where the largest stakeholder owns less than 50%) have lower agency costs than firms where the largest shareholder has enough power to extract private benefits from minority shareholders (i.e., where the largest shareholder owns between 50% and 75%). Furthermore, we find that the presence of a large shareholder outside the controlling group leads to lower agency costs. We also document an inverse relationship between the ownership stake of the second largest shareholder and

agency costs, providing support for the view that minority expropriation will be lower in companies where control is more contestable.

CHAPTER 3

DETERMINANTS OF CASH HOLDINGS IN PRIVATE FIRMS[49]

I. Introduction

It is an empirical fact that companies hold cash balances. Why companies hold cash and why they select the levels observed have long intrigued academic researchers as well as practitioners alike. Early research on these issues tended to focus on normative prescriptive advice. Several recent studies have alternatively addressed these questions from a positive descriptive angle, focusing on the empirical determinants of cash holdings predicted by extant financial theory. While providing important insights, a common feature of extant studies on cash holdings is that the analysis is restricted to publicly traded companies, in large part due to data availability. As a result, little is known about the cash holdings policies of privately held firms. The knowledge about the cash holdings policies of private companies and company policies in general is especially important as private firms internationally outnumber publicly traded firms, employ a larger proportion of work force and are considered an indispensible part of any economy. For example, it is estimated that more than 99% of American businesses and over 95% of firms in the U.K. are privately owned businesses and account for more than half of each country's GDP. Further, in 2004, small firms with fewer than 500 employees accounted for all of the

[49] This chapter is based on collaborative work with Scott C. Linn and Pradeep K. Yadav.

net new jobs created in the U.S.[50] This study examines the cash holdings of more than 40,000 U.K. based private firms for the 2000-2009 period. We investigate the determinants of cash holdings in private firms and explore the relation between cash holdings and agency costs in private firms.

Existing research on cash holding can be traced back to Keynes (1936), who indicates two main benefits from holding cash: to avoid transaction costs that arise while trying to raise funds externally (the "transactions cost" motive) and to finance new and existing projects if other sources are unavailable or too expensive (the "precautionary" motive). Miller and Orr (1966) develop a trade-off model of cash holdings according to which companies determine the optimal level of cash holdings by balancing the costs and benefits of holding liquid assets. The trade-off model is in contrast to the pecking order or financing hierarchy theory developed by Myers and Majluf (1984) and does not necessarily predict an optimal cash holdings level. The pecking order theory suggests that information asymmetry induced financing constraints result in firms stocking up on liquid assets to finance future investment opportunities with internal funds. The third line of inquiry examines cash holdings within a framework that takes as given that managers may be prone to pursue their own self-interest over than the interests of security holders, an agency perspective. Research in this area considers the hypothesis that managers who do not act in the best interests of shareholders will tend to amass liquid assets as such balances are

[50] Sources: U.S. statistics: The 2006 Small Business Economy Report published by The Small Business Administration. U.K. statistics: Ball and Shivakumar (2005).

relatively easy to expend on managerial excesses.[51] This line of thought stems in large part from the arguments put forward by Jensen (1986).

The empirical analysis of the determinants of firms' cash holdings has received growing attention in the last few years.[52] However, to the best of our knowledge, little attention has been given to the determinants of cash holdings in private firms.[53] The findings presented in the extant literature, which are based on examining publicly traded companies, cannot be applied to private firms as private firms differ from publicly traded corporations in several important ways. For instance, a fundamental difference between private and public firms is their ownership structure and hence the degree to which control is valued by their shareholders. Public firms have thousands of shareholders while private firms

[51] See for example, Jensen (1986), Blanchard,Lopez-de-Silanes, and Shleifer (1994), and Myers and Rajan (1998).

[52] Existing empirical literature mainly refers to U.S. listed companies (Kim, Mauer and Sherman, 1998; Opler, Pinkowitz, Stulz and Williamson, 1999; Harford, Mansi, and Maxwell, 2008; Mello, Krishnaswami and Larkin, 2008), to the evolution of their cash holdings (Bates, Kahle and Stulz, 2009), to U.S. multinational firms (Foley, Hartzell, Titman and Twite, 2007) and to cross-country comparisons (Dittmar, Mahrt-Smith and Servaes, 2003; Pinkowitz and Williamson, 2001; Pinkowitz, Stulz and Williamson, 2006). Some empirical evidence has also been reported for European Monetary Union (EMU) listed firms (Ferreira and Vilela, 2004) or EMU large firms (Pal and Fernando, 2006). European single country evidence is limited to the influence of managerial ownership on cash holdings of U.K. listed firms (Ozkan and Ozkan, 2004), the adjustment of large Dutch firms to long-run liquidity targets (Bruinshoofd and Kool, 2004), the role of inter-group relations in the cash reserves of Belgian firms (Deloof, 2001), cash holdings in Italian firms (Bigelli and Vidal, 2009) and the determinants of cash levels for Spanish SME firms (Garcia-Teruel and Martinez-Solano, 2007).

[53] Bigelli and Sanchez-Vidal (2009) examine cash holdings in Italian private firms. Our paper is an improvement on their work in several aspects. First, the data we employ are based upon the constituent firms following a common set of audited reporting guidelines. The companies represented in our sample are all domiciled in the U.K. and must comply with government mandated reporting requirements. Second, we explore the relationship between agency costs and cash holdings in private companies. Lastly, our sample period extends until 2009 and therefore provides us an opportunity to examine the cash holdings of private companies during the recent financial crisis.

typically have one or few shareholders. Another important distinction between private and public firms is the level of information asymmetry between insiders and outsiders. Private firms are more opaque to outsiders and the information asymmetry is compounded by heterogeneous expectations. That is, an assumption implicit in the Myers and Majluf's (1984) financing hierarchy model is that the manager of a firm (insider) knows the true value of new projects and she is expected to credibly convey this information to outsiders. However, the management team in private firms may not be complete and may lack the necessary skills and sophistication to estimate and convey the true value of new projects. Other differences include access to capital markets and potential costs of under/over investment (Ang, 1991). All these factors are likely to be important in shaping the cash policy of private firms.

We examine a unique data set composed of U.K. private companies. Three principal features of the financial reporting regulations for U.K. companies are substantially equivalent for private and public firms. First, the U.K. Companies Act requires all private and public companies to file annual financial statements that comply with the same accounting standards. Second, financial statements filed by both U.K. private as well as public companies must be audited.[54] Third, private and public companies are subject to the same tax laws. These standards therefore provide us with a set of comparably measured data for both public and private companies. Our dataset includes firms with a wide array of ownership structures ranging from

[54] There is an exemption for very small companies which we return to in section IV.

firms with a single owner-manager to firms with multiple owners and outside managers.

This paper proceeds in three steps. We first assess the success of the trade-off and the financing hierarchy models in explaining changes in cash holdings of private firms. We find that the cash holdings of private firms revert to the mean indicating that these firms have target cash levels. In fact, the rate of mean reversion is higher in private companies when compared to the rate of mean reversion in publicly traded firms. Finding that private firms do have target cash levels, we attempt to distinguish more directly between the trade-off model and the financing hierarchy models. The results indicate that both these models are relevant in explaining cash holdings of private firms. It seems the two models capture different aspects of the change in cash holdings of private firms.

In our second step, we empirically test the determinants of cash holdings in private firms. The results suggest that smaller firms, which are younger, riskier and presumably more financially constrained, hold significantly more cash and less cash substitutes than bigger firms. Reported evidence of a panel data analysis supports both the trade-off model and financing hierarchy model. With respect to the former model, we find that firms with more growth opportunities and riskier cash flows hold more cash. In addition, we document a negative relation between leverage and cash holdings. This result is consistent with the predictions of the financing hierarchy

theory.[55] Private firms that pay dividends hold more cash. Evidence also shows that net working capital can be considered as a cash substitute.

In our third step, we investigate the relation between cash holdings and governance structures in private firms. We find in the cross-section and over time that private firms with high insider ownership have higher cash holdings, while firms that are not owner managed have lower cash holdings. Overall, firms with lower agency costs (low ACI) have higher cash reserves than those with higher agency costs (high ACI).[56]

The rest of the paper is organized as follows. Section 2 discusses and adapts previous theories to a private firm context. Section 3 describes the dataset and the variables. Section 4 discusses empirical results related to the determinants of cash holdings in private firms. Section 5 discusses empirical results related to cash holdings and agency costs in private firms. Section 6 concludes.

II. Theory and Hypothesis

In this section we review the main contributions on the determinants of firms' cash holdings and relate each to a private firm context.

[55] The trade-off theory does not make clear predictions about the relation between cash holdings and leverage.

[56] ACI is the agency cost index developed by Gogineni, Linn and Yadav (2011). ACI is calculated based upon a multivariate factor analysis of several accounting variables widely used as agency cost proxies. The factor score of the dominant factor explaining the non-unique variance is used as the index of agency costs. Please refer to Gogineni, Linn and Yadav (2011) for more details.

A. The trade-off theory of cash holdings

If capital markets were perfect in the strictest sense there would be no transaction costs associated with raising cash and holdings of liquid assets would not affect a firm's value. But markets are far from perfect and transaction costs associated with raising funds are positive. Companies must therefore determine the optimal level of cash holdings by trading-off the marginal costs of holding liquid assets such as lower returns on cash holdings with the marginal benefit of liquid assets such as minimizing transaction costs and underinvestment problems (Miller and Orr, 1966; Kim, Mauer and Sherman, 1998). The trade-off theory predicts a positive relation between the cost of external financing and investment in liquid assets. The trade-off theory gives rise to several predictions regarding specific company characteristics and the demand for cash holdings by firms. We review these predictions next.

Size: Extant research shows that there are substantial fixed costs of raising external financing. Barclay and Smith (1996) and Dittmar, Mahrt-Smith and Servaes (2003) argue that the cost of external financing is smaller for larger firms because of the economics of scale resulting from a substantial fixed cost component of external financing. This argument should hold for both public and private companies and larger companies are expected to have easier and cheaper access to financing. In addition, raising cash by selling non-core assets in periods of financial distress (Lang, Poulsen and Stulz, 1995) should be easier for diversified companies, and larger companies tend to be more diversified (Rajan and Zingales, 1995). From the

above relationships, the trade-off model would predict that larger private companies should hold a lower proportion of their assets invested in cash.

Growth opportunities: Firms expecting an increase in the number of profitable investment opportunities tend to hold large cash balances in order to decrease the probability of foregoing these projects. In addition, the literature on real options emphasizes the value of waiting to invest in uncertain price and/or cost environments (McDonald and Siegel, 1986; Dixit and Pindyck, 1994). For these reasons, holding liquid assets could be more valuable for firms with more investment opportunities especially if they are financially constrained (Denis and Sibilkov, 2009). We argue that the tendency to invest in liquid assets for precautionary motives is much stronger among private firms. This is because the cost of foregoing profitable investment opportunities is much higher for private firms than publicly traded companies (Ang, 1991).

Risk or volatility of cash flows: The precautionary motive for cash holdings suggests that firms hold cash to absorb adverse shocks and to increase the odds of surviving through periods of poor business conditions. Therefore, one would expect firms with greater cash flow uncertainty to hold more cash, especially if they are financially constrained (Han and Qui, 2007). In private firms, the level of financial frictions should be higher and the access to external financing more difficult. We therefore expect such a relationship to be even stronger. Hence, more variable cash flows should lead to higher levels of cash holdings in private firms.

B. The financing hierarchy theory and cash holdings

Firms with more severe information asymmetry between inside and outside investors face higher costs of external financing. Outsiders want to make sure that the securities they purchase are not overpriced and consequently discount them appropriately. The discount may at times be large enough that a firm selects to not issue securities and consequently foregoes a valuable investment opportunity (Myers and Majluf, 1984). Such losses are real. A solution to reduce the costs arising from information asymmetries is to build cash reserves as financial slack, using 'stored' funds first when investment opportunities arise and then accessing debt and equity markets in that order once internal resources are used up.

The information asymmetry problem is likely to be accentuated in private companies because of heterogeneous expectations. An assumption implicit in the Myers and Majluf (1984) model is that the manager of the firm knows the true value of new projects. However, management teams in private firms may not be complete and may lack the necessary skills and sophistication to accurately estimate and convey the true value of new projects. In this case, there are optimistic owners/managers who overestimate the value of their projects as well as informed owners who are capable of accurately determining the value of projects. Lenders, aware of such behavior would make fewer funds available and make accessing external funds even more costly for private firms, *ceteris peribus.* The theory gives rise to several predictions about the demand for cash holdings and company characteristics.

Financing deficit: According to the pecking order theory, there is neither an optimal debt level for the company nor an optimal level of cash holdings. It follows that when internal funds are not sufficient, companies will issue debt first followed by equity. A private firm's financing deficit, assuming no access to the equity market, would then lead either to a reduction of cash holdings or to an increase in debt, or both. We therefore expect that private firms with higher financing deficits have lower cash holdings.

Dividends: Publicly traded firms disperse a considerable portion of retained earnings by paying dividends. One hypothesis is that dividend paying firms use dividends to commit themselves to regular cash distributions thus increasing potential scrutiny of management by forcing the firm to return to the capital market more frequently for new capital to fund investment opportunities (Easterbrook, 1984).[57] The prediction is that firms that pay dividends tend to hold lower cash balances (Opler, Pinkowitz, Stulz and Williamson, 1999; Harford, Mansi, and Maxwell, 2008).

The rationale and use of dividends in private companies are quite different from those of publicly traded firms. Owners of private firms integrate the firm's distributions, salary and bonuses, with personal incomes into a personal consumption function where dividends received is only one component. A firm’s assets and the

[57] Financially constrained firms in need of cash may try to increase retained earnings by cutting dividends, especially when there are difficulties in raising more debt or issuing new equity (Fazzari, Hubbard and Petersen, 1988). However, doing so is prohibitively expensive for publicly traded firms as cutting back on dividends is viewed as bad news and the stock market punishes firms that cut back on dividends.

owners' personal wealth are often perceived as a being the same (Ang, 1992). *I*n most private firms there is only one shareholder, often the founder or the founding family (Corbetta and Montemerlo, 1999; Brav,2009). It follows that the choice to pay out dividends depends mostly on the firm's needs for cash to finance new investments or to fund a financing deficit. Brav(2009) finds dividend payments in private firms are much more sensitive to the firm's operating performance compared to dividend payments in publicly traded firms. Given these observations, we argue that dividend payments in private firms should be correlated with excess generation of cash flows, and lower or no dividends associated with a cash shortage. We therefore expect that private firms that pay dividends have higher cash balances.

Net working capital: Current assets that can be easily transformed into cash are considered cash substitutes. Receivables, for example, can be easily cashed out through factoring in private firms or by securitization processes in larger firms.[58] Net working capital (excluding cash) can therefore be considered a cash substitute (Opler, Pinkowitz, Stulz and Williamson, 1999) both in public and private firms. It follows that private firms with a higher net working capital should have lower cash balances.

C. Agency costs of managerial discretion and cash holdings:

We now turn to agency costs of managerial discretion. Agency theory suggests that in the presence of agency costs of managerial discretion, management

[58] Factoring refers to selling current assets to a third party at a discount in exchange for immediate cash.

may prefer to hold cash to pursue its own objectives since cash reserves are easily accessible by management with little scrutiny and much of their use is discretionary (Jensen and Meckling, 1976; Jensen, 1986).[59] While there is considerable literature examining the relation between cash holdings, agency problems and corporate governance, the evidence is inconclusive.

Harford (1999), and Opler Pinkowitz, Stulz and Williamson (1999) do not find strong evidence for agency based explanations of cash holdings. Along the same lines, Mikkelson and Partch (2003) find that agency costs do not explain operating performance differences among high cash firms. On the other hand, Dittmar and Mahrt-Smith (2007) show that the value of cash can in part be determined by how investors expect cash to be used when there are potential managerial agency problems. Klacheva and Lins (2007) find that cash levels are generally higher in countries with poor investor protection, which reflects likely agency problems. Harford, Mansi and Maxwell (2008) report that firms with expected poor governance actually hold less cash.

While studies to date have focused on agency explanations for cash holdings in publicly traded firms, the presence of agency problems in private firms suggests the explanations should in principle apply in that setting as well. Recent empirical evidence shows that there are large variations in the ownership and governance structures of private companies and that agency costs are real and of economic

[59] On the other hand, it could also be the case that management may hold cash simply because managers are risk averse and wish to avoid market discipline or do not want to make payouts to shareholders in order to build up slack (Myers and Majluf 1984).

significance in private companies (Ang, Cole and Lin, 2000; Nagar, Petroni and Wolfenzon, 2010; Gogineni, Linn and Yadav, 2011)

The conflicting evidence on the role of agency costs in publicly traded firms' decisions to hold liquid assets and the lack of research pertaining to private companies motivates us to examine the relation between agency costs and cash holdings in private companies. Private companies are largely shielded from market scrutiny and governance mechanisms. In this context, we believe that even in countries like the U.S. and the U.K. where external governance mechanisms are strong, agency costs play an important role in how private firms deal with their cash balances. On the other hand, since owners of private firms are in a better position to monitor external managers, it could be the case that agency related arguments are irrelevant in explaining cash holdings in private firms. This issue warrants empirical investigation.

III. Data

We obtain company data from the FAME database produced by *Bureau Van Dijk*; each installment contains the latest available ownership and management structure data and 10 years of financial statement data for more than 2.5 million firms registered in the U.K. and Ireland. The U.K. Companies Act of 1967 (and subsequent revisions to the act) requires all private and public companies to file annual financial statements that comply with the same accounting standards. All accounts submitted to the Companies House must be audited and certified by an

accountant. However, certain small and medium companies can claim exemptions from either or both of these requirements. In addition, such companies are allowed to file abridged financial statements in order to simplify reporting requirements.[60] We restrict our analysis to private companies.

The data we examine are from the period 2000-2009 extracted from update 260 (February 2011) release of the FAME data base.[61] We include all private firms with total assets of at least £5,000, revenues of at least £1,000 and non-missing cash data for each of the years between 2005 and 2009. These criteria enable us to identify a broad cross-section of ownership and management structures and industry affiliations. Likewise, the criteria mitigate concerns of possible sample selection bias from imposing the size threshold implied by the auditing requirements of the Companies House. Such a restriction might result in a sample that includes only large, successful single owner-managed firms. The tradeoff is that our sample contains some very small firms. We screen out observations that are likely to be erroneous by excluding those firm-year observations for which book value of assets changed by over 50% from the previous year (Ball and Shivkumar, 2005; Almeida,

[60] The definition of a "small" or "medium" company has changed over time. For accounting periods ending after 30 January 2004, a company is considered small (medium) if one of the following requirements are met: i.) annual revenues are less than 5.6 (22.8) million, ii) balance sheet total is 2.8 (11.4) million or less and iii.) number of employees is less than 50 (250). Small companies are exempt from both auditing and accountant's report requirement whereas medium companies are exempt from auditing requirements but should contain an accountants report. For more details please refer to http://www.companieshouse.gov.uk/about/gbhtml/gba3.shtml#three. Since it is possible that different types of exemptions might affect accounting quality, we control for accounting types in our multivariate analysis.

[61] For analysis involving ownership and management structure data, we restrict our sample period from 2006-2009. Lagged governance data are extracted from updates 196, 208, 221 and 233 corresponding to October 2005, October 2006, November 2007 and October 2008 respectively.

Campello and Weisbach, 2004; and Acharya, Almeida and Campello, 2007). The final sample consists of 284,082 observations. The dataset is an unbalanced panel with 42,036 unique firms.[62]

A. Measures of liquid asset holdings

We follow Kim, Mauer and Sherman (1998) and Opler, Pinkowitz, Stulz and Williamson (1999) in our construction of variables measuring cash holdings. . We measure liquid assets (Cash) as cash plus bank deposits divided by total assets. While not reported in this paper, we also measure liquidity by replacing total assets in the denominator with total assets minus cash. This alternative measure does not affect our main conclusions. We measure firm size (Size) as the natural logarithm of the book value of assets in 2005 pound sterling. Leverage (Total Debt) is defined as the sum of short-term and long-term debt scaled by total assets. We use the ratio of capital expenditures (Capex) defined as the change in total assets plus depreciation scaled by total assets as an alternate measure of growth opportunities.

We measure cash flow riskiness using two measures. First, we measure firm risk using the standard deviation of cash flows for the prior three years of operation relative to the year in which cash holdings is measured (CF Volatility). Second, we measure industry cash flow volatility as the average across the industry group of the

[62] Among these, 90,855 firms are subject to mandatory auditing requirements of the Companies House. These firms represent 192,839 firm-year observations.

standard deviations of firm cash flow (Industry Sigma).[63] Cash flow (CF) is defined as profit after tax plus depreciation and amortization less common dividends scaled by total assets. To distinguish the effects of a firm's dividend payouts, we define a dummy variable (Div Dummy) that equals 1 in years where a firm pays a dividend or 0 otherwise. The duration of cash conversion cycle (CCC) is obtained from the inventory conversion period plus receivables' collection period minus the payment period for the accounts' payable.[64] In order to reduce the possible influence of extreme observations, all financial variables have been winsorized at the 1% level on both sides of the distributions. The FAME database contains a measure of the probability of company failure labeled Quiscore.[65]

Figure I shows the median cash-to-assets ratio for the 2000-2009 period. The figure indicates that there is a moderate upward trend in the amount of cash held by U.K. private firms over the sample period. In addition, the figure reveals that the cash holdings of private companies are less volatile than those of publicly listed companies.

[63] We divide the sample into 19 industry groups based on the 2003 U.K. industry classification. These groups are presented in Table 2.

[64] CCC is calculated using the following formula: 365*[(inventory/cost of goods sold) + (accounts receivables / sales) - (accounts payable / cost of goods sold)]

[65] Quiscore is produced by CRIF Decision Solutions Ltd. Quiscore is a measure of the likelihood of company failure in the year following the date of calculation. A Quiscore can take any value within the range 0 to 100 where the following interpretations apply: 0-20 (high risk band), 21-40 (caution band), 41-60 (normal band), 61-80 (stable band) and 81-100 (secure band). In determining a score, a number of separate calculations are performed using various combinations of financial characteristics including turnover (revenue), pre-tax profit, working capital, intangibles, cash and bank deposits, creditors, bank loans and overdrafts, current assets, current liabilities, net assets, fixed assets, share capital, reserves, shareholders funds.

**** Insert Figure I here ****

Table XX reports univariate statistics for the main variables used in the analysis over the whole sample period. Summary statistics for publicly listed companies over the sample period are presented for comparison purposes. The mean and median cash balances for private firms are 0.23 and 0.12 respectively and are much higher than the mean and median cash balances for publicly listed firms. On a pound sterling basis, the median firm has cash holdings of £136,762, a relatively small amount. This statistic reflects the size distribution in our sample. The median firm in the sample has an asset base of £1,121,000. In terms of other financial data, the average firm in the sample has a cash flow to asset ratio of 3.6%, leverage ratio of 40% and has capital expenditures equal to 1.5% of assets. The mean and median quiscores indicate the sample firms tend to fall in the normal or better regions for the index.

**** Insert Table XX here ****

Table XXI reports cash holdings by industry. Industries are defined according to the subsections defined in the publication U.K. standard industrial classification of economic activities - 2003.[66] Firms belonging to manufacturing industries hold between 5% - 8% of their total assets as cash while firms in the wholesale and retail trade invest close to 10% of their assets in cash holdings. Statistics for the years 2001 and 2009 indicate a general trend of increase in cash-to-assets ratio of all industries between 2001 and 2009. We treat the year 2001 instead of the year 2000 as the

[66] More details of the classification system are available at http://www.statistics.gov.uk/methods_quality/sic/downloads/uk_sic_vol1(2003).pdf

starting point because there are far fewer observations (approximately 3,000) available for the year 2000 as opposed to more than 20,000 observations each year starting 2001. Since all our main regressions are estimated with industry dummy variables, time in-variant industry effects are not a concern.[67]

**** Insert Table XXI here ****

IV. The determinants of cash balances

We start with testing whether firms have target cash levels. We then estimate linear regression models where the cash holdings variable is treated as a function of several firm characteristics identified by extant theory as determinants of cash holdings.

A. Do firms have target cash levels?

In a world of perfect capital markets there would be no transaction costs for raising cash, and holdings of liquid assets would not affect a firm's value. But markets are far from perfect and transaction costs are never irrelevant. The trade-off theory suggests that companies must determine the optimal level of cash holdings by

[67] The industry dummies *(Industry Affiliations)* are based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry. Small and medium firms are eligible to submit abridged financial statements under UK law. Firms in our sample are categorized into seven groups based on the type of financial statements they file: a) small company statements b) medium company statements, c) total exemption small, d) total exemption full, e) partial exemption f) full accounts and g) group accounts. We include dummy variables *(Accounting Quality)* to control for the effects of different types of financial statements on accounting quality with small company statements being the excluded group.

trading-off the marginal costs and marginal benefits of holding liquid assets (Miller and Orr, 1966; Kim, Mauer and Sherman, 1998).

A testable prediction of the trade-off theory is that any firm has a target level of cash holdings. To test this prediction, we first examine whether cash holdings of private firms revert to the mean. If they do not, we can reject the hypothesis that firms have target cash levels. However, predictions of the financing hierarchy model are not entirely inconsistent with mean reversion in cash holdings. According to the latter, changes in cash are a function of changes in a firm's growth in internal resources. Therefore, any autocorrelation in internal resources will lead to similar autocorrelation in cash holdings (Opler, Pinkowitz, Stulz and Williamson, 1999). We test the hypothesis that cash holdings are mean reverting by estimating a first order autoregressive model for each private firm using equation (1)

$$\Delta Cash_t = \alpha + \beta \Delta Cash_{t-1} + \varepsilon_t, \quad (1)$$

where $\Delta Cash_t$ is calculated as cash holdings in year *t* minus cash holdings in year *t-1*. Figure II shows the distribution of the autoregressive coefficients (β) from this regression for all U.K. private firms with more than five years of data in the 2000-2009 period. The median of the estimated coefficients is negative (-0.300), indicating that cash balances are mean reverting in private firms. We repeat this analysis for a set of publicly traded firms in the U.K. with more than five years of data in the 2000-2009 period the median coefficients is -0.250 respectively.[68] The rate of mean

[68] The median coefficient for publicly traded U.K. firms closely resembles the findings of Opler et al (1999) who conduct a similar analysis using publicly traded U.S. firms and report a median coefficient of -0.242.

reversion is higher for private firms indicating that private firms adjust their cash holdings quicker than public companies.

**** Insert Figure II here ****

We next examine whether the trade-off model and the financing hierarchy model are relevant in explaining the changes in cash holdings of firms. Target adjustment models suggest that difference between actual and 'target' cash holdings in year *t-1* determines the changes in cash holdings in year *t.* We use the average cash holdings of a firm during the three previous years as the firm's target cash holdings. This model is similar to the models tested in the capital structure literature discussed in Syam-Sunder and Myers (1999). Results are presented in Table XXII, column 2. The coefficient estimate on target cash is negative and significant at the 5% level suggesting that target adjustment models explain some of the change in cash holdings. As a robustness check, we use a smaller sample for which cash holdings data are available for at least 8 years. Results using this sub-sample are presented in Table XXII, column 3 and are qualitatively similar.

**** Insert Table XXII here ****

We next turn to the financing hierarchy model. We test this model by assuming that changes in cash holdings are given by the flow of funds deficit. The flow of funds deficit is calculated as dividends plus capital expenditures plus the change in net working capital less cash minus operating cash flow. Results of regressions using the flow of funds deficit are presented in Table 3, columns 4 and 5.

The coefficient estimate on the flow of funds deficit is negative and significant in both regressions providing support for the financing hierarchy model.

We test the significance of both the target adjustment and financing hierarchy models in a multivariate setting by including both the target cash and the flow of funds deficit measures as independent variables. Table XXII, columns 6 and 7 present results of these regressions. Coefficient estimates on both these variables are significant suggesting that the two models capture different aspects of the change in cash holdings of firms.

B. Univariate analysis

We construct quartiles based on cash holdings and test whether the characteristics of companies which hold low cash balances, such as those in the first quartile, differ from those with high cash balances, such as those companies in the fourth quartile. Table XXIII presents the statistics. The ranges of the cash-to-assets ratio overlap across quartiles as we construct the quartiles each year. Table XXIII shows that firms in the first and fourth quartiles differ significantly from each other. These differences are significant at the 10% level or better, for all variables. Significance levels are determined by employing *t*-tests for differences in mean and Wilcoxon tests for differences in medians. Test statistics are not presented for the sake of brevity.

**** Insert Table XXIII here ****

There is an inverse relationship between firm size and cash holdings. Firms with the most cash are smaller than the ones with the least cash. Further, firms with most cash are younger by almost 8 years on average when compared to firms with low cash holdings. With respect to financial characteristics, firms in the fourth quartile are less levered than those in the first quartile. Median cash flow to assets ratio increase monotonically from the first quartile to the fourth quartile. Average capital expenditures and the length of cash conversion cycle decreases monotonically as we move from the first quartile to the fourth quartile, except for the second quartile. The ratio of net working capital to total assets follows a similar pattern.

C. Determinants of liquidity

The dependent variable in Table XXIV is defined as cash plus bank deposits scaled by total assets in all models. The first column of the table lists the independent variables. Table XXIV, column 2 reports coefficient estimates computed using the method presented in Fama and MacBeth (1973). In this approach, a cross-sectional regression is estimated each year. The results suggest that cash holdings decrease significantly with size, firm age, net working capital and leverage. Cash holdings increase significantly with the capital expenditures to total assets ratio, industry volatility, tax rate and whether a firm pays dividends. Column 3 presents results of a two way clustered regression where the standard errors are clustered by firm and year. Column 4 presents results of a cross-sectional regression estimated using the average of the variables over the sample period. The results appear robust, as the

signs and significance of the main explanatory variables tend to remain stable over the three different models with just one exception: the coefficient estimate on capital expenditures variables changes sign in the cross-sectional regression.

**** Insert Table XXIV here ****

Overall, there is support for both the trade-off model and the financing hierarchy theory: The coefficient estimates on size, capital expenditures and cash flow volatility (industry sigma) suggest that smaller firms and those characterized by more growth opportunities and riskier cash flows hold more cash, whilehe coefficient estimate on total debt variable is negative and significant indicating that highly levered firms carry less cash. Similarly, firms with higher net working capital hold significantly less cash. Positive and significant coefficient estimates on the dividend dummy suggest private firms that pay dividends hold more cash.[69]

Results presented in Table XXIII show that firms with high cash holdings (i.e. in the fourth quartile of cash-to-assets ratio) are significantly different from firms with low cash holdings (i.e., those in the first quartile of cash-to-assets ratio). To address the possibility that the results are driven by firms with large cash holdings, we estimate the clustered regression presented in Column 3 after eliminating from the sample the firms that are in the fourth quartile of cash holdings. Results using this subsample are presented in Table XXIV, column 5 and are qualitatively similar.

[69] We include financial variables such as flow of funds deficit measure used in Table 3, and cash conversion cycle as independent variables. Inclusion of these variables do not change our results. Results are not reported for the sake of brevity.

Table XXV presents regressions with alternate specifications to ensure the robustness of results presented in Table XXIV. First, it is likely that cash holdings and some of the financial variables used as independent variables in Table XXIV may be jointly determined for each firm. The trade-off theory would suggest firms choose leverage, cash holdings and investment policy simultaneously. We estimate the regressions of Table XXIV omitting the capital expenditure, dividend and leverage variables. Results are presented in Table XXV, columns 2 through 4 and are robust to the exclusion of aforementioned variables. Table XXV, columns 5 through 7 presents results of regressions with changes in cash holdings as an additional independent variable. The purpose of including this variable is to capture the transitory nature of cash holdings. That is, firms may accumulate cash holdings either because they are off their target level or to invest in the near future. Again, all our original findings remain unchanged.

**** Insert Table XXV here ****

V. Ownership structures, management control and cash holdings

Agency theory suggests that in the presence of agency costs of managerial discretion, management may prefer to hold cash to pursue its own objectives since cash reserves are easily accessible by management with little scrutiny and much of their use is discretionary (Jensen and Meckling, 1976; Jensen, 1986). While there is considerable literature examining the relation between cash holdings, agency problems and corporate governance, the evidence is still inconclusive. Furthermore,

a common feature of extant studies is that the analysis is restricted to publicly traded companies.[70] We examine the relation between cash holdings and governance characteristics in private companies. Extant literature examining agency costs in private companies, though small, suggests that these costs are real and have an economic impact on private companies (Ang, Cole and Lin, 2000; Nagar, Petroni and Wolfenzen, 2010; and Gogineni, Linn and Yadav, 2011).

For this analysis, we use a subset of private firms for which detailed ownership and governance data are available. This dataset is constructed as follows. We restrict our sample to the 2006-2009 period and identify firms for which ownership data lagged by one year are available.[71] That is, if financial data are taken for the year 2006, ownership data are taken from the year 2005. Table XXVI, Panel A presents the distribution of ownership structures for our sample of private firms. Column 1 lists the six different ownership structures into which firms are categorized; (1) firms that are owned by a single individual, (2) firms that are owned only by a single family, (3) firms that are owned by multiple families only, (4) firms that are owned jointly by a combination of families and private companies including investment funds, (5) firms that are owned exclusively by private holding companies

[70] When agency costs from ownership-control separation are relevant, cash-rich firms are more likely to engage in value destroying acquisitions (Harford, 1999), shareholders assign a lower value to cash holdings in diversified firms (Tong, 2011) and in firms with poor corporate governance (Dittmar and Mahrt-Smith, 2007; Klacheva and Lins, 2007), while firms with weaker corporate governance hold smaller cash holdings (Harford et al., 2008).

[71] Each yearly installment of the FAME data produced by *Bureau Van Dijk* contains the latest available ownership and management structure data and 10 years of financial statement data. However, ownership data prior to 2005 is extremely sparse and unreliable.

and (6) firms that are categorized as public, not quoted. Even-numbered columns present the number of firms that are owner-managed.[72]

**** Insert Table XXVI here ****

Table XXVI, Panel B presents company level summary statistics for firms based on ownership structures. An average one owner firm is small and holds a larger proportion of its assets (37%) as cash. Median assets increase and median cash holdings decrease monotonically as we move away from the one owner firms increasing as the number of owners increases. Firms that are owned by a single individual or a single family are on average younger than firms that are owned by holding companies. The distribution of Quiscores' across ownership classifications indicates the sample firms tend to fall in the normal or better regions for the index. Firms owned by a single individual or a single family are younger.

A. Univariate analysis

Results presented so far suggest a strong relation between firm size and cash holdings. We examine whether a similar relation exists between firm size and governance characteristics. We sort firms into size quintiles each year. The mean and median cash holdings and governance variables within the 1st, 3rd and 5th size quintiles are reported in Table XXVII, Panel A. We perform *t*-tests for differences in

[72] These firms constitute a subset of firms examined by Gogineni, Linn and Yadav (2011). Please refer to Gogineni, Linn and Yadav (2011) for more details on sample construction and ownership classifications.

mean and Wilcoxon tests for differences in medians to examine whether the reported means and medians are significantly different across the 1st and 5th quintiles. The results suggest significant differences between the 1st and 5th quintiles for all of the variables. Smaller firms have more cash, higher insider ownership and concentration (number of shareholders who are directors scaled by total number of directors) and a large majority are managed by owners.

**** Insert Table XXVII here ****

Next, we examine the relation among the governance variables using a double sort. We sort using firm size quintiles and then using a proxy for agency costs. Prior studies examining publicly traded companies use indices such as the GIndex (Gompers, Ishi and Metric, 2003) or the EIndex (Bebchuk, Cohen and Ferrell, 2009) as proxies of agency costs.[73] However, such indices are not available for privately held firms. Gogineni, Linn and Yadav (2011) address this issue by creating an Agency Cost Index (hereafter ACI).[74] Larger values of ACI indicate higher agency costs. They verify the validity of the ACI by showing that ACI is related to the GIndex and EIndex described above for publicly traded companies.

We use ACI as our proxy for agency costs. We sort the ACI into quartiles and examine the mean and median levels of the other governance variables between

[73] It has been argued that firms with higher agency costs are associated with weak corporate governance.

[74] ACI is calculated based upon a multivariate factor analysis of several accounting variables widely used as agency cost proxies. The factor score of the dominant factor explaining the non-unique variance is used as the index of agency costs. Please refer to Gogineni, Linn and Yadav (2011) for more details.

the 1st (lower agency costs) and the 4th (higher agency costs) quartiles within each of the five size quintiles. We only report the extreme quartiles within each quintile for the sake of brevity. To test for significance across the ACI quartiles, we perform *t*-tests for differences in mean and Wilcoxon tests for differences in medians. Results are presented in Table XXVII, Panel B. Within each size quintile, we find that firms with lower agency costs (1st quartile ACI) have insider ownership measures and a larger proportion of these firms are owner managed. The panel also provides evidence on the univariate relation between cash holdings and the governance variables while effectively controlling for firm size. We find large, statistically significant differences between cash holdings based on the ACI quartiles. For example, in the smallest size quintile, firms with lower agency costs have median cash holdings of 40% relative to 33% for firms with higher agency costs. Firms with lower agency costs hold significantly more cash across all size quintiles.

B. Multivariate analysis

We next examine the relation between agency costs and cash holdings in a multivariate setting. The dependent variable in all regressions is Cash defined as cash plus bank deposits scaled by total assets. The independent variables are governance-related variables and financial variables that are found to be determinants of cash holdings in private firms.

An important issue in governance related studies is the endogenous nature of governance structures and firm performance measures. Put simply, while governance

structure may affect cash holdings, it is possible that cash holdings may also be one of the determinants of governance structures. Prior theory suggests that the causality between governance and cash holding is more likely to be influenced by the firm's governance structure than vice versa. For example, Kalcheva and Lins (2008) in their study of the relationship between cash holdings and governance measures rely on OLS regressions of cash holdings on governance proxies in a given year. One alternative approach to controlling for endogeneity is two-stage least squares estimation. However, the ability to identify exogenous variables in the first stage that are not related to the second-stage dependent variable determines the validity of 2SLS models. Unfortunately, prior empirical and theoretical work on corporate governance and cash holdings use similar control variables, which leaves us with little insight in determining reasonable instrumental variables.

We address this issue by first examining whether ownership is sticky and does not tend to vary over time for our sample companies.[75] Constant ownership levels in companies would effectively make ownership an exogenous, predetermined variable which is a sufficient condition to motivate its use as an independent variable in a performance regression (Smith and Watts (1992)). Even though we find that ownership is indeed sticky and does not tend to vary over time, we use lagged

[75] While it might be possible for an owner to increase her equity investment, she will be constrained by her own personal resources (Berger and Udell, 2002; Cole, Wolken and Woodburn, 1996). In most private company settings, especially those cases involving a single owner, most of the owner's wealth is likely to already be tied up in the company she owns. As a result of this resource constraint and the fact that such ownership interests are not easily transferable, investors in close corporations cannot easily adjust their ownership positions as conditions change.

ownership and management classification data in our analysis to minimize any possibility of contemporaneous jointly determined effects.

**** Insert Table XXVIII here ****

Table XXVIII, column 2 presents results of regression specification where the dependent variable is cash and the independent variables include financial variables and a proxy for agency costs, agency cost index, ACI. As expected, the coefficient estimate on this variable is negative and significant. All other financial variables retain the correct signs and significance from Table XXIV. Next, we test for a non-linear relation between cash holdings and agency costs. We do this by sorting our sample firms into quartiles based on ACI and then create two dummy variables. ACI 1st Quartile dummy the equals 1 if a firm belongs to the first quartile (lower agency costs) and 0 otherwise. ACI 4th Quartile is a dummy variable that equals 1 if a firm belongs to the fourth quartile (higher agency costs) and 0 otherwise. We replace ACI with these dummy variables and rerun the regression specification. The coefficient estimates on both these dummy variables are significant and similar in size, which suggests that a linear specification my indeed correctly capture the relation. We use two additional proxies for agency costs and the results of these specifications are presented in Table XXVIII, columns 4 and 5. The results are robust to these alternate governance measures and indicate a negative relation between cash holdings and agency costs. Overall, the results suggest that private firms with lower agency costs hold higher cash balances.

VI. Conclusion

This study examines cash policy of more than 40,000 U.K. based private firms for the 2000-2009 period. We examine the determinants of private firms cash holdings.

We first assess the success of the trade-off and the financing hierarchy models in explaining changes in cash holdings of private firms. We find that the cash holdings of private firms revert to the mean indicating that these firms have target cash levels. In fact, the rate of mean reversion is higher in private companies when compared to the rate of mean reversion in publicly traded firms. Finding that private firms do have target cash levels, we attempt to distinguish more directly between the trade-off model and the financing hierarchy models. The results indicate that both these models are relevant in explaining the changes in cash holdings of private firms. It seems the two models capture different aspects of the change in cash holdings of private firms.

We then empirically test the determinants of cash holdings in private firms. The results suggest that smaller firms, which are younger, riskier and presumably more financially constrained, hold significantly more cash and less cash substitutes than bigger firms. Reported evidence of a panel data analysis supports both the trade-off model and financing hierarchy model. With respect to the former model, we find that firms with more growth opportunities and riskier cash flows hold more cash. In addition, we document a negative relation between leverage and cash holdings. This result is consistent with the predictions of the financing hierarchy theory. Private

firms that pay dividends hold more cash. Evidence also shows that net working capital can be considered as a cash substitute.

We also investigate the relation between cash holdings and governance structures in private firms. We find in the cross-section and over time that private firms with high insider ownership have higher cash holdings, while firms that are not owner managed have lower cash holdings. Overall, firms with lower agency costs (low ACI) have higher cash reserves than those with higher agency costs (high ACI).

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Appendix A
Chapter 1 Description of Variables

Variable	Description
Asset mix	net property, plant and equipment to total assets
Board Control Index (BCI)	board controlled by insiders + board authorized to change boards without shareholder approval + board can amend bylaws without shareholder approval
CAR2	Cumulative abnormal returns measured over the (0, 1) period
CAR3	Cumulative abnormal returns measured over the (-1, 1) period
CAR5	Cumulative abnormal returns measured over the (-2, 2) period
Debt	ratio of long-term debt to total assets
Executive ownership	fraction of shares held by insiders
FCF	(net income plus depreciation and change in working capital less capital expenditures) / total assets
Firm Risk	standard deviation of profitability
Institutional ownership	average quarterly institutional ownership over the previous four calendar quarters
Profitability	earnings before interest, tax, depreciation and amortization scaled by total assets
Size	log(total assets)
State provisions	incorporated in state with control share provisions + cash out provision + freeze out provision + fair price provision
Takeover restrictions	poison pill + sunset provision + qualified offer provision + super majority requirement to approve merger + incorporated in a state with anti-takeover provision
Tax Ratio	total income taxes scaled by sales
Tobins Q	firm market value divided by the book value of assets (as of latest fiscal year)
Voting restrictions	staggered board + super majority requirement for charter amendment + dual class shares + super majority requirement to amend bylaws
Zscore	3.3*(earnings before interest and tax/sales) + sale/assets + 1.4*(retained earnings/total assets) + 1.2*(working capital/total assets) + 0.6*(market value of equity/book value of liabilities).

APPENDIX B:
Chapter II Sample Creation

Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. We use current year's financial data and lagged ownership and management data. For example, financial data for year 2006 come from the October 2006 update and ownership and management data are extracted from the update dated October 2005.

A. Ownership Structures

A.1. Initial screening criteria for company selection

Criteria Employed	2006	2007	2008	2009
Include firms with Min. Assets of $5,000 and Min. Sales of $1,000	280,728	279,270	269,060	246,039
Exclude firms with the following SIC codes: 10-14 (mining), 40 (electricity), 64-70 (finance), 75 (social services), 80 (education) SIC = 7415 or 7487 (management of holding companies category. These firms solely exist for the purpose of being a holding company and hence, financial information is often unavailable)	200,019	192,651	182,996	168,233
Exclude firms where account type is not available	199,500	191,259	181,716	167,133
Restrict sample to private limited, public not quoted, public quoted firms on LSE, AIM and OFEX	187,394	180,522	173,019	158,377
Net after exclusions	187,394	180,522	173,019	158,377
Of which				
Private firms where all owners are individuals	128,527	123,053	116,109	103,168
Private firms with at least one non-individual owner, such as a holding company	54,847	53,715	53,382	51,949
Public, Not Quoted and Public, Quoted Firms	4,020	3,754	3,528	3,260

A.2. Stand-alone firms

Firms in this category are classified as stand-alone firms as these firms do not have any subsidiaries and are not affiliated with any holding companies. The following table documents the steps taken to further categorize firms owned by individuals.

Criteria Employed	2006	2007	2008	2009
Private firms where all owners are individuals *(From Table A.1)*	128,527	123,053	116,109	103,168
Exclude private firms with unclear owner names[76]	124,241	118,612	111,866	99,025
Exclude private firms where the stake of the identified owners is less than 98%	119,141	118,282	111,605	94,650
Of which				
Net after exclusions	119,141	118,282	111,605	94,650
Private firms in which a single individual owns 100% of the firm	46,674	46,598	45,254	40,247
Private firms in which multiple individuals own 100% of the firm	72,467	71,684	66,351	54,403

A.3. Private firms with at least one non-individual owner

The following table documents the steps taken to categorize firms where a non-individual such as a mutual fund, bank, or industrial company is present as a shareholder.

Criteria Employed	2006	2007	2008	2009
Private firms with at least one non-individual owner *(From Table A.1)*	54,847	53,715	53,382	51,949

[76] We search for characters such as 'executors of', 'family', 'trustee', 'committee', 'foundation' etc., and for firms where multiple shareholders are listed on the same line. A complete list of search terms employed is available upon request. For such firms, it is impossible to accurately identify ownership stakes.

Criteria Employed	2006	2007	2008	2009
Exclude private firms with unclear owner names				
Exclude private firms where the stake of the identified owners is less than 98%				
Net after exclusions	42,412	43,719	43,711	40,726
Of which				
Private firms owned by a combination of individuals and other firms	4,577	5,354	5,173	3,580
Private firms wholly-owned by other firms	37,835	38,365	38,538	37,146

A.4. Summary of ownership structures for firms in the sample

Ownership Structure	2006	2007	2008	2009
Private firms in which a single individual owns 100% of the firm	46,674	46,598	45,254	40,247
Private firms owned by One Family	39,612	38,279	35,429	29,718
Private firms owned by Multiple Families	32,855	33,405	30,922	24,685
Private firms owned by a combination of individuals and other firms	4,577	5,354	5,173	3,580
Private firms wholly-owned by other firms	37,835	38,365	38,538	37,146
Public, Not Quoted and Public, Quoted Firms	4,020	3,754	3,528	3,260
Total	165,573	165,755	158,844	138,636

B. Management Structures

In order to categorize firms into owner-managed and non owner-managed groups, we match firms from the ownership file with those in the directors file using the company's registered number issued by Companies House. We examine the directors file carefully and remove all name duplications. We retain current directors and calculate their age and tenure as of the current year's financial statement date. We determine the presence of shareholders among directors through two methods. First, we identify cases where the directors file explicitly states that a particular director is a shareholder. Since it is possible that some directors who are shareholders are not stated as such, we complement the information provided by *Bureau Van Dijk* by a combination of programmable and manual searches to make sure we identify all shareholders among directors. The following table provides the distribution of firms based on owner-managed and non owner-managed categories. Owner-managed firms (OM) are those where the ratio of shareholders among directors to total number of directors is equal to 1, that is where the following ratio is equal to 1 The remaining companies in the sample are identified as non-owner-managed (NOM).

"**Concentration**" measures the proportion of managing directors who are also shareholders of the firm. Concentration is calculated as follows:

$$\textbf{Concentration} = \frac{\textbf{Number of shareholders amongst managing directors}}{\textbf{Number of managing directors}}$$

	2006		2007		2008		2009	
	OM	NOM	OM	NOM	OM	NOM	OM	NOM
One Owner	33,759	12,568	33,721	12,673	32,645	12,385	29,638	10,496
One Family	35,190	4,174	34,190	4,037	31,619	3,752	26,683	2,993
Multiple Families	24,957	7,609	25,148	8,040	23,103	7,665	18,715	5,919
Families & Firms	1,239	3,244	1,404	3,846	1,311	3,765	896	2,620
Holding Companies		37,326		37,781		37,937		36,637
Public, Not Quoted		2,813		2,558		2,381		2,185
Public, Quoted		1,207		1,196		1,147		1,075
Total	**164,086**		**164,594**		**157,710**		**137,857**	

B.1. Final Sample

As a final selection criteria, we require that all firms in the sample have non-missing values for AT (Total sales / Total assets), OPEXP (Operating expenses / Total sales), and EBITD (Earnings before interest, tax, depreciation and amortization / Total assets) values, as defined in Appendix B. Application of these criteria results in the following sample:

	2006		**2007**		**2008**		**2009**		**Row Total**
	OM	**NOM**	**OM**	**NOM**	**OM**	**NOM**	**OM**	**NOM**	
One Owner	33,542	12,416	33,519	12,534	32,444	12,235	29,440	10,353	**176,483**
One Family	34,942	4,140	33,947	4,012	31,381	3,735	26,483	2,974	**141,614**
Multiple Families	24,728	7,494	24,894	7,918	22,900	7,544	18,513	5,814	**119,805**
Families & Holding Cos.	1,226	3,103	1,391	3,701	1,293	3,612	884	2,519	**17,729**
Holding Companies only		35,609		35,938		36,095		34,747	**142,389**
Public, Not Quoted		2,788		2,532		2,361		2,164	**9,845**
Public, Quoted		1,189		1,185		1,139		1,071	**4,584**
Year-wise Totals	**161,177**		**161,571**		**154,739**		**134,962**		**612,449**

APPENDIX C
Chapter II Variable Definitions

Variable	Definition
Accounting Quality	Set of 7 dummy variables representing the different types of accounts filed by firms.
AGE	Firm age measured in years from date of incorporation to statement date
ASSETS	Total assets, measured in thousands
AT	Asset turnover ratio, defined as Total sales / Total assets
BANKLOAN	Bank loans outstanding / Total assets
Concentration	No. of shareholders among directors / No. of directors
DIFF	Difference between the ownership stakes of the largest and second largest shareholders
EBITD	Earnings before interest, tax, depreciation and amortization / Total assets
E-Index	Index of corporate governances constructed according to Bebchuk, Cohen and Ferrell (2009)
G-Index	Index of corporate governances constructed according to Gompers, Ishi and Metrick (2003)
Financial Characteristics	SIZE, $SIZE^2$, AGE, BANKLOAN, T.LIABILITIES, NBRSUBS, NBRHOLD
HIGH CONC	Dummy variable that equals 1 if the largest shareholder owns more than 75% of the firm and zero otherwise
ACI	Agency cost index equal to the factor score calculated from a factor analysis of deviations of AT, OPEXP and EBITD from the respective averages for the zero agency cost firms, first principal factor
ACI-2	Agency cost index equal to the factor score calculated from a factor analysis of deviations of AT, OPEXP including cost of goods sold and EBITD from the respective averages for the zero agency cost firms, first principal factor
INDI_FAM	Dummy variable that equals 1 if the firm is owned by a combination of families and holding companies and zero otherwise
Industry Controls	Set of 19 dummy variables representing the 19 industry sectors presented in Panel B, Table 1
Largest Stake	Ownership stake of the largest shareholder
LOW CONC	Dummy variable that equals 1 if the largest shareholder owns less than 50% of the firm and zero otherwise
MED CONC	Dummy variable that equals 1 if the largest shareholder owns between 50% - 75% of the firm and zero otherwise
MUL FAM	Dummy variable that equals 1 if the firm is owned by a multiple families and zero otherwise
MUL FAM - NOM	Dummy variable that equals 1 if the firm is owned by multiple families and not managed by them and zero otherwise
MUL FAM - OM	Dummy variable that equals 1 if the firm is owned and managed by multiple families and zero otherwise
NBRHOLD	No. of holding companies (direct and indirect holding companies)
NBRSUBS	No. of subsidiaries (at least 50% owned)
NS	Dummy variable that equals 1 if the firm is classified either as INDI_FAM or WO and zero otherwise
ONE FAM	Dummy variable that equals 1 if the firm is owned by a single family and zero otherwise
ONE FAM - NOM	Dummy variable that equals 1 if the firm is owned by a single family and not managed by that family and zero otherwise
ONE FAM - OM	Dummy variable that equals 1 if the firm is owned and managed by a single family and zero otherwise
ONE OWNER - NOM	Dummy variable that equals 1 if the firm is owned by a single individual and not managed by him and zero otherwise
OPEXP	Operating expenses / Total sales
PUBLICNQ	Dummy variable that equals 1 if the firm is classified as public, not quoted and zero otherwise

Variable	Definition
PUBLICQ	Dummy variable that equals 1 if the firm is classified as public quoted and zero otherwise
QUISCORE	Credit score produced by CRIF Decision Solutions Ltd. This score is a measure of the likelihood of company failure in the year following the date of calculation
Riskiness	Set of 5 dummy variables representing the five bands of Quiscore.
SECOND	Ownership stake of the second largest shareholder
SIZE	Log(Total Sales)
T. LIABILITIES	(Total Assets – Shareholders Equity)/ Total Assets
WO	Dummy variable that equals 1 if the firm is owned by a holding company

Figure I. Median Cash-to-Assets, 2000-2009
The figure reports the evolution of cash holdings in the 2000-2009 sample period for the 42,036 private firms and 284,082 firm-year observations. Cross-sectional median cash-to-assets ratios for private companies are presented. Similar statistics for 525 public companies and 3,817 firm-year observations are presented for comparison purposes. The time steps are annual. Cash-to-assets ratio is calculated as cash plus bank deposits scaled by total assets.

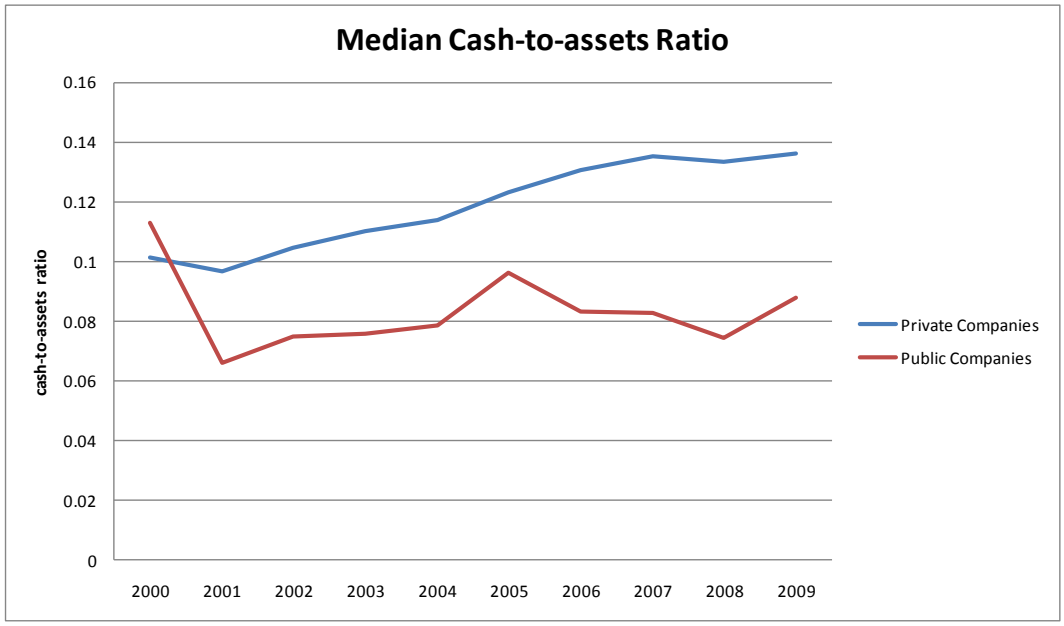


Figure II. Distribution of Coefficients on Lagged Change in Cash
The figure presents the distribution of coefficients on lagged change in cash from the firm-wise regression:

$$\Delta Cash_t = \alpha + \beta \Delta Cash_{t-1} + \in_t,$$

where Δ is a first difference operator, and time steps are annual. Cash is defined as cash plus bank deposits scaled by total assets. The chart includes information on 34,946 U.K. private firms with at least five years of data on cash holdings in the 2000-2009 period. The mean and median coefficient values are -0.244 and -0.300 respectively.

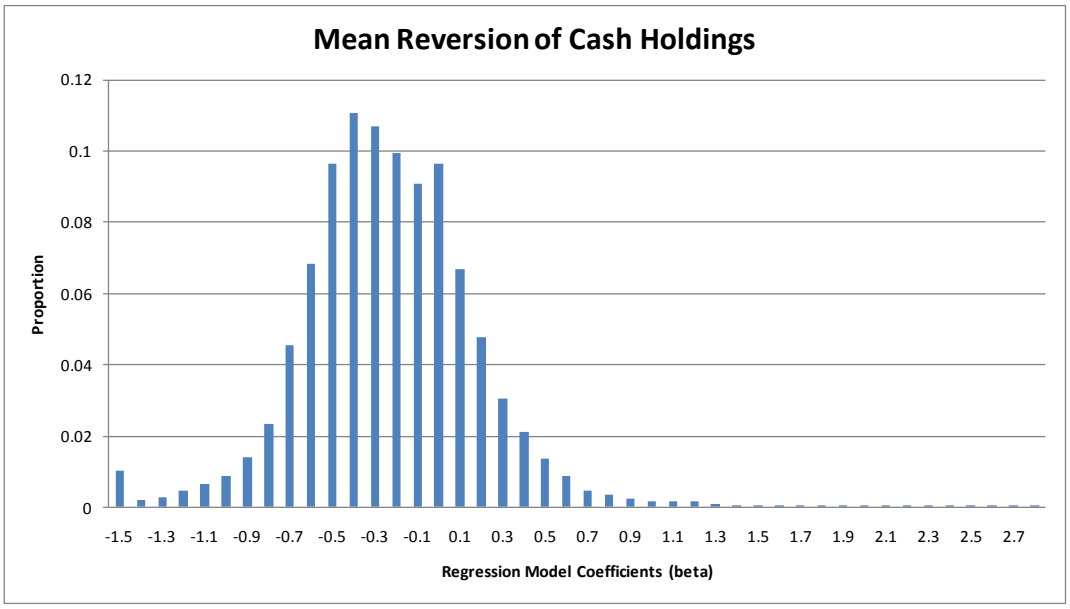


Table I. Governance Characteristics

This table provides summary statistics of various governance provisions available in the dataset provided by the Riskmetrics Group. The sample consists of all publicly traded corporations in the U.S. during 2002-2009.

Year	2002	2003	2004	2005	2006	2007	2008	2009
Board controlled by insiders & affiliated outsiders	25.75%	22.76%	13.88%	30.12%	31.30%	31.61%	32.07%	33.35%
Board size < 6	8.06%	17.67%	17.06%	16.60%	16.19%	16.66%	16.63%	17.42%
The board is authorized to change size of board without shareholder approval	.	70.51%	80.59%	80.68%	86.42%	87.35%	88.82%	89.70%
Staggered Board	60.52%	54.64%	53.49%	51.89%	49.63%	48.79%	47.63%	46.64%
Board can amend bylaws without shareholder approval	87.45%	80.31%	83.48%	86.59%	88.72%	89.30%	91.52%	92.48%
Chairman and CEO are combined	51.53%	51.33%	52.52%	49.55%	48.10%	45.82%	44.43%	43.76%
A board approved CEO succession plan is in place	4.32%	14.33%	34.82%	40.14%	53.55%	56.66%	59.97%	61.32%
Poison Pill	59.63%	73.15%	73.89%	61.63%	60.30%	55.04%	47.01%	42.17%
There is a super majority vote requirement to amend charter/bylaws	53.14%	44.73%	44.84%	46.26%	45.08%	45.42%	45.95%	47.26%
There is a supermajority vote requirement to approve mergers	36.55%	20.71%	21.68%	21.20%	22.48%	22.21%	20.57%	20.44%
Dual class capital structure, super voting shares closely held by insiders	10.73%	7.69%	5.88%	4.74%	4.86%	4.69%	4.30%	4.22%
Incorporation in state with state anti-takeover provisions	96.83%	95.84%	96.12%	96.19%	96.32%	96.43%	96.65%	96.79%
Incorporation in state w/ a control share acquisition statute	20.08%	22.18%	21.49%	21.11%	20.48%	20.63%	19.60%	19.50%
Incorporation in state with a control share cash-out statute	2.21%	2.18%	1.90%	1.83%	1.70%	1.78%	1.56%	1.59%
Incorporation in state with strong freeze-out provisions	22.00%	22.91%	22.80%	22.79%	23.09%	22.55%	22.05%	22.26%
Incorporation in state with a fair price provision	29.89%	31.20%	31.49%	31.61%	31.61%	31.39%	30.53%	30.63%
Officers + directors ownership as % of shares outstanding is >= 1% and <= 5%	27.85%	17.16%	19.70%	19.75%	21.62%	23.35%	23.55%	23.41%
Officers + directors ownership as % of shares outstanding is > 5% and <= 30%	50.18%	51.82%	52.14%	50.34%	51.78%	49.29%	47.88%	47.69%
No governance committee has been established	74.00%	63.38%	38.01%	31.97%	28.73%	27.48%	25.87%	24.59%
The governance committee met during the past year	.	26.73%	46.34%	49.60%	63.57%	66.11%	66.63%	68.73%
Governance details are publicly disclosed	5.10%	19.44%	45.01%	49.87%	46.62%	48.67%	49.38%	51.11%
Number of Firms	*2,804*	*5,500*	*5,259*	*5,296*	*5,249*	*4,989*	*5,188*	*5,148*

Table II. Distribution of Number of Deals and Type of Bidder Over Time

The sample comes from SDC and includes all completed mergers and going private transactions between 2002 and 2009 where the bidder acquires 51% or more of the controlling interest of the target firms. Column II presents the full sample distribution. Columns III through V present distributions of sub-samples based on different criteria. Merger refers to deals where acquirer is a publicly traded firm in the U.S. PE backed GP refers to deals where at least one private equity firm is involved as a bidder.

Year	Full Sample	Public	PE backed GP	Non PE backed GP
I	*II*	*III*	*IV*	*V*
2002	18	17	0	1
2003	94	70	5	19
2004	108	85	12	11
2005	131	98	23	10
2006	136	89	30	17
2007	139	93	33	13
2008	78	58	10	10
2009	91	71	13	7
Total	795	581	126	88

Table III. Summary Statistics

Panel A compares firms that went private with a sample of firms that were taken over by other public firms and a sample of firms that remained public during 2002-2009. Please refer to Appendix for a description of variables. The last two columns present the *p-value* of differences in means calculated by employing *t*-tests for differences in means. Panel B presents pairwise correlations. Statistical significance at the 10, 5 and 1 percent levels are indicated by *, **, and *** respectively.

Variable	Going Private Sample (GP)	Merger Sample	Survivors	Test of Differences	
				GP Vs. Merger	GP Vs. Survivors
Panel A					
Assets	1,372.9	1,797.0	3,812.6	0.027	0.000
Market Value	1,302.4	1,864.5	2,432.8	0.003	0.000
Tobins Q	1.596	2.082	2.010	0.000	0.000
Book to Market	0.690	0.462	0.530	0.000	0.000
Profitability	0.092	0.036	0.007	0.000	0.000
FCF	-0.020	-0.074	-0.141	0.004	0.000
Debt	0.188	0.163	0.174	0.010	0.098
Zscore	3.282	1.075	-1.683	0.000	0.000
Asset Mix	0.276	0.215	0.204	0.000	0.000
Tax Ratio	0.411	0.242	0.297	0.000	0.000
Firm Risk	0.111	0.191	0.311	0.000	0.000
Panel B					
Institutional Ownership	0.520	0.573	0.497	0.000	0.084
Executive Ownership	0.125	0.118	0.110	0.458	0.093
Takeover Restrictions	2.283	2.467	2.296	0.000	0.706
BCI	1.341	1.275	1.270	0.048	0.020
Voting Restrictions	2.395	2.499	2.407	0.004	0.720
State Provisions	0.549	0.473	0.800	0.106	0.000
G-Index	6.534	6.812	6.795	0.010	0.008
Entrenchment Index	2.365	2.534	2.407	0.000	0.326
Observations	*765*	*2,150*	*19,978*		

Panel B: Pair-wise Correlations

	BCI	Takeover Restrictions	Voting Restrictions	State Provisions	Assets	G-Index
Takeover Restrictions	0.108**					
Voting Restrictions	0.1493**	0.3292**				
State Provisions	-0.0897**	-0.0276**	-0.042**			
Assets	-0.0409**	0.0217**	0.0226**	-0.0144*		
G-Index	0.1488**	0.6806**	0.5784**	0.5052**	-0.001	
E-Index	0.0942**	0.6144**	0.6685**	0.0002	0.031**	0.6586**

Table IV. Baseline Regression Model

Firm-year observations are treated as recurring censored events until the firm ceases to exist because of a going private transaction or a merger. Model I of Panel A presents results of a multinomial regression model where the probability of going private or a merger with another public company is measured against the probability of being a survivor. Model II of Panel A presents a specification where the going private sample is divided into private equity and non private equity backed deals. The regression model controls for time variation by including year dummy variables. Please refer to Appendix for a description of variables. Standard errors are corrected for firm-level clustering effects using a robust-variance estimation methodology. Panel B presents differences in coefficient estimates of Model II and the associated p-values for z-test of differences. The symbols *, **, and *** indicate statistical significance at the 10%, 5% and 1% respectively.

Panel A:

	Model I		Model II		
	Merger Sample	GP Sample	Merger Sample	PE backed GP	Non PE backed GP
Constant	-1.0832	-2.5097	-0.9768	-3.2778	-2.0252
	(0.000)***	(0.000)***	(0.001)***	(0.000)***	(0.001)***
Size	-0.3884	-0.2985	-0.3864	-0.1538	-0.5543
	(0.000)***	(0.000)***	(0.000)***	(0.086)*	(0.000)***
FCF	0.0649	0.1707	0.0646	0.3918	-0.0491
	(0.404)	(0.535)	(0.414)	(0.000)***	(0.776)
Debt	0.2522	0.3432	0.2571	0.1129	0.6931
	(0.174)	(0.273)	(0.158)	(0.795)	(0.117)
Tobins Q	-0.1022	-0.415	-0.1001	-0.3198	-0.6556
	(0.001)***	(0.000)***	(0.001)***	(0.004)***	(0.000)***
Profitability	-0.1214	0.6097	-0.1192	1.0172	0.2959
	(0.026)**	(0.364)	(0.031)**	(0.117)	(0.660)
Tax Ratio	-0.0066	0.0001	0.0015	0.0036	0.0026
	(0.124)	(0.839)	(0.046)**	(0.001)***	(0.004)***
Z-Score	0.0015	0.0025	-0.0065	0.0005	0.0001
	(0.047)**	(0.002)***	(0.129)	(0.498)	(0.996)
Asset Mix	-0.3785	0.6391	-0.3712	-0.2443	1.6828
	(0.129)	(0.053)*	(0.137)	(0.603)	(0.000)***
Firm Risk	-0.0236	-0.3141	-0.024	-1.359	-0.0625
	(0.466)	(0.449)	(0.473)	(0.170)	(0.641)
Institutional Ownership	0.4005	0.0934	0.3859	0.1664	0.0702
	(0.000)***	(0.110)	(0.000)***	(0.087)*	(0.336)
Executive Ownership	0.4858	0.3138	0.0225	0.0703	0.0406
	(0.030)**	(0.380)	(0.363)	(0.167)	(0.560)
Observations	22,893	22,893	22,893	22,893	22,893
Chi-Square	150.51^{***}			201.73^{***}	
Psuedo R^2	0.027			0.0313	

Table IV - *(Continued)*

Panel B:

	PE backed GP - Merger		PE backed GP - Non PE backed GP		Non PE backed GP - Merger	
	Δ beta	p-value	Δ beta	p-value	Δ beta	p-value
Size	0.232	0.023**	0.4	0.007***	-0.167	0.196
FCF	0.327	0.012**	0.44	0.028**	-0.113	0.550
Debt	-0.144	0.759	-0.58	0.349	0.436	0.361
Tobins' Q	-0.219	0.056*	0.335	0.101	-0.555	0.001***
Profitability	1.136	0.081*	0.721	0.441	0.415	0.539
Z-Score	0.002	0.074*	0.001	0.316	0.001	0.264
Tax Ratio	0.007	0.101	0.001	0.435	0.006	0.132
Asset Mix	0.126	0.811	-1.927	0.003***	2.053	0.000***
Riskiness	-1.334	0.178	-1.296	0.194	-0.038	0.779
Institutional Ownership	-0.219	0.058*	0.096	0.427	-0.315	0.001***
Executive Ownership	0.047	0.396	0.029	0.73	0.018	0.807

Table V. Accounting for Governance Characteristics – Aggregate Governance Measure
Firm-year observations are treated as recurring censored events until the firm ceases to exist. Panel A presents results of a multinomial regression model where the probability of undergoing an LBO or a merger with another public company is measured against the probability of being a survivor. Panel B presents a specification where the LBO sample is divided into private equity and non private equity backed deals. The regression model controls for time variation by including year dummy variables. Please refer to Appendix for a description of variables. Standard errors are corrected for firm-level clustering effects using a robust-variance estimation methodology. p-values are presented in parenthesis. The symbols *, **, and *** indicate statistical significance at the 10%, 5% and 1% respectively.

Panel A:

	Model I		Model II		
	Merger Sample	GP Sample	Merger Sample	PE backed GP	Non PE backed GP
Constant	-0.9496	-2.0199	-0.8238	-3.0612	-1.2016
	(0.007)***	(0.000)***	(0.018)**	(0.000)***	(0.118)
G-Index	-0.0097	-0.052	-0.0138	-0.0117	-0.1078
	(0.680)	(0.173)	(0.553)	(0.810)	(0.065)*
Size	-0.3956	-0.3041	-0.3963	-0.1645	-0.561
	(0.000)***	(0.000)***	(0.000)***	(0.068)*	(0.000)***
FCF	0.1541	0.1099	0.159	0.3874	-0.0668
	(0.080)*	(0.723)	(0.079)*	(0.000)***	(0.564)
Debt	0.2649	0.3886	0.2769	0.1138	0.8438
	(0.189)	(0.212)	(0.158)	(0.793)	(0.053)*
Tobins Q	-0.1017	-0.4448	-0.0997	-0.3291	-0.7505
	(0.001)***	(0.000)***	(0.002)***	(0.003)***	(0.000)***
Profitability	-0.1653	0.6234	-0.1643	0.9747	0.2639
	(0.001)***	(0.382)	(0.001)***	(0.173)	(0.676)
Tax Ratio	-0.0064	0.0000	0.0021	0.0034	0.0026
	(0.147)	(0.965)	(0.000)***	(0.002)***	(0.006)***
ZScore	0.0021	0.0025	-0.0062	0.0004	-0.0001
	(0.000)***	(0.003)***	(0.157)	(0.593)	(0.839)
Asset Mix	-0.2518	0.7005	-0.2396	-0.1578	1.7656
	(0.323)	(0.033)**	(0.347)	(0.734)	(0.000)***
Riskiness	-0.0271	-0.3965	-0.0279	-1.3683	-0.0801
	(0.462)	(0.426)	(0.465)	(0.171)	(0.688)
Institutional Ownership	0.4473	0.1063	0.4326	0.1751	0.0913
	(0.000)***	(0.072)*	(0.000)***	(0.070)*	(0.227)
Executive Ownership	0.5084	0.274	0.0155	0.0688	0.0211
	(0.034)**	(0.467)	(0.543)	(0.185)	(0.758)
Observations	20,962	20,962	20,962	20,962	20,962
Chi-Square	150.68***			197.91***	
Psuedo R^2	0.03			0.0344	

Table VI. Accounting for Governance Characteristics

Firm-year observations are treated as recurring censored events until the firm ceases to exist because of a going private transaction or a merger. Model I of Panel A presents results of a multinomial regression model where the probability of going private or a merger with another public company is measured against the probability of being a survivor. Model II of Panel A presents a specification where the going private sample is divided into private equity and non private equity backed deals. The regression model controls for time variation by including year dummy variables. Please refer to Appendix for a description of variables. Standard errors are corrected for firm-level clustering effects using a robust-variance estimation methodology. Panel B presents differences in coefficient estimates of Model II and the associated p-values for z-test of differences. The symbols *, **, and *** indicate statistical significance at the 10%, 5% and 1% respectively.

Panel A

	Model I		Model II		
	Merger Sample	GP Sample	Merger Sample	PE backed GP	Non PE backed GP
Constant	-1.8599	-3.0183	-1.0308	-3.5262	-1.2854
	(0.000)***	(0.000)***	(0.005)***	(0.000)***	(0.108)
Takeover Restrictions	0.09	-0.0752	0.0778	0.0161	-0.3498
	(0.074)*	(0.417)	(0.138)	(0.872)	(0.023)**
BCI	-0.0893	0.2695	-0.0897	0.3596	0.0177
	(0.197)	(0.031)**	(0.215)	(0.009)***	(0.921)
Voting Restrictions	0.0523	-0.0697	0.0422	-0.0173	0.0964
	(0.431)	(0.535)	(0.544)	(0.899)	(0.534)
State Provisions	-0.1855	-0.1548	-0.1801	-0.1475	-0.065
	(0.000)***	(0.069)*	(0.001)***	(0.136)	(0.568)
Size	-0.2038	-0.173	-0.3897	-0.1695	-0.5729
	(0.000)***	(0.003)***	(0.000)***	(0.065)*	(0.000)***
FCF	0.1665	-0.0063	0.1807	0.4037	-0.0688
	(0.015)**	(0.985)	(0.030)**	(0.000)***	(0.597)
Debt	0.1545	0.3563	0.2471	0.0704	0.8191
	(0.450)	(0.303)	(0.234)	(0.869)	(0.063)*
Tobins Q	-0.0966	-0.3742	-0.1036	-0.3305	-0.7531
	(0.001)***	(0.000)***	(0.001)***	(0.003)***	(0.000)***
Profitability	-0.1538	1.1263	-0.1691	1.0401	0.2939
	(0.001)***	(0.122)	(0.001)***	(0.151)	(0.654)
Z-Score	0.002	0.0037	0.0022	0.0037	0.0026
	(0.000)***	(0.001)***	(0.000)***	(0.001)***	(0.010)**
Tax Ratio	-0.0056	0.0006	-0.0062	0.0008	0.0001
	(0.204)	(0.495)	(0.158)	(0.315)	(0.878)
Asset Mix	-0.5016	0.561	-0.2078	-0.0512	1.8133
	(0.039)**	(0.114)	(0.413)	(0.911)	(0.000)***
Firm Risk	-0.0248	-2.0046	-0.0326	-1.6185	-0.0841
	(0.468)	(0.070)*	(0.428)	(0.144)	(0.669)
Institutional Ownership	0.3822	0.0758	0.4044	0.1577	0.0894
	(0.000)***	(0.224)	(0.000)***	(0.092)*	(0.235)
Executive Ownership	0.0151	0.0428	0.0174	0.0683	0.0203
	(0.541)	(0.357)	(0.495)	(0.189)	(0.766)
Observations	20962	20962	20,962	20,962	20,962
Chi-Square	146.32***			225.22***	
Pseudo R^2	0.0271			0.0383	

Table VI - *(Continued)*

Panel B

	PE backed GP - Merger		PE backed GP - Non PE backed GP		Non PE backed GP - Merger	
	Δ beta	p-value	Δ beta	p-value	Δ beta	p-value
Takeover Restrictions	-0.061	0.580	0.365	0.045	-0.427	0.008
BCI	0.449	0.004	0.341	0.009	0.107	0.575
Voting Restrictions	-0.059	0.694	-0.113	0.580	0.054	0.748
State Provisions	0.032	0.770	-0.082	0.584	0.115	0.357
Size	0.220	0.037	0.403	0.008	-0.183	0.167
FCF	0.223	0.100	0.472	0.006	-0.249	0.107
Debt	-0.176	0.707	-0.748	0.221	0.572	0.239
Tobins' Q	-0.226	0.053	0.422	0.063	-0.649	0.001
Profitability	1.209	0.095	0.746	0.446	0.462	0.482
Z-Score	0.001	0.117	0.001	0.282	0.000	0.629
Tax Ratio	0.007	0.110	0.000	0.348	0.006	0.153
Asset Mix	0.156	0.764	-1.864	0.003	2.021	0.000
Riskiness	-1.585	0.152	-1.534	0.172	-0.051	0.797
Institutional Ownership	-0.246	0.033	0.068	0.568	-0.315	0.002
Executive Ownership	0.050	0.377	0.047	0.576	0.002	0.968

Table VII: Predicted Probabilities

Panels A through D present predicted probabilities of possible outcomes for various values of BCI, Takeover restrictions, Voting restrictions and State provisions respectively. Values of all other variables are fixed at the respective means. Coefficient estimates from the regression results presented in Model II of Panel A, Table 6 are used to compute the probabilities. Merger Sample includes firms acquired by publicly traded firms. PE backed GP includes GPs backed by a private equity firm and Non PE backed GP includes GPs undertaken by private acquirers other than private equity firms. Basecase includes firms that remained public in a given year.

Panel A

	Merger		PE backed GP		Non PE backed GP		Basecase	
	Prob	Δprob	Prob	Δprob	Prob	Δprob	Prob	Δprob
BCI = 0	0.0222		0.0017		0.0015		0.9746	
BCI = 1	0.0201	-9.46%	0.0024	41.18%	0.0015	0.00%	0.9760	0.14%
BCI = 2	0.0183	-8.96%	0.0035	45.83%	0.0015	0.00%	0.9768	0.08%
BCI = 3	0.0165	-9.84%	0.0050	42.86%	0.0015	0.00%	0.9771	0.03%

Panel B

	Merger		PE backed GP		Non PE backed GP		Basecase	
	Prob	Δprob	Prob	Δprob	Prob	Δprob	Prob	Δprob
Takeover Restrictions = 0	0.0155		0.0025		0.0032		0.9788	
Takeover Restrictions = 1	0.0168	8.39%	0.0026	4.00%	0.0022	-31.25%	0.9784	-0.04%
Takeover Restrictions = 2	0.0181	7.74%	0.0026	0.00%	0.0016	-27.27%	0.9777	-0.07%
Takeover Restrictions = 3	0.0196	8.29%	0.0026	0.00%	0.0011	-31.25%	0.9767	-0.10%
Takeover Restrictions = 4	0.0211	7.65%	0.0027	3.85%	0.0008	-27.27%	0.9754	-0.13%
Takeover Restrictions = 5	0.0228	8.06%	0.0027	0.00%	0.0005	-37.50%	0.9739	-0.15%

Panel C

	Merger		PE backed GP		Non PE backed GP		Basecase	
	Prob	Δprob	Prob	Δprob	Prob	Δprob	Prob	Δprob
Voting Restrictions = 0	0.0169		0.0027		0.0011		0.9793	
Voting Restrictions = 1	0.0176	4.14%	0.0027	0.00%	0.0012	9.09%	0.9785	-0.08%
Voting Restrictions = 2	0.0183	3.98%	0.0026	-3.70%	0.0013	8.33%	0.9777	-0.08%
Voting Restrictions = 3	0.0191	4.37%	0.0026	0.00%	0.0015	15.38%	0.9768	-0.09%
Voting Restrictions = 4	0.0199	4.19%	0.0025	-3.85%	0.0016	6.67%	0.9759	-0.09%

Panel D

	Merger		PE backed GP		Non PE backed GP		Basecase	
	Prob	Δprob	Prob	Δprob	Prob	Δprob	Prob	Δprob
State Provisions = 0	0.0209		0.0029		0.0014		0.9748	
State Provisions = 1	0.0175	-16.27%	0.0025	-13.79%	0.0014	0.00%	0.9787	0.40%
State Provisions = 2	0.0147	-16.00%	0.0022	-12.00%	0.0013	-7.14%	0.9819	0.33%
State Provisions = 3	0.0123	-16.33%	0.0019	-13.64%	0.0012	-7.69%	0.9847	0.29%
State Provisions = 4	0.0103	-16.26%	0.0016	-15.79%	0.0011	-8.33%	0.987	0.23%

Table VIII. Wealth Effects to Target Shareholders

The sample comes from SDC and includes all completed mergers between 2002 and 2009 where the bidder acquires 51% or more of the controlling interest of the target. Merger Sample refers to deals where the acquirer is a publicly traded U.S. corporation. GP sample refers to all going private transactions. PE backed GP refers to all GPs backed by a private equity firm and Non PE backed GP refers to going private transactions undertaken by private acquirers other than private equity firms. Please refer to Appendix for a description of variables. Panel A presents average event period returns for various types of acquisitions. The last column reports the p-values of differences in means calculated by employing *t*-tests for differences in mean. Panel B presents results of second step in a two-step Heckman estimation. Dependent variable is CAR(-1,+1). Selection equation estimates the probability of a firm going private. Results of this step are not presented for the sake of brevity. p-values are presented in parenthesis below the coefficient estimates. Significance levels at 1%, 5% and 10% are denoted by ***, **, and *, respectively.

Panel A:

	Merger Sample	GP Sample	PE backed GP	Non PE backed GP	Diff. of Means Merger vs GP
CAR(-1,+1)	0.2503	0.2141	0.2126	0.2141	0.056
CAR(-2,+2)	0.2571	0.2175	0.2143	0.2203	0.038
CAR(-5,+5)	0.2588	0.2151	0.2178	0.2091	0.066

Table VIII - *(Continued)*

Panel B:

	Model I	Model II	Model III
Constant	-0.472	-0.4735	0.0938
	(0.313)	(0.312)	(0.877)
Takeover Restrictions	-0.0184	-0.0189	-0.0253
	(0.617)	(0.608)	(0.481)
BCI	0.0612	0.0686	0.0495
	(0.108)	(0.212)	(0.389)
Voting Restrictions	0.0295	0.0289	-0.0034
	(0.396)	(0.414)	(0.925)
State Provisions	-0.0203	-0.0201	-0.0197
	(0.393)	(0.398)	(0.422)
Size	-0.0411	-0.0427	-0.0418
	(0.029)**	(0.031)**	(0.088)*
Private Equity		0.0352	0.0249
		(0.753)	(0.827)
PE * BCI		-0.0158	-0.0086
		(0.827)	(0.906)
Institutional Ownership			0.033
			(0.233)
FCF			-0.0914
			(0.346)
Debt			0.0587
			(0.682)
Z-Score			0.0017
			(0.748)
Asset Mix			-0.1643
			(0.244)
Executive Ownership			0.0149
			(0.220)
Profitability			-0.1659
			(0.415)
Tax Ratio			-0.0141
			(0.511)
Firm Risk			-0.2413
			(0.271)
Endogeneity Correction	0.317	0.315	0.207
	(0.089)*	(0.091)*	(0.379)
Observations	21,857	21,857	21,848
Censored Observations	190	190	190

Table IX. Average Annual Changes in Governance Provisions

This table presents average annual changes in governance provisions across various groups. Merger Sample includes firms acquired by publicly traded firms. PE backed GP includes GPs backed by a private equity firm and Non PE backed GP includes GPs undertaken by private acquirers other than private equity firms. Basecase includes firms that remained public in a given year. Please refer to Appendix for a description of variables. The last three columns report the p-values of differences in means calculated by employing *t*-tests for differences in mean.

	PE backed GP	Basecase	Merger Sample	Non PE backed GP	Test of Means, p-values		
Provision	I	II	III	IV	I vs II	I vs III	I vs IV
BCI	0.07143	0.04668	0.06862	0.00483	0.4303	0.9361	0.6716
Takeover Restrictions	0.01437	0.00059	0.01012	0.04348	0.6099	0.8855	0.4640
State Provisions	-0.00287	-0.01221	-0.00578	0.0791	0.0782	0.6704	0.1571
Voting Restrictions	0.00575	0.00895	-0.00651	0.03955	0.8801	0.5911	0.5465
BCF	0.00287	-0.02336	-0.03109	0.00483	0.4140	0.3408	0.9671
GIM	0.07143	0.04908	0.07594	0.13559	0.6618	0.9371	0.4224

Table X. Distribution of the Sample Across Owner/Manager Classifications

This table presents the distribution of the sample based upon six different ownership structures. Owner managed firms are those where all directors are shareholders. Panel B presents industry patterns of various sub-samples. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. We use current year's financial data and lagged ownership and management data. Refer to Appendix A for details about the classification of firms.

	2006		**2007**		**2008**		**2009**		**Row Total**
	OM	**NOM**	**OM**	**NOM**	**OM**	**NOM**	**OM**	**NOM**	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
One Owner	33,542	12,416	33,519	12,534	32,444	12,235	29,440	10,353	**176,483**
One Family	34,942	4,140	33,947	4,012	31,381	3,735	26,483	2,974	**141,614**
Multiple Families	24,728	7,494	24,894	7,918	22,900	7,544	18,513	5,814	**119,805**
Families & Holding Cos	1,226	3,103	1,391	3,701	1,293	3,612	884	2,519	**17,729**
Holding Cos		35,609		35,938		36,095		34,747	**142,389**
Public, Not Quoted		2,788		2,532		2,361		2,164	**9,845**
Public, Quoted		1,189		1,185		1,139		1,071	**4,584**
Year-wise Total	**161,177**		**161,571**		**154,739**		**134,962**		**612,449**

Table XI. Industry Classification and Ownership Classification (Fractions of Sample)
This table presents industry patterns of various sub-samples. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009.

	One Owner	One Family	Multiple Families	Families & Holding Cos	Holding Cos	Public, Not Quoted	Public, Quoted
Agriculture, Hunting and Forestry	1.10%	1.71%	0.98%	1.77%	1.08%	1.09%	1.07%
Fishing	0.05%	0.07%	0.12%	0.11%	0.14%	0.05%	0.04%
Manufacture of Food Products, Beverages and Tobacco	0.29%	0.48%	0.52%	1.33%	1.68%	1.14%	3.18%
Manufacture of Textiles and Textile Products	0.38%	0.39%	0.48%	0.55%	0.78%	1.03%	1.61%
Manufacture of Leather and Leather Products	0.03%	0.06%	0.05%	0.08%	0.08%	0.06%	0.24%
Manufacture of Wood and Wood Products	0.27%	0.40%	0.45%	0.34%	0.41%	0.18%	0.11%
Manufacture of Pulp, Paper and Paper Products Publishing	1.46%	1.53%	2.54%	2.61%	3.29%	2.94%	3.47%
Manufacture of Chemicals, Rubber and Plastic products	0.28%	0.40%	0.61%	1.13%	3.11%	2.09%	5.63%
Manufacture of Metallic and Non-metallic Mineral Products	1.59%	2.41%	2.67%	2.79%	5.75%	3.92%	5.91%
Manufacture of Electrical and Optical Equipment	0.56%	0.77%	1.17%	1.30%	3.37%	3.63%	9.01%
Manufacture of Transport Equipment	0.27%	0.30%	0.29%	0.49%	1.01%	0.75%	0.89%
Manufacturing Not Elsewhere Classified	0.87%	1.13%	1.40%	1.25%	2.08%	2.20%	1.94%
Total Manufacturing	*6.00%*	*7.87%*	*10.17%*	*11.86%*	*21.56%*	*17.94%*	*32.00%*
Construction	15.05%	17.37%	14.25%	8.31%	7.09%	8.54%	3.88%
Wholesale Trade	4.72%	5.87%	6.58%	9.52%	11.21%	13.77%	5.50%
Retail Trade	7.65%	8.91%	7.99%	5.65%	3.89%	3.53%	5.17%
Hotels and Restaurants	4.64%	4.37%	6.00%	4.17%	3.68%	2.34%	2.68%
Transport, Storage and Communication	4.88%	4.46%	4.67%	5.31%	7.16%	7.67%	6.68%
Real Estate, Renting and Business Activities	45.13%	40.98%	38.04%	41.86%	34.28%	36.67%	35.49%
Other Services	10.79%	8.38%	11.19%	11.44%	9.91%	8.40%	7.48%
Total	**176,483**	**141,614**	**119,805**	**17,729**	**142,389**	**9,845**	**4,584**

Table XII. Summary Statistics

The table show basic statistics about the firms in the sample. The number of observations in the sample, N, corresponds to observations with non-missing values of total assets. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. Please refer to Appendix B for a description of the variables reported in the table.

	One Owner		One Family		Multiple Families		Families & Holding Cos		Holding Cos		Public, Not Quoted		Public, Quoted	
Variable	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
ASSETS (M £)	288	35	444	60	848	95	5,670	329	23,762	3,474	65,642	4,597	563,216	39,394
AT	2.98	2.25	2.74	2.11	2.80	2.13	2.08	1.41	1.94	1.36	1.70	1.35	1.10	0.91
OPEXP	0.52	0.40	0.50	0.38	0.53	0.39	0.67	0.38	0.57	0.30	0.73	0.33	2.18	0.44
EBITD	0.66	0.34	0.56	0.27	0.32	0.16	0.13	0.08	0.09	0.08	0.05	0.08	0.00	0.09
T. LIABILITIES	0.81	0.71	0.77	0.69	0.88	0.75	1.00	0.75	1.00	0.73	0.75	0.65	0.56	0.52
BANKLOAN	0.08	0.00	0.08	0.00	0.09	0.00	0.08	0.00	0.06	0.00	0.08	0.01	0.07	0.03
AGE (Years)	7.05	4.09	10.69	6.48	10.54	6.04	13.34	7.98	20.4	14.28	21.41	15.92	25.97	11.97
QUISCORE	47	45	52	48	51	49	58	58	71	77	75	85	77	85
ACI	-0.12	0.00	-0.08	0.03	0.00	0.07	0.17	0.19	0.16	0.19	0.24	0.19	0.56	0.25
Concentration	0.81	1.00	0.94	1.00	0.86	1.00	0.46	0.50	.	.	.	.	.	.
N	*176,483*		*141,614*		*119,805*		*17,729*		*142,389*		*9,845*		*4,584*	

Table XIII. Relationship Between ACI and Governance Indices

This table presents results of a regression analysis relating the agency cost index ACI to corporate governance index proposed by Gompers et al. (2003), labeled here the GIM-Index, and the Entrenchment index proposed by Bebchuk et al. (2009), labeled here the E-Index. Governance data used in the construction of the indices are from the Riskmetrics Group. 'Company Specific Controls' include: company size (log of annual sales and its square), company age, bank debt scaled by total assets, total liabilities scaled by total assets, likelihood of company failure (dummy variables for high risk, normal, stable and secure into which the Quiscore of a company falls with the 'caution' band being the excluded group), dummy variables based on the type of financial statements filed (small company statements , medium company statements, total exemption small, total exemption full, partial exemption , full accounts and group accounts with small company statements being the excluded group), the number of subsidiaries and number of holding companies. 'Industry Affiliations' are dummy variables based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry. 'Year Fixed Effects' are dummies for each year, with the first year indicator (2006) being the excluded dummy variable. Standard errors are adjusted for firm-level clustering as described by Petersen (2009). Statistical significance at 5 and 1 percent levels are respectively denoted by * and **.

	(1)	(2)	(3)	(4)
Intercept	1.9664	0.8137	0.1343	0.8505
	(0.000)***	(0.039)**	(0.004)***	(0.038)**
GIM-Index	0.0216	0.0264		
	(0.055)*	(0.063)*		
E-Index			0.0415	0.0493
			(0.059)*	(0.072)*
Company Specific Controls	No	Yes	No	Yes
Industry Affiliations	No	Yes	No	Yes
Year Fixed Effects	No	Yes	No	Yes
Firm Level Clustering	Yes	Yes	Yes	Yes
Number of Clusters	424	386	424	386
Adjusted R-squared	0.171	0.321	0.004	0.317
N	1,261	1,078	1,261	1,059

Table XIV. Agency Costs in Owner-Managed and Non Owner-Managed Firms: Multivariate Analysis

The dependent variable proxying for agency costs in Panels A and B is the agency cost index ACI. Panel A presents results using the full sample. Panel B presents results using two sub-samples. Model specification 1 presents results using a sample of firms that are not exempt from auditing requirements or accountants' certification while filing their financials with the Companies House. Model specification 2 presents results using a sample of firms with a high probability of default as indicated by the QuiScore (i.e., QuiScore less than 20). Panel C presents results using alternate proxies for agency costs. The dependent variables proxying for agency costs in Model specification 1 and 2 of Panel C are the operating expenses to sales ratio and ACI-2 respectively. NOM is a dummy variable that equals 1 if the firm is not managed by the owners and 0 otherwise. Governance data used in the construction of the indices are from the Riskmetrics Group. 'Company Specific Controls' include: company size (log of annual sales and its square), company age, bank debt scaled by total assets, total liabilities scaled by total assets, likelihood of company failure (dummy variables for high risk, normal, stable and secure into which the Quiscore of a company falls with the 'caution' band being the excluded group), dummy variables based on the type of financial statements filed (small company statements , medium company statements, total exemption small, total exemption full, partial exemption , full accounts and group accounts with small company statements being the excluded group), the number of subsidiaries and number of holding companies. 'Industry Affiliations' are dummy variables based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry. 'Year Fixed Effects' are dummies for each year, with the first year indicator (2006) being the excluded dummy variable. Please refer to Appendix B for a description of all variables. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. We use current year's financial data and lagged ownership and management data. Standard errors in model specifications 1 and 2 of Panel are adjusted for heteroskedasticity using White's (1980) methods. Standard errors in all remaining models are adjusted for firm-level clustering as described by Petersen (2009). Statistical significance at 5 and 1 percent levels are respectively denoted by * and **.

	Panel A			**Panel B**		**Panel C**	
	(1)	(2)	(3)	(1)	(2)	(1)	(2)
Intercept	0.7081	0.7149	0.692	0.5128	1.3573	1.3735	0.4884
	(0.006)**	(0.009)**	(0.015)**	(0.023)**	(0.149)**	(0.020)**	(0.015)**
NOM	0.1154	0.1169	0.1159	0.0906	0.1167	0.0713	0.1187
	(0.002)**	(0.002)**	(0.003)**	(0.006)**	(0.021)**	(0.003)**	(0.003)**
Company Specific Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Affiliations	No	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm Level Clustering	No	No	Yes	Yes	Yes	Yes	Yes
Number of Clusters	-	-	112,061	35,762	5,133	112,061	112,061
Adjusted R-squared	0.182	0.184	0.178	0.196	0.295	0.213	0.17
N	403,425	403,425	334,088	113,061	11,332	334,088	334,088

Table XV. Agency Costs Across Firms with Different Ownership Structures

The dependent variable proxying for agency costs in Panels A and B is the agency cost index ACI. Panel A presents results using the full sample. Panel B presents results using two sub-samples. Model specification 1 presents results using a sample of firms that are not exempt from auditing requirements or accountants' certification while filing their financials with the Companies House. Model specification 2 presents results using a sample of firms with a high probability of default as indicated by the QuiScore (i.e., QuiScore less than 20). Panel C presents results using alternate proxies for agency costs. The dependent variables proxying for agency costs in Model specification 1 and 2 of Panel C are the operating expenses to sales ratio and ACI-2 respectively. Firms with different ownership structures are indicated by dummy variables ONE FAM, MUL FAM, INDI_FAM, WO, PUBLICNQ and PUBLICQ. 'Company Specific Controls' include: company size (log of annual sales and its square), company age, bank debt scaled by total assets, total liabilities scaled by total assets, likelihood of company failure (dummy variables for high risk, normal, stable and secure into which the Quiscore of a company falls with the 'caution' band being the excluded group), dummy variables based on the type of financial statements filed (small company statements , medium company statements, total exemption small, total exemption full, partial exemption , full accounts and group accounts with small company statements being the excluded group), the number of subsidiaries and number of holding companies. 'Industry Affiliations' are dummy variables based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry. 'Year Fixed Effects' are dummies for each year, with the first year indicator (2006) being the excluded dummy variable. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. We use current year's financial data and lagged ownership and management data. Standard errors in model specifications 1 and 2 of Panel are adjusted for heteroskedasticity using White's (1980) methods. Standard errors in all remaining models are adjusted for firm-level clustering as described by Petersen (2009). Statistical significance at 5 and 1 percent levels are respectively denoted by * and **.

	Panel A			**Panel B**		**Panel C**	
	(1)	(2)	(3)	(1)	(2)	(1)	(2)
Intercept	0.679	0.688	0.670	0.532	1.308	1.353	0.470
	(0.006)**	(0.009)**	(0.015)**	(0.024)**	(0.148)**	(0.020)**	(0.015)**
ONE FAM	0.030	0.029	0.024	0.010	0.017	0.015	0.026
	(0.002)**	(0.002)**	(0.004)**	-0.012	-0.023	(0.003)**	(0.0041)**
MUL FAM	0.102	0.102	0.094	0.010	0.104	0.058	0.108
	(0.002)**	(0.002)**	(0.0041)**	-0.012	(0.0225)**	(0.0041)**	(0.0042)**
INDI_FAM	0.194	0.196	0.178	0.062	0.274	0.095	0.181
	(0.005)**	(0.005)**	(0.0076)**	(0.0154)**	(0.0538)**	(0.0102)**	(0.0077)**
WO	0.177	0.178	0.170	0.071	0.294	0.115	0.165
	(0.003)**	(0.003)**	(0.0055)**	(0.0104)**	(0.0808)**	(0.0071)**	(0.0054)**
Public NQ	0.206	0.209	0.196	0.118	0.469	0.173	0.203
	(0.005)**	(0.0055)**	(0.0084)**	(0.0140)**	(0.1750)**	(0.0124)**	(0.0079)**
Public Q	0.359	0.365	0.348	0.348	0.418	0.394	0.309
	(0.009)**	(0.0096)**	(0.0155)**	(0.0715)**	(0.1082)**	(0.0267)**	(0.0159)**
Company Specific Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Affiliations	No	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm Level Clustering	No	No	Yes	Yes	Yes	Yes	Yes
Number of Clusters	-	-	112,061	35,762	5,133	112,061	112,061
Adj R^2	0.185	0.187	0.18	0.196	0.298	0.215	0.172
N	403,425	403,425	334,088	113,061	11,332	334,088	334,088

Table XVI. Magnitude of Agency Costs in Private Firms: Full Sample Multivariate Analysis

The dependent variable proxying for agency costs in Panels A and B is the agency cost index ACI. Panel A presents results using the full sample. Panel B presents results using two sub-samples. Model specification 1 presents results using a sample of firms that are not exempt from auditing requirements or accountants' certification while filing their financials with the Companies House. Model specification 2 presents results using a sample of firms with a high probability of default as indicated by the QuiScore (i.e., QuiScore less than 20). Panel C presents results using alternate proxies for agency costs. The dependent variables proxying for agency costs in Model specification 1 and 2 of Panel C are the operating expenses to sales ratio and ACI-2 respectively. Firms with different ownership structures are indicated by dummy variables ONE FAM, MUL FAM, INDI_FAM, WO, NS, PUBLICNQ and PUBLICQ. Owner managed firms are those that are completely managed by shareholders. They are indicated by OM next to each ownership structure. Non owner managed firms are indicated by NOM. 'Company Specific Controls' include: company size (log of annual sales and its square), company age, bank debt scaled by total assets, total liabilities scaled by total assets, likelihood of company failure (dummy variables for high risk, normal, stable and secure into which the Quiscore of a company falls with the 'caution' band being the excluded group), dummy variables based on the type of financial statements filed (small company statements , medium company statements, total exemption small, total exemption full, partial exemption , full accounts and group accounts with small company statements being the excluded group), the number of subsidiaries and number of holding companies. 'Industry Affiliations' are dummy variables based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry. 'Year Fixed Effects' are dummies for each year, with the first year indicator (2006) being the excluded dummy variable. Please refer to Appendix B for a description of all variables. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. We use current year's financial data and lagged ownership and management data. Standard errors in model specifications 1 and 2 of Panel are adjusted for heteroskedasticity using White's (1980) methods. Standard errors in all remaining models are adjusted for firm-level clustering as described by Petersen (2009). Statistical significance at 5 and 1 percent levels are respectively denoted by * and **.

(Table continued on following page)

Table XVI - *Continued*

	Panel A				Panel B		Panel C	
	(1)	(2)	(3)	(4)	(1)	(2)	(1)	(2)
Intercept	0.6368	0.6434	0.6252	0.8058	0.4654	1.2848	1.3311	0.4207
	(0.0061)**	(0.0095)**	(0.0152)**	(0.0155)**	(0.0284)**	(0.1480)**	(0.0207)**	(0.0154)**
Concentration				-0.1253				
				(0.0042)**				
One Owner NOM	0.1229	0.1235	0.1219		0.1103	0.1219	0.057	0.1354
	(0.0038)**	(0.0038)**	(0.0059)**		(0.0202)**	(0.0305)**	(0.0059)**	(0.0061)**
ONEFAM	0.053	0.0518	0.0459		0.0563	0.0415	0.0252	0.0505
	(0.0027)**	(0.0027)**	(0.0044)**		(0.0202)**	(0.0249)	(0.0038)**	(0.0046)**
ONEFAM NOM	0.1174	0.1182	0.1174		0.0627	0.0653	0.0614	0.1297
	(0.0053)**	(0.0053)**	(0.0080)**		(0.0144)**	(0.0597)	(0.0089)**	(0.0082)**
MULFAM	0.1253	0.125	0.1168		0.0567	0.1236	0.0649	0.1348
	(0.0030)**	(0.0030)**	(0.0048)**		(0.0192)**	(0.0252)**	(0.0045)**	(0.0049)**
MULFAM NOM	0.0553	0.0572	0.0576		0.0493	0.0518	0.0424	0.0558
	(0.0042)**	(0.0042)**	(0.0062)**		(0.0112)**	(0.0403)	(0.0069)**	(0.0062)**
INDI_FAM	0.2366	0.2393	0.2209		0.1318	0.3056	0.1154	0.229
	(0.0055)**	(0.0055)**	(0.0079)**		(0.0210)**	(0.0547)**	(0.0104)**	(0.0080)**
WO	0.2272	0.2298	0.2212		0.1405	0.3276	0.1402	0.2214
	(0.0038)**	(0.0038)**	(0.0059)**		(0.0176)**	(0.0812)**	(0.0074)**	(0.0059)**
Public NQ	0.2591	0.2633	0.2499		0.1876	0.5058	0.1996	0.2622
	(0.0057)**	(0.0057)**	(0.0087)**		(0.0199)**	(0.1749)**	(0.0126)**	(0.0083)**
Public Q	0.4145	0.4219	0.4046		0.4183	0.4558	0.4223	0.3712
	(0.0097)**	(0.0097)**	(0.0157)**		(0.0728)**	(0.1081)**	(0.0268)**	(0.0161)**
Company Specific Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Affiliations	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Level Clustering	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Number of Clusters	-	-	112,061	109,073	35,762	5,133	112,061	112,061
Adjusted R-squared	0.189	0.191	0.184	0.174	0.197	0.3	0.216	0.176
N	403,425	403,425	334,088	323,352	113,061	11,332	334,088	334,088

Table XVII. Minority Expropriation and Shared Control: Multivariate Analysis

The dependent variable proxying for agency costs in Panels A and B is the agency cost index ACI. Panel A presents results of three model specifications using the full sample. Panel B presents results using two sub-samples. Model specification 1 presents results using a sample of firms that are not exempt from auditing requirements or accountants' certification while filing their financials with the Companies House. Model specification 2 presents results using a sample of firms with a high probability of default as indicated by the QuiScore (i.e., QuiScore less than 20). Panel C presents results using alternate proxies for agency costs. The dependent variables proxying for agency costs in Model specification 1 and 2 of Panel C are the operating expenses to sales ratio and ACI-2 respectively. The variables LOW CONC and HIGH CONC are dummy variables that are set to 1 if the largest shareholder owns less than 50% or above 75% of the firm respectively and zero otherwise. Governance data used in the construction of the indices are from the Riskmetrics Group. 'Company Specific Controls' include: company size (log of annual sales and its square), company age, bank debt scaled by total assets, total liabilities scaled by total assets, likelihood of company failure (dummy variables for high risk, normal, stable and secure into which the Quiscore of a company falls with the 'caution' band being the excluded group), dummy variables based on the type of financial statements filed (small company statements , medium company statements, total exemption small, total exemption full, partial exemption , full accounts and group accounts with small company statements being the excluded group), the number of subsidiaries and number of holding companies. 'Industry Affiliations' are dummy variables based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry. 'Year Fixed Effects' are dummies for each year, with the first year indicator (2006) being the excluded dummy variable. Please refer to Appendix B for a description of all variables. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. We use current year's financial data and lagged ownership and management data. Standard errors in model specifications 1 and 2 of Panel are adjusted for heteroskedasticity using White's (1980) methods. Standard errors in all remaining models are adjusted for firm-level clustering as described by Petersen (2009). Statistical significance at 5 and 1 percent levels are respectively denoted by * and **.

	Panel A			**Panel B**		**Panel C**	
	(1)	(2)	(3)	(1)	(2)	(1)	(2)
Intercept	0.9455	0.9422	0.9328	0.9146	1.6071	1.5975	0.6888
	(0.020)**	(0.0207)**	(0.0330)**	(0.0686)**	(0.2189)**	(0.0516)**	(0.0335)**
LOW CONC	-0.0292	-0.0297	-0.0271	-0.0311	-0.0842	-0.0367	-0.0256
	(0.004)**	(0.0047)**	(0.0076)**	(0.0138)*	(0.0470)	(0.0079)**	(0.0077)**
HIGH CONC	0.0219	0.0784	0.0586	0.0406	0.1657	0.0443	0.0554
	(0.006)**	(0.0098)**	(0.0142)**	(0.0224)	(0.0984)	(0.0178)*	(0.0142)**
HIGH CONC * OM		-0.0934	-0.0774	-0.0668	-0.1996	-0.0635	-0.071
		(0.0112)**	(0.0162)**	(0.0262)*	(0.1111)	(0.0203)**	(0.0163)**
Company Specific Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Affiliations	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Level Clustering	No	No	Yes	Yes	Yes	Yes	Yes
Number of Clusters	-	-	23,348	3,233	1,325	23,348	23,348
Adjusted R-squared	0.212	0.213	0.205	0.305	0.312	0.245	0.169
N	85,730	85,730	64,640	8,848	2,937	64,640	64,640

Table XVIII. Minority Expropriation and Contestability: Multivariate Analyses Using Ownership Stake of the Second Largest Shareholder

The dependent variable proxying for agency costs in Panels A and B is the agency cost index ACI. Panel A presents results using the full sample. Panel B presents results using two sub-samples. Model specification 1 presents results using a sample of firms that are not exempt from auditing requirements or accountants' certification while filing their financials with the Companies House. Model specification 2 presents results using a sample of firms with a high probability of default as indicated by the QuiScore (i.e., QuiScore less than 20). Panel C presents results using alternate proxies for agency costs. The dependent variables proxying for agency costs in Model specification 1 and 2 of Panel C are the operating expenses to sales ratio and ACI-2 respectively. SECOND refers to the ownership stake of second largest shareholder. Please refer to Appendix B for a description of all variables. Governance data used in the construction of the indices are from the Riskmetrics Group. 'Company Specific Controls' include: company size (log of annual sales and its square), company age, bank debt scaled by total assets, total liabilities scaled by total assets, likelihood of company failure (dummy variables for high risk, normal, stable and secure into which the Quiscore of a company falls with the 'caution' band being the excluded group), dummy variables based on the type of financial statements filed (small company statements , medium company statements, total exemption small, total exemption full, partial exemption , full accounts and group accounts with small company statements being the excluded group), the number of subsidiaries and number of holding companies. 'Industry Affiliations' are dummy variables based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry. 'Year Fixed Effects' are dummies for each year, with the first year indicator (2006) being the excluded dummy variable. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. We use current year's financial data and lagged ownership and management data. Standard errors in model specifications 1 and 2 of Panel are adjusted for heteroskedasticity using White's (1980) methods. Standard errors in all remaining models are adjusted for firm-level clustering as described by Petersen (2009). Statistical significance at 5 and 1 percent levels are respectively denoted by * and **.

	Panel A			**Panel B**		**Panel C**	
	(1)	(2)	(3)	(1)	(2)	(1)	(2)
Intercept	1.049	1.0735	1.0582	1.0039	1.8191	1.6489	0.807
	(0.021)**	(0.0213)**	(0.0337)**	(0.0704)**	(0.2259)**	(0.0527)**	(0.0237)**
SECOND	-0.0035						
	(0.000)**						
LOW CONC * SECOND		-0.0039	-0.0038	-0.0028	-0.0071	-0.0023	-0.0036
		(0.0001)**	(0.0002)**	(0.0005)**	(0.0014)**	(0.0003)**	(0.0002)**
MED CONC * SECOND		-0.0042	-0.0041	-0.0027	-0.0066	-0.0019	-0.0039
		(0.0002)**	(0.0003)**	(0.0008)**	(0.0020)**	(0.0004)**	(0.0002)**
HIGH CONC * SECOND		-0.0039	-0.0046	-0.0016	-0.0104	-0.0024	-0.0045
		(0.0005)**	(0.0008)**	(0.0013)	(0.0054)	(0.0009)**	(0.0006)**
Company Specific Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Affiliations	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Level Clustering	Yes	No	Yes	Yes	Yes	Yes	Yes
Number of Clusters			23,315	3,217	1,324	23,315	23,315
Adjusted R-squared	0.218	0.219	0.211	0.309	0.32	0.246	0.174
Observations	85,570	85,570	64,547	8,803	2,934	64,547	64,547

Table XIX. Minority Expropriation and Contestability: Multivariate Analyses Using the Difference in Ownership Stakes of the Two Largest Shareholders

The dependent variable proxying for agency costs in Panels A and B is the agency cost index ACI. Panel A presents results using the full sample. Panel B presents results using two sub-samples. Model specification 1 presents results using a sample of firms that are not exempt from auditing requirements or accountants' certification while filing their financials with the Companies House. Model specification 2 presents results using a sample of firms with a high probability of default as indicated by the QuiScore (i.e., QuiScore less than 20). Panel C presents results using alternate proxies for agency costs. The dependent variables proxying for agency costs in Model specification 1 and 2 of Panel C are the operating expenses to sales ratio and ACI-2 respectively. DIFF refers to the difference between the ownership stakes of the two largest shareholders. Please refer to Appendix B for a description of all variables. Governance data used in the construction of the indices are from the Riskmetrics Group. 'Company Specific Controls' include: company size (log of annual sales and its square), company age, bank debt scaled by total assets, total liabilities scaled by total assets, likelihood of company failure (dummy variables for high risk, normal, stable and secure into which the Quiscore of a company falls with the 'caution' band being the excluded group), dummy variables based on the type of financial statements filed (small company statements , medium company statements, total exemption small, total exemption full, partial exemption , full accounts and group accounts with small company statements being the excluded group), the number of subsidiaries and number of holding companies. 'Industry Affiliations' are dummy variables based upon the industry sectors presented in Table II with the Agriculture, Hunting and Forestry industry being the excluded industry. 'Year Fixed Effects' are dummies for each year, with the first year indicator (2006) being the excluded dummy variable. Please refer to Appendix B for a description of all variables. Data are obtained from updates of the FAME data base produced by *Bureau Van Dijk* dated October 2005, October 2006, November 2007, October 2008 and October 2009. We use current year's financial data and lagged ownership and management data. Standard errors in model specifications 1 and 2 of Panel are adjusted for heteroskedasticity using White's (1980) methods. Standard errors in all remaining models are adjusted for firm-level clustering as described by Petersen (2009). Statistical significance at 5 and 1 percent levels are respectively denoted by * and **.

	Panel A			**Panel B**		**Panel C**	
	(1)	(2)	(3)	(1)	(2)	(1)	(2)
Intercept	0.9054	0.9014	0.8942	0.8839	1.5299	1.5485	0.6511
	(0.020)**	(0.0202)**	(0.0320)**	(0.0675)**	(0.2152)**	(0.0503)**	(0.0323)**
DIFF	0.001						
	(0.000)**						
LOW CONC * DIFF		0.0043	0.004	0.0017	0.0071	0.0021	0.0039
		(0.0003)**	(0.0004)**	(0.0008)*	(0.0031)*	(0.0005)**	(0.0004)**
MED CONC * DIFF		0.0016	0.0015	0.0012	0.0029	0.0013	0.0015
		(0.0001)**	(0.0002)**	(0.0004)**	(0.0014)*	(0.0002)**	(0.0002)**
HIGHT CONC * DIFF		-0.0008	-0.0009	-0.0005	-0.0014	-0.0007	-0.0008
		(0.0001)**	(0.0002)**	(0.0004)	(0.0014)	(0.0002)**	(0.0002)**
Company Specific Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Affiliations	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Level Clustering	Yes	No	Yes	Yes	Yes	Yes	Yes
Number of Clusters	-	-	23,315	3,217	1,324	23,315	23,315
Adjusted R-squared	0.213	0.214	0.206	0.304	0.313	0.245	0.17
N	85,570	85,570	64,547	8,803	2,934	64,547	64,547

Table XX. Description of Variables for the 2000-2009 U.K sample

This table presents the descriptive statistics on key variables for our sample of firm years from the 2000-2009 sample of U.K. based firms. Data are obtained from update 260 (February 2011) of the FAME data base produced by *Bureau Van Dijk.* Cash is defined as cash plus bank deposits scaled by total assets. Size is defined as the natural logarithm of total assets deflated using the CPI into 2005 pound sterling. Cash flow (CF) is defined as profit after tax plus depreciation and amortization less common dividends scaled by total assets. Net working capital (NWC) is calculated without cash. Cash flow volatility (CF Volatility) is defined as the standard deviation of cash flows for the prior three years. Total debt is defined as the sum of short term and long term debt scaled by total assets. Tax rate is defined as tax expense scaled by earnings before tax. Industry sigma is a measure of the volatility of an industry's cash flow for a 3 year period. Capital expenditures (Capex) are calculated as the change in total assets plus depreciation scaled by total assets. Cash conversion cycle (CCC) is given by the inventory conversion period plus the receivable's collection period minus the payment period for the accounts payable. Div dummy is an indicator variable that equals 1 if a firm pays dividend in a given year or 0 otherwise. Company count is the number of years a firm with non missing cash data is included in the sample. Quiscore, produced by CRIF Decision Solutions Ltd, is a measure of the likelihood of company failure in the year following the date of calculation. A higher score indicates lower probability of default. N is the number of non-missing observations in the sample for each variable.

	Private Firms					**Public Firms**		
Variable	Mean	25th Percentile	Median	75th Percentile	*N*	Mean	Median	*N*
Cash	0.235	0.024	0.122	0.363	*284,082*	0.139	0.08	*3,817*
Size	6.902	4.689	7.01	8.941	*284,082*	10.99	11.116	*3,817*
Firm Age	20.8	7.4	14.2	26.6	*284,082*	33.4	18.8	*3,817*
CF	0.036	-0.002	0.043	0.111	*281,584*	-0.01	0.041	*3,817*
NWC	-0.09	-0.25	-0.029	0.163	*283,269*	0.007	0.002	*3,817*
CF Volatility	0.434	0.022	0.057	0.144	*210,793*	0.099	0.035	*2,930*
Total debt	0.408	0.079	0.259	0.548	*221,631*	0.23	0.191	*3,277*
Tax rate	0.166	0	0.19	0.278	*275,915*	0.184	0.229	*3,815*
Industry Sigma	0.013	0.006	0.009	0.018	*235,882*	0.014	0.012	*3,074*
Capex	0.015	-0.06	0.043	0.152	*280,962*	0.023	0.053	*3,783*
Div Dummy	0.389	0	0	1	*284,082*	0.639	1	*3,817*
CCC	85.7	10.5	47.7	97.9	*120,218*	104.1	54.7	*2,613*
Quiscore	69	52	73	90	*280,418*	79	89	*3,766*
Count	7.5	6	8	9	*284,082*	7.8	8	*3,817*

Table XXI. Cash Holdings by Industry

This table presents the median cash holdings by industry for the full sample period and for the years 2001 and 2009. Cash is defined as cash plus bank deposits scaled by total assets. Proportion is the percentage of observations in each industry.

	Full Sample		2001		2009	
Industry Name	Median	Proportion	Median	Proportion	Median	Proportion
Agriculture, Hunting and Forestry	0.072	1.50%	0.046	1.71%	0.098	1.40%
Fishing	0.140	0.13%	0.097	0.13%	0.246	0.13%
Manufacture of Food Products, Beverages and Tobacco	0.040	1.23%	0.033	1.40%	0.049	1.15%
Manufacture of Textiles and Textile Products	0.071	0.77%	0.048	0.86%	0.075	0.71%
Manufacture of Leather and Leather Products	0.154	0.15%	0.103	0.18%	0.221	0.13%
Manufacture of Wood and Wood Products	0.066	0.36%	0.054	0.40%	0.062	0.35%
Manufacture of Pulp, Paper and Paper Products Publishing	0.094	2.84%	0.074	3.24%	0.105	2.68%
Manufacture of Chemicals, Man-made Fibers, Rubber and Plastic products	0.051	2.19%	0.042	2.51%	0.066	1.99%
Manufacture of Metallic and Non-metallic Mineral Products	0.075	4.79%	0.053	5.56%	0.099	4.48%
Manufacture of Electrical and Optical Equipment	0.096	2.62%	0.074	3.20%	0.124	2.39%
Manufacture of Transport Equipment	0.069	0.80%	0.059	0.95%	0.074	0.73%
Manufacturing Not Elsewhere Classified	0.074	1.85%	0.056	2.03%	0.092	1.75%
Construction	0.187	9.56%	0.161	8.50%	0.209	10.03%
Wholesale Trade	0.094	10.48%	0.080	11.97%	0.102	9.77%
Retail Trade	0.117	6.23%	0.103	5.99%	0.129	6.28%
Hotels and Restaurants	0.056	4.13%	0.039	3.79%	0.054	4.27%
Transport, Storage and Communication	0.133	6.27%	0.108	6.50%	0.141	6.20%
Real Estate, Renting and Business Activities	0.163	33.56%	0.131	30.88%	0.170	34.89%
Other Services	0.174	10.56%	0.145	10.21%	0.190	10.68%
		100 %		100%		100%

Table XXII. Time Series Analysis of Cash Holdings

This table presents results of regressions examining whether firms have target cash levels. The sample includes data on U.K. based private firms the 2000-2009 period. Data are obtained from update 260 (February 2011) of the FAME data base produced by *Bureau Van Dijk.* The dependent variable is the change in cash where cash is calculated as cash plus bank deposits scaled by total assets. Target cash level is estimated as the average of the prior three years of cash. FFD is the flow of funds deficit defined as cash dividends plus capital expenditures, change in net working capital (less cash) less operating cash flow, where all variables are scaled by total assets. Columns 3, 5 and 7 present regression results using a sub-sample of firms for which data are available for at least 8 years during 2000-2009. Standard errors, show in parenthesis, are corrected for heteroskedascitiy using the White's (1980) test. Significance levels at the 5% and 1% level are indicated by * and ** respectively.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	0.0168	0.0147	0.0175	0.017	0.025	0.0226
	(0.0003)**	(0.0005)**	(0.0004)**	(0.0009)**	(0.0005)**	(0.0011)**
Target Cash	-0.0649	-0.0594			-0.0339	-0.028
	(0.0012)**	(0.0025)**			(0.0017)**	(0.0036)**
FFD			-0.0459	-0.0532	-0.0409	-0.0479
			(0.0010)**	(0.0027)**	(0.0012)**	(0.0031)**
Observations	215,141	44,539	108,796	20,777	84,238	16,141
Adjusted R-squared	0.017	0.015	0.04	0.045	0.044	0.049

Table XXIII. Firm characteristics by cash quartiles

This table presents the descriptive statistics on key variables for our sample of firm years from the 2000-2009 sample of U.K. based firms divided into cash quartiles. Data are obtained from update 260 (February 2011) of the FAME data base produced by *Bureau Van Dijk*. Quartiles for cash are determined each year. Cash is defined as cash plus bank deposits scaled by total assets. Size is defined as the natural logarithm of total assets deflated using the CPI into 2005 pound sterling. Cash flow (CF) is defined as profit after tax plus depreciation and amortization less common dividends scaled by total assets. Net working capital (NWC) is calculated without cash. Cash flow volatility (CF Volatility) is defined as the standard deviation of cash flows for the prior three years. Total debt is defined as the sum of short term and long term debt scaled by total assets. Tax rate is defined as tax expense scaled by earnings before tax. Industry sigma is a measure of the volatility of an industry's cash flow for a 3 year period. Capital expenditures (Capex) are calculated as the change in total assets plus depreciation scaled by total assets. Cash conversion cycle (CCC) is given by the inventory conversion period plus the receivable's collection period minus the payment period for the accounts payable. Div dummy is an indicator variable that equals 1 if a firm pays dividend in a given year or 0 otherwise. Company count is the number of years a firm with non missing cash data is included in the sample. Quiscore, produced by CRIF Decision Solutions Ltd, is a measure of the likelihood of company failure in the year following the date of calculation. A higher score indicates lower probability of default. N is the number of non-missing observations in the sample for each variable. Quartile 4 variables that are statistically different from quartile 1 variables at 5% level or better are indicated in bold. Significance levels are determined by employing *t*-tests for differences in mean and Wilcoxon tests for differences in medians.

	First Quartile		Second Quartile		Third Quartile		Fourth Quartile	
Quartile Range	0 to 0.0267		0.018 to 0.135		0.096 to 0.400		0.299 to 1.00	
Variable	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Cash	0.007	0.004	0.065	0.061	0.223	0.214	**0.640**	**0.612**
Size	7.89	8.12	7.67	7.96	6.80	6.96	**5.26**	**4.77**
Firm Age	23.6	16.4	22.7	15.5	20.8	14.5	**16.1**	**11.1**
CF	0.022	0.030	0.032	0.040	0.043	0.055	**0.045**	**0.057**
NWC	-0.022	0.003	0.005	0.024	-0.058	-0.008	**-0.275**	**-0.188**
CF Volatility	0.640	0.037	0.691	0.045	0.155	0.062	**0.236**	**0.105**
Total debt	0.483	0.374	0.441	0.303	0.363	0.179	**0.305**	**0.119**
Taxrate	0.154	0.167	0.169	0.190	0.177	0.198	**0.164**	**0.191**
Industry Sigma	0.013	0.008	0.013	0.009	0.013	0.010	**0.014**	**0.010**
Capex	0.021	0.030	0.019	0.037	0.017	0.054	**0.003**	**0.056**
Div Dummy	0.289	0	0.326	0	0.418	0	**0.52**	**1**
CCC	109	52	91	56	72	45	**50**	**27**
Quiscore	70	77	72	78	70	74	**64**	**63**
Count	8	8	8	8	8	8	7	7

Table XXIV. Regressions Predicting Private Firm Liquidity Levels, 2000-2009

The sample includes data on U.K. based private firms the 2000-2009 period. Data are obtained from update 260 (February 2011) of the FAME data base produced by *Bureau Van Dijk.* The dependent variable in all regressions is cash defined as cash plus bank deposits scaled by total assets. Cash is defined as cash plus bank deposits scaled by total assets. Size is defined as the natural logarithm of total assets deflated using the CPI into 2005 pound sterling. Net working capital (NWC) is calculated without cash. Total debt is defined as the sum of short term and long term debt scaled by total assets. Tax rate is defined as tax expense scaled by earnings before tax. Industry sigma is a measure of the volatility of an industry's cash flow for a 3 year period. Capital expenditures (Capex) are calculated as the change in total assets plus depreciation scaled by total assets. Div dummy is an indicator variable that equals 1 if a firm pays dividend in a given year or 0 otherwise. Column 2 presents Fama-MacBeth regression. The Fama-MacBeth model gives the average of the time series of coefficients from annual cross-sectional regressions. Columns 3 presents pooled cross-sectional time-series regression with standard errors clustered by firm and year. Column 4 presents a cross-sectional regression using the means of all variables for each firm. Only firms for which data for all years between 2001 and 2009 are available are used in the cross-sectional specification. Column 5 presents regressions using firms belonging to the first three cash quartiles. Standard errors are clustered by firm and year. Significance levels at the 5% and 1% level are indicated by * and ** respectively.

(1)	(2)	(3)	(4)	(5)
Intercept	0.3862	0.3759	0.419	0.1702
	(0.0047)**	(0.0114)**	(0.0100)**	(0.0084)**
Size	-0.0249	-0.0274	-0.0323	-0.0096
	(0.0002)**	(0.0007)**	(0.0007)**	(0.0005)**
Firm Age	-0.0003	-0.0002	-0.0003	-0.0001
	(0.0000)**	(0.0000)**	(0.0000)**	(0.0000)**
Capex	0.0114	0.0155	-0.1089	0.0074
	(0.0064)	(0.0077)*	(0.0103)**	(0.0020)**
Total debt	-0.1256	-0.1266	-0.1264	-0.0325
	(0.0029)**	(0.0042)**	(0.0036)**	(0.0016)**
Taxrate	0.0214	0.0192	0.0589	0.0102
	(0.0013)**	(0.0019)**	(0.0070)**	(0.0008)**
NWC	-0.1577	-0.1577	-0.1497	-0.0317
	(0.0045)**	(0.0058)**	(0.0038)**	(0.0019)**
Industry Sigma	0.7392	0.293	1.2121	0.1158
	(0.3606)	(0.0855)**	(0.4679)**	(0.0533)*
Div Dummy	0.0452	0.047	0.0731	0.0164
	(0.0026)**	(0.0033)**	(0.0032)**	(0.0015)**
Industry Affiliations	Yes	Yes	Yes	Yes
Accounting Quality	Yes	Yes	Yes	Yes
Observations	7	177,929	36,749	144,667
Adjusted R-squared	0.23	0.24	0.306	0.079

Table XXV. Modified Regressions Predicting Firm Liquidity Levels, 2000-2009

The dependent variable in all regressions is cash defined as cash plus bank deposits scaled by total assets. Cash is defined as cash plus bank deposits scaled by total assets. Size is defined as the natural logarithm of total assets deflated using the CPI into 2005 pound sterling. Cash flow is defined as profit after tax less interest, taxes, and common dividends scaled by total assets. Net working capital is calculated without cash. Total debt is defined as the sum of short term and long term debt scaled by total assets. Tax rate is defined as tax expense scaled by earnings before tax. Industry sigma is a measure of the volatility of an industry's cash flow for a 3 year period. Capital expenditures are calculated as the change in total assets plus depreciation scaled by total assets. Dividend dummy is an indicator variable that equals 1 if a firm pays dividend in a given year or 0 otherwise. Delta Cash is the difference in cash holdings calculated as in cash from year *t* to *t+1*. Columns 2 and 3 present Fama-MacBeth regressions. The Fama-MacBeth model gives the average of the time series of coefficients from annual cross-sectional regressions. Columns 4 and 5 present pooled cross-sectional time-series regression with standard errors clustered by firm and year. Columns 6 and 7 present cross-sectional regressions using the means of all variables for each firm. Only firms for which data for all years between 2001 and 2009 are available are used in the cross-sectional specification. Significance levels at the 5% and 1% level are indicated by * and ** respectively.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	0.4635	0.3946	0.3548	0.3796	0.38	0.4165
	(0.0082)**	(0.0058)**	(0.0107)**	(0.0102)**	(0.0102)**	(0.0101)**
Size	-0.0374	-0.026	-0.0333	-0.0281	-0.0398	-0.0321
	(0.0004)**	(0.0002)**	(0.0006)**	(0.0006)**	(0.0007)**	(0.0007)**
Firm Age	-0.0001	-0.0003	0.0001	-0.0002	0	-0.0003
	(0.0000)*	(0.0000)**	(0.0001)	(0.0000)**	(0.0001)	(0.0000)**
Taxrate	0.0673	0.0223	0.0661	0.0202	0.217	0.0604
	(0.0023)**	(0.0008)**	(0.0029)**	(0.0014)**	(0.0075)**	(0.0071)**
NWC	-0.0834	-0.1452	-0.0823	-0.1456	-0.0704	-0.1479
	(0.0049)**	(0.0028)**	(0.0057)**	(0.0044)**	(0.0030)**	(0.0038)**
Industry Sigma	0.8179	0.7334	0.2741	0.0076	1.6618	1.3138
	(0.6177)	(0.4356)	(0.0992)**	(0.1547)	(0.4551)**	(0.4931)**
Capex		0.0095		0.0145		-0.1136
		(0.0083)		(0.0088)		(0.0103)**
Total debt		-0.1207		-0.1213		-0.1261
		(0.0026)**		(0.0039)**		(0.0036)**
Div Dummy		0.0416		0.0429		0.0724
		(0.0021)**		(0.0028)**		(0.0032)**
Delta Cash		-0.4131		-0.4136		0.1964
		(0.0046)**		(0.0038)**		(0.0190)**
Industry Affiliations	Yes	Yes	Yes	Yes	Yes	Yes
Accounting Quality	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7	6	228,514	147,961	41,188	36,610
Adjusted R-squared	0.192	0.283	0.206	0.293	0.266	0.308

Table XXVI. Distribution of Sample Across Owner/Manager Classifications
Panel A presents the distribution of the sample based upon five different ownership structures. Panel B presents the descriptive statistics on key variables Owner managed firms (OM) are those where all directors are shareholders. NOM indicates firms that are not owner-managed. Data are obtained from updates 196, 208, 221, 233, and 244 of the FAME data base produced by *Bureau Van Dijk*. These updates correspond to October 2005, October 2006, November 2007, October 2008 and October 2009 respectively. We use current year's financial data and lagged ownership and management data.

Panel A

	2006		2007		2008		2009		Row Total
	OM	NOM	OM	NOM	OM	NOM	OM	NOM	
One Owner	3,296	1,577	3,605	1,709	3,706	1,764	3,822	1,702	21,181
One Family	4,734	683	5,233	764	5,364	748	5,206	676	23,408
Multiple Families	3,209	1,222	3,744	1,446	3,736	1,541	3,433	1,323	19,654
Families and Holding Companies	179	565	259	807	282	810	195	607	3,704
Holding Companies		10,583		11,248		11,909		12,306	46,046
Public, Not Quoted		1,083		1,054		1,063		1,072	4,272

Panel B

	One Owner		One Family		Multiple Families		Families & Holding Cos		Holding Cos		Public, Not Quoted	
Variable	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Cash	0.373	0.286	0.346	0.256	0.278	0.177	0.235	0.132	0.158	0.074	0.155	0.076
Size	4.495	4.1525	4.864	4.5824	5.629	5.3965	7.038	7.2675	8.674	8.7094	8.860	8.605
Firm Age	12.8	9.0	16.3	11.2	18.1	12.6	21.9	16.5	26.3	19.7	25.7	20
CF	0.020	0.033	0.021	0.032	0.027	0.036	0.028	0.035	0.026	0.041	0.025	0.034
CF Volatility	0.200	0.115	2.737	0.093	0.142	0.067	0.113	0.041	0.146	0.050	0.082	0.037
Industry Sigma	0.016	0.011	0.015	0.011	0.015	0.011	0.015	0.011	0.015	0.011	0.014	0.010
NWC	-0.194	-0.118	-0.177	-0.104	-0.128	-0.048	-0.081	-0.021	-0.004	0.057	0.037	0.026
Capex	-0.010	0.022	-0.009	0.021	-0.003	0.023	0.007	0.032	0.010	0.043	0.021	0.043
Div Dummy	0.559	1	0.601	1	0.489	0	0.332	0	0.232	0	0.379	0
CCC	103.7	40.6	88.6	37.3	70.8	35.5	101.4	43.6	85.0	54.2	119.7	49.1
Total debt	0.376	0.2222	0.34	0.2044	0.356	0.1935	0.413	0.2588	0.484	0.312	0.317	0.216
Taxrate	0.160	0.194	0.167	0.197	0.162	0.195	0.161	0.194	0.175	0.213	0.192	0.215
Quiscore	52.1	49.0	55.6	53.0	61.7	60.0	72.6	76.0	83.2	89.0	86.6	91
N	21,181		23,408		19,645		3,704		46,046		4,272	

Table XXVII. Cash Holdings and Governance Variables Relative to Firm Size

This table shows means and medians of cash holdings and governance variables sorted by size and governance characteristics. Data are obtained from updates 196, 208, 221, 233, and 244 of the FAME data base produced by *Bureau Van Dijk*. These updates correspond to October 2005, October 2006, November 2007, October 2008 and October 2009 respectively. We use current year's financial data and lagged ownership and management data. Cash is defined as cash plus bank deposits scaled by total assets. Size is defined as the natural logarithm of total assets deflated using the CPI into 2005 pound sterling. Inside ownership represents equity ownership of directors. Concentration is defined as the ratio of shareholders who are directors to total number of directors. Owner managed (OM) is a dummy variable that equals 1 if a firm is managed by owners or 0 otherwise. Standalone is a dummy variable that equals 1 if a firms is owned by a single individual, single family or multiple families. Otherwise, this variable equals 0. In Panel A, we examine the relation between cash holdings and the governance metrics based on firm size. We sort firms into size quintiles each year. We report the mean and median levels of cash holdings and the governance variables within the 1st, 3rd, and 5th size quintiles. In Panel B, we sort the data within each size quintile based on the Agency Cost Index (ACI) quartiles. We report the mean and median levels for the 1st (low agency costs) and 4th quartiles (high agency costs) of the ACI within each size quintile. In both panels, we use the *t-test* and Wilcoxon rank-sum test to examine whether the means and medians are significantly different between the 1st and 5th quintiles for Panel A, and the 1st and 4th quartiles in Panel B. Data in bold represent statistical significance at the 95% confidence level.

Panel A

Variable		Cash	Insider Ownership	Concentration	Owner Managed	Standalone
Size Quintile = 1 (Smallest)	Mean	0.42	79.54	0.87	0.81	0.96
	Median	0.38	100.00	1.00	1.00	1.00
Size Quintile = 3	Mean	0.23	48.83	0.51	0.42	0.56
	Median	0.12	50.00	0.50	0.00	1.00
Size Quintile = 5 (Largest)	Mean	**0.12**	**11.43**	**0.09**	**0.05**	**0.11**
	Median	**0.05**	**0.00**	**0.00**	**0.00**	**0.00**

Table XXVII - *(Continued)*

Panel B

		Cash	Insider Ownership	Concentration	Owner Managed	Standalone
Size Quintile 1						
Low ACI (lower agency costs)	Mean	0.43	80.36	0.90	0.86	0.97
	Median	0.40	100.00	1.00	1.00	1.00
High ACI (higher agency costs)	Mean	**0.41**	**76.52**	**0.82**	**0.75**	**0.93**
	Median	**0.33**	**100.00**	**1.00**	**1.00**	**1.00**
Size Quintile 2						
Low ACI (lower agency costs)	Mean	0.36	73.89	0.81	0.75	0.87
	Median	0.29	100.00	1.00	1.00	1.00
High ACI (higher agency costs)	Mean	**0.31**	**65.39**	**0.70**	**0.61**	**0.81**
	Median	**0.16**	**99.00**	**1.00**	**1.00**	**1.00**
Size Quintile 3						
Low ACI (lower agency costs)	Mean	0.25	47.63	0.49	0.40	0.54
	Median	0.19	50.00	0.50	0.00	1.00
High ACI (higher agency costs)	Mean	**0.20**	**45.37**	**0.47**	0.39	0.53
	Median	**0.08**	**45.00**	**0.50**	**0.00**	**1.00**
Size Quintile 4						
Low ACI (lower agency costs)	Mean	0.18	24.42	0.21	0.13	0.25
	Median	0.12	0.00	0.00	0.00	0.00
High ACI (higher agency costs)	Mean	**0.15**	**20.39**	**0.20**	**0.13**	**0.21**
	Median	**0.05**	**0.00**	**0.00**	**0.00**	**0.00**
Size Quintile 5						
Low ACI (lower agency costs)	Mean	0.14	13.61	0.11	0.06	0.13
	Median	0.08	0.00	0.00	0.00	0.00
High ACI (higher agency costs)	Mean	**0.11**	**8.38**	**0.07**	**0.03**	**0.08**
	Median	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**

Table XXVIII. Multivariate Analysis of Cash Holdings and Governance Variables

The dependent variable in all regressions is cash defined as cash plus bank deposits scaled by total assets. Size is defined as the natural logarithm of total assets deflated using the CPI into 2005 pound sterling. Net working capital (NWC) is calculated without cash. Total debt is defined as the sum of short term and long term debt scaled by total assets. Tax rate is defined as tax expense scaled by earnings before tax. Industry sigma is a measure of the volatility of an industry's cash flow for a 3 year period. Capital expenditures (Capex) are calculated as the change in total assets plus depreciation scaled by total assets. Inside ownership represents equity ownership of directors. ACI is the agency cost index described in Gogineni, Linn and Yadav (2011). Larger values of ACI indicate higher agency costs. ACI 4th Quartile (ACI 1st Quartile) is a dummy variables that equal 1 if a firm belongs to 4th (1st) quartile when sorted by ACI. NOM is a dummy variable that equals 1 if a firm is not managed by owners and 0 otherwise. Data are obtained from updates 196, 208, 221, 233, and 244 of the FAME data base produced by *Bureau Van Dijk*. These updates correspond to October 2005, October 2006, November 2007, October 2008 and October 2009 respectively. We use current year's financial data and lagged ownership and management data. Standard errors are clustered at the firm level. Significance levels at the 5% and 1% level are indicated by * and ** respectively.

(1)	(2)	(3)	(4)	(5)
Intercept	0.3937	0.3936	0.4126	0.4044
	(0.0115)**	(0.0116)**	(0.0119)**	(0.0118)**
ACI	-0.0146			
	(0.0035)**			
ACI 4th Quartile		-0.0148		
		(0.0027)**		
ACI 1st Quartile		0.0097		
		(0.0028)**		
Insider Ownership			0.0102	
			(0.0039)**	
NOM				-0.0086
				(0.0039)*
Size	-0.0279	-0.0277	-0.0296	-0.0282
	(0.0008)**	(0.0008)**	(0.0009)**	(0.0008)**
Firm Age	-0.0001	-0.0001	-0.0002	-0.0002
	(0.0001)*	(0.0001)	(0.0001)*	(0.0001)**
Capex	0.0259	0.0256	0.0289	0.0261
	(0.0040)**	(0.0040)**	(0.0041)**	(0.0040)**
Total debt	-0.1431	-0.1428	-0.1484	-0.1456
	(0.0042)**	(0.0042)**	(0.0042)**	(0.0041)**
Taxrate	0.0283	0.0274	0.0307	0.0296
	(0.0027)**	(0.0026)**	(0.0028)**	(0.0027)**
NWC	-0.1678	-0.1679	-0.1695	-0.1683
	(0.0042)**	(0.0042)**	(0.0043)**	(0.0042)**
Industry Sigma	-0.0717	-0.0675	-0.0722	-0.0778
	(0.0606)	(0.0606)	(0.0625)	(0.0606)
Industry Affiliations	Yes	Yes	Yes	Yes
Accounting Quality	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Observations	88,554	88,554	84,913	88,554
Adjusted R-squared	0.238	0.239	0.238	0.238