ESSAYS ON CHANGES IN CORPORATE GOVERNANCE: OWNERSHIP STRUCTURE AND BOARD STRUCTURE

by

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Chapter 1

Introduction

An important feature of the corporate form of business is the agency relationship between owners and managers. Minimizing agency costs i.e. the costs arising from the conflicts in this relationship (Jensen & Meckling, 1976), is the primary focus of scholars and practitioners of corporate governance. For example, Shleifer & Vishny (1997) describe corporate governance as dealing with the ways in which suppliers of finance to the corporation assure themselves of getting a return to their investment. Fama & Jensen (1983) argue that the board of directors is the primary governance mechanism internal to firms. Jensen & Meckling (1976) and Demsetz (1983) argue that ownership structure is the primary firm-level governance mechanism external to firms. These two governance mechanisms are the focus of this dissertation.

This dissertation extends the literature on the ownership and board structure of firms by examining the adjustments that take place in these mechanisms during periods of corporate restructuring. The first essay examines the evolution of ownership structure of corporate spinoffs. I document the changes in the ownership structure of spinoffs to answer the following questions: what explains the changes in ownership structure and do the changes have any implications for firm performance and survival? The second essay documents changes in the board structure of acquiring firms in the banking industry and examines the determinants of participation of target directors on the board of the merged firm.

Most empirical studies of governance mechanisms focus on static examinations since firm governance changes slowly over time. The results in this dissertation provide

scarce new evidence of how governance mechanisms evolve in response to radical changes in the nature of the firm. The experimental setting in this dissertation makes it possible to relate changes in governance to changes in firm characteristics. This feature of the experimental setting also significantly mitigates the problem of endogeneity – widespread in studies of governance. These aspects of this dissertation constitute a significant departure from the existing reliance on reduced form analyses to relate governance to firm characteristics.

Most empirical examinations of governance mechanisms[1] employ a cross-section or panel of firms to estimate the relation between governance and firm performance or other firm outcomes such as CEO dismissal, takeover premium etc. The model used by Hermalin & Weisbach (2003) in the context of board structure is very useful to summarize the methodology and the associated problems.

$$(\text{managerial action})_{t+s} = \varphi(\text{governance characteristic})_t + \varepsilon_t \quad (1)$$

$$(\text{firm performance})_{t+s} = \beta(\text{managerial action})_t + \eta_t \quad (2)$$

$$(\text{governance characteristic})_{t+s} = \mu(\text{firm performance})_t + \xi_t \quad (3)$$

ε, η, and ξ denote the rest of the model including errors. The subscript t denotes time and s (≥ 0) is used to create an appropriate lead-lag relation. The intuition of the model is that existing governance affects managerial action, managerial action affects firm performance and firm performance affects future governance.

However there are few empirical studies that estimate structural models such as the one described above (Agrawal & Knoeber, 1994 is a notable exception). Instead, most studies carry out reduced form analyses that typically combine equation (1) and (2) as follows:

[1] See Bibliography

$$(\text{firm performance})_{t+s} = \beta(\varphi(\text{governance characteristic})_t + \varepsilon_t) + \eta_t. \quad (4)$$

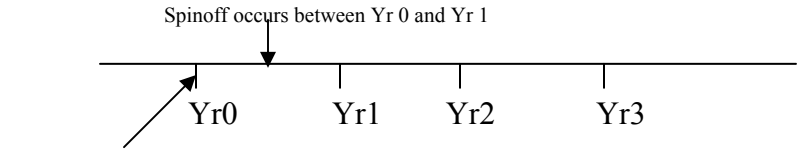
To the extent that ε and η are incomplete there exists a problem of endogeneity that has been a significant issue of concern in the governance literature (Coles, Lemmon & Meschke, 2003, Hermalin & Weisbach, 2003). This problem is exacerbated by the relatively slow pace of change of firms'[2] governance mechanisms, which reduces the efficacy of using lags in overcoming it. Core & Larcker (2001) argue that the process of adjustment of ownership structure could be slow due to significant costs of adjustment. These costs of adjustment and their variation across firms could make it difficult to measure the relation between current performance and future governance in structural models e.g. equation (3) in the model above.

By focusing on significant restructuring events and examining governance in event time this dissertation lessens most of the above mentioned problems. In an event time approach, changes in the governance mechanisms that occur in response to an event are examined. Therefore the more difficult measurement of the changes in governance mechanisms due to past changes in firm performance is avoided, thereby eliminating the need for structural systems such as the one described above. Second, by an appropriate choice of event, it is possible to ensure that the required changes in the governance mechanisms are sufficiently large. In other words it is possible to find events where the costs of adjustment of governance mechanisms are below the benefits of the resulting changes, at least on an ex-ante basis. Finally, unlike a reduced form analysis that relates the variation in governance mechanisms to variation in firm characteristics in an event

[2] For example, for ownership structure see Barclay & Holderness (1989), Denis & Sarin (1999), Zhou (2001) and for board structure see Lehn, Patro & Zhao (2005)

time approach it is possible to establish a more direct relation between changes in governance mechanisms and changes in firm characteristics.

The relative advantage of the event time approach hinges on an appropriate choice of event. In the first essay, to study ownership structure I choose corporate spinoffs. Spinoffs inherit the ownership structure of the parent from which they are spun off. Specifically, in a transaction where 100% of the shares of the spinoff are distributed to the shareholders of the parent firm, the spinoff begins with an ownership structure that is identical to the ownership structure of the parent as of the record date of the distribution. This creates a unique experimental setting in which ownership structure is held constant and firm characteristics such as size, risk, extent of growth opportunities and industry are changed radically i.e. from the pre-spinoff parent firm characteristics to those of the spinoff. The diagram below shows the event time line for the study.



Using a sample of 117 spinoffs in the period 1980 through 2000 I find that the ownership structure of spinoffs measured by the level of block ownership (a block owner in this study is one who owns at least 5% of the voting rights of the firm), changes rapidly and significantly increasing from a mean inherited block ownership (used interchangeably with prior ownership) level of 20.34% (year 0) to a mean of 27.35% in year 3. In year 1 the mean and median block ownership is significantly different from that of a matching sample of seasoned firms chosen on the basis of size and industry. By year 3 the difference in the two samples becomes insignificant.

The change in block ownership of spinoffs measured relative to the inherited ownership structure is significantly related to differences between spinoffs and pre-spinoff parents in firm and industry characteristics in ways that are consistent with efficiencies in monitoring. These characteristics include differences in firm size and market-to-book ratio, measures of industry relatedness, the inherited level of block ownership and the long run survival of the spinoff. I use three measures of industry relatedness – differences in SIC codes, correlation of stock returns and the vertical relatedness measure of Fan & Lang (2000).

The difference in block ownership between spinoffs and matching firms is insignificantly related to differences in firm characteristics in year 1. By year 3 differences in firm size, idiosyncratic risk (measured by the standard error from a market model), the market-to-book ratio, asset tangibility (measured by the ratio of plant, property and equipment to book assets) and long run survival are significantly related to differences in the block ownership of the two samples.

Regarding firm performance (survival) and changes in block ownership – I find that changes in the block ownership of spinoffs are significantly positively related to the changes in the market valuation measured by the market-to-book ratio (survival) of the spinoffs in year 3 and either insignificantly or less significantly related in the earlier years. Similarly, the difference in market valuation of spinoffs and matching firms is significantly positively associated with the corresponding difference in block ownership in year 3.

The results of the first essay constitute scarce new evidence on the extent of changes in ownership structure and their determinants. Although ownership structure of

seasoned firms changes slowly over time, when circumstances warrant significant changes on an ex-ante basis they are indeed observed ex-post. Unlike previous studies the results provide direct support to existing arguments made in the literature that the variation in ownership structure is endogenous to firm characteristics (Demsetz & Lehn 1985, Himmelberg Hubbard & Palia 1999). The positive association between firm performance (survival) and past changes in block ownership suggests that greater ownership concentration may be valuable to firms. This is subject to the condition that the market-to-book ratio is an appropriate measure of firm performance. An alternative explanation for the positive relation between block ownership and the market-to-book ratio is that the market-to-book ratio is a proxy for the extent of growth opportunities and firms with more growth opportunities need greater monitoring and therefore have more concentrated ownership structures.

Even assuming that the market-to-book ratio is an appropriate measure of performance, it must be noted that the evidence is insufficient to infer the causality of ownership structure in determining firm performance. The increase in block ownership could either cause an improvement in performance or could be a reflection of the superior stock picking abilities of the block owners.

In the second essay, to study board structure I choose a sample of firms from the banking industry that carry out mergers and acquisitions. Compared to most other investment decisions made by firms, mergers and acquisitions are bigger and usually carry greater implications for effective firm monitoring. Similar to a spinoff, around a merger, firm characteristics of the acquirer, such as firm size, risk and the extent of growth opportunities change significantly. This in turn changes the monitoring task that

is the raison d'etre of corporate boards. I document changes in the board structure of acquiring firms to relate the participation of target directors on the board of the merged firm to proxies for changes in the monitoring task of the board of directors of the acquired firm.

Using a sample of 141 acquisitions in the banking industry I find that there is a significant 14% increase in board size post-merger and an insignificant change in composition. The probability of hiring at least one target director is positively associated with the size and accounting performance of the target measured relative to the acquirer, negatively related to the similarity of the target and acquirer as measured by the correlation of stock returns in the pre-merger period and insignificantly related to the size of the target board.

The number of target directors hired is similarly positively related to the relative size and accounting performance of the target and negatively related to the stock return correlation. In addition the number of target directors hired is positively related to the relative market-to-book ratio of the target and significantly negatively related to the ownership stake of the target directors. The last result is consistent with a disciplining argument – target boards with greater ownership are entrenched and therefore not chosen to the board of the merged firm. Alternatively, the result is consistent with the regularity that high ownership usually occurs in small and family owned banks where the willingness to merge may also signal the willingness to cash stakes and exit the business.

The rational variation in the choice of target directors combined with the fact that the increase in the average board size of the acquirer is actually smaller than the average

number of target directors hired shows that mergers, while contributing to increases in board size, are unlikely to decrease their effectiveness as monitoring mechanisms.

Overall, the results of this dissertation show that governance mechanisms of firms adapt to changes in monitoring requirements resulting from changes in asset characteristics. There is an extensive literature which shows that firm governance is determined endogenously by monitoring requirements. This dissertation extends this literature by giving a glimpse into the process by which this occurs and thus helps clarify the main implication of this literature – not accounting for firms' abilities to self-adjust their governance could result in misleading measurements of the consequences of governance on firm performance and eventually in misguided policy changes. The rest of this dissertation is organized as follows. Chapter 2 studies the ownership structure of spinoffs and Chapter 3 studies the board structure of bank acquirers. Chapter 4 concludes.

Chapter 2

1. Introduction

This chapter examines the evolution of the ownership structure of corporate spinoffs i.e. firms that are spun off by parent companies. At inception these firms inherit the ownership structure of the parent from which they are spun off. This feature of spinoffs combined with the fact that the assets of spinoffs are different from those of their parents creates a unique experimental setting for examining ownership structures that are unlikely to be in equilibrium. I exploit this experimental setting to test hypotheses regarding changes in ownership structure, the determinants of the changes, and the relation between ownership structure and firm performance and survival.

Most previous analysis of ownership structure is of mature or large firms and is seldom associated with corporate events that significantly change the nature of the firm. This precludes significant changes in the distribution of ownership structure of the firms studied. Several papers that examine the issue find that ownership structure exhibits high serial correlation. These include Denis & Sarin (1999), who study inside ownership and Zhou (2001), who examines changes in managerial ownership. Barclay & Holderness (1989) find that once a firm has a block holder it usually has one five years later. This high serial correlation in turn impedes analysis of changes in ownership structure – a potentially rewarding avenue of research, especially in the context of the ongoing debate over the causes and consequences of ownership structure (Demsetz & Villalonga, 2001).

I overcome this problem by identifying a setting that warrants large changes in ownership structure. If ownership structure is determined endogenously, then the ownership structure inherited by spinoffs will change in response to differences between

the monitoring requirements of parent companies and spinoffs. This could be due to significant differences in attributes such as firm size, risk, growth options and industry mix. As an illustration of the changes that I expect, consider the ownership structure of Corn Products, spun-off by Bestfoods. The parent, Bestfoods, had no 5% block holder listed in the proxy statements prior to the spinoff or in the subsequent years. In contrast, in its first proxy statement, Corn Products had one block holder (FMR Corp) holding 8% of the shares. In year 2 total block holdings increased to 25%, decreased to 17% in year 3, 12% in year 4 and finally increased to 22% in year 5. Similar differences are found in a comparison of managerial ownership (i.e. ownership of the officers and directors of the firm). Figure 1A and 1B illustrate the differences between parent and spinoff for block and managerial ownership respectively.

In addition to finding a natural experiment to examine ownership structure, this chapter identifies a gap in the literature on spinoffs. Although the literature on spinoffs is extensive, relatively little is known about the governance of these firms. A frequently cited motivation for spinoffs and a potential source of value gains associated with spinoffs[3, 4] is the improvement in firm monitoring due to more efficient managerial incentives and a reduction in information problems. However, the role of ownership structure as a monitoring mechanism has remained largely ignored. It is addressed in this chapter.

[3] See Hite & Owers 1983, Miles & Rosenfeld 1983, and Schipper & Smith 1983 for the extent of value gains due to spinoffs.

[4] Empirical examinations of the sources of value gains associated with spinoffs include increases in focus (Daley, Mehrotra & Sivakumar 1997, Desai & Jain 1999 and Schlingemann, Stulz & Walkling 2002), improvements in information quality (Krishnaswami & Subramanian 1999, Gilson, Healy, Noe & Palepu 2001), better access to capital markets (Krishnaswami & Subramanian 1999) and more efficient managerial incentives (Seward & Walsh 1996).

Using a sample of 117 spinoffs from 1981 through 2000 I test several predictions about ownership structure and its changes. The primary measure of ownership structure is the total holdings of owners of more than 5% of the voting shares of the spinoff (henceforth block ownership[5]). The hypotheses concern the magnitude of changes in block ownership, the determinants of these changes and their relation to firm performance and survival. A description of salient findings is below.

Regarding the changes in block ownership I find the following:

- In a three (five) year window the block ownership of spinoffs shows an average increase of about 7 (7) percentage points. This increase is significant both economically and statistically and is significantly higher than the corresponding change in a sample of mature matching firms chosen on the basis of size and industry.
- A large part of this change, about 4 percentage points, occurs in the first year. The changes in block ownership become progressively smaller and less significant. Also, the increase in ownership concentration is mainly due to the increase in outside block holdings i.e. where the beneficial owner is unaffiliated to the management of the firm – block holdings of insiders (i.e. officers and directors) show no significant change over time.
- There are patterns similar to those above, in the cross-sectional correlation between the inherited block ownership and the subsequent block ownership of spinoffs – the correlation declines sharply from 0.57 in year 1, to approximately 0.39 in years 2 and 3. The correlation is smaller and the fall in correlation is larger than in the matching sample over a similar period (for the matching sample the correlation falls from 0.89 to 0.80).
- Combined with evidence on other dimensions of ownership structure these findings suggest that the ownership structure of spinoffs reaches a steady state in a period of approximately 3 years.

Regarding the determinants of changes in block ownership I find the following:

- Measures of relatedness of the spinoff and parent and differences in size and market-to-book ratio are significantly related to changes in block ownership of spinoffs. However the most significant determinant of these changes is the block ownership of the parent prior to the spinoff. Firms with greater beginning block ownership have smaller subsequent changes in block ownership. This result persists with strong significance after including other determinants of the changes in block ownership and is consistent with concavity of returns to increases in ownership concentration.

[5] In the rest of the paper I use ownership structure and block ownership interchangeably.

- Similarly, differences between spinoffs and matching seasoned firms, in firm size, market-to-book ratio, idiosyncratic risk, asset tangibility (measured as the ratio of property, plan and equipment to book value of assets) and long run survival are significantly positively related to differences in block ownership in ways that are consistent with efficiencies in monitoring.
- In a regression setting, in the first year of the firms' existence, the fit between the ownership structure and asset characteristics of spinoffs (adjusted R-square 37%) is at least as good as the corresponding fit for the matched sample (adjusted R-square 22%). Also, the inherited block ownership is provided a poor fit by the asset characteristics of the spinoff (adjusted R-square is 7%).

Regarding the survival and firm performance of spinoffs I find the following:

- Firm survival of spinoffs is significantly positively related to past changes in block ownership and is marginally positively related to the inherited block ownership.
- Changes in the market-to-book ratio of spinoffs are similarly positively related to past changes in block ownership, but unrelated to the inherited block ownership. There is no such association for the sample of matching firms nor are there any similar patterns in either sample when accounting measures of performance are used.
- The difference in the market-to-book ratio of spinoffs and matching firms is increasingly significantly related to the corresponding difference in block ownership as the spinoffs season.
- In a simultaneous equation framework I find that the relation between the market-to-book ratio and block ownership of spinoffs becomes less significant over time and more similar to the corresponding relation in the sample of matching non-spinoffs.

The results have several implications. First, the results suggest that though ownership structure is highly serially correlated, when circumstances warrant it, ownership structure does change significantly and tends to move towards a new equilibrium. Second, the movement towards a new equilibrium is governed by tradeoffs that are known in the literature to influence the establishment of the optimal ownership structure of firms. Third, the changes in block ownership are positively associated with enhancements in the stock valuation of spinoffs and the probability of their survival. This result combined with the absence of results in tests of operating performance is consistent with the prior literature on spinoffs that finds improvements in the ***operating performance*** of ***parent***

firms (Daley et al 1997) and the ***stock valuation*** of the ***spinoffs*** (Krishnaswami & Subramaniam 1999)**.** Finally, as spinoffs move towards a new equilibrium ownership structure the association between firm performance and ownership structure becomes insignificant. Overall the results are consistent with ownership structure being determined by efficiencies in monitoring and considerations of value-maximization.

The rest of this chapter is organized as follows. In Section 2 I discuss the choice of spinoffs for a study of ownership structure. I then describe the typical spinoff process and develop the hypotheses. In Section 3 I list the data sources and describe the sample selection procedure. In Section 4 I present descriptive statistics of the spinoffs and matching firms and compare the cross-sectional properties of ownership structure of these two sets of firms. Section 5 contains results regarding changes in block ownership and the relation between block ownership and firm performance and survival. Section 6 discusses the robustness of the results and Section 7 concludes.

2. Literature Review, Institutional Details and Hypotheses Development

2.1 Using spinoffs to study changes in ownership structure

A majority of the empirical literature that examines ownership structure, studies the determinants of the level of ownership concentration and its relation to firm performance. These studies are usually cross-sectional (see Demsetz & Lehn 1985, Demsetz & Villalonga 2001, Agrawal & Knoeber 1996 and Cho 1998). Himmelberg, Hubbard & Palia (1999) a longitudinal study – is a notable exception. Changes in ownership structure of firms are relatively less studied. Gilson (1990) studies changes in the block ownership of firms that default on their debt obligations. Parrino, Sias & Starks (2003) study changes in institutional ownership around forced CEO turnover. Denis &

Sarin (1999) study the relation between changes in managerial ownership and board structure over a ten year period. Kole & Lehn (1999) study inside and block ownership in the airline industry around deregulation. Frye & Smith (2003) study changes in the block and managerial ownership of IPO firms in the four years subsequent to the issue. Wruck (1989) finds an average increase in ownership concentration of 6 percentage points in a sample of firms that carry out private placements of equity[6] during the first half of the 1980s. Franks, Mayer & Rossi (2003) study the evolution of ownership of a sample of UK firms incorporated in the early 1900s. Gompers & Metrick (2000) study secular trends in institutional ownership.

In a study relating to spinoffs, Abarbanell, Bushee and Raedy (2003) examine changes in the institutional ownership of spinoffs and parent firms around the announcement and effective date of the spinoff transaction. The motivation of their study, institutional investor preferences and the impact of institutional trading on abnormal returns, is vastly different from the motivation of this chapter.

A key aspect of ownership structure that discourages studies of its changes is that it usually changes slowly over time. Core & Larcker (2001) argue that the slow pace of change of ownership structure could be due to the significant costs attached to it[7]. Until the marginal loss due to a departure from the first-best ownership structure is not greater than the marginal cost of changing it, the ownership structure of a firm will remain unchanged. Consistent with this argument, most of the studies mentioned above, focus on

[6] Barclay, Holderness & Sheehan (2003) study private placements between 1979 and 1997 and find that blocks are often used to solidify management control.

[7] Documented block premiums ranging from 5.5% (Mikkelson & Regassa (1991)) to 16% (Barclay & Holderness (1989)) are indicative of the magnitude of costs of concentrating ownership.

circumstances that significantly affect the marginal cost-benefit trade-off of changes in ownership structure.

In this respect this chapter is similar to the studies mentioned above. However, different from these studies I find a setting in which the cost-benefit tradeoff of changes in ownership structure is affected along multiple dimensions, all of which have monitoring implications. In a corporate spinoff the ownership structure of the firm is held constant while the nature of the firm is fundamentally changed. Spinoffs usually operate in a different industry, are of a different size than the parent firm, have significantly different growth opportunities and quite often require distinctly different management styles. All these factors affect the monitoring task and therefore the marginal cost-benefit tradeoff of changes in ownership structure. In addition to benefits arising from separation of operations, the very reason that firms are spun-off suggests that there may be benefits to separate and differential monitoring of firms.

The second advantage of using spinoffs is that, unlike IPO firms, the ownership structure at the inception of the firm is more likely inappropriate for spinoffs. Jensen & Meckling (1976) argue that as long as public investors are rational, the costs and benefits of the chosen ownership structure will be reflected in the offer price of a firm's IPO and thus internalized by the entrepreneur who decides the initial ownership structure[8]. It is less likely that such arguments extend to the ownership structure of spinoffs. Other than differences in asset characteristics, this is supported by the fact that spinoffs can be a last resort for firms to divest assets. This could be due to a combination of the failure to find the right price for an outright sale of assets and poor conditions in the IPO market.

[8] This view has been challenged by Bebchuk & Zingales (1996) who argue that although the ownership structure chosen may maximize private benefits it could be sub-optimal in terms of social benefits.

Another advantage of using spinoff transactions for such a study is that ownership structure is rarely cited as a motive for spinoffs. This alleviates potential problems of endogeneity. Specifically, if there were important ownership-structure related motivations for spinoffs, an examination of changes in ownership structure would need to account for those first. However, examination of press articles relating to sample transactions shows little evidence that this is the case. To that extent, spinoffs present a relatively clean experimental setting in terms of the endogeneity of the transaction to the variables under study[9].

The final advantage of using spinoffs for a study of changes in ownership structure is that, like IPO firms, spinoffs can choose a host of other firm and governance characteristics in an efficient manner. These include firm leverage, board size and composition and executive compensation design. These firm and governance characteristics are known to be systematically related to the ownership structure of firms and efficient choices of these, simplifies hypothesis development. Dittmar (2004) finds that the leverage ratio of spinoffs is similar to comparable non-spinoffs. Although empirical tests are limited, the academic literature on spinoffs often suggests improved incentive alignment as a motivation for spinoffs (Schipper & Smith 1986, Miles & Woolridge 1999). This is also a motivation cited frequently by financial managers. Regarding board structure, casual examination of sample transactions shows that spinoff boards are formed with care and deliberation. The boards are often formed several months prior to the distribution and consist of executives from the parent and spinoff, and

[9] One possible significant motivation for a spinoff may be the desire of a controlling family to reduce their stake in a part of the business. I check this possibility in the empirical tests and find little evidence of the existence of such divestiture motives.

outside directors. There is usually a plan of transition for the spinoff board to become independent around the time of the distribution[10]. The efficient choice of all these monitoring mechanisms increases the likelihood that changes in ownership structure are isolated and therefore more observable.

2.2 Institutional details

Because I aim to explore the evolution of ownership structures that are inherited, I focus on institutional details in order to find out if there are ways in which the ownership structure of the spinoff may depart from an exact replication of the ownership structure of the parent firm. The description below shows that after excluding spinoffs where less than 100% of the ownership is distributed there is little institutional provision for this to happen.

Spinoffs are usually structured as pro-rata tax-free dividend distributions. In order to distinguish them from ordinary taxable dividends an IRS ruling is required. The typical spinoff transaction is made contingent upon this ruling. The conditions for the distribution to be tax-free are detailed in Appendix A. The sample in this paper is restricted to tax-free transactions. The transaction is also filed with the SEC (Form 10)[11]. Finally, if exchange listing is proposed, details are provided to the exchange. This sample is restricted to issues that trade on the NYSE, NASDAQ or AMEX.

The two major steps for a proposed spinoff to be effective are that the SEC declares the Form 10 filing effective and that the IRS rules the transaction tax-free. By this stage in the process, a shareholder vote has been obtained, and a record date as well

[10] Wruck & Wruck (2002) study top management defined as consisting of the chairman, CEO and president but do not study board structure.

[11] Based on certain guidelines (also listed in Appendix A) the SEC distinguishes between a usual sale of securities that requires registration of the *transaction* under the Securities Act 1933 and a spinoff that requires registration of the *new security* under Securities Exchange Act 1934.

as a proposed distribution date set. For this sample the median duration between the first public information of the transaction and the actual declaration date of the deal is approximately seven months and spans the period during which SEC approval and the IRS ruling are obtained.

All holders of record on the record date are entitled to the dividend on a pro-rata basis (cash payments are made for fractional shares). In order to ensure an exact replication of the ownership structure I exclude any spinoffs where less than 100% of the shares are distributed. The median duration between the dividend declaration date and the payment date is approximately 15 days. During this period, beginning shortly after the declaration date, the stock of the newly formed independent company is traded on a when-issued basis[12]. For a sample of 28 two-stage spinoffs, Ezzell, Miles & Mulherin (2001) document a mean duration of 15 days of when-issued trading. Choi & Strong (1983) document a similar duration for stock splits. The parent firm usually trades in two ways – regular-way and when-issued[13]. In Exhibit A the process discussed above is illustrated with the spinoff of Roxio Inc. from Adaptec Inc.

[12] When-issued trading differs from regular trading (also called regular-way trading) in several aspects. Whereas regular-way trades are settled five business days after the trade, when-issued trades are not settled until 5 days after the issue date. Thus the purchase of when-issued shares reflects an interest free borrowing for the buyer for the duration that is incremental to a normal settlement cycle. This is reflected in the form of a price premium (Vijh 1994). Empirical studies of the when-issued market find that when-issued shares are quoted and traded significantly less frequently than comparable regular-way traded shares. This illiquidity of when-issued shares is reflected in the form of wider bid-ask spreads. Vijh (1994) and Ezzell, Miles & Mulherin (2001) note that financial institutions often have restrictions on investing in when-issued shares. This temporarily restricts demand for the shares of the spinoffs. Given a downward sloping demand curve this could cause a significantly positive abnormal return on stocks of spinoffs on the ex-date. This issue is examined by Abarbanell, Bushee & Raedy (2003). In this paper I examine ownership on an annual basis and therefore abstract from these fluctuations.

[13] In regular-way trading, shares of the parent firm trade cum-dividend until the payment date and shareholders selling before the effective date will also be selling the right to receive shares of common stock in the spinoff. All such sellers, being holders of record will receive the shares of the spinoff from the company (or via their broker if they hold the shares in the "street name") and will in turn deliver these shares to the ultimate (post-record date) buyer. When-issued shares of the parent firm reflect the spinoff of the subsidiary, and buyers of such shares are not entitled to shares of the subsidiary firm.

Usually the ownership structure of the parent firm that is replicated i.e. the ownership structure on the record date, is unobservable. Therefore I use the last recorded ownership structure of the parent firm as a proxy. In order to ensure the integrity of this proxy I eliminate spinoff transactions where there are significant alterations in the ownership structure of the parent firm between the last ownership date and the record date (discussed further in Section 3).

2.3 Hypotheses

2.3.1 Changes in ownership structure

Recent studies of spinoffs document an average relative market value of approximately 30% (Krishnaswami & Subramniam 1999) and an average relative risk (ratio of standard deviation of stock returns of the spinoff to the parent) of 130% (Abarbanell, Bushee & Raedy 2001) . The relatively smaller size of spinoffs and the benefits of greater monitoring of higher risk firms imply greater net benefits of an increase in ownership concentration. Based on this, I expect an average increase in the ownership concentration of these firms.

Past studies of ownership structure suggest that it changes slowly. Kole & Lehn (1999) document changes in the ownership structure of airline firms over a 15 year period around the industry's deregulation. Frye & Smith (2003) document quicker changes for a sample of IPO firms. They find that block ownership increases by approximately 8% in the 4 years after the IPO. Given the relatively bigger shock associated with a spinoff I expect the adjustment process of ownership structure of spinoffs to be quicker. However it may still take more than a year if institutional and other potential block owners would like to observe the spinoff firm as an independent entity before making decisions

regarding ownership. For example, a one year period allows the passing of milestones such as publication of the first financial statements of the new entity and completion of an earnings cycle.

If the increase in ownership concentration of spinoffs is in response to the shock to the nature of the firm then the impact of the shock should reduce over time – this means the increases should get progressively smaller. I also expect the cross-sectional correlation of block ownership of the spinoff firm and its inherited block ownership to decrease over time. This expectation is consistent with the argument that the new ownership structure of the spinoffs is not a trivial conversion of the inherited ownership structure (for example, spinoffs are uniformly more concentrated than their respective parents).

Because changes in ownership structure over time are inevitable (albeit usually small) it is important to compare spinoffs to a set benchmark firms. I use benchmark firms chosen on the basis of size, industry and maturity. Using mature firms makes it possible to compare ownership structures that are likely to be in equilibrium to those that are unlikely to be in equilibrium. The greater maturity of the matching firms means that these firms are more likely to have equilibrium ownership structures. Therefore, I expect the changes in the ownership structure of spinoffs to be significantly larger than those of the seasoned sample. Also, ensuring that there is no systematic restructuring activity[14] in the benchmark sample implies there should be little change in the ownership structure of the matching firms. The differences in the ownership structure of the spinoffs and the matching firms should decrease over time and the cross-sectional correlation should

[14] In forming the matching sample I ensure that no significant restructuring activities take place in these firms.

increase over time. The last two expectations are based on the assumption that a mature, size and industry matched firm serves as an appropriate benchmark of ownership structure. If this is indeed the case then the ownership structure of the spinoffs should resemble that of the matching firms more closely over time. However, given the limited evidence on the intra-industry and inter-industry variation in ownership structure, there exists a joint hypothesis problem in tests that use benchmark firms.

2.3.2 Changes in ownership structure and their relation to firm characteristics

Whereas the earlier sub-section dealt with changes in the distribution of ownership structure of spinoffs the hypotheses in this section relate to the cross-section of these changes. For the remaining hypotheses in the paper I focus on the block ownership of spinoffs because this is the dimension of ownership that is replicated and therefore the direct subject of the tests. I use variables that are commonly used in the ownership literature (for e.g. Himmelberg et al 1999) to predict changes in the block ownership of spinoffs.

Size and control potential - Given the well-documented negative relation between firm size and block ownership, ceteris paribus, the larger the spinoff relative to the parent the smaller the increase in ownership concentration of the spinoff. Similarly, the greater the control potential of the spinoff (relative to the parent), the larger the increase in ownership concentration, ceteris paribus. Demsetz & Lehn (1985) define control potential as the wealth gain achievable through more effective monitoring of managers by a firm's owners. Following Demsetz & Lehn (1985) I use the standard error of estimate calculated from fitting the market model using 36 observations of monthly returns beginning with

the spinoffs' independent existence. To estimate the parent's idiosyncratic risk I use the 36 months preceding the first firm announcement of the spinoff.

Industry relatedness – Asset characteristics of firms vary across industry. However it is unlikely that all differences in monitoring trade-offs across industries are captured by differences in asset characteristics. Spinoffs are often in industries unrelated to the industry of the parent firm. Dittmar (2004) documents 50% of her sample spinoffs are in different 1-digit SIC industries and 90% in different 4-digit SIC industries. Further, Daley, Mehrotra & Sivakumar (1997) and Schlingemann, Stulz & Walkling (2002) find that gains from spinoff transactions are concentrated in unrelated spinoffs. This provides an added basis for exploring the influence of industry differences in determining changes in block ownership.

I measure industry relatedness using SIC codes and the correlation in monthly stock returns of the post-spinoff parent and the spinoff in the 3 years subsequent to the spinoff. Additionally I use Fan & Lang's (2000) measures of vertical relatedness and industry complementarity. These measures are calculated using commodity flow data from the *Benchmark Input-Output Account for the U.S. Economy*. Vertical relatedness is calculated as follows. Define a_{ij} as the dollar value of industry i's output required to produce industry j's total output. V_{ij} is defined as a_{ij} divided by the dollar output of industry j. The relatedness of spinoffs and parents is calculated as $\frac{1}{2}(V_{ij}+ V_{ji})$ where i and j are the parent and spinoff industry respectively[15]. This measure captures the extent to which the spinoff industry and the parent industry are dependent on each other for inputs and outputs.

[15] Fan provides the concordance between SIC codes and the industry classification used in the input-output tables.

Complementarity is calculated as follows. For spinoff industry i calculate the fraction supplied to each other industry k (except the parent industry). This gives us a vector V_{ik} . In a similar manner calculate B_{ik} as the fraction obtained as input from each industry (except the parent industry). Calculate corresponding vectors V_{jk} and B_{jk} where j is the parent industry. Complementarity is calculated as $\frac{1}{2}(corr(V_{ik}\ V_{jk})+corr(B_{ik}\ B_{jk}))$. This measure captures the extent to which the parent and spinoff industry depend on the same ***other*** industries i.e. non-spinoff and non-parent industries, for inputs and outputs.

Market-to-book ratio[16] - This ratio, frequently used as a proxy for Tobin's Q, captures components of firm performance and also asset characteristics such as tangibility and the extent of growth options (Smith & Watts 1992). In the literature on ownership structure Q is frequently used as a measure of firm performance (Morck, Shleifer & Vishny 1988). In a study of spinoffs and internal capital markets Gertner, Powers & Scharfstein (2002) use Q as a proxy for investment opportunities. In this sample of spinoffs I find that poor performance is frequently associated with low growth and declining demand. For example, this is true of defense industry related spinoffs in the early 90s of Western Atlas by Litton Industries and Tripos by Evans and Sutherland, and the semi-conductor industry related spinoffs in the late 90s of Varian Semiconductor by Varian Associates and Conexant Systems by Rockwell International. This feature of spinoffs complicates hypotheses relating to Q. To the extent that Q captures growth options (and therefore control potential), higher relative Q will lead to a greater increase in ownership concentration. However to the extent that Q captures poorer performance, lower relative Q will lead to a greater increase in ownership concentration. This is because there are greater benefits to monitoring firms that are doing poorly. In certain specifications I also

[16] In most of the paper this is used interchangeably with Q.

use the ratio of property, plant and equipment to total assets as an inverse measure of the extent of growth options in the firm.

Survivorship – The eventual survival of the company captures positive aspects of the stability and future growth of the firm that may not be captured by other variables. It is also the case that some spinoffs occur as a last resort for divesting assets. For such firms there is a known lower likelihood of survival since the optimal outcome may be a merger or liquidation. Presumably, such firms provide lower control potential to block owners (though they may provide sufficient control potential and synergies to a 100% acquirer). Therefore I expect that companies that survive as stand-alone entities over the long run will have greater increases in block ownership. I classify a firm as a survivor if the delisting code in the CRSP database as of December, 2003 is 100. All other firms are classified as non-survivors.

Prior ownership - Assuming a concave relation between the level of block ownership and the benefits of monitoring, prior ownership concentration should be negatively related to subsequent changes in ownership concentration. This is similar to arguments made in the literature that assume exogeneity of ownership structure[17]. In the current setting it is applicable since the prior ownership structure is "exogenously" imposed on the spinoff firm and is unlikely to be its optimal ownership structure.

Fit between firm characteristics and the level of ownership concentration – If the block ownership inherited by the spinoffs is inappropriate to their monitoring requirements, variation in the inherited (new) block ownership should be poorly (better) explained by its asset characteristics. If the process of adjustment has progressed adequately the fit

[17] If ownership is determined endogenously and all firms are have the first-best ownership structure then a departure from this structure will have an effect on the firm which is of comparable magnitude irrespective of the level of ownership concentration. In this case the usual concavity argument does not hold.

between ownership concentration and asset characteristics of spinoffs should be comparable to that of the matching firms. This fit should improve over time as the ownership structure of the spinoff adjusts more completely to its asset characteristics.

2.3.3 Differences in block ownership of spinoffs and matching firms

The previous subsection dealt with the changes in block ownership of spinoffs. Similar tests and hypotheses would apply to the difference in block ownership of the spinoffs and the matching firms. In the case of the parent firms the pre-spinoff parent's ownership structure is relevant for comparison since it is the point of departure. However in the case of the matching firms a year-by-year matching is relevant since it would control for the potential effects of industry changes and secular trends. Therefore I measure the difference in block ownership of spinoffs and matching firms and run regressions on differences in firm characteristics. To the extent that the ownership structure of spinoffs gets better suited to firm characteristics over time the relation between differences in block ownership of spinoffs and matching firms and corresponding differences in firm characteristics should get more systematic and significant over time.

2.3.4 Ownership structure and firm performance and survival – Beginning with Berle & Means (1932), there is a rich literature that argues about the inadequacy of corporate ownership structures in improving or maintaining firm performance. One commonly maintained hypothesis of this literature is that in a certain range of ownership concentration, management is able to entrench itself while reducing firm value (Morck, Shleifer and Vishny 1988 and Stulz 1988. Also see Wruck 1989, McConnell & Servaes 1990 & 1995, Loderer & Martin 1997, Cho 1998, Holderness, Kroszner & Sheehan

1999[18,19]). As mentioned earlier one complication in tests that measure the impact of ownership structure on firm performance is that there is little change in ownership structure over time. The experimental setting on hand is uniquely suited to overcome this problem.

I hypothesize that the increase in block ownership of the spinoff is positively associated with changes in firm performance i.e. stock valuation (measured by the market-to-book ratio) and the probability of survival as a stand-alone entity. Core & Larcker (2002) argue that in the presence of significant costs, adjustments in ownership structure will not take place unless the counterbalancing benefits are comparable. This suggests that firm survival would be an appropriately significant performance measure. However, increases in the likelihood of firm survival could also stem simply from the difficulty in taking over a firm with more concentrated ownership and therefore need not necessarily be consistent with value-maximization[20]. This possibility necessitates the tests of stock valuations.

An alternative approach to examining the performance implications of the changing ownership structure of spinoffs is to examine the relation between the differences in block ownership of the spinoffs and matching firms to the corresponding differences in the market-to-book ratio. The ownership structure of the matching firms is likely to be steady since these firms are mature. On the other hand, as discussed earlier, rapid and significant changes are expected in the spinoff sample. Due to the superior stock picking abilities of the block owners or due to their superior monitoring of the firms

[18] Demsetz & Villalonga (2001) contains a comprehensive summary of the important evidence.
[19] However, there is little description of the ways in which such an ownership structure may result.
[20] It is also possible that the presence of a larger number of blockholders actually facilitates a takeover (Shleifer & Vishny 1989).

in which they acquire stakes or due to a greater need for monitoring high-Q firms, a positive relation is expected between the matching-firm-adjusted market-to-book ratio of spinoffs and the differences in block ownership between spinoffs and matching firms.

Finally, I examine the relation between stock valuations (as opposed to changes in valuations) and the level of ownership of spinoffs. It is now well documented that after accounting for endogeneity there is no systematic relationship between the equilibrium ownership concentration of firms and their performance as measured by Q (Himmelberg, Hubbard & Palia, 1999 and Demsetz & Villalonga 2001)[21]. To the extent that the ownership structure of spinoffs has adjusted to its new equilibrium I should find a similar result for these firms. On the other hand a persistent significant relation between ownership structure and firm performance could mean that either these firms do not reach equilibrium or that the changes in ownership structure are not consistent with value-maximizing considerations. In order to test these competing hypotheses of the relation between firm performance and block ownership of spinoffs, I follow the literature and use a simultaneous equation framework and compare the results to those of the matching firms.

3. Sample selection and empirical methodology

3.1 Sample selection of spinoffs

I form an initial sample of spinoffs using a combination of CRSP distributions and spinoff transactions listed on the SDC Platinum Database. The time period used is 1980-2000. I start with all CRSP distribution codes that begin with 37 or 38. Using SDC I identify all spinoff transactions between 1981 and 2000 where both the target (the spinoff

[21] Coles, Meschke & Lemmon use a structural model to explain the observed relation between ownership structure and firm valuation.

firm) and the parent are public. I exclude 2-stage spinoffs. This results in an overlapping sample of 372 transactions from SDC and 582 distributions from CRSP. SDC has a smaller sample because data does not exist before 1984. Also, not all the distribution codes from CRSP are spinoffs – they also include some carve-outs, 2 stage spinoffs and rights issues.

I use several filters on this original sample. The first criterion for inclusion is that the transaction has a distribution code in the CRSP database and adequate news stories are available on the Factiva news source. I reject 32 transactions because news stories regarding these transactions are unavailable or inadequate i.e. it is not possible to confirm the parent's identity and/or the completion of the deal. Next I exclude all transactions if one or more of the following conditions are met (i) less than 100% of the firm is spun-off, (ii) the transaction is taxable (I obtain the tax-status of the transaction from Factiva and SDC) (iii) the spinoff occurs as a result of the parent merging with another company and (iv) the ownership structure of the parent firm changes significantly due to reasons not related to the spinoff.

Point (iii) and (iv) above ensure that parent firms undertaking recaps, stock issuances (for mergers and other reasons) private placements and other transactions that could alter their ownership structure for reasons not related to the spinoff are excluded from the sample. I do this because measuring the inherited ownership structure is noisy for these transactions. This reduces the sample to a total of 249 transactions.

The next requirement is that the spinoff should survive at least 3 years from the date of formation of the firm. This is to allow sufficient time to observe changes in ownership structure. This reduces the sample to 169 transactions. For this sample of 169

transactions I obtain ownership data from proxy statements. I use the Lexis-Nexis data source for electronic proxies. Usually Lexis-Nexis does not go back beyond 1987. Therefore, for the early sample I use the microfilm collection of proxy statements at the Penn State Business Library. I am able to find complete proxy data i.e. for a minimum of three years, for 117 spinoffs. Where available I collect up to five years of ownership data. Additional years are used to check the robustness of the results. The break-up by year and industry is in TABLE 1. I lose several transactions in the early 80s due to proxy unavailability. This is especially true of small firms and may create a size bias in the earlier part of the sample.

3.2 Selection of matching firms

The purpose of building a sample of matching firms is to compare ownership structures that are in equilibrium (matching firms) and those that are not (spinoffs). Given the purpose of matching I use the following algorithm. I create a universe of matches by matching each of the spinoffs against all Compustat firms, excluding the spinoffs and the parent firms. From this set of potential matches I eliminate matches if any of the following conditions are met (i) the market value of equity is less than 0.7 or greater than 1.3 times the market value of equity of the spinoff firm (ii) the matching firm has existed for less than 5 years before the spinoff (iii) the matching firm does not exist for at least as long as the spinoff firm and (iv) the matching firm undergoes significant restructuring activity. The size cut-offs are in order to obtain a reasonably close match in terms of size and the time requirements are in order to ensure that the matching firm is reasonably mature. The restructuring requirements are to ensure that the ownership structures of these firms are more likely in equilibrium.

From all the matches that meet the criteria above I pick the one with historical SIC codes (Data324 in Compustat) closest to the corresponding spinoff. If there are several matches with the same SIC code, I pick the one closest in size. For the sample transactions prior to 1987 I follow the similar procedure but use CRSP historical SIC codes since Compustat does not carry historical SIC codes before 1987. Based on this I have 58 4-digit code matches, 19 3-digit code matches, 32 2-digit code matches and 8 1-digit code matches. The sample characteristics of these matches are discussed in Section 4 of this chapter.

3.3 Ownership data

I collect ownership data from proxy statements filed with the SEC. From each statement I obtain the record date, the number of outstanding shares, the number of outstanding options that could vest in the next 60 days, the name and number of shares held by each block holder of greater than 5%, the holdings of all the officers and directors (henceforth managerial ownership) of the firm and the holdings of the CEO.

If a firm has more than one class of voting shares I convert the shares into votes. I calculate percentages based on the total votes. I do not collect 5% holders of any one class if they are not 5% holders of the total votes. Holdings of the CEO and management include options whereas those of outside block holders do not.

In order to record the ownership of the parent before the spinoff I use the last proxy statement that is available after the announcement date and before the effective date. This is to ensure that the announcement effect of the spinoff is factored into the ownership structure. If there is a proxy statement that is associated with the spinoff itself I use that. However this is rare and occurs in only 7 out of the 117 transactions. In the

majority of the transactions I find that the ownership of the parent firm is available before the announcement date and then only after the effective date. It is possible that for such firms the inherited ownership structure is altered by the spinoff announcement. However to the extent that this happens because of the spinoff (and not due to some other stated reason) it is not an issue.

3.4 Financial information and stock returns

I use COMPUSTAT for financial information and the CRSP database for stock market data. The issue of aligning ownership data with COMPUSTAT information is tackled as follows. If the record date and the end of the COMPUSTAT fiscal year are within 3 months of each other I link them to create one record. If the difference is greater than 3 months I assign the financial information such that the COMPUSTAT fiscal year end comes before the record date. Where possible I check institutional filings to see if the block owner has entered the firm at a time after the fiscal year end date. If this is the case, I assign the COMPUSTAT fiscal year following the record date. The list of variable names is given in Table 0.

4. Descriptive statistics of firm characteristics and ownership structure

4.1 Firm characteristics

Table 2, Panel A compares the asset characteristics of the spinoff and the parent prior to the spinoff. The median book value of assets (in 2003 constant dollars) of spinoffs in year 1 is $588 million and of the parents prior to the spinoff is $ 3035 million. Spinoffs are also significantly smaller than parents in terms of market value of equity, sales and number of employees. Spinoffs are significantly riskier in terms of idiosyncratic risk. Differences in leverage, Q, beta and return-on-assets are not significant. All spinoff

and parent firm characteristics listed above, except Q, are pair-wise highly correlated (significant at the 1% level) – Q is correlated at the 5% significance level. The lower correlation in Q (0.194) is consistent with the fact that not all spinoffs occur because the spun-off division is the relatively poor performer.

Table 2, Panel B reports a similar comparison of the spinoffs and the matching firms. Spinoffs have marginally higher sales (t =1.72) and significantly lower beta (t =-2.00). All other attributes are insignificantly different. Except for beta and leverage all firm attributes of the spinoffs and matching sample are correlated at the 1% significance level. Leverage is correlated at the 5% level and the correlation in beta is insignificant. Overall the correlations show that the spinoffs are reasonably well matched in terms of firm attributes to the non-spinoffs.

4.2 Changes in ownership structure of spinoffs and matching firms

Table 3 reports measures of the ownership structure of spinoffs for years 1, 2 and 3. I report 4 measures of ownership structure – block ownership, inside block ownership, management ownership and CEO ownership in Panels A, B, C and D respectively. These are compared to the corresponding measures of the parent prior to the spinoff (year 0). Tests of significance of one, two and three year changes are in the 6 rightmost columns. In each panel the ownership structure of the matching firms is reported for years 1, 2 and 3 below the corresponding measures for the spinoffs. The bottom rows of each panel contain test results of the difference between the spinoff and the matching firms.

Block ownership in the first year of the spinoffs' existence increases from a mean (median) of 20.34% (18.03%) to 24.22% (21.87%). This increase is significant at the 1% level. The increase in year 2 of 2.36% is smaller but significant at the 1% level. The

change in year 3 is insignificant. The total increase in block ownership over the first three years of the spinoffs existence is 7.01% (significant at the 1% level). Spinoffs have significantly lower block ownership than the matched firms in year 1 (t = -2.72). This difference gets smaller in year 2 (t = -1.59) and is insignificant in year 3 (t = -0.82). The matching firms show insignificant changes in ownership during the corresponding 3 year period.

Inside block ownership, defined as the sum of blocks of 5% or more of voting rights owned by the officers or directors of the firm, is highly stable in both the spinoff as well as the matching sample. Spinoffs have significantly lower inside block ownership than the matched sample. This is consistent with the fact that spinoffs are often divisions of large parents (often conglomerates) and therefore are less frequently family owned. Therefore there is a lower incidence of inside blocks in these firms. The stability of the inside blocks indicates that it is unlikely that spinoffs are used as a means of divestiture of stakes in the spinoff assets for management of the parent company. Also, the stability of inside blocks indicates that much of the increase in block ownership occurs due to outside block shareholders. I find that the mean number of block holders in spinoffs in year 1, 2 and 3 is 2.49, 2.84 and 2.96 respectively compared to 2.10 block holders in the parent prior to the spinoff. The regularity that much of the block holding is due to outside block holders is especially important in the context of the emphasis on types of block holders in the recent ownership literature.

Managerial ownership of spinoffs in the first year is significantly lower than that of the parent prior to the spinoff (t = -2.19). However it increases significantly in each of the subsequent years and by year 3, managerial ownership in spinoffs is insignificantly

different from that of the parent prior to the spinoff (t = -0.90). This is consistent with the fact that managerial ownership often accumulates via stock option and other performance grants which take place in the years after the spinoff shares have been created[22]. CEO ownership shows a similar trend as managerial ownership. However in year 3 spinoffs have significantly higher CEO ownership than the parent prior to the spinoff. This is likely due to the smaller size of the spinoffs.

4.3 Serial correlations of ownership structure of spinoffs and matching firms

Table 4, Panel A reports the cross-sectional correlation between the various measures of ownership for the spinoffs and their corresponding parent measures prior to the spinoff. Block ownership is the least correlated of the measures with a correlation of 57.1% in the first year. This reduces to 39.9% in the second year and is 37.9% in year 3. Other measures of ownership are more highly correlated and show smaller decreases in correlation. This is consistent with the argument that block ownership being a market-mediated governance mechanism is subject to more rapid change than other measures.

The high correlation of inside block ownership is consistent with results in the previous table which shows zero median changes in insider block ownership. The high correlation of managerial ownership warrants further comment - although not a dimension of ownership that is replicated during a spinoff, at a level of 82.8% it is nevertheless more highly correlated than block ownership. This implies that managerial stock ownership patterns in parent firms are closely replicated in spinoffs. The smaller fall in correlation is consistent with arguments in the literature that internal governance mechanisms change relatively slowly compared to external governance mechanisms.

[22] As a result of having more family owned firms in the matching sample the managerial ownership of the matching firms is significantly higher than of the spinoffs in all years. CEO ownership shows a similar trend as managerial ownership.

In Table 4, Panel B the corresponding correlations of the matching firms are all higher than for spinoffs and decrease less over time. The correlation between ownership measures of spinoffs and matching firms (Table 4, Panel C) are smaller than those between the spinoff and parent. Also there is no discernible pattern over time. This is inconsistent with the hypothesis that the correlation should show an increase over time. Also, the correlations in measures of ownership between the matching firm and the pre-spinoff parent (Table 4, Panel D) are mostly higher than those between the spinoffs and the matching firms. This is puzzling since the only dimension along which the matching firms are more similar to the parent firms than the spinoffs is firm maturity.

Table 5 reports correlations of block ownership of spinoffs and parents for sub-groups formed on the basis of industry relatedness. Panel A shows results for subgroups formed on the basis of sameness of 2-digit SIC codes and Panels B & C shows results for the sample split on the basis of median vertical relatedness and industry complementarity. The block ownership of spinoffs has a lower correlation and greater reductions in correlation for greater differences in industry i.e. for different SIC codes and lower degrees of vertical relatedness and industry complementarity. The exception is year 1 when 2-digit SIC codes are used – in that case the correlation for different SIC codes is 0.5791 versus 0.5492 for same SIC codes. The same pattern holds for managerial ownership (the exception is in year 3 when the industry complementarity measure is used). This is consistent with the argument that greater differences in industry reflect greater differences in monitoring requirements and cause a greater movement away from the inherited ownership structure.

5. Block ownership changes, firm performance and survival

5.1 Firm characteristics and changes in block ownership

The focus in this section is on block ownership for two reasons. First, this is the dimension of ownership that is replicated and therefore the direct subject of the tests. Second, being an external governance mechanism that is more directly determined by market forces the likelihood of finding patterns of adaptation is greater.

In order to examine the determinants of changes in block ownership I first perform univariate tests – results are reported in Table 6. I form terciles based on each of the firm characteristics used in the hypotheses to predict changes in ownership concentration – relative size (Panel A), relative idiosyncratic risk (Panel B), relative Q (Panel C), industry relatedness based on stock return correlation (Panel D) and inherited ownership (Panel E). In Panel F & Panel G, I form groups based on 2-digit SIC codes & survivorship respectively. Finally in Panels H & I results for terciles formed on the basis of vertical relatedness and industry complementarity are presented. Each panel reports the beginning block ownership and changes measured over the three year horizon for each tercile/group. Regression results, where the dependent variable is the three-year change in the log of block ownership are in Table 6, Panel J.

Table 6 Panel A shows that, in the lowest relative size tercile the mean (median) 3 year change in block ownership is 13.51% (11.11%). In the middle tercile the mean (median) change is 6.31% (8.39%). In the highest relative size tercile there is an insignificant change in ownership over the 3 year horizon. The difference in the changes in the highest and lowest terciles is significant at the 1% level. In a univariate regression

(Panel J), consistent with this result the coefficient on relative size is significantly negative (t =-3.28)[23].

Table 6, Panel B shows there is an increasing trend in the changes in block ownership across terciles formed on the basis of relative idiosyncratic risk. In the lowest tercile the mean change is 4.42%, 7.54% in the middle tercile and 9.07% in the largest tercile. The difference in the changes between the highest and lowest terciles is significant at the 10% level. However the coefficient on relative idiosyncratic risk is insignificant in the univariate regression (Panel J).

Panel C shows a decreasing trend in the changes in block ownership across terciles formed based on relative Q. In the lowest relative Q tercile the change in block ownership is 13.02%. The change in the middle quartile and the highest quartile are 5.81% and -1.65%. The difference in the changes between the highest and lowest terciles is significant at the 1% level. In a univariate regression (Panel J) the coefficient on relative Q is negative and significant (t =-2.23). This is consistent with the argument that firms performing poorly, offer greater benefits to increased monitoring and therefore have increases in ownership concentration and inconsistent with the hypothesis that firms with higher Q should have more concentrated ownership because of a need for greater monitoring of firms with more growth options.

Panel D shows that, ownership changes are negatively related to industry relatedness measured by the stock return correlation of the spinoff and the post-spinoff parent. In the lowest tercile of relatedness the change in block ownership is 12.22%. In the middle tercile the change is 3.02% and in the highest tercile it is 6.18%. The

[23] It should also be noted that the beginning level of ownership is increasing across the relative size terciles. This has an implication for the multivariate analysis.

difference between the changes in the lowest and highest terciles is marginally significant and the difference between the lowest and middle tercile is significant at the 1% level. In a univariate regression (Panel J) the coefficient on the log of relatedness is significant at the 10% level (t =-1.72).

Panel E shows that firms spun-off from parents in the lowest block ownership tercile have an average increase in block ownership of 16.42%. In the middle tercile the increase is 8.74% and in the highest tercile there is actually a decrease in block ownership of 4.23%. The changes are significantly different from each other at the 1% level. In the regressions (Panel J) I use the tercile rank of ownership as the explanatory variable. This is in order to avoid a spurious negative correlation with the dependent variable (which, as noted above is the change in the log of block ownership). The coefficient is significantly negative (t = -5.59). Similar results obtain when prior management ownership is used to form the terciles.

This result presents interesting new evidence on ownership structure. It shows that firms tend to preserve their high ownership concentration if they acquire one "exogenously" – the increases in block ownership of firms beginning with a diffuse ownership are much higher (16.42%) than the decreases in block ownership of firms beginning with a concentrated ownership (a decrease of only 4.23%). Further the decrease of 4.23% is not as significant considering that the beginning block ownership of these firms is close to 40%. This evidence is consistent with the notion that block formation is costly and therefore blocks are self-preserving. Also it suggests that though diffusion in ownership structure could be beneficial, "freely available" concentrations in ownership are beneficial to the firm.

Panel F shows that spinoffs with the same 1 digit SIC code as the parent have a change in block ownership of 5.59% compared to 8.50% for those with different 1 digit SIC codes. In a univariate regression (Panel J) this difference is significant at the 10% level (t =-1.82).

In Panel G, the mean change in block ownership of the surviving spinoffs is 8.72% and that for non-survivors is 2.82%. The difference is significant at the 1% level. In a univariate regression (Panel J) the coefficient on the survivorship dummy is insignificant at traditional levels of significance. However, the results in the multivariate analysis differ (discussed below).

Panels H & I report results for terciles formed on the basis of vertical relatedness and industry complementarity. The results show that for spinoffs with greater vertical relatedness and industry complementarity with the parent the changes in block ownership are larger. In the case of vertical relatedness the change in the highest tercile of relatedness is 9.8% and in the lowest tercile is 5.4% (difference significant at 1% level) and in the case of industry complementarity the changes are 11.9% and 6.1% (difference significant at 1% level). In a univariate regression both measures of industry similarity are significant at the 1% with coefficients of -0.0717 (t = -2.24) and -0.0223 (t = -2.29).

The last two columns in Panel J show multivariate analyses of changes in ownership. Prior ownership remains highly significant. The coefficients on relative size and relative Q reduce in magnitude and the significance is lowered to the 10% level. This is probably due to relative size and relative risk being correlated to the beginning level of block ownership (refer footnote 19). Survivorship becomes significant at the 10% level.

Vertical relatedness remains significant and relative idiosyncratic risk remains insignificant.

A comparison of the adjusted R-square shows that prior ownership and relative size have substantially larger explanatory power than other variables – 23% and 8% respectively. Relative Q has an adjusted R-square of 3% and stock return correlation, 2%. In the multivariate specifications adjusted R-square is 26% and 28%. This compares favorably to the adjusted R-squared of 40% reported by Himmelberg et al (1999, in the cross-sectional specification) and 35% reported by Demsetz & Lehn (1985) for analyses of the level of block ownership. The comparable adjusted R-square for changes in block ownership is a direct demonstration that changes in ownership structure are determined to a significant degree by firm characteristics used in the literature as proxies for the monitoring requirements of firms.

Table 7, Panel A, presents regression models of the log of block ownership of the spinoff (year 1) and the pre-spinoff parent. I also report corresponding results for the matching firms. The manner and extent to which block ownership is explained by firm characteristics is similar for the spinoff and parent firms. Block ownership is significantly negatively related to firm size (market value of equity) and significantly positively related to idiosyncratic risk. For both parents and spinoffs, asset tangibility (measured by the PPE ratio), Q and the extent of capital expenditures are not significantly related to block ownership. In both models the management dummy is positive and significant. This is a dummy that takes on a value of 1 if the officers and directors of the firm own more than 25% of the voting rights of the firm. This dummy is included in order to explain what might otherwise be construed as abnormally high block ownership.

The extent to which leverage and survivorship are related to block ownership differs significantly for spinoffs and parent firms. For spinoffs, unlike the parents, leverage is significantly positively associated with the extent of block ownership. For spinoffs the survivorship dummy enters the model with a positive coefficient that is significant at the 10% level. The lack of a similar association for the relatively mature parent firms is not surprising. This is consistent with the argument that block owners are not making bets based on the expected survival of these mature firms. The adjusted R-square for the parent firms is uniformly higher than for the spinoffs.

Since the spinoffs are significantly smaller than their parents and in different industries the matching firms provide a more appropriate benchmark for comparing ownership structure. Results are in Table 7 Panel A. Like for spinoffs, block ownership of the matching firms is significantly negatively associated with firm size and positively associated with leverage. However, for the matching firms there is no positive association between block ownership and idiosyncratic risk and there is a significant positive association with Q. Like in the case of the parent firms the eventual survival of the matching firms is not a significant determinant of block ownership.

I find that firm characteristics explain block ownership to a higher degree for the spinoffs (adjusted R-square of 18%) than for the matching firms (adjusted R-square of 12%). However, when Q and block ownership are estimated simultaneously (discussed later in this section), this result changes.

Finally, I check the extent to which variation in the inherited block ownership i.e. the block ownership of the parent prior to the spinoff is explained by the characteristics of the spinoff firm. Except for idiosyncratic risk all firm attributes are insignificant in

explaining the prior block ownership. The significantly low(er) adjusted R-square of 7% suggests the extent to which the inherited block ownership is "inappropriate" for the spinoffs firm characteristics.

In order to test the hypothesis that the fit between ownership structure and firm characteristics improves with time, in Table 7, Panel B I present regression models of block ownership of spinoffs and matching firms for the first three years of the spinoffs' existence. Inconsistent with the hypothesis, there is no improvement in fit or significance of the explanatory variables. For the spinoff sample this could be due to high and divergent growth rates in the sample. However a similar trend for the matching firms suggests that this could be an industry phenomenon. Spinoff transactions cluster in industries that are experiencing technology or demand shocks. It is possible that for firms in such industries the fit between ownership concentration and firm characteristics worsens. However the declining trend in the adjusted R-square for the matching firms disappears when Q is endogenized.

One interesting result in Table 7 Panel B is that the significance of survivorship increases over time from 0.0356 (t = 1.72) in year 0 to 0.0855 (t = 3.42) in year 3. This is consistent with a rational expectations equilibrium in which block owners make bets based on the expectations of eventual survival.

When lagged ownership is added to the model, for spinoffs the coefficient diminishes in magnitude and significance as we go forward in time. In year 1 the coefficient is 0.36 (t =5.01), in year 2 it is 0.10 (t = 1.38) and in year 3 it is 0.057 (t =0.61). By contrast coefficients of lagged ownership for the matching firms remain large and significant, 0.80 in year 2 (t =12.32) and 0.71 in year 3 (t =10.11). Also unlike

spinoffs, in the case of matching firms, when lagged ownership is added all other variables are rendered insignificant and the adjusted R-square increases to the 70% level. Consistent with the correlation results presented earlier, these results show that ownership changes substantially less over time for the matching firms than for the spinoffs.

5.2 Difference in block ownership of spinoffs and matching firms

To test the hypotheses regarding the differences in block ownership of spinoffs and matching firms I run regressions of the difference in log of block ownership on corresponding differences in firm characteristics. Results are in Table 7 Panel C. In the first year only the difference in leverage is significantly related to the difference in log of block ownership. Differences in all other firm characteristics are insignificant. In the second year differences in firm size, idiosyncratic risk and the ratio of property, plant and equipment to assets are significant at the 10% level or better. The adjusted r-square jumps from 2.61% to 7.68%. In year 3 additionally the difference in the market-to-book ratio of assets and the long run survival of the company are also significant at the 10% level.

In a specification that includes the differences in a management dummy (variable that takes a value of 1 if management owns more that 25% of the firm) the variable is highly significant and renders most other variables insignificant. Also, the adjusted r-squared jumps to over 50%. Overall, the results suggest that the differences in ownership relative to the matching firms are more systematically linked to the differences in firm characteristics as the spinoffs season.

5.3 Ownership structure, firm performance and survival

The evidence to this stage clearly shows that there are significant changes in the ownership structure of spinoffs. The evidence also suggests that these changes occur in

ways that are consistent with efficiencies in monitoring. In order to examine the impact of changes in block ownership on firm value, I examine the effect of past changes in block ownership on firm survival and stock valuations[24],[25]. Since the market-to-book ratio of the spinoff firm is also a reflection of the history of the firm as a subsidiary I examine changes in the ratio rather than the level of the ratio. Results are in Panels A (firm survival) and B (changes in stock valuation) of Table 8.

For firm survival, the dependent variable takes a value of 1 if the firm's delisting code in the CRSP database as of December, 2003 is 100. I use the changes in block ownership over a 1, 2 and 3 year period to predict the eventual survival of the firm. In addition to the changes in block ownership, I include firm size and the level of block ownership. All else equal, the chances of liquidation and the ease of acquisition of a firm are lower the larger the firm. Also, all else equal, it is likely that acquiring a firm with highly concentrated ownership could be more difficult. I also include accounting and stock performance measures because poorly performing firms may be acquired or liquidated with greater probability. Finally I include idiosyncratic risk (also in log form) as a control variable.

I find that the changes in block ownership over a 2 and 3 year period are significant in explaining the eventual survival of spinoffs (p-values of 0.04 and 0.01). That the change in block ownership in year 1 is insignificant is not surprising given earlier results that show that block ownership continues to show significant average

[24] The existing literature on ownership offers few links between operating performance of firms and their ownership structure. Also, the existing literature on spinoffs suggests little change in the operating performance of these firms post-spinoff.

[25] I find no association between changes in block ownership and operating performance. Results available upon request from the author.

changes in year 2 (only about 60% of the three year change occurs in year 1) and has likely not reached a steady state.

Also the coefficient on the level of inherited block ownership is significant in years 1 and 2. It should be noted that all the firms are in the sample in all three years and therefore the growing significance of the block ownership variables is not a spurious result driven by selective survival. The coefficient on firm size is positive and significant in all three years and is not a surprising result. The adjusted percentage of deviation explained increases from 2.10% in year 1 to 7.50% in year 3 and can be mainly attributed to the increase in significance of the block ownership variables.

In Panel B of Table 8 I examine changes in the market-to-book ratio of spinoffs. Since the market-to-book ratio is available at the end of the first year of the spinoff firm these tests are constrained to years 2 and 3. In addition to the block ownership variables I include firm size, idiosyncratic risk and measures of accounting performance as control variables. The results show that changes in block ownership over the 2 and 3 year period are positively associated with changes in Q. However, the significance is marginal (T-stats of 1.57 and 1.69 respectively). The adjusted R-square of the model is low and of the control variables only the log of idiosyncratic risk is significant.

In Panel C of Table 8 I examine the log market-to-book ratio of the spinoff firm minus the log market-to-book ratio of the matching firm. As in the earlier regressions I include the following firm characteristics as control variables – firm size, idiosyncratic risk, ratio of capital expenditure to assets, ratio of property, plant and equipment to assets and block ownership. All variables enter as the difference of the log transforms. The difference in log of block ownership has a coefficient of 0.0673 and is insignificant in

year 1. In year 2 the coefficient jumps to 0.2597 and is significant at the 10% level. In year 3 the coefficient is 0.4264 and is significant at the 1% level. The results clearly demonstrate that as the spinoffs season and get closer to their equilibrium ownership structure the differences between spinoffs and benchmark firms in valuation are more systematically and significantly related to differences in ownership structure. The difference in firm size, idiosyncratic risk and capital expenditure ratios are significantly positive and the PPE ratio is insignificant.

The results above show that changes in the block ownership of spinoffs are positively associated with the likelihood of survival and the changes in the market-to-book ratio. However, these results do not provide any evidence on the level of the market-to-book ratio which is the traditional performance metric in the ownership literature. Therefore, following the literature I use a simultaneous equation framework that jointly estimates Q and the level of ownership. Results in an earlier sub-section show that Q of the spinoffs measured relative to the parents is a significant explanatory factor of subsequent changes in block ownership. Panel D of Table 8 shows the changes in block ownership of terciles formed on the basis of Q of the spinoffs in the first year (i.e. not measured relative to the parent). The decreasing trend shows that in addition to relative Q, raw Q is also a significant explanatory factor of three-year changes in block ownership. This clearly establishes the need for simultaneous estimation of the relation between Q and block ownership of spinoffs. I run similar models for the matching firms and compare the results to those of the spinoffs.

When the dependent variable is log of block ownership, the independent variables include the log of firm size (market value of equity), idiosyncratic risk, log of Q (the

market-to-book of assets), log of the ratio of capital expenditure to assets, log of the PPE ratio, log of book leverage and the management dummy. For the Q equation in addition to block ownership I include firm size (measured by sales), operating performance and idiosyncratic risk as explanatory variables. Following Himmelberg, Hubbard and Palia (1999) I use sales as a proxy for firm size. This is in order to avoid a spurious correlation that could arise if the book value of assets or the market value of equity (or assets) is used. Results are in Table 9.

The results show that in the Q equation the coefficient on block ownership of spinoff firms is negative in years 1, 2 and 3 but significant only in year 1. The magnitude of the coefficient decreases sharply from -1.3 to -0.46. Combined with the earlier results on the ***changes in Q*** this shows that block ownership of spinoffs adjusts so that as Q is marginally improved the relation between the level of Q and block ownership becomes insignificant over time. For the matching firms the corresponding coefficient is positive and insignificant and also shows a sharp fall in magnitude (from 0.51 in year 1 to -.14 in year 3). For the matching firms, the results are similar to earlier results documented in the literature of an insignificant association between ownership structure and firm performance in a simultaneous equation framework (Himmelberg et al 1999 and Demsetz & Villalonga 2001). Also for the matching firms the adjusted R-square of the block ownership equation improves from the 20% level to the 40% level and does not show the earlier decline observed in the OLS specifications.

6. Robustness and additional tests

6.1 Industry relatedness

The first test is with respect to the measures of industry relatedness. Table 10 tests the difference in industry relatedness between spinoffs with the same and different 1, 2 and 3-digit SIC codes as the parent. Panel A presents summary statistics of vertical relatedness and industry complementarity and Panel B tests the differences. Industry complementarity is significantly higher for same SIC code pairs than different SIC code pairs at all levels of the code (p-value = 1%). In the case of vertical relatedness the difference is significant at the 5% level for 2 and 4 digit codes and at the 10% level for the 3-digit code.

6.2 Share turnover

In the tests discussed in Section 5 I use the last recorded ownership structure of the parent firm as a proxy for the inherited ownership structure of the spinoff. Therefore it is not clear to what extent post-spinoff-announcement trading changes this inherited ownership structure. Specifically, there may be intensive trading between the record date and the effective date of the spinoff. In order the estimate the potential effect of this trading I record the parent firm's share turnover in the 10[26] trading days (record period turnover) immediately prior to the first day of trading of the spinoff shares and relate it to the changes in block ownership.

Table 11 Panel A reports summary statistics for record period turnover. Panel A also reports the ratio of the record period turnover to the turnover in the 10 day period immediately preceding it (called abnormal record period turnover). The average (median) ratio is 1.327 (1.172) and is significantly greater than 1 at the 1% level. . Table 11 Panel B reports regression results of changes in block ownership of spinoffs in the first year on

[26] The average duration of the period between record date and effective date is 15 days which translates into 10 trading days.

record period turnover, abnormal period turnover and control variables. Record period turnover is negative and marginally significant (t =-1.54). Abnormal record period turnover is negative and significant (t =-2.52). The negative sign is surprising since it suggests that the greater the abnormal record period turnover the smaller the subsequent changes in block ownership. When used jointly abnormal period turnover remains negative and significant. When used with other control variables both measures of turnover are insignificant and the adjusted r-square drops from 27.88% to 25.85%. Overall the results suggest that trading during the record period is not a likely driver of the results.

6.3Piece-wise linear regression model of market-to-book on block ownership

Morck et al (1989) find a piece-wise non-linear relation between the Tobin's Q and managerial ownership for a sample of large firms. They offer the argument that at low levels (0-5%) of managerial ownership increases in ownership enhance firm performance. In an intermediate range (5-25%) increases in managerial ownership cause entrenchment and at very high levels (>25%) the incentive effects outweigh the entrenchment effects. In order to check the potential evolution of a piece-wise linear relation between block ownership and market-to-book ratio of spinoffs I replicate their analysis. Descriptive statistics are in Table 12 Panel A and regression results are in Panel B (using block ownership) and Panel C (using managerial ownership). The table clearly shows neither a pre-existing pattern nor the evolution of a pattern similar to the one found by Morck et al. When the piece-wise linear ownership variables are added, none of them enters significantly and the adjusted r-squared falls sharply.

6.4. Survival

Survival defined as of a particular date (in this case Dec 31, 2003) treats earlier transactions differently from later transactions. In order to account for this effect I redefine survival as existence for a period of 3, 4 and 5 years after the transactions. Longer horizons are precluded due to a drop in sample size (for example a period of 10 years eliminates all transactions after 1993). The results are qualitatively similar – although the magnitude of the coefficient on the change in block ownership is lower the significance levels are comparable.

6.5 Abnormal returns

In the tests so far I use Q as the performance measure. The theory that uses Q as a performance measure bases its hypotheses on marginal Q. I use changes in Q as a proxy for marginal Q. Another potential measure is the abnormal stock performance. I first document the cumulative abnormal returns for three value-weighted portfolios formed on the basis of long-run survival of the spinoff – survivors, targets and delisted firms. The results are in Figure 2A. The results show that the surviving sample outperforms the other two samples in the first three years of the spinoffs' existence. Next, in Figure 2B I document abnormal returns for terciles of value-weighted spinoffs formed on the basis of changes in 1 year block ownership. Cumulative abnormal returns for the corresponding matching firms are also plotted. Spinoff 1 is for the biggest increase in block ownership and Spinoff 3 for the smallest. Match 1 plots matching firms CARs corresponding to the Spinoff 1 sample etc. As can be seen the only significant difference in performance is for the tercile with the largest changes in block ownership. At the end of 3 years the spinoff sample has a CAR of 57% compared to 27% for the matching firms.

In order to examine the abnormal stock performance of the stocks I form tercile portfolios based on 1 year changes in block ownership. The portfolios are value-weighted (using the market value of equity) and are long on the spinoff firm and short on the corresponding matching firm. I measure the alpha of each portfolio using a Fama-French 3 factor model. I find that the alpha of the portfolio with the largest changes in ownership is significant (t = 1.88) and the alphas of the remaining portfolios is insignificant. This lends support to the earlier results that changes in block ownership are positively associated with changes in Q[27].

6.6 Simultaneous estimation of Q and block ownership

Finally, for the simultaneous estimation of Q and block ownership I use a specification where all variables except firm size are in raw form instead of the log transforms. The results for the block ownership variable remain qualitatively similar.

7. Conclusions and future research

Unlike previous studies of ownership structure, I identify a setting in which the ownership structure of firms is expected to change significantly. For a set of newly spun-off firms, block ownership and managerial ownership change significantly and rapidly. Block ownership increases by 7 percentage points in the first 3 years of the spinoffs' existence. This increase occurs in a series of changes that get successively smaller. Managerial ownership of spinoffs also increases significantly from beginning levels and by the end of the third year is not significantly different from the managerial ownership of the parent firm. These changes are significant and larger than the corresponding changes in comparable non-spinoffs. All measures of ownership structure of the matching firms show little time-series variation.

[27] Results available upon request from author.

The size and market-to-book ratio of the spinoff firm measured relative to the parent, measures of industry and stock return relatedness, the eventual survival of the spinoff firm and the inherited ownership structure are significant determinants of changes in block ownership of spinoffs. Prior block ownership is negatively related to future increase in block ownership. Similarly the difference in firm characteristics of spinoffs and matching firms are more systematically and significantly related to corresponding differences in block ownership as the spinoffs season. The evidence regarding the changes in block ownership is consistent with the view that ownership structure adapts to changes in the nature of the firm. Regression analysis shows that the amount of variation of block ownership of spinoffs explained by firm characteristics is similar to comparable non-spinoffs.

I find that changes in block ownership are positively associated with the probability of survival and changes in Q. The difference in block ownership of spinoffs and matching firms is increasingly positively associated with the difference in market-to-book ratios as the spinoffs season. These results suggest that block holders either enhance firm value or possess superior stock picking skills. Alternatively it could be an artifact of high-Q firms requiring greater monitoring via more concentrated ownership structures. In a simultaneous equation framework where the relation between Q and block ownership of spinoffs is estimated jointly, block ownership affects the market-to-book ratio negatively. However, this relation is significant only in the first year. This is consistent with results in the literature regarding ownership and firm performance of mature firms – as spinoffs season they mimic the behavior of mature firms more closely.

The results have the following implications. First, the results constitute scarce new evidence of significant changes in ownership structure. Most previous studies focus on a static examination of ownership structure since it changes slowly through time. The evidence in this paper regarding the determinants of changes in ownership structure provides a glimpse of how ownership structure evolves in response to changes in the nature of the firm. The experiment is strengthened by the relative exogeneity of the spinoff decision to ownership structure. Second, the evidence has important implications for the time dependency of ownership structure. Though widely cited in the literature there is little systematic evidence of this aspect of ownership structure. A significant portion of the sample firms inherits a highly concentrated ownership structure and on average retains this structure. This is in stark contrast to those firms which inherit a diffuse ownership structure. While showing that the existing ownership structure affects future changes in ownership structure this also shows that, absent significant costs, more concentrated ownership structures are more efficient and are therefore retained. Third, the results on survival and performance constitute direct evidence that the ownership structure of firms can potentially play a significant role in the survival of the firm and its financial performance.

This paper uses summary measures of block holdings and abstracts from the issue of investor type. However, there is a growing literature that reflects the importance of type of investor. A dimension of ownership structure unexplored in this study is the type of investors in spinoffs. What types of new investors take up stakes in the firm? What types of investors tend to stay over from the parent firm and what type exit? How does this relate to firm characteristics? How does the rate of turnover of different types of

block holders in spinoffs compare to that in a set of matching mature firms? Do any of these aspects of ownership structure incrementally impact the performance of these firms or their survival?

A natural extension of the sample of this paper is to two-stage spinoffs, equity carve-outs and tracking stocks. Are the changes in ownership structure of carve-out firms different from those documented in this paper? The results regarding prior ownership structure suggest that there would be significant differences. Performance comparisons show that carve-outs perform better than spinoffs (Michaely & Shaw 1995). Is this difference related to ownership structure and the retention of control by the parent?

Another closely related topic is the examination of the changes in ownership structure of the parent firms around spinoffs. Exploratory findings in this direction suggest that the changes in the block ownership of parent firms are significantly smaller than those of the spinoffs. However spinoffs of large relative size and importance would reveal more interesting results.

Chapter 3[28]

1. Introduction

Notwithstanding the extensive literature on firm governance and mergers and acquisitions (M&A) there has been little positive inquiry into the formation of corporate boards around mergers. Recent literature on corporate boards reflects increased interest of scholars to study boards in a positive light. Boone, Field, Karpoff & Raheja (2004), Lehn, Patro & Zhao (2004) and Yang, Linck & Netter (2004) are some recent studies that examine the variation in board size and composition. However, these and similar studies do not examine the effect of mergers on the board structure of acquiring firms.

Our proposition is that the changes occurring in the board structure of the acquiring firm around a merger reflect systematic choices related to the effective monitoring of the combination of target and acquirer firm assets. Based on this premise we examine changes in the board structure of acquiring firms and test hypotheses regarding the determinants of these changes.

When firms merge, changes in firm size, asset mix and market strategies change the magnitude and nature of the agency problems that are the raison d'etre of corporate boards. The acquiring firm's reliance on the directors of the target firm (or other new directors) to address the changes in the scope and intensity of their monitoring task depends on the efficacy of the target board relative to the acquirer board and the competence and monitoring incentives of the individual directors of both firms.

Using a sample of 141 mergers in the banking industry during the period 1995-2000 we test hypotheses that relate the asset characteristics, firm performance, board structure and managerial ownership of the target and acquirer firm, to three dimensions of

[28] This chapter is co-authored with Prof. Kenneth Lehn and Prof. Gershon Mandelker.

the survivor board[29]. These include the size of the survivor board, the probability that at least one target director is hired (henceforth probability of representation) and the number of target directors hired (henceforth extent of representation) on the survivor board[30]

We focus on a single industry to build homogeneity in the nature of merger transactions as well as in the governance characteristics of the sample firms. Mitchell & Mulherin (1996) and Harford (2204) document significant industry-clustering in M&A activity. The variation in the reasons that underlie M&A clustering could potentially affect the ways in which boards change around mergers. At the same time, Gillan, Hartzell & Starks (2003) find that industry factors contribute to about half the variation in board structure. By focusing on mergers within a single industry we abstract from these effects and the complexities associated with them.

The banking industry is well-suited to this study for several reasons. First, the banking industry is a large and important part of capital and product markets. Second, in the 1990s M&A activity in the banking industry was extensive, enabling us to limit our study to a single industry[31]. Finally, there is a large literature that exclusively examines the governance of banks and mergers in the banking industry. Few other industries have received as much individual focus in the M&A and governance literature.

Our analysis yields the following results. The board size of the acquirer increases by an average of 14% and changes in composition are insignificant. After controlling for pre-merger board size, the board size of the acquirer post-merger is positively related to

[29] We use the phrase 'post-merger acquirer firm' and survivor interchangeably.
[30] The probability of representation is 1 if there is at least one target director on the survivor board, 0 otherwise. The extent of representation is the number of target directors on the survivor board.
[31] M&A activity in the banking sector is discussed in the next section.

the size, market-to-book and accounting performance of the target firm measured relative to the acquirer and the mean age of the target directors.

On average 1.8 target directors are hired to the survivor board and there is significant variation in this number. In 60% of the transactions there is at least one target firm director on the survivor board and in 40% of the transactions the target CEO is hired. Consistent with the existence of efficiencies in monitoring, we find that the firm size, accounting performance and market-to-book ratio of the target measured relative to the acquirer significantly explain the probability of representation and the extent of representation of target directors on the survivor board. Also, we find that the correlation of stock returns of target and acquirer is significantly negatively related to the probability of representation and the extent of representation of target directors on the survivor board.

In a logit model the target firm's board size does not influence the probability of representation after controlling for the firm characteristics mentioned above. This is consistent with the argument that the target board does not represent a default extension of the market for directors from which survivor board seats may be filled. However, the target board size is significantly positively related to the extent of representation of target directors on the board of the merged firm. This suggests that if the target firm board passes the bar and is therefore considered a part of the labor market from which directors are chosen, then ceteris paribus, the bigger the target board the larger the number chosen as part of the survivor board. After controlling for the firm characteristics mentioned above the composition of the target and acquirer boards and the geographical separation

of the target and acquirer do not influence either the probability or extent of representation.

We use the ownership stake and age of the directors as proxies for monitoring incentives and competence. We find that after controlling for other firm and board characteristics, the ownership stake of the target CEO is not related to the probability and extent of representation of the target directors on the survivor board. The ownership stake of the remaining officers and directors of the target firm is unrelated to the probability but significantly negatively related to the extent of representation of the target directors on the survivor board. The last result is puzzling and may be caused due to these members of the target board cashing their stakes at the time of the merger[32]. The mean and median age of the directors has no explanatory power.

The results are robust to sub-sampling based on the relative size of the target and are also robust to different methods for handling multiple acquisitions by the same acquirer. Combined with the high explanatory power, (adjusted R-square of 70% for the number of directors hired and adjusted percentage deviation explained of 40% for the probability that at least one director is hired) the results support our proposition that board formation around mergers reflects systematic choices related to efficiencies in monitoring.

The rest of this paper is organized as follows. In the next section we discuss boards of banks, M&A activity in the banking industry and develop hypotheses. Section 3 describes the sample formation and data collection steps. Section 4 presents empirical results. Section 5 provides concluding comments.

[32] It is hard to test whether the sale of stake is simple due to the merger or due to not being hired as a survivor director.

2. Corporate boards and M&A in the banking industry

2.1 Boards of banking firms

Although the mandate of a bank's board is the same as that of a manufacturing firm, the task of a bank's board is arguably different due to the specific nature of banking activity. Morgan (2002) argues that the assets of banks are more opaque than those of manufacturing firms. On the one hand this may be caused due to lending to opaque borrowers – by definition banks in their role of intermediaries are supposed to lend to borrowers who need greater screening and monitoring (Diamond 1983). On the other hand the trading positions of banks are hard to monitor because the highly liquid nature of the assets makes the positions easily changeable (Morgan, 2002). Morgan (2002) finds support for the opacity argument in the greater disagreement between rating agencies regarding bank debt and the systematically lopsided nature of bank debt ratings.

Flannery (1994) and Morgan (2002) argue that the traditionally high leverage of banks could lead to significant asset and risk substitution problems (Galai & Masulis (1976), Jensen & Meckling (1976).This is especially true given the existence of a significant fraction of liquid trading assets in a bank's portfolio. The combination of opacity of assets and high leverage can create greater potential for agency conflict in banks compared to the average manufacturing firm. This could mean that the board of a banking firm has a more difficult governance role than a non-financial firm.

Booth Cornett & Tehranian (2002) argue that the greater regulation of banks may act as a substitute monitoring mechanism. They interpret the relatively weaker correlations (compared to non-financial firms) among different governance mechanisms of banks as evidence consistent with this hypothesis. On the other hand it is well-

accepted that there are greater costs to market discipline of banks compared to non-financial firms (Prowse (1997), Morgan (2002), Adams & Mehran (2003)). These authors argue that it is regulation which increases the costs of market discipline of banking firms relative to firms in non-regulated industries. Given the recent interest in deregulating the banking industry the efficacy of regulation as a substitute for market discipline is not without question. Given the focus on bank boards in the literature and its content we find little reason to believe that the boards of banks serve a function any less important than the boards of non-financial firms.

In comparing the governance of banks and manufacturing firms Booth, Cornett & Tehranian (2002) and Adams & Mehran (2003) find that bank boards are larger and more independent. Adams & Merhan (2003) offer the explanation that the number of parties with a stake in a bank's activities could complicate governance in a way that leads to larger boards.

In a study of firm performance Adams & Mehran (2002) find that, similar to non-financial firms (Hermalin & Weisbach (1991), Klein (1998), Bhagat & Black (2000)) the composition of bank boards is unrelated to measures of accounting performance and the market-to-book ratio. However, contrary to Yermack's results (1996) they find that the size of bank boards is positively related to the market-to-book ratio. Belkhir (2004) finds a similar result.

Adams & Mehran (2002) offer the suggestion that, given their empirical findings, limiting the board size of banks may prove counterproductive. Belkhir (2004) argues that the observed relation may be spuriously caused by increases in board size around

mergers[33]. However, Adams & Mehran (2002) point to a decreasing trend in board size in the 1990s as being inconsistent with Belkhir's (2004) conclusion.

2.2 M&A activity in the banking industry

In their study of M&A in the banking industry during the 1990s Becher & Campbell (2004) find that in the first half of the decade bank mergers were facilitated by reciprocal banking agreements (regional compacts) between states. In 1994 Congress passed the Riegle-Neal Interstate Banking and Branching Efficiency Act which essentially allowed banks to acquire out-of-state banks and to branch into other states without the permission of the host state. Becher & Campbell (2004) argue that this deregulation was the driving force behind the mergers in the second half of the 1990s.

Houston, James & Ryngaert (2001) study a sample of large bank mergers (mega-mergers) from 1985-96. They find that mega-mergers during their sample period were associated with significantly positive wealth effects, attributable mainly to cost savings. Becher & Campbell (2004) confirm the results of Houston et al for the first half of the 1990s. In addition they find that mergers in the second half of the 1990s are significantly value-decreasing. The distinguishing factor between these two periods is the degree of branch overlap with mergers in the second half of the 1990s having a lower degree of overlap and therefore lower cost savings. Berger, Demsetz & Strahan (1999) provide a detailed survey of the literature that examines gains from banking mergers. Overall, the results suggest that the sources of gains in banking mergers are as varied and hard to identify as in mergers of non-financial firms.

[33] Belkhir finds an average increase of 2 directors for a doubling in firm size.

2.3 Hypotheses

For a merger to be productive there must be effective integration of the merging entities. The degree of integration necessary may vary depending on the motivation for the merger and the size of the merging entities – for example realizing operational synergies or merging operations of large relative size arguably requires more careful integration than realizing gains from market power or merging operations of small relative size. The more difficult it is to integrate the merging entities, the more crucial the monitoring and advisory role of the board.

We hypothesize that a rational response to a greater monitoring and advisory role is a more 'co-operative' board i.e. with greater participation of target directors on the board of the merged firm. This is because a co-operative board would have a broader spectrum of expertise that better covers both acquirer and target assets. We use relative size, the relative market-to-book ratio and the correlation in stock returns of acquirer and target to capture complexities in the effective integration of the merging entities.

Additional measures of the complexity in integration that are of particular interest in commercial banking operations are the geographical separation of branch operations (Houston, James & Ryngaert 2001) and the composition of assets. In order to capture the geographical dispersion we check if both target and acquirer are in the same state or different states. To capture differences in asset composition we calculate distance measures based on the ratio of loans to total assets and the composition of loans into three categories – loans to individuals, industrial loans and real estate loans.

Although we hypothesize that a more co-operative board is desirable for a smoother transition around complex mergers this is not without a caveat. If the target

directors are of relatively poor quality then the optimal response may be to increase the acquirer's board size via directorial talent from the labor market. For example this could be true of a merger where the main motivation is disciplining the target management team. Our primary measures of the quality of the target board are firm performance and the ownership stakes of the board members. Firm performance reflects the competence of the target board and the ownership stake reflects (at least on an ex-ante basis) the incentives of the target directors.

3. Sample

Using the SDC Platinum database we form an initial sample of all mergers with announcement dates during the period 1995 through 2000. We use the CUSIP identifier to link the sample firms in SDC to the CRSP database. In order to restrict the sample to the commercial banking sector we select only those transactions where both the target and the acquirer have a CRSP 2-digit SIC code of 60 at the time of the merger. This yields a total of 518 transactions. We match the names of the acquirer and the target in SDC to the names in CRSP to ensure that the sample firms are correctly identified.

Because we need stock returns and accounting information we require the target and the acquirer bank to be listed in both CRSP and COMPUSTAT. This requirement eliminates 233 transactions. For the remaining 285 mergers we read news stories on Factiva to ensure that the acquirer and target are properly matched and that the deal was completed. We drop two transactions because there are no news stories available on Factiva and one because it was later cancelled. Four transactions are dropped because the target bank is listed multiple times in the SDC Database with different acquirer names and information on Factiva and CRSP is inadequate to correctly identify the merger. Two

transactions are dropped because the target was a subsidiary of the acquirer. Two transactions are dropped because the acquirer is delisted from the CRSP database before the target and three are dropped because the SDC merger announcement date is later than the CRSP delisting date for the target. Thus a total of 14 transactions are dropped. This leaves a total of 271 transactions for which news stories and CRSP/COMPUSTAT information are available.

We collect data on the board of directors from electronic proxy statements available in the Lexis-Nexis database. For each merger we require that a proxy statement be available no more than 1 year before the effective date of the merger for both acquirer and target and no more than 1 year after the effective date for the acquirer. This requirement is imposed in order to capture board characteristics before and after the merger as accurately as possible. A longer window increases the likelihood of other events that may affect board structure. As a result of imposing this requirement we are left with a final sample of 141 mergers. Table 13 reports the year-wise distribution of the sample of mergers.

From each proxy statement we collect the name, age, tenure, ownership and committee membership of each director and the total ownership of the board members. From the post-merger proxy statement of the acquirer we identify directors who come from the target firm and new additions to the acquirer board. We identify the CEO and chairman of the company and have a variable to indicate if the two are separate. We classify directors from each of the three proxy statements for every transaction into three classes listed – insiders, independent outsiders and gray directors. Gray directors are those who have material transactions with the firm in the period surrounding the merger.

4. Results

4.1 Descriptive statistics

Table 14 reports summary firm characteristics of the acquirer and target sample. The median asset size of the acquirers is $12.1 and of the targets $1.0 billion. The median market value of equity is $2.2 billion for the acquirers and $0.2 for the targets. Flannery, Kwan & Nimalendran (2001) report a mean market value of equity of $0.36 billion for a sample of 332 banks during the period 1990-1997. The targets in this sample are on average somewhat smaller than their sample and the acquirers significantly larger.

The mean return on assets (ROA) of the acquirer (target) sample is 2.9% (2.6%). These figures are higher than the average of 1.07% (0.87%) reported by Houston, James & Ryngaert (2001) for acquirers (targets)[34]. The average (median) market-to-book of assets of the acquirer sample is 1.127 (1.107) and of the target sample 1.083 (1.080). The average (median) market-to-book of equity of the acquirer sample is 2.586 (2.410) and of the target sample is 1.955 (1.860).

The ratio of target ROA to acquirer ROA has an average (median) value of 92.2% (90.5%). The ratio is significantly below 1 at the 1% significance level. Similarly the mean ratio of the market-to-book of assets (equity) of the target firms to that of the acquirer firms is less than 1 at the 1% (1%) significance level. These results suggest that the acquirer firms are, on average, better performing than the targets.

Table 15 reports summary statistics of the geographical separation of acquirers and targets and for a sub-sample of acquirers and targets, details of the loan portfolio. Geographical data is obtained from the proxy statement. Table 15, Panel A shows that in 66 transactions both target and acquirer are from the same state. For the same state

[34] Flannery et al do not report the ROA in their sample.

transactions the probability of at least one target director being hired is 0.73, significantly higher than 0.49 the probability when both are from different states (p-value = 1%).

Loan data is obtained from the Chicago Federal Reserve (Chicago Fed) collection of quarterly call reports submitted by banks and bank holding companies to the Federal Reserve Board and is available for only a sub-sample of firms. Some of the firms that are identified as banks by CRSP are not listed in the Chicago Fed database. In some cases although the company is listed in the Chicago Fed database the data items are not available in the call reports or the call reports themselves are unavailable. All data items are available for 109 acquirers and 54 targets and for 46 acquirer-target pairs.

Table 15 Panel B reports the ratio of loans to total assets. Panel B shows that the ratio of loans to total assets is approximately the same for the acquirer and target sub-sample, with a mean around 60%. A pair-wise comparison shows that the mean (and median) ratios are insignificantly different. However a look at the composition of loan portfolios shows significant differences. Panel C reports the composition of the loan portfolio of acquirers and targets. Three components are reported - the loans that are made to individuals as a fraction of total loans, the fraction of real estate loans and the fraction of industrial and commercial loans made. The classes of loans used here conform to the classification used by banks in their reports to the Federal Reserve Board.

Panel C shows that acquirers make a larger fraction of loans to individuals (mean 17.30%) than targets (mean 11.17%). The proportion of industrial loans is higher in the acquirer sub-sample (mean 22.71%) than for targets (mean 17.55%). Also, targets have more real estate loans (mean 68.49%) than acquirers (mean 56.31%). A pair-wise comparison shows that the mean and median ratios are significantly different at the 1%

level. The two other classes of loans used in the call reports i.e. lease financing receivables and agricultural loans are a negligible fraction of the loan portfolio for both acquirers and targets and are therefore omitted from the analysis.

In order to capture the differences between the loan composition of the acquirer and the target I compute the following distance measure.

Comp_distance = Abs(Fraction of loans to individuals acq. – fraction of loans to individuals target)
+ Abs(Fraction of real estate loans acq. – fraction of real estate loans target)
+ Abs(Fraction of industrial loans acq. – fraction of industrial loans target)

I also compute the following distance measure to capture differences in the asset profile of the acquirer and target.

Loan_distance = Abs(Fraction of loans in total assets acq. – Fraction of loans in total assets target)

Summary statistics are in Table 15 Panel D.

Table 16 reports summary statistics of the boards of the pre-merger acquirer and the target samples. The acquirer boards with a mean (median) size of 14.62 (13.50) and mean (median) fraction of outsiders of 61.04% (60.00%) are in line with statistics reported by Houston, James & Ryngaert (2001) – for a sample of larger banks they report an average board size of 16 and % independent outsiders of 58% (the classification of outside directors in this study is closer to their definition of independent outside directors than all outside directors).

Consistent with their larger size, acquirers have larger boards, lower CEO ownership and lower total ownership of board members compared to target firms. The median board size of 10 for targets is significantly smaller than that of acquirers at the 1% level. CEO ownership and ownership of all board members of targets are each more than twice that of the corresponding figure for acquirers (differences significant at the 1%

level). The average of the median board age is approximately 60 for both target and acquirer. Median tenure of target directors at 10.61 years is larger than 8.44 years for acquirer directors (difference significant at the 1% level).

Consistent with the larger board size of the acquirers the fraction of insiders is smaller than that of targets (difference significant at the 1% level). The leadership structure of the boards of the target and acquirer are significantly different. For the acquirers the CEO and chairman positions are separated in 33 (23%) cases. For targets this figure at 69 (49%) is significantly higher (P-value 1%).

4.2 Changes in the acquirer board

Table 17 compares the acquirer board before and after the merger. The number of directors increases from an average (median) of 14.62 (13.50) to 16.21 (16.0). The difference and the % difference in board size are significant at the 1% level. 86 (61.0%) of the acquirers have an increase in board size post-merger, 30 (21.3%) have no change and 25 (17.7%) have a decrease. The proportion with an increase (decrease) in board size is greater (lesser) than 0.5 at the 1% level. Changes in board composition are smaller – insiders form an average (median) 16.9% (16.2%) of the board before the merger and 15.9% (15.4%) after. The change in % insiders is significant at the 5% level. However, the % of outsiders remains roughly the same at 60% and the change in % outsiders across the merger is insignificant.

In 85 (60%) out of the 141 transactions there is at least one target director on the survivor firm board. This proportion is greater than half at the 2% level. The average number of directors on the survivor board from the target board is 1.8. This is actually greater than the average increase in the board size of 1.64 and is not surprising given the

fact that some acquirers actually reduce their board size post-merger. The target CEO is chosen to be on the survivor board in 56 (40%) out of the 141 transactions[35]. The conditional probability of the CEO being chosen to the survivor board of 0.66 (56/85), is significantly greater than half at the 1% level. The unconditional probability that the target CEO is hired is less than half at the 2% level.

4.3 Size of the survivor board and, probability of representation and extent of representation of target board on survivor board

We hypothesize that the survivor board is formed by changing the acquirer board to an extent determined by the scale and complexity of the merger. Therefore in the regression model for the board size of the survivor we include the pre-merger acquirer board size as a control variable and add proxies for the scale and complexity of the merger. Table 18 reports regression results for the size of the survivor board. After controlling for the size of the acquirer board pre-merger, the size of the survivor board is positively related to the size of the target board, and the relative size, market-to-book ratio and return on equity of the target.

The significance of firm characteristics, after controlling for the board sizes of both acquirer and target, in predicting survivor board size, implies that the survivor board is not a simple union of the two boards. The coefficient of 0.043 on relative firm size (P-value = 0.00) and 0.079 on the market-to-book (P-value = 0.07) ratio imply that a larger survivor board is required for mergers with relatively larger and higher growth targets. The positive coefficient of return on equity of the target (P-value = 0.00) is consistent with the argument that better performance of the target firm leads to more directors being

[35] It is a coincidence that 85 the number with at least one director and 56 the number with the CEO adds up to 141 the sample size.

hired from the target board which in turn leads to a bigger survivor board. The positive coefficient of the mean age of acquirer directors (P-value = 0.06) may be due to the creation of additional capacity to account for retirements. A similar result for the target directors suggests that in a merger scenario more experienced target directors are valued more.

The coefficient of 0.086 on target board size (P-value = 0.00) suggests that a bigger pool of potential directors increases the probability that an addition is made. However the positive coefficient may also be driven by some large and well-performing target boards contributing a large number of directors to the survivor board. This is further examined below.

Table 19 reports results of logit regressions for the probability of at least one target director being chosen to the survivor board. As mentioned earlier in 85 out of 141 (60.3%) transactions at least one target director is hired to the acquirer board. The probability is positively related to the relative size of the target (t = 4.96), the relative performance of the target (t = 2.58) and insignificantly related to the relative market-to-book ratio of the target. However the probability is significantly negatively related to the stock return correlation. This suggests that directors of targets whose stocks are similar i.e. have greater co-movement with the acquirers' stocks are less valuable and therefore less likely to be hired to the survivor board.

The second and third columns of Table 19 show results for the sub-sample for which the loan distance and composition distance measures are available. The loan distance measure is negatively related to the probability of representation. This runs contrary to the result for stock correlation since greater distance means that the

companies are more dissimilar (stock return correlation remains negative and significant for the sub-sample). The result suggests that greater differences in asset profiles makes the directors of the target less likely to be hired and less valuable. Similarly, composition distance has a negative coefficient but it is insignificant. For these two specifications the relative market-to-book ratio of the target is positively related to the probability of survival. A similar result obtains when the only the stock return correlation is used for this sub-sample.

The probability of representation is associated positively with the acquirer board size. This is consistent with the argument that the marginal cost of adding a board member is lower for bigger boards. This is also consistent with the argument that certain boards follow a style of adding board members following mergers. Such board could grow large over time and their continued practice may result in the positive relation between existing board size and the probability of hiring a new director from the target firm.

The probability of representation is insignificantly related to the target board size. This result holds both in a univariate regression and in specifications with alternative sets of control variables. The result is consistent with the argument that a bigger board does not necessarily mean a larger pool of potential directors. Instead, whether or not a pool of directors constitutes potential candidates for the survivor board is more importantly conditioned on the competence of the board. This result is all the more striking given prior results for banks, that bigger boards are associated with better performance (Adams & Mehran, 2002 and Belkhir 2004)[36]. On the other hand, if the Yermack (1996) results

[36] When we replicate the regressions of Adams & Mehran (2002) and Belkhir (2004) we find no significant correlation between the market-to-book ratio and board size for both the target and acquirer sample.

were assumed to hold for banks, i.e. firms with smaller boards performed better then the poorer performance of a larger board would offset the higher probability of hiring due to a larger pool of directors and thus would lead to the insignificance of target board size in the regression. The ownership of the target CEO and, the ownership of the directors and their age (both acquirer and target) are not significant in any of the specifications. Finally, although the same state dummy is significant in univariate tests, in a multivariate setting it loses its significance. This could be partly due to the reason that same state mergers are significantly larger (median relative market value of equity =15.55%) compared to across state mergers (median relative market value of equity =8.69%)

Table 20 presents regression results (Panel A) for the number of target directors hired to the survivor board. Because this variable is discrete we also use a Poisson regression (Panel B). For the (OLS) Poisson model the dependent variable is (log) one plus the number of target directors hired. For the specifications that use the full sample the number of target directors hired is positively related to the board size of both acquirer (t =3.49 OLS, t =2.22 Poisson) and target (t =2.21 OLS and t =2.61 Poisson), relative size (t = 9.72 OLS, t =7.85 Poisson) and relative accounting performance measured by return on equity (t = 3.45 OLS, t = 3.01 Poisson) of the target. Similarly, the relative market-to-book ratio of the target is positive and marginally significant in both models (t =1.73 OLS, t =1.88 Poisson). These results are consistent with the scope, complexity and competence arguments made in the section on hypotheses development.

The ownership of the board members of the acquirer is positively associated with the number of target directors hired in the OLS specification (t = 1.70 OLS, t = 2.26 Poisson). This result is intuitive from different viewpoints. On the one hand greater

ownership by the incumbent board members represents better incentive alignment. This could prompt the rational response of a more 'co-operative' board. On the other hand it is possible that greater ownership by the incumbent board members shields them (and the firm) from a potential conflict due to the presence of a significant number of target directors.

The coefficient on the ownership of the target board members is consistently negative and significant (t =-2.10 OLS, t =-2.22 Poisson). One possible interpretation of this result is that targets with greater ownership have entrenched management (Morck, Shleifer & Vishny) and mergers involving such targets have more of a disciplining stance. The probability of target directors being hired when the merger is for disciplining reasons is low. An alternative explanation is that when targets with highly concentrated ownership, typically small and family-owned signal a willingness to merge, the owners could be simultaneously exiting the business. Banking deregulation and the attendant shakeout during this period could play a significant role in motivating such a desire. Finally we find that the state dummy, the ownership of the target CEO and the age of the target and incumbent directors have no explanatory power. For the smaller sub-samples for which the loan and composition distance measures are available the results are mixed. Relative size, relative ROE and the ownership of the target directors are the variables that are consistently significant. The distance measures are insignificant.

The adjusted r-square (percentage of deviation explained) of the model that uses the full sample is 65.21% (73.85%). For the smaller sub-samples the r-squared of the OLS specifications are actually higher at 78.26% and 78.67% but significantly lower for the Poisson models.

4.4 Robustness

4.4.1 Multiple acquisitions – The results so far assume that transactions are independent even when there are multiple acquisitions by the same acquirer. To account for the potential effects of clustering the following algorithm is used. Any acquisitions by the same acquirer that occur within 2 years of each other (i.e. with effective dates separated by less than two years) are classified as consecutive acquisitions. If there is a series of such acquisitions during the sample period then the whole series is classified as consecutive acquisitions. Target, acquirer and survivor, firm and governance characteristics in consecutive acquisitions are calculated as follows.

1. Targets – All the targets in a set of consecutive acquisitions are pooled to form a single target. Weighted averages of all firm and board characteristics are calculated using targets' market value of equity as weights.
2. Acquirer – Acquirer firm and governance characteristics are recorded at the time of the first acquisition.
3. Survivor – Survivor firm and governance characteristics are recorded at the time of the last acquisition. The number of target directors hired is the sum of the number of targets directors hired from all targets in the series.

This method of handling multiple acquisitions is superior to using a dummy for subsequent acquisitions because a dummy variable would not capture the size and importance of the subsequent acquisitions. To the extent that these acquisitions are planned they may have a significant impact on the choice of directors from the current target. Considering only the last acquisition would be incorrect for similar reasons. In the

method described above all acquisitions are taken into consideration and are duly weighted.

Using the method of pooling described, the frequency of acquisitions is shown in Table 21, Panel A. Because of the pooling there are a total of 87 transactions. Using this sample of 87 transactions we replicate the following regressions, board size of the survivor, and probability and extent of representation. Results are in Table 21, Panel B.

Column 1 shows that results for the survivor board size are similar to the regression results where each acquisition is treated as an independent observation. The following coefficients are different - the age variables lose their significance and the acquirer board ownership is significant and positive where earlier it was insignificant and positive. The r-squared at 72% is higher than that for the un-pooled sample (68%). The results in Column 2 for probability of representation are similar to the whole sample results. The target board size continues to be insignificant. The significance of the other variables remains largely unchanged. Column 3 reports results for the number of target directors hired. The significance of the main explanatory variables remains similar to the whole sample results. The result that the target ownership is negatively related to the number of directors hired still holds. Mean age of target directors is significant in the OLS. Overall, from Table 21 it is clear that the results are not driven due to clustering of acquisitions with some targets.

4.4.2 Specification – This robustness test is related to the use of relative firm characteristics in the regression model. The arguments in the hypotheses section are made on the basis of relative firm characteristics since the acquirer board is already in existence and the target directors are incrementally added. However, it is possible to have a less

restrictive model in which acquirer and target characteristics are not constrained to have the same magnitude of coefficients. The regression results when acquirer and target characteristics enter the model independently are similar to the results obtained using relative firm characteristics with the target and acquirer characteristics usually having opposite signs.

4.4.3 Filter based on relative size – For relatively small targets the ex-ante probability of a target director being hired is low. Therefore some of the variation that is induced in the probability and extent of representation may be "artificial". Therefore I apply a relative size dummy – a variable that takes on a value of 1 for transactions where the market value of equity of the target is less than 5% of the market value of equity of the acquirer. The results are similar and the relative size dummy is insignificant.

4.4.4 Consideration – It is possible that variation in the method of payment i.e. cash versus stock could affect the hiring of target directors. For example if the target directors own significant amounts of stock then a stock swap may increase the probability of hiring target directors since they may be large shareholders of the acquirer.

Table 22 shows the mode of payment for the acquisitions. The sample consists of mainly pure stock deals (90%). There are 6 transactions where the target shareholders have a choice of either cash or stock and 5 where it is a fixed combination of cash and stock. The 4 cash deals are for Cornerstone Financial (acquired by BayBanks Inc.), Corpus Christi Bancshares (acquired by Cullen/Frost Bankers Inc.), CSF Holdings Inc (acquired by NationsBank) and Transworld Bancorp (acquired by Golden State Bancorp). The relative market value of the target in these acquisitions is quite small (0.66%, 2.54%,

1.15% and 7.18% respectively). Inclusion of a dummy variable for consideration type does not change any of the results.

5. Conclusions

We study boards of 141 acquiring firms and their targets in the banking industry. Boards of acquiring firms change significantly around the merger – board size increases by an average of 1.6 directors (14%), an average of 1.80 target directors are added to the survivor board, in 60% of the transactions there is at least one target director added to the survivor board and the CEO of the target is chosen in 40% of the transactions[37].

After controlling for pre-merger board size we find that the board size of the acquirer post-merger is determined by the relative size, relative market-to-book ratio, the relative accounting performance and board size of the target firm and its similarity to the acquirer as measured by the correlation of stock returns. The probability of hiring at least one target director and the number of target directors hired are similarly affected by these factors. Interestingly, though, the probability of hiring a target director is unaffected by the target board size. This suggests that the competence of the target board rather than its size comes into play and that there exist disciplining stances even in the so-called 'friendly' mergers that were typical of the banking industry during this time.

The ownership of the board members of the acquirer is positively related to the formation of more co-operative boards (i.e. boards with target directors). However, the ownership of the target board members is negatively associated with the number of target directors hired. This result could be driven by owners of small targets i.e. those with high ownership concentration exiting the business at the time of the merger.

[37] The changes in board composition are marginal.

Overall the results are consistent with the argument that board formation around mergers reflects choices aimed at efficiently tackling the monitoring task that is the responsibility of the board. In providing support for this proposition our paper extends the recent literature on corporate boards that examines the variation in their size and composition. Although we document that board size increases after mergers, we do not compare the board size to that of similar sized firms that were not involved in a merger. This would be useful in informing researchers if the boards of acquirers are larger in comparison to stand-alone firms. If this is indeed the case then the poorer performance of acquiring firms and their larger board size may throw light on the well-documented but puzzling negative relation between board size and firm performance.

Chapter 4

Conclusion

This dissertation examines changes in two important governance mechanisms – ownership structure and board structure, around restructuring events. Ownership structure is one of the most important external governance mechanisms and has held researchers interest since Berle & Means (1933). Board structure is one of the most important internal governance mechanisms and there is a large literature which reflects this importance (Hermalin & Weisbach, 2003). Together, these monitoring mechanisms are the most important means to mitigate agency conflict between shareholders and managers. The first essay of this dissertation examines the evolution of ownership structure of corporate spinoffs and the second examines changes in the board structure of acquirer banks around mergers.

Although the literature on each of these governance mechanisms is extensive there is little direct examination of the evolution of these mechanisms. A major obstacle to such examination is that firm governance changes slowly over time, making study expensive. Therefore the traditional approach has been to use a cross-section or panel of firms that are large and usually considered to be in equilibrium to establish reduced form results relating firm governance to proxies of monitoring requirements. This dissertation departs from this approach by focusing on the evolution of these governance mechanisms.

The choice of restructuring events is driven by their appropriateness to the mechanism under study. I choose corporate spinoffs to study ownership structure. Spinoffs inherit the ownership structure of the parent from which they are spun-off. This creates a unique natural experiment since the ownership structure remains the same but

all the aspects of firms that serve as proxies for monitoring requirements change sharply. Spinoffs are usually smaller, riskier, have significantly different growth potential and are usually in different industries. Existing theories of the endogenous determination of ownership structure suggest that the ownership structure that the spinoff inherits at the time of its inception should adapt to its firm characteristics. Empirical tests reveal that it does.

Using a sample of 117 transactions in the period 1980 to 2000 I find that the ownership structure of spinoffs changes rapidly and significantly. Average block ownership of spinoffs increases from an inherited level of 20.34% to 27.35% by the third year of the spinoffs' existence. Similar large changes are observed for managerial and CEO ownership. Spinoffs begin with a level of block ownership that is significantly below the block ownership of a set of mature matching firms and in a series of progressively smaller changes have a level of block ownership that is insignificantly different from that of the matching firms by the third year. This set of results marks the first contribution of this essay – there are significant changes in ownership structure when the situation warrants them.

The changes in the block ownership of spinoffs are significantly related to firm characteristics that are used in the literature to explain the level of block ownership. These characteristics include, firm size, firm risk, market-to-book ratio, measures of industry similarity and the long run survival of the firm. Similarly, differences in the block ownership of spinoffs and the matching firms are increasingly significantly related to corresponding differences in firm characteristics. The adjusted r-squares of these regressions are comparable to those of models of the level of block ownership. These

results are the second contribution of this study – the significant changes in ownership structure of spinoffs occur in response to the changes in monitoring requirements of these firms.

Finally I find that the changes in block ownership of spinoffs are positively associated with the changes in the market-to-book ratio and the long-run survival of the firm. Similarly, the difference in block ownerships of spinoff and matching firms are increasingly positively related to the differences in the market-to-book ratio. These results are important since they confirm that the increasing block ownership of spinoffs is consistent with value-enhancements and does not simply entrench management or otherwise prevent takeovers.

In the second essay my co-authors and I use mergers and acquisitions to study the board structure of acquirer banks. Mergers typically lead to an increase in the acquirer's size and complexity. This changes the monitoring task of the board of directors of the acquirer. We focus on banks in order to abstract from industry differences in firm governance and specifically board structure. The extensive wave of bank mergers in the second half of 1990s facilitates limiting the study to one industry. Our proposition is that forming a more co-operative board is value enhancing, provided the target board is effective. Therefore, we examine the determinants of the board size of the merged firm, the probability that at least one target director is hired and the number of target directors hired.

Using a sample of 141 mergers we find that that there is a significant 14% increase in acquirer board size and insignificant changes in its composition. After controlling for the target board size and the pre-merger acquirer board size we find that

the board size of the merged firm is positively related to the relative size and performance of the target and the mean age of the target and acquirer directors. The probability that at least one target director is hired is similarly positively related to the relative size and accounting performance of the target and the ownership of the acquirer directors after controlling for the acquirer and target board size. Greater similarity of target and acquirer as measured by the correlation of stock returns of acquirer and target in the pre-merger period is negatively related to the probability that a target director is hired. Most notably the target board size has no explanatory power.

After controlling for target and acquirer board size the number of target directors hired is positively related to the relative firm size, accounting performance and market-to-book ratio of the target and negatively related to the stock return correlation of acquirer and target. The ownership of the target directors is negatively related to the number of target directors hired and is consistent with a disciplining argument as well as exit of target directors of smaller, family owned banks. Although geographical separation matters in univariate tests, in multivariate settings it has no significance. Similarly, for a sub-sample of banks with loan composition information differences in the loan portfolio have no significance in determining either the probability or extent of representation of target directors.

The results regarding the rational variation in the choice of target directors combined with the fact that the average number of target directors hired is greater than the average increase in the acquirer board size suggests that although board size of acquirer banks increases around mergers it does so for good reasons.

The combined results of the two essays establish the following empirical regularity – firm governance changes around events that cause changes in governance requirements. Failure in recognizing this feature of firms and their governance mechanisms could results in errors in measuring the impact of governance on firm performance and ultimately may result in misguided policy decisions.

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Appendix A

Conditions for a spin-off to be a tax-free transaction

According to IRC Section 355, unlike dividends in kind, a pro-rata distribution of a spin-off firm is tax-free, provided the following conditions are met:

1. The distributing company (parent) must have control of the spin-off firm. This is in order to ensure that the holders of the spin-off shares will be substantially the same as the holders of the parent company.
2. A minimum of 80% of the ownership of the spin-off firm is distributed. This is in order to ensure that an independent company is created.
3. The parent and the spin-off should have been involved in the active conduct of business during the 5 years preceding the distribution date.
4. There must be a valid business purpose for the spin-off.

Conditions for a spin-off to not be registered as a sale

According to SEC Staff Legal Bulletin No. 4 (CF) the spin-off need not register under the Securities Act 1933 provided:

1. Parent shareholders do not provide consideration for the spun-off shares
2. The spin-off is pro-rata
3. The parent provides adequate information about the spin-off and the subsidiary to its shareholders and to the trading markets
4. The parent has a valid business purpose for the spin-off and
5. If the parent spins-off restricted securities it has held those securities for at least two years.

Exhibit A

The Spin-off

On April 12, 2001, the Adaptec board declared a dividend to Adaptec stockholders of record on April 30, 2001, of shares of Roxio common stock. The dividend will be paid after the close of business on May 11, 2001, in the amount of 0.1646 shares of Roxio common stock for each share outstanding of Adaptec common stock.

Adaptec stockholders will not be required to pay any cash or other consideration for the shares of Roxio common stock distributed to them or to surrender or exchange their shares of Adaptec common stock to receive the dividend of Roxio common stock.

The Number of Shares Received

Adaptec stockholders who sell their shares of Adaptec common stock between the record date and the distribution date in the "regular way" market will also be selling their Roxio dividend shares, as explained below.

Trading between the Record Date and the Distribution Date

After the record date and through May 11, 2001, the distribution date, there may be two markets in Adaptec common stock, a "regular way" market and a "when issued" market. Shares that trade on the "regular way" market will be reported under Adaptec's ticker symbol "ADPT" and will trade with an entitlement to shares of Roxio common stock distributed pursuant to the spin-off. Shares that trade on the "when issued" market will be reported under the special ticker symbol "ADPTV" and will trade without an entitlement

to shares of Roxio common stock distributed pursuant to the spin-off. Therefore, those who own shares of Adaptec common stock on the record date, and sell those shares on the "regular way" market prior to or on May 11, 2001, the distribution date, will also be selling the shares of Roxio common stock that would have been distributed to them pursuant to the spin-off. If those shares of Adaptec common stock are sold on the "when issued" market prior to the distribution date, the stockholder will still receive the shares of Roxio common stock that were to be distributed to him/her pursuant to his/her ownership of the shares of Adaptec common stock.

Furthermore, it is expected that between the record date and distribution date there will develop a "when-issued" trading market in Roxio shares. The "when-issued" trading market will be for shares of Roxio common stock that will be distributed to Adaptec stockholders on the distribution date. Those that own shares of Adaptec common stock at the close of business on the record date are entitled to shares of Roxio common stock distributed pursuant to the spin-off. Stockholders may trade this entitlement to shares of Roxio common stock, without the shares of Adaptec common stock owned, on the Roxio "when-issued" trading market. With the Roxio Form 10 Registration Statement now declared effective, such trading may begin at any time.

When and How the Dividend will be Paid

Adaptec will pay the dividend after the close of business on May 11, 2001 by releasing the shares of Roxio common stock to be distributed in the spin-off to Chase Mellon Shareholder Services, Adaptec's transfer agent. After the close of business on May 11, 2001, the transfer agent will cause the shares of Roxio common stock to which an

Adaptec stockholder is entitled, to be registered in his/her name or in the "street name" of his/her brokerage firm. Most Adaptec stockholders have their Adaptec certificates held on account by a stock brokerage firm. In such cases, the brokerage firm is the registered holder or "street name" and the physical Roxio certificates will be mailed to the brokerage firm. These brokers will in turn electronically credit the appropriate accounts for the Roxio shares received. This will take three to eight business days after the distribution date. Persons with questions in this regard should contact their broker on the mechanics of having the Roxio shares posted to their account.

Roxio certificates representing ownership of whole shares of Roxio common stock will be mailed directly from the transfer agent to persons who physically hold their Adaptec stock certificates and are the registered holders. The transfer agent will begin mailing such stock certificates promptly after the distribution date.

The transfer agent will not deliver any fractional shares of Roxio common stock in connection with the spin-off. Instead, the transfer agent will aggregate all fractional shares and sell them on behalf of those holders who otherwise would be entitled to receive a fractional share. Such holders will then receive a cash payment in an amount equal to their pro rata share of the total net proceeds of that sale. Checks for any cash that individuals may be entitled to receive instead of fractional shares of Roxio common stock will follow separately. We currently estimate that it will take about two weeks from the dividend payment date for the transfer agent to complete these mailings.

TABLE 0 – List of variables for Chapter 1

Variable name	Description
Market equity	Market value of the firm's common stock (in descriptive statistics I use 2003 constant dollars)
Assets	Book value of total assets (in descriptive statistics I use 2003 constant dollars)
Sales	Dollar value of the firms sales (in descriptive statistics I use 2003 constant dollars)
Idiosyncratic risk	Standard error of a market model using the CRSP value weighted index. For the spin-off and matching firm I use the 36 months beginning with the spin-off's existence. For the parent firm I use the 36 months preceding the first firm announcement of the spin-off
Volatility	Standard deviation of monthly stock returns for the same period as above
Beta	Derived from the model above
Leverage	Ratio of book value of long term debt to book value of assets
Capx. to assets	Ratio of capital expenditures to assets
PPE ratio	Ratio of net property plant and equipment to total assets
Q	Market-to-book of assets calculated as the market value of equity plus the book value of assets less the book value of equity divided by the book value of assets
ROA	Operating income before depreciation divided by book value of assets
Relatedness	Correlation of monthly stock returns of the spin-off and the parent in the first 36 months after the spin-off
Vertical relatedness	Define a_{ij} as the dollar value of industry i's output to produce industry j's total output. V_{ij} is defined as a_{ij} divided by the dollar output of industry j. The relatedness of spinoffs and parents is calculated as $\frac{1}{2}(V_{ij}+ V_{ji})$ where i and j are the parent and spinoff industry respectively
Complementarity	For spinoff industry i calculate the fraction supplied to each other industry k (except the parent industry). This gives us a vector V_{ik} . Similarly, calculate B_{ik} as the fraction obtained as input from each industry (except the parent industry). Calculate corresponding vectors V_{jk} and B_{jk} where j is the parent industry. Complementarity is calculated as $\frac{1}{2}(\text{corr}(V_{ik}\ V_{jk})+\text{corr}(B_{ik}\ B_{jk}))$.
Survivorship dummy	Dummy that equals 1 if the firm's delisting code in December 2003 is 100, 0 otherwise
Block ownership	Fraction of voting rights held by all owners who own at least 5% of voting rights
Inside blocks	Sum of all blocks of at least 5% where the beneficial owner is held either a director or officer of the firm
Management ownership	% of voting rights held by all officers and directors of the firm
CEO ownership	% of voting rights held by the named CEO of the firm (if no CEO is named I pick the ownership of the Chairman-President and the larger of the two if the role is split)
Management dummy	Dummy that equals 1 if management ownership defined above is more than 25%

TABLE 1 – Sample firms by year and industry

PANEL A - Spin-off sample by year

Year	Number of Spin-offs	% of Sample
1981	3	2.6%
1982	2	1.7%
1983	0	0.0%
1984	1	0.9%
1985	3	2.6%
1986	2	1.7%
1987	4	3.4%
1988	4	3.4%
1989	7	6.0%
1990	4	3.4%
1991	1	0.9%
1992	6	5.1%
1993	4	3.4%
1994	6	5.1%
1995	7	6.0%
1996	17	14.5%
1997	17	14.5%
1998	13	11.1%
1999	14	12.0%
2000	2	1.7%
Total	117	

PANEL B – Spin-off sample by industry type

Industry Name	Number of Spin-offs	% of Sample
Utilities	7	6.0%
Financial	9	7.7%
Service Industries	20	17.1%
Wholesale & Retail Trade	16	13.7%
Manufacturing	60	51.3%
Construction & Mining	5	4.3%
Total	117	

TABLE 2 – Firm characteristics of spin-offs, parent firms and matching firms

Volatility of spin-off is measured as the standard deviation of monthly stock returns in the first 36 months of the firm's existence. For the parent it is measured as the standard deviation of monthly returns in the 36 months preceding the first firm announcement of the spin-off. For the matching firm the period used is the same calendar period as for the corresponding spin-off. Idiosyncratic risk is the standard error from a market model using the CRSP value weighted index for the same periods. Beta is derived from the same model. Q is defined as the market-to-book ratio of assets. Return on assets is defined as operating income before depreciation divided by book value of assets. Dollar values are in 2003 constant dollars. Correlations and paired t-tests for means and medians are reported. *, ** and **** denote the 10%, 5% and 1% significance level respectively.

PANEL A: Comparison of firm characteristics of spin-offs and parent

	Spin-off			Parent			T-stat for diff. in means	T-stat for diff. in medians	Correlation
	Mean	Median	Std.Dev.	Mean	Median	Std.Dev.			
Book Value of Assets ($ mio)	2199.93	588.45	11562.20	6311.89	3035.40	10645.30	-5.06	-8.78	0.718***
Market Value of Equity ($ mio)	1179.26	453.72	1882.01	5578.82	2647.64	10047.50	-4.99	-8.22	0.496***
Sales ($ mio)	1418.66	639.59	2156.19	5709.29	2920.97	8678.98	-6.00	-8.86	0.649***
Employees (thousands)	10.07	3.50	29.92	34.66	15.29	62.53	-5.86	-8.84	0.792***
Volatility	0.1353	0.1221	0.0541	0.0917	0.0835	0.0366	-10.29	-7.91	0.542***
Idiosyncratic risk	0.1263	0.1119	0.0539	0.0801	0.0684	0.0357	-11.07	-8.28	0.552***
Beta	1.0506	1.0352	0.6642	1.1017	1.0250	0.4848	-0.79	-0.73	0.301***
Leverage	0.2095	0.1916	0.1775	0.2053	0.1706	0.1443	0.11	0.16	0.555***
Q	1.7520	1.3092	1.1399	1.5951	1.4299	0.5295	1.36	-0.19	0.194**
ROA	0.1147	0.1317	0.1272	0.1415	0.1396	0.0630	-2.43	-0.88	0.260***

PANEL B: Comparison of firm characteristics of spin-offs and matching firms

	Spin-off			Match Firm			T-stat for diff. in means	T-stat for diff. in medians	Correlation
	Mean	Median	Std.Dev.	Mean	Median	Std.Dev.			
Book Value of Assets ($ mio)	2199.93	588.45	11562.20	2378.11	502.82	8498.05	-0.29	0.28	0.931***
Market Value of Equity ($ mio)	1179.26	453.72	1882.01	1481.79	415.69	3342.51	-1.31	-0.44	0.657***
Sales ($ mio)	1418.66	639.59	2156.19	1108.77	522.68	1464.25	1.72	1.60	0.525***
Employees (thousands)	10.07	3.50	29.92	6.78	2.32	9.75	1.42	0.77	0.509***
Volatility	0.1353	0.1221	0.0541	0.1417	0.1207	0.0723	-0.95	0.19	0.365***
Idiosyncratic risk	0.1263	0.1119	0.0539	0.1277	0.1099	0.0664	-0.22	0.75	0.392***
Beta	1.0506	1.0352	0.6642	1.2435	1.1238	0.8527	-2.00	-1.87	0.064
Leverage	0.2095	0.1916	0.1775	0.1790	0.1404	0.1735	1.45	1.47	0.180**
Q	1.7520	1.3092	1.1399	1.7653	1.4497	0.9409	-0.11	-1.90	0.249***
ROA	0.1147	0.1317	0.1272	0.1188	0.1235	0.1003	-0.32	0.23	0.253***

TABLE 3 – Changes in ownership structure of spin-offs and matching firms

Block ownership is defined as the fraction of shares held by all holders who hold more than 5%. An inside block holder is either an officer or director of the firm. Management ownership is defined as the % shares held by officers and directors of the firm. It includes options that can vest within the next 60 days. This is also true of CEO ownership. Outstanding shares include options that can vest in the next 60 days. Each vote is counted as a share. Dual classes are combined into a single class based on voting rights. Non-voting shares are not considered. Paired t-tests for means and medians are reported. For the parent/spin-off comparison these appear in the columns to the right. For the spin-off/match firm comparison these appear in rows below each description of ownership.

		PANEL A Block Ownership				T-stats for Tests of Differences In Comparison to					
						Year 0			Year 1		Year 2
		Yr 0	Yr 1	Yr 2	Yr 3	Yr1-Yr0	Yr2-Yr0	Yr3-Yr0	Yr2-Yr1	Yr3-Yr1	Yr3-Yr2
Spin-off	Mean	0.2034	0.2422	0.2658	0.2735	2.85	3.85	4.06	2.31	2.36	0.87
	Median	0.1803	0.2187	0.2423	0.2604	3.33	3.99	4.20	2.51	2.44	0.69
	Std.	0.1670	0.1496	0.1525	0.1761						
Matching Firm	Mean		0.2983	0.2997	0.2922				-0.16	0.59	0.78
	Median		0.2584	0.2747	0.2670				0.00	0.52	0.71
	Std.		0.1993	0.2086	0.2066						
T-stat for Diff. in Means			-2.72	-1.59	-0.82						
T-stat for Diff. in Medians			-2.50	-1.43	0.79						
		PANEL B Insider Blocks				T-stats for Tests of Differences In Comparison to					
						Year 0			Year 1		Year 2
		Yr 0	Yr 1	Yr 2	Yr 3	Yr1-Yr0	Yr2-Yr0	Yr3-Yr0	Yr2-Yr1	Yr3-Yr1	Yr3-Yr2
Spin-off	Mean	0.0751	0.0670	0.0664	0.0692	-0.94	-0.92	-0.58	-0.23	0.61	0.78
	Median	0.0000	0.0000	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00
	Std.	0.1316	0.1410	0.1394	0.1464						
Matching Firm	Mean		0.1495	0.1475	0.1404				-0.42	-1.03	-0.92
	Median		0.0609	0.0581	0.0591				-0.61	-0.87	0.43
	Std.		0.2052	0.2060	0.1997						
T-stat for Diff. in Means			-4.11	-3.87	-3.4						
T-stat for Diff. in Medians			-3.32	-2.99	-2.65						

TABLE 3 – Changes in ownership structure of spin-offs and matching firms (contd.)

Block ownership is defined as the fraction of shares held by all holders who hold more than 5%. An inside block holder is either an officer or director of the firm. Management ownership is defined as the % shares held by officers and directors of the firm. It includes options that can vest within the next 60 days. This is also true of CEO ownership. Outstanding shares include options that can vest in the next 60 days. Each vote is counted as a share. Dual classes are combined into a single class based on voting rights. Non-voting shares are not considered. Paired t-tests for means and medians are reported. For the parent/spin-off comparison these appear in the columns to the right. For the spin-off/match firm comparison these appear in rows below each description of ownership.

		PANEL C Management Ownership				T-stats for Tests of Differences In Comparison to					
						Year 0			Year 1		Year 2
		Yr 0	Yr 1	Yr 2	Yr 3	Yr1-Yr0	Yr2-Yr0	Yr3-Yr0	Yr2-Yr1	Yr3-Yr1	Yr3-Yr2
Spin-off	Mean	0.1046	0.0891	0.0887	0.0969	-2.19	-1.93	-0.90	-0.05	1.37	2.24
	Median	0.0432	0.0269	0.0392	0.0482	-2.82	-0.67	-1.03	4.54	4.22	4.45
	Std.	0.1369	0.1187	0.1089	0.1087						
Matching Firm	Mean		0.1982	0.1938	0.1933				-1.05	-0.11	0.85
	Median		0.1099	0.1196	0.1273				-1.02	-1.05	0.53
	Std.		0.2030	0.2034	0.2023						
T-stat for Diff. in Means			5.81	5.6	-5.11						
T-stat for Diff. in Medians			5.42	5.16	-5.12						
		PANEL D CEO Ownership				T-stats for Tests of Differences In Comparison to					
						Year 0			Year 1		Year 2
		Yr 0	Yr 1	Yr 2	Yr 3	Yr1-Yr0	Yr2-Yr0	Yr3-Yr0	Yr2-Yr1	Yr3-Yr1	Yr3-Yr2
Spin-off	Mean	0.0326	0.0215	0.0230	0.0274	-2.21	-1.95	-1.00	1.49	2.94	2.2
	Median	0.0057	0.0057	0.0087	0.0116	0.00	0.75	2.33	4.23	5.35	5.80
	Std.	0.0642	0.0449	0.0434	0.0476						
Matching Firm	Mean		0.0994	0.0982	0.0955				-0.31	-0.71	-0.66
	Median		0.0252	0.0252	0.0276				0.00	0.95	1.05
	Std.		0.1621	0.1662	0.1623						
T-stat for Diff. in Means			-5.26	-4.9	-4.65						
T-stat for Diff. in Medians			-6.59	-5.64	-5.36						

TABLE 4 – Serial correlation of ownership structure of spin-offs and matching firms

The correlation between ownership measures of the parent prior to the spin-off and the spin-off firm/match firm in the first 3 years of the spin-off firm's existence are reported. Block ownership is defined as the fraction of shares held by all holders who hold more than 5%. An inside block holder is one who is either an officer or director of the firm. Management ownership is defined as the % shares held by officers and directors of the firm. It includes options that can vest within the next 60 days. This is also true of CEO ownership. Outstanding shares include options that can vest in the next 60 days. Each vote is counted as a share. Dual classes are combined into a single class based on voting rights. Non-voting shares are not considered.

PANEL A

Correlation of spin-off ownership structure and the parent ownership structure prior to spin-off

	Year 1	Year 2	Year 3
Block Ownership	0.5706***	0.3992***	0.3789***
Insider Blocks	0.7701***	0.7320***	0.7034***
Management Ownership	0.8281***	0.7610***	0.7391***
CEO Ownership	0.5365***	0.5571***	0.5019***

PANEL B

Correlation of the ownership structure of the matched firm and its own prior ownership structure

	Year 1	Year 2	Year 3
Block Ownership	0.8924***	0.8568***	0.7938***
Insider Blocks	0.9766***	0.9463***	0.929***
Management Ownership	0.9755***	0.9531***	0.9227***
CEO Ownership	0.9842***	0.9865***	0.9601***

PANEL C

Correlation of the ownership structure of the matched firm and the spin-off firm

	Year 1	Year 2	Year 3
Block Ownership	0.2086**	0.2156**	0.1744*
Insider Blocks	0.2551***	0.1861**	0.1716*
Management Ownership	0.2931***	0.2726***	0.2533***
CEO Ownership	0.1651*	0.1248	0.2204**

PANEL D

Correlation of the ownership structure of the matched firm and the parent ownership structure prior to spin-off

	Year 1	Year 2	Year 3
Block Ownership	0.3064***	0.2473***	0.2493***
Insider Blocks	0.3246***	0.2804***	0.2788***
Management Ownership	0.3233***	0.3200***	0.2853***
CEO Ownership	0.0927	0.0619	0.0842

*,** and *** denote the 10%, 5% and 1% significance level respectively

TABLE 5 – Correlation of block ownership by industry relatedness

The correlations between ownership measures of the parent prior to the spin-off and the spinoff, in the first 3 years of the spinoffs' existence are reported for groups formed on the basis of industry relatedness. Block ownership is defined as the fraction of shares held by all holders who hold more than 5%. Management ownership is defined as the % shares held by officers and directors of the firm. It includes options that can vest within the next 60 days. Outstanding shares include options that can vest in the next 60 days. Each vote is counted as a share. Dual classes are combined into a single class based on voting rights. Non-voting shares are not considered.

Vertical relatedness is calculated (Fan & Lang 2000) as follows. Define a_{ij} as the dollar value of industry i's output to produce industry j's total output. V_{ij} is defined as a_{ij} divided by the dollar output of industry j. The relatedness of spinoffs and parents is calculated as $½(V_{ij}+ V_{ji})$ where I and j are the parent and spinoff industry respectively (Fan and Lang 2000 provides the concordance between SIC codes and the input-output tables). Complementarity is calculated (Fan & Lang 2000) as follows. For spinoff industry I calculate the fraction supplied to each other industry k (except the parent industry). This gives us a vector V_{ik} . In a similar manner calculate B_{ik} as the fraction obtained as input from each industry (except the parent industry). Calculate corresponding vectors V_{jk} and B_{jk} where j is the parent industry. Complementarity is calculated as $½(\text{corr}(V_{ik}\ V_{jk})+\text{corr}(B_{ik}\ B_{ik}))$. High and low vertical relatedness groups (complementarity) are formed based on median splits. All reported correlations are significant at the 1% level.

Correlation of spin-off ownership structure and the parent ownership structure prior to spin-off

	Block Ownership		Management Ownership	
PANEL A	Different 2 digit SIC code	Same 2 digit SIC code	Different 2 digit SIC code	Same 2 digit SIC code
Year 1	0.5791	0.5492	0.8197	0.8577
Year 2	0.3824	0.4457	0.7301	0.8682
Year 3	0.3692	0.5205	0.7418	0.7806
PANEL B	Low vertical relatedness	High vertical relatedness	Low vertical relatedness	High vertical relatedness
Year 1	0.4917	0.6785	0.7726	0.9024
Year 2	0.2770	0.5413	0.6917	0.8532
Year 3	0.3152	0.7710	0.5188	0.7892
PANEL C	Low complementarity	High complementarity	Low complementarity	High complementarity
Year 1	0.5392	0.6367	0.9105	0.7416
Year 2	0.3789	0.4401	0.7687	0.7598
Year 3	0.3131	0.4801	0.8023	0.6784

All correlations are significant at the 1% level

TABLE 6 – Determinants of changes in block ownership of spin-offs

Descriptive statistics of measures of beginning ownership and 3 year changes in these measures are presented for different terciles. Relative size terciles are based on the relative market value of equity of the spin-off in year 1 to the parent in year 0. Relative idiosyncratic risk is measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. For the parent firm the 36 months preceding the first firm announcement of the spin-off are used. Q is measured as the market-to-book of assets in year 1 for the spin-off and measured prior to the spin-off for the parent. Stock return correlation terciles use the correlation between the monthly stock return of the parent and spin-off in the first 36 months of the spin-off firm's existence. Survivorship is a dummy which takes on a value of 1 if the spin-off is still surviving, 0 otherwise. Prior block ownership terciles use the block ownership of the parent prior to the spin-off.

Panel A - Relative size

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Tercile 1 (lowest)	0.143	0.112	0.135	0.111
Tercile 2	0.224	0.182	0.063	0.084
Tercile 3 (highest)	0.249	0.224	0.011	0.006

Panel B - Relative idiosyncratic risk

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Tercile 1 (lowest)	0.209	0.180	0.044	0.077
Tercile 2	0.209	0.180	0.075	0.075
Tercile 3 (highest)	0.192	0.169	0.091	0.110

Panel C – Relative Q

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Tercile 1 (lowest)	0.186	0.152	0.130	0.863
Tercile 2	0.198	0.155	0.058	0.051
Tercile 3 (highest)	0.226	0.200	-0.017	-0.005

Panel D – Stock return correlation

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Tercile 1 (lowest)	0.160	0.118	0.122	0.112
Tercile 2	0.236	0.198	0.030	0.036
Tercile 3 (highest)	0.211	0.191	0.062	0.078

Panel E - Prior block ownership

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Tercile 1 (lowest)	0.033	0.000	0.164	0.147
Tercile 2	0.180	0.180	0.087	0.083
Tercile 3 (highest)	0.397	0.365	-0.041	0.005

Panel F - 1 digit SIC code

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Same code	0.202	0.180	0.056	0.068
Different code	0.205	0.180	0.085	0.084

Panel G – Survivorship

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Survivors	0.212	0.182	0.087	0.083
Non-survivors	0.196	0.171	0.028	0.035

TABLE 6 – Determinants of changes in block ownership of spin-offs

Descriptive statistics of measures of beginning ownership and 3 year changes in these measures are presented for terciles formed on the basis of vertical relatedness and complementarity. Block ownership is defined as the fraction of shares held by all holders who hold more than 5%. Each vote is counted as a share. Dual classes are combined into a single class based on voting rights. Non-voting shares are not considered.

Vertical relatedness is calculated (Fan & Lang 2000) as follows. Define a_{ij} as the dollar value of industry i's output to produce industry j's total output. V_{ij} is defined as a_{ij} divided by the dollar output of industry j. The relatedness of spinoffs and parents is calculated as $\frac{1}{2}(V_{ij}+ V_{ji})$ where i and j are the parent and spinoff industry respectively (Fan and Lang 2000 provides the concordance between SIC codes and the input-output tables). Complementarity is calculated (Fan & Lang 2000) as follows. For spinoff industry i calculate the fraction supplied to each other industry k (except the parent industry). This gives us a vector V_{ik} . In a similar manner calculate B_{ik} as the fraction obtained as input from each industry (except the parent industry). Calculate corresponding vectors V_{jk} and B_{jk} where j is the parent industry. Complementarity is calculated as $\frac{1}{2}(\text{corr}(V_{ik}\ V_{jk})+\text{corr}(B_{ik}\ B_{ik}))$. High and low vertical relatedness groups (complementarity) are formed based on median splits. All reported correlations are significant at the 1% level.

Panel H – Vertical relatedness

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Tercile 1 (lowest)	0.206	0.184	0.098	0.112
Tercile 2	0.198	0.180	0.059	0.072
Tercile 3 (highest)	0.206	0.180	0.054	0.060

Panel I – Complementarity

	Yr 0		Yr3-Yr0	
	Mean	Median	Mean	Median
Tercile 1 (lowest)	0.216	0.188	0.119	0.103
Tercile 2	0.200	0.183	0.047	0.061
Tercile 3 (highest)	0.194	0.179	0.061	0.078

TABLE 6 - Determinants of changes in block ownership of spin-offs (contd.)

The dependent variable is the log of block ownership of the spin-off firm in year 3 minus the log of block ownership of the parent firm prior to the spin-off. Relative market equity is the log of the ratio of the market equity of the spin-off to the parent prior to the spin-off. Relative Q is measured similarly using the market-to-book of assets and is logged. Relative idiosyncratic risk is measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. For the parent firm the 36 months preceding the first firm announcement of the spin-off are used. The log of the ratio is used here. Stock return correlation is the log of the stock return correlation calculated as the correlation between the monthly stock return of the parent and spin-off in the first 36 months of the spin-off firm's existence Survivorship is a dummy which takes on a value of 1 if the spin-off is still surviving , 0 otherwise. Ownership rank is the tercile rank of the spin-off firm ranked upon the basis of block ownership of the parent prior to the spin-off. Vertical relatedness and industry complementarity are defined on the previous page. Heteroscedasticity consistent T-stats are provided in parentheses.

Panel J

	Change in log of block ownership of the spin-off firm from yr0 to yr3										
Intercept	-0.0182	0.0438	0.0559	0.1415	0.0858	0.0894	0.0578	0.0423	0.0379	0.0982	0.1194
	(-1.01)	(2.27)	(4.29)	(7.78)	(4.64)	(4.11)	(3.80)	(2.29)	(1.85)	(2.71)	(3.43)
Relative market equity	-0.0325									-0.0205	-0.0154
	(-3.28)									(-1.68)	(-1.88)
Relative idiosyncratic risk		0.0317								-0.0261	-0.2310
		(1.03)								-0.75	(-0.89)
Relative Q			-0.0483							-0.0406	-0.1018
			(-2.23)							(-1.69)	(-2.15)
Ownership rank				-0.0841						-0.0856	-0.0489
				(-5.95)						(-5.18)	(-3.96)
SIC dummy					-0.0469						
					(-1.82)						
Stock return correlation						-0.1156				-0.0277	
						(-1.72)				(-0.43)	
Vertical Relatedness							-0.0717				-0.1514
							(-2.24)				(-1.93)
Industry Comeplementarity								-0.0223			0.0484
								(-2.29)			(0.78)
Survivorship dummy									0.0340	0.0482	0.0485
									(1.24)	(1.86)	(1.88)
Adjusted R-squared	8.44%	0.05%	3.37%	23.12%	2.02%	1.69%	1.49%	1.76%	0.47%	27.55%	26.27%

TABLE 7 – Determinants of ownership structure of spin-offs, parent firms and matching firms

The dependent variable is the log of block ownership for the parent prior to the spin-off and in year 1 for the spin-off/match-firm. Market equity is the log of the market value of equity. Idiosyncratic risk is the log of the idiosyncratic risk measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. The same calendar months are used for the match firm. For the parent firm the 36 months preceding the first firm announcement of the spin-off are used. Q is measured as the market-to-book of assets. The log value is used here. Capex. to assets is the log of the ratio of capital expenditures to assets. PPE ratio is the log of the ratio of net property, plant and equipment to total assets. Leverage is the log of the book value of debt to book value of assets. Management dummy takes on a value of 1 if the officers and directors of the firms own more than 25% of the voting rights of the firm, 0 otherwise. Survivorship is a dummy which takes on a value of 1 if the spin-off is still surviving, 0 otherwise. Heteroscedasticity consistent T-stats are provided below each coefficient estimate.

PANEL A

	Parent			Spin-off			Match firm			Spin-off using inherited ownership		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Intercept	0.6831	0.5613	0.5661	0.3839	0.3000	0.2843	0.4503	0.3959	0.3728	0.4140	0.3287	0.3190
	(8.91)	(8.33)	(8.36)	(4.82)	(4.19)	(3.98)	(5.00)	(4.54)	(4.20)	(4.22)	(4.01)	(3.86)
Log of market equity	-0.0264	-0.0161	-0.0126	-0.0183	-0.1078	-0.0117	-0.0415	-0.0334	-0.0361	-0.0116	0.0003	-0.0020
	(-3.06)	(-1.92)	(-1.63)	(-2.30)	(-1.87)	(-1.55)	(-4.10)	(-3.37)	(-3.58)	(-1.18)	(0.04)	(-0.23)
Log of idiosyncratic risk	0.1109	0.1104	0.1126	0.0589	0.0492	0.0379	-0.0226	-0.0262	-0.0288	0.0912	0.0877	0.0807
	(3.40)	(4.02)	(4.08)	(2.10)	(1.97)	(1.48)	(-0.71)	(-0.87)	(-0.96)	(2.64)	(3.07)	(2.73)
Log Q (market-to-book)	-0.0225	-0.0429	-0.0444	-0.0203	-0.0259	-0.0246	0.0731	0.0751	0.0753	0.0273	0.0235	0.0243
	(-0.55)	(-1.24)	(-1.27)	(-0.93)	(-1.33)	(-1.28)	(2.16)	(2.33)	(2.35)	(1.01)	(1.05)	(1.09)
Log of capex. to assets	-0.2854	-0.2458	-0.2301	-0.0401	-0.2342	-0.2301	-0.4368	-0.4558	-0.4417	-0.0509	-0.3217	-0.3191
	(-0.91)	(-0.93)	(-0.87)	(-0.13)	(-0.82)	(-0.81)	(-1.14)	(-1.25)	(-1.21)	(-0.13)	(-0.98)	(-0.98)
Log of PPE ratio	-0.0374	-0.0002	-0.0109	-0.0168	-0.0173	-0.0142	-0.0218	-0.0270	-0.0257	0.0033	0.0039	0.0058
	(-0.34)	(0.00)	(-0.12)	(-1.17)	(-1.36)	(-1.11)	(-1.59)	(-1.93)	(-1.84)	(0.19)	(0.27)	(0.39)
Log of leverage	-0.0314	-0.0233	-0.0196	0.2343	0.2235	0.2141	0.2434	0.1566	0.1718	0.1104	0.1068	0.1010
	(-0.27)	(-0.24)	(-0.20)	(3.08)	(3.29)	(3.17)	(2.18)	(1.44)	(1.77)	(0.17)	(1.07)	(1.19)
Management dummy		0.1674	0.1667		0.1563	0.1584		0.1161	0.1195		0.2142	0.2155
		(6.45)	(6.41)		(5.88)	(6.01)		(3.43)	(3.53)		(7.04)	(7.07)
Survivorship dummy			0.0166			0.0356			0.0367			0.0206
			(0.86)			(1.72)			(1.25)			(0.91)
Adjusted R-squared	29.12%	49.60%	49.46%	18.09%	35.95%	37.15%	12.19%	21.22%	21.66%	6.66%	36.34%	36.25%

TABLE 7 - Determinants of block ownership of spin-offs, parent firms and matching firms (contd.)

The dependent variable is the log of block ownership in year 1, 2 and 3 for the spin-off/match-firm. Market equity is the log of the market value of equity. Idiosyncratic risk is the log of the idiosyncratic risk measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. The same calendar months are used for the match firm. Q is measured as the market-to-book of assets. The log value is used here. Capex. to assets is the log of the ratio of capital expenditures to assets. PPE ratio is the log of the ratio of net property, plant and equipment to total assets. Leverage is the log of the book value of debt to book value of assets. Management dummy takes on a value of 1 if the officers and directors of the firms own more than 25% of the voting rights of the firm, 0 otherwise. Survivorship is a dummy which takes on a value of 1 if the spin-off is still surviving, 0 otherwise. Lagged-ownership is the ownership of the parent prior to the spin-off for the spin-offs. It is the ownership in year 1 for the matched firm. Heteroscedasticity consistent T-stats are provided in parentheses below each coefficient estimate.

PANEL B

	Spin-off			Match firm			Spin-off			Match firm		
	Yr1	Yr2	Yr3	Yr1	Yr2	Yr3	Yr1	Yr2	Yr3	Yr 1	Yr2	Yr3
Intercept	0.2843	0.2301	0.2656	0.3728	0.3956	0.3536	0.2199	0.2293	0.3460		0.0344	0.0449
	(3.98)	(3.33)	(2.84)	(4.20)	(4.33)	(3.66)	(3.85)	(4.190	(4.420		(0.50)	(0.78)
Log of market equity	-0.0117	-0.0229	-0.0229	-0.0361	-0.0241	-0.0271	-0.0123	-0.0208	-0.0184		-0.0008	-0.0059
	(-1.55)	(-2.94)	(-2.40)	(-3.58)	(-2.35)	(-2.92)	(-1.84)	(-2.88)	(-2.08)		(-0.16)	(-1.15)
Log of idiosyncratic risk	0.0379	-0.0352	-0.0216	-0.0288	-0.0175	-0.0241	0.0051	-0.0484	0.0228		-0.0066	-0.0174
	(1.48)	(-1.32)	(-0.58)	(-0.96)	(-0.54)	(-0.74)	(0.21)	(-1.88)	(0.53)		(-0.37)	(-0.33)
Log Q (market-to-book)	-0.0246	-0.0322	-0.0016	0.0753	0.0500	0.0430	-0.0322	-0.0381	0.0083		0.0015	-0.0135
	(-1.28)	(-1.52)	(-0.07)	(2.35)	(1.42)	(1.20)	(-1.88)	(-1.95)	(0.350		(0.09)	(-0.68)
Log of capex. to assets	-0.2301	-0.3331	-0.3055	-0.4417	-0.8269	-0.3097	0.0399	0.0338	-0.3499		-0.0447	-0.0955
	(-0.81)	(-0.96)	(-0.88)	(-1.21)	(-2.40)	(-0.78)	(0.17)	(0.14)	(-1.25)		(-0.25)	(-0.440
Log of PPE ratio	-0.0142	-0.0163	-0.0055	-0.0257	-0.0264	-0.0223	-0.1171	-0.1783	-0.0479		0.0034	-0.0038
	(-1.11)	(-1.27)	(-0.32)	(-1.84)	(-1.67)	(-1.42)	(-1.70)	(-2.61)	(-0.51)		(0.42)	(-0.44)
Log of leverage	0.2141	0.0964	0.0794	0.1718	0.0527	0.0432	0.1673	0.1099	0.1221		0.0017	-0.0332
	(3.17)	(1.39)	(0.89)	(1.77)	(0.44)	(0.35)	(2.70)	(1.75)	(1.87)		(0.03)	(-0.49)
Management dummy	0.1584	0.1560	0.1582	0.1195	0.1048	0.0875	0.1042	0.1818	0.1861		0.0575	0.0804
	(6.01)	(5.37)	(4.63)	(3.53)	(2.82)	(2.23)	(3.76)	(5.57)	(4.75)		(2.79)	(3.73)
Survivorship dummy	0.0356	0.0586	0.0855	0.0367	0.0117	0.0284	0.0171	0.0340	0.0524		0.0012	0.0197
	(1.72)	(2.95)	(3.42)	(1.25)	(0.36)	(0.87)	(0.94)	(1.82)	(2.33)		(0.08)	(1.11)
Lagged Ownership							0.3579	0.1042	0.0574		0.8044	0.7114
							(5.01)	(1.38)	(0.61)		(12.32)	(10.11)
Adjusted R-squared	37.15%	34.57%	25.49%	21.66%	12.80%	10.71%	48.68%	44.54%	38.26%		77.97%	73.37%

TABLE 7 - Determinants of differences in block ownership of spin-offs and matching firms

The dependent variable is the log of block ownership in year 1, 2 and 3 for the spin-off/match-firm. Market equity is the log of the market value of equity. Idiosyncratic risk is the log of the idiosyncratic risk measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. The same calendar months are used for the match firm. Q is measured as the market-to-book of assets. The log value is used here. Capex. to assets is the log of the ratio of capital expenditures to assets. PPE ratio is the log of the ratio of net property, plant and equipment to total assets. Leverage is the log of the book value of debt to book value of assets. Management dummy takes on a value of 1 if the officers and directors of the firms own more than 25% of the voting rights of the firm, 0 otherwise. Survivorship is a dummy which takes on a value of 1 if the spin-off is still surviving, 0 otherwise. Lagged-ownership is the ownership of the parent prior to the spin-off for the spin-offs. It is the ownership in year 1 for the matched firm. Heteroscedasticity consistent T-stats are provided in parentheses below each coefficient estimate.

PANEL C

Log of block ownership spinoff – log of block ownership matching firm						
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Intercept	-0.0447	-0.0029	-0.0030	-0.0173	0.0055	-0.0087
	(-2.59)	(-0.14)	(-0.15)	(-1.42)	(0.36)	(-0.71)
Log of market equity	-0.0167	-0.0404	-0.0406	-0.0178	-0.0116	-0.0127
	(-0.81)	(-2.16)	(-2.56)	(-1.25)	(-0.87)	(-1.31)
Log of idiosyncratic risk	-0.0524	-0.0881	-0.1271	-0.0303	-0.0369	-0.0589
	(-1.37)	(-2.29)	(-2.87)	(-1.14)	(-1.34)	(-2.17)
Log Q (market-to-book)	0.0256	0.0292	0.0624	0.0279	0.0376	0.0313
	(0.85)	(0.97)	(1.85)	(1.34)	(1.77)	(1.73)
Log of capex. to assets	-0.0032	-0.0392	-0.0445	-0.0472	-0.0208	-0.0104
	(-0.10)	(-1.53)	(-1.32)	(-2.01)	(-1.15)	(-0.51)
Log of PPE ratio	0.0131	0.0227	0.0273	0.0041	0.0004	-0.0090
	(0.92)	(1.62)	(1.82)	(0.42)	(0.04)	(-0.96)
Log of leverage	0.1697	0.0845	-0.0024	0.0565	0.0678	0.0635
	(1.87)	(0.88)	(-0.02)	(0.88)	(1.00)	(1.05)
Management dummy				0.2115	0.1987	0.2194
				(10.33)	(10.10)	(13.29)
Survivorship dummy	0.0294	0.0363	0.0509	0.0234	0.0259	0.0286
	(1.06)	(1.31)	(1.68)	(1.22)	(1.33)	(1.67)
Adjusted R-squared	2.63%	7.68%	10.61%	53.19%	54.33%	67.77%

TABLE 8 – Firm survival, performance and block ownership

PANEL A

The dependent variable takes a value of 1 if the spin-off firm is a survivor, 0 otherwise. Firm size is the log of market value of equity. Idiosyncratic risk is the log of the idiosyncratic risk measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. Return on assets is defined as operating income before depreciation divided by book value of assets. Q is measured as the market-to-book ratio of assets. Change in block ownership is defined as change in the log of the fraction of shares held by all holders who own more than 5%. P-values are in parentheses below the estimates.

	Firm survival using 1 year change in block ownership	Firm survival using 2 year change in block ownership	Firm survival using 3 year change in block ownership
Intercept	-.7849	-1.1763	-0.6012
Log of market equity	0.5980	0.6652	0.7933
	(0.00)	(0.00)	(0.00)
Log Q	-0.0865	0.0600	-0.0474
	(0.84)	(0.90)	(0.91)
Log of idiosyncratic risk	1.4074	1.5500	2.2062
	(0.01)	(0.01)	(0.00)
ROA	0.1903	-0.6478	-0.3600
	(0.92)	(0.71)	(0.80)
Change in log of block ownership	2.888	3.9691	4.3511
	(0.19)	(0.04)	(0.01)
Log of inherited block ownership	2.7979	3.7500	4.2734
	(0.16)	(0.08)	(0.04)
Adjusted % deviation explained	2.10	3.60%	7.50%

PANEL B

The dependent variable is the change in market-to-book ratio. Firm size is the log of market value of equity. Idiosyncratic risk is the log of the idiosyncratic risk measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. Return on assets is defined as operating income before depreciation divided by book value of assets. Q is measured as the market-to-book ratio of assets. Change in block ownership is defined as change in the log of the fraction of shares held by all holders who own more than 5%. Heteroscedasticity consistent T-stats are in parentheses below each coefficient estimate.

	2 year change in block ownership	3 year change in block ownership
Intercept	-0.4238	-0.4284
	(-2.26)	(-1.95)
Log of market equity	-0.0126	0.0238
	(-0.58)	(0.89)
ROA	0.1350	-0.1506
	(0.54)	(-0.59)
Log of idiosyncratic risk	-0.1912	-0.1137
	(-2.36)	(-1.67)
Change in log of block ownership	0.3492	0.4120
	(1.57)	(1.69)
Log of inherited block ownership	0.2235	0.1580
	(0.75)	(0.46)
Adjusted R-square	5.08%	1.10%

TABLE 8 – Difference in stock valuation of spin-offs and matching firms

The dependent variable is the market-to-book ratio of assets of spinoffs minus the corresponding ratio for the matching firms. All independent variables are similarly measured as the difference between spinoff and matching firm. Idiosyncratic risk is the log of the idiosyncratic risk measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. The same calendar months are used for the match firm. Capex. to assets is the log of the ratio of capital expenditures to assets. PPE ratio is the log of the ratio of net property, plant and equipment to total assets. Heteroscedasticity consistent T-stats are in parentheses below each coefficient estimate.

PANEL C

	Year 1	Year 2	Year 3
Intercept	-0.2186	-0.5759	-0.7564
	(-0.72)	(-1.86)	(-2.45)
Log of market equity	0.6211	0.6762	0.5633
	(4.70)	(5.66)	(6.39)
Log of idiosyncratic risk	6.224	5.6184	5.0288
	(2.93)	(2.67)	(2.10)
Log of capex. to assets	5.6473	5.1948	5.7050
	(2.21)	(1.97)	(2.36)
Log of PPE ratio	-0.7961	-0.2140	-0.9419
	(-1.21)	(-0.32)	(-1.27)
Log of block own.	0.0673	0.2597	0.4264
	(0.37)	(1.67)	(2.39)
Adjusted R-square	22.52%	23.45%	32.55%

PANEL D

Q is measured as the market-to-book of assets. Tercile 1 is lowest (Q) and Tercile 3 is the highest (Q)

	Spin-off		
	Q Tercile1	Q Tercile2	Q Tercile3
Inherited block ownership	0.1813	0.2252	0.2047
Spinoff block ownership	0.2637	0.2754	0.1879
Change in block ownership	0.0806	0.0502	-0.0238

TABLE 9 - Firm performance and block ownership

The dependent variables are the long of block ownership of spin-off/match firms and log of Q measured as the market to book of assets. Market equity is the log of the market value of equity. Sales is the log of sales. Idiosyncratic risk is the log of the idiosyncratic risk measured as the standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. The same calendar months are used for the match firm. Capex. to assets is the log of the ratio of capital expenditures to assets. PPE ratio is the log of the ratio of net property, plant and equipment to total assets. Leverage is the log of the book value of debt to book value of assets. Management dummy takes on a value of 1 if the officers and directors of the firms own more than 25% of the voting rights of the firm, 0 otherwise. ROA is return on assets, defined as operating income before depreciation divided by book value of assets. T-stats are in parentheses below each coefficient estimate.

	Spin-off						Match firm					
	Year 1		Year 2		Year 3		Year 1		Year 2		Year 3	
	BlkOwn	Q	BlkOwn	Q	BlkOwn	Q	BlkOwn	Q	BlkOwn	Q	BlkOwn	Q
Intercept	0.3586	1.9729	0.2725	1.0427	0.2548	0.9825	0.2115	0.7674	0.2314	0.7192	0.2031	0.8119
	(5.97)	(6.27)	(4.90)	(3.46)	(5.60)	(3.91)	(3.68)	(2.90)	(4.08)	(2.84)	(5.07)	(4.64)
Log of market equity	-0.0131		-0.0230		-0.0094		-0.0122		-0.0115		-0.0208	
	(-2.03)		(-3.38)		(-1.54)		(-1.79)		(-1.94)		(-2.95)	
Log of sales		-0.1846		-0.1043		-0.1325		-0.0162		-0.0218		-0.0556
		(-6.84)		(-3.86)		(-5.59)		(-1.17)		(-1.86)		(-2.32)
Log of idiosyn. risk	0.03788	0.2140	-0.0309	0.0307	-0.0065	-0.1890	-0.0062	0.2126	-0.0037	0.1146	-0.0368	0.0464
	(1.54)	(1.84)	(-1.17)	(0.28)	(-0.22)	(-2.09)	(-0.22)	(0.194)	(-0.12)	(1.05)	(-1.68)	(0.61)
Log of capex. to assets	-0.2780		0.0254		-0.2087		-0.3252		-0.3913		-0.3512	
	(-0.94)		(0.07)		(-0.74)		(-0.94)		(-1.31)		(-1.41)	
Log of PPE ratio	-0.1199		-0.1472		-0.1078		0.0303		0.0273		0.0322	
	(-1.78)		(-2.19)		(-1.73)		(0.33)		(0.29)		(0.47)	
Log of leverage	0.2205		0.1497		0.1444		0.0946		0.0519		0.0312	
	(3.24)		(2.11)		(1.95)		(0.95)		(0.48)		(0.40)	
Mgt. dummy	0.1502		0.1614		0.1872		0.2011		0.2122		0.2106	
	(6.38)		(5.78)		(7.52)		(8.05)		(8.11)		(12.13)	
ROA		2.3131		1.7096		1.0777		0.6713		0.5992		0.5095
		(4.99)		(4.56)		(4.30)		(1.72)		(1.81)		(1.75)
Q	-0.0115		0.0203		0.1872		0.0600		0.0399		0.0548	
	(-0.41)		(0.45)		(0.21)		(1.62)		(1.03)		(1.88)	
Log of block own.		-1.3000		-0.7465		-0.4652		0.5071		0.2651		0.1364
		(-2.17)		(-1.20)		(-0.88)		(1.11)		(0.61)		(0.45)
Adjusted R Squared	37.56%	33.48%	34.26%	17.94%	29.55%	15.81%	46.28%	13.23%	45.83%	8.76%	48.07%	9.61%

TABLE 10 – Industry relatedness of spinoffs and parents using Input-Output Tables

Vertical relatedness is calculated (Fan & Lang 2000) as follows. Define a_{ij} as the dollar value of industry i's output to produce industry j's total output. V_{ij} is defined as a_{ij} divided by the dollar output of industry j. The relatedness of spinoffs and parents is calculated as $\frac{1}{2}(V_{ij}+ V_{ji})$ where i and j are the parent and spinoff industry respectively (Fan and Lang 2000 provides the concordance between SIC codes and the input-output tables). Complementarity is calculated (Fan & Lang 2000) as follows. For spinoff industry i calculate the fraction supplied to each other industry k (except the parent industry). This gives us a vector V_{ik} . In a similar manner calculate B_{ik} as the fraction obtained as input from each industry (except the parent industry). Calculate corresponding vectors V_{jk} and B_{jk} where j is the parent industry. Complementarity is calculated as $\frac{1}{2}(\text{corr}(V_{ik}\ V_{jk})+\text{corr}(B_{ik}\ B_{ik}))$.

Panel A – Descriptive Statistics

	Vertical relatedness		Complementarity	
	Spinoff and Parent	All industry pairs (Fan & Lang 2000)	Spinoff and Parent	All industry pairs (Fan & Lang 2000)
Mean	0.0215	0.0119	0.4330	0.1347
75% percentile	0.0145	0.0002	0.6316	0.1784
Median	0.0037	0.0000	0.3407	0.0895
25% percentile	0.0004	0.0000	0.1733	0.0424
Std. Dev	0.0518		0.3301	

Panel B – Mean relatedness and complementarity by sameness of SIC codes

	Vertical Relatedness		Complementarity	
	Same	Different	Same	Different
1 Digit SIC Code	0.0232	0.0195	1.0000	0.3491***
2 Digit SIC Code	0.0352	0.0156**	0.9693	0.3288***
3 Digit SIC Code	0.0390	0.0184*	0.7342	0.2971***
4 Digit SIC Code	0.0454	0.1830**	0.5844	0.2530***

, * and ******* denote differences at the 10%,5% and 1% level

TABLE 11– Share activity around the between the record date and effective date

Record period turnover is the average fraction of parent firms shares traded daily in the 10 day period prior to the issuance of the spinoff shares. This period is used as a proxy for the period between the record date and the effective date of the spinoff. Abnormal record period turnover is measured as the ratio of the daily share turnover in this 10 day period to the daily share turnover in the 10 day period immediately preceding.

Panel A – Descriptive statistics

	Record period turnover (x 10^{-3})	Abnormal record period turnover
Average	8.093	1.327***
Median	3.950	1.172***
75th percentile	7.542	1.512
25th percentile	2.304	0.822
Std. Dev.	16.299	0.722
Skewness	27.381	9.836
Kurtosis	92.881	17.517

*** denotes the ratio is different from 1 at the 1% level

Panel B – Regression results

The dependent variable is the log of block ownership of the spin-off firm in year 3 minus the log of block ownership of the parent firm prior to the spin-off. Relative market equity is the log of the ratio of the market equity of the spin-off to the parent prior to the spin-off. Relative Q is measured similarly using the log of the market-to-book of assets ratio. Relative idiosyncratic risk is measured as the log standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. For the parent firm the 36 months preceding the first firm announcement of the spin-off are used. Relatedness is the log of the stock return correlation calculated as the correlation between the monthly stock return of the parent and spin-off in the first 36 months of the spin-off firm's existence Survivorship is a dummy which takes on a value of 1 if the spin-off is still surviving , 0 otherwise. Ownership rank is the tercile rank of the spin-off firm ranked upon the basis of block ownership of the parent prior to the spin-off.

Record period turnover is the average fraction of parent firms shares traded daily in the 10 day period prior to the issuance of the spinoff shares. This period is used as a proxy for the period between the record date and the effective date of the spinoff. Abnormal record period turnover is measured as the ratio of the daily share turnover in this 10 day period to the daily share turnover in the 10 day period immediately preceding. Both variables are used in log form. Heteroscedasticity consistent T-stats are in parentheses below each coefficient estimate.

Change in log of block ownership of the spin-off firm from yr0 to yr1					
Intercept	0.0594	0.0425	0.0448	0.0979	0.1335
	(2.99)	(3.76)	(2.13)	(2.70)	(3.68)
Record period turnover	-0.0175		-0.0018		-0.0061
	(-1.54)		(-0.13)		(-0.38)
Abnormal record period turnover		-0.0575***	-0.0554**		0.0172
		(-2.52)	(-1.97)		(0.52)
Relative market equity				-0.0204	-0.0115*
				(-1.69)	(-1.85)
Relative idiosync. risk				-0.0245	-0.2885
				-0.78	(-1.13)
Relative Q				-0.0551	-0.0601*
				(-1.89)	(-1.67)
Ownership rank				-0.0855	-0.0482***
				(-5.21)	(-3.86)
Survivorship dummy				0.0481	0.0510**
				(1.89)	(1.92)
Adjusted R-square	1.17%	4.14%	3.59%	27.88%	25.85%

TABLE 12 – Replication of Morck Shleifer Vishny piece-wise linear regression models

Panel A – Frequency distribution of block and managerial ownership

Distribution of block ownership and managerial of sample firms is reported. Also the distribution using Morck, Shleifer and Vishny's breakpoints of 5% and 25% are also reported. The breakpoint of 5% is not usable for data collected from proxy statements because the minimum block size in the proxy statement is 5%.

Distribution of block ownership

Level of block ownership	Year 1	Year 2	Year 3
0%-5%	9	5	9
5%-10%	13	14	12
10%-15%	12	10	13
15%-20%	17	9	12
20%-25%	17	23	10
25%-30%	8	10	13
30%-40%	21	24	17
40%-50%	15	12	18
>50%	5	10	13
Morck, Shleifer & Vishny breakpoints of 5% and 25%			
0%-5%	9	5	9
>5% -25%	59	56	47
>25%	49	56	61
Using breakpoints of 10% and 25%			
0%-10%	22	19	21
>10% -25%	46	42	35
>25%	49	56	61

Distribution of managerial ownership

Level of mgr. ownership	Year 1	Year 2	Year 3
0%-5%	74	70	60
5%-10%	8	13	22
10%-15%	7	7	8
15%-20%	7	9	7
20%-25%	7	6	8
25%-30%	4	3	1
30%-45%	8	8	10
>45%	2	1	1
Morck, Shleifer & Vishny breakpoints of 5% and 25%			
0%-5%	74	70	60
>5% -25%	29	35	45
>25%	14	12	12

TABLE 12 – Replication of Morck Shleifer Vishny piece-wise linear regression models

Panel B – Piece-wise linear regression results using block ownership

The dependent variable is the market-to-book ratio of spinoffs. Firm size is measured as the log market value of equity of spinoffs. Relative idiosyncratic risk is measured as the log standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. Capex-to-assets is the capital expenditure divided by the book value of assets. Ownership 0 to 10 takes on the value of block ownership for levels of less than 10% and 10% otherwise. Ownership 10 to 25 takes on the value of zero for block ownership levels below 10%, block ownership minus 10% for levels between 10 and 25% , and 25% otherwise. Ownership over 25 takes on the value of 0 for levels below 25% and ownership minus 25% otherwise. Heteroscedasticity consistent T-stats are provided below each coefficient estimate.

	Year1	Year2	Year3	Year1	Year2	Year3
Intercept	1.7574	1.1263	0.6902	2.5071	1.9257	1.8584
	6.91	4.63	2.47	(3.20)	(2.72)	(2.87)
Firm Size	0.1695	0.1061	0.1234	0.2041	0.1422	0.1739
	6.46	4.13	3.87	(2.77)	(2.12)	(2.46)
Idiosyncratic risk	0.1669	0.0109	-0.2212	0.9039	0.3615	0.3683
	2.53	0.10	-1.82	(3.48)	(1.79)	(1.29)
Capex-to-assets	2.2448	1.6399	1.0668	3.6425	2.3015	2.8332
	5.20	4.63	3.14	(1.25)	(0.75)	(1.03)
Ownership 0 to 10				-0.5242	-3.7036	-8.4475
				(-0.12)	(-0.77)	(-2.01)
Ownership 10 to 25				-0.9937	-1.077	0.8245
				(-0.65)	(-0.80)	(0.58)
Ownership over 25				-1.3946	0.0305	-0.0394
				(-0.88)	(0.02)	(-0.03)
Adjusted R-square	34.16%	24.14%	14.41%	12.66%	5.28%	5.82%

Panel C – Piece-wise linear regression results using managerial ownership

The dependent variable is the market-to-book ratio of spinoffs. Firm size is measured as the log market value of equity of spinoffs. Relative idiosyncratic risk is measured as the log standard error of estimate of the market model that uses the first 36 months of the spin-off firm's existence. Capex-to-assets is the capital expenditure divided by the book value of assets. Ownership 0 to 5 takes on the value of managerial ownership for levels of less than 5% and 5% otherwise. Ownership 5 to 25 takes on the value of zero for managerial ownership levels below 5%, managerial ownership minus 5% for levels between 5 and 25% , and 25% otherwise. Ownership over 25 takes on the value of 0 for levels below 25% and ownership minus 25% otherwise. Heteroscedasticity consistent T-stats are provided below each coefficient estimate.

	Year1	Year2	Year3	Year1	Year2	Year3
Intercept	0.9438	0.4333	0.2871	1.3892	0.7443	0.7756
	(4.04)	(1.82)	(0.87)	(1.87)	(1.07)	(1.01)
Firm Size	0.2204	0.1420	0.1411	0.2539	0.1916	0.1974
	(7.18)	(5.17)	(4.08)	(3.38)	(2.81)	(2.60)
Idiosyncratic risk	0.1417	0.0111	-0.2042	0.7726	0.3343	0.3566
	(2.19)	(0.10)	(-1.85)	(2.88)	(1.86)	(1.24)
Capex-to-assets	2.9842	2.1376	1.3267	4.1932	3.1403	3.4968
	(5.77)	(4.93)	(2.78)	(1.41)	(0.96)	(1.24)
Ownership 0 to 5				10.4414	8.5248	6.4485
				(1.35)	(1.15)	(0.73)
Ownership 5 to 25				-1.2470	-1.0545	-0.1411
				(-0.49)	(-0.51)	(-0.06)
Ownership over 25				-0.21	0.6157	-0.0580
				(-0.11)	(0.38)	(-0.03)
Adjusted R-square	29.44%	23.21%	12.41%	10.88%	3.79%	2.74%

TABLE 13 – Year-wise distribution of mergers

Year	Number announced	Number effective
1995	20	4
1996	15	19
1997	41	29
1998	34	45
1999	31	32
2000	-	12
Total	141	141

TABLE 14 Firm characteristics of the acquirer and target firms

Assets is the book value of assets in $ million. Market value of equity is also in $ million. The market-to-book ratio of assets is measured as the (the book value of assets + the market value of equity - the book value of equity) / book value of assets. The market-to-book ratio of equity is the ratio of the market value of equity to the book value of equity. ROA is operating income divided by book value of assets. ROE is net income divided by the market value of equity. Stock return correlation is the correlation in monthly returns of the acquirer and target in the 60 months prior to the announcement of the merger.

	Count	Average	Median	Std.	Min.	Max.	25th %	75th %	Skewness	Kurtosis
Acq. Assets	141	29031	12108	50247	396	303989	4501	23034	16.07	28.83
Acq. Mkt. val. eqty.	141	5550	2232	8977	59	65787	800	5542	17.10	40.18
Acq. MTB Assets	141	1.127	1.107	0.087	0.993	1.548	1.073	1.171	8.62	12.29
Acq. MTB Equity	141	2.586	2.410	0.983	0.890	5.988	1.878	3.108	5.16	2.65
Acq. ROA	141	0.029	0.028	0.006	0.014	0.045	0.025	0.032	0.41	0.08
Acq. ROE	141	0.155	0.150	0.053	0.059	0.352	0.112	0.186	4.63	3.15
Tar. Aassets	141	5401	1039	15150	66	114096	411	3520	27.92	90.79
Tar. Mkt. val. eqty.	141	876	184	2422	13	24143	73	638	33.90	149.93
Tar. MTB Assets	141	1.083	1.080	0.063	0.974	1.358	1.034	1.121	4.56	4.61
Tar. MTB Equity	141	1.955	1.860	0.746	0.799	5.003	1.413	2.400	4.58	3.15
Tar. ROA	141	0.026	0.026	0.006	0.007	0.045	0.021	0.030	0.52	1.14
Tar. ROE	141	0.170	0.147	0.079	0.064	0.512	0.120	0.191	9.53	12.55

	Count	Average	Median	Std.	Min.	Max.	25th %	75th %	Skewness	Kurtosis
tassets/aassets	141	0.246***	0.149***	0.327	0.006	1.961	0.042	0.298	14.09	24.24
teqty/aeqty	141	0.213***	0.127***	0.267	0.003	1.470	0.039	0.278	11.27	14.38
troa/aroa	141	0.922***	0.905***	0.231	0.374	1.737	0.753	1.074	1.34	1.08
troe/aroe	141	1.144***	1.080***	0.458	0.368	3.270	0.798	1.390	7.59	10.55
tmtba/amtba	141	0.964***	0.966***	0.064	0.699	1.197	0.938	0.997	-3.71	8.73
tmtbe/amtbe	141	0.806***	0.766***	0.299	0.253	2.058	0.617	0.963	5.02	5.51
Stock return correlation	141	0.188***	0.159***	0.159	-0.063	0.726	0.073	0.255	5.25	2.79

***** denotes significantly different from 1 (0 for stock return correlation) at the 1% level**

TABLE 15 PANEL A – Geographical separation of acquirers and targets

	N	At least one target director hired	Number of target directors hired
Target and acquirer from the same state	66	0.73	2.14
Target and acquirer from different states	75	0.49	1.52

PANEL B - Loan portfolio of targets and acquirers

	Ratio of loans to total assets	
	Acquirer	Target
N	109	54
Average	0.6263	0.6002
Median	0.6415	0.6268
Std. Dev.	0.0998	0.1170
Min.	0.0738	0.1939
Max.	0.7951	0.8335
Lower Quartile	0.5865	0.5365
Upper Quartile	0.6891	0.6577
Skewness	-9.282	-2.497
Kurtosis	18.728	2.738

PANEL C - Loan composition of targets and acquirers

	Fraction of loans to individuals in loan portfolio		Fraction of industrial loans in loan portfolio		Fraction of real estate loans in loan portfolio	
	Acquirer	Target	Acquirer	Target	Acquirer	Target
N	109	54	109	54	109	54
Average	0.1730	0.1117	0.2271	0.1755	0.5631	0.6849
Median	0.1737	0.0690	0.2032	0.1693	0.5794	0.6781
Std. Dev.	0.0796	0.1045	0.1233	0.0967	0.1449	0.1634
Min.	0.0264	0.0055	0.0711	0.0000	0.0572	0.3224
Max.	0.4393	0.4741	0.8859	0.4381	0.8660	0.9842
Lower Quartile	0.1112	0.0296	0.1389	0.1209	0.4408	0.5721
Upper Quartile	0.2205	0.1802	0.2707	0.2109	0.6819	0.8090
Skewness	2.706	3.869	8.928	1.453	-2.185	-0.248
Kurtosis	0.771	2.225	15.589	0.639	0.464	-1.102

Means (medians) of acquirer and target are different at the 1% level

TABLE 15 PANEL D- Distance measures

Comp_distance = Abs(Fraction of loans to individuals acq. – fraction of loans to individuals target) + Abs(Fraction of real estate loans acq. – fraction of real estate loans target) + Abs(Fraction of industrial loans acq. – fraction of industrial loans target)
Loan_distance = Abs(Fraction of loans in total assets acq. – Fraction of loans in total assets target)

	Loan_distance	Comp_distance
N	46	46
Average	0.1092	0.4030
Median	0.0691	0.2986
Std. Dev.	0.1111	0.2948
Min.	0.0092	0.0554
Max.	0.4781	1.3848
Lower Quartile	0.0452	0.1896
Upper Quartile	0.1263	0.5625
Skewness	5.740	3.532
Kurtosis	5.856	1.976

TABLE 16 Board characteristics of the acquirer and target firms

	Average	Median	Std.	Min.	Max.	25th %	75th %	Skewness	Kurtosis
Acquirer									
Board Size	14.62	13.50	4.41	7.00	26.00	11.00	18.00	2.45	-1.47
% outsiders	61.04%	60.00%	15.74%	0.08%	93.33%	50.00%	73.91%	-1.90	-0.04
% insiders	16.86%	16.23%	9.15%	3.85%	55.56%	9.76%	22.65%	6.25	7.15
Median Age	59.96	60.00	4.00	51.50	72.00	56.75	62.50	0.82	-0.01
Median Tenure	8.44	8.00	3.60	1.00	22.50	6.00	10.00	3.53	3.54
% Ownership	7.06	5.03	7.24	0.00	47.00	2.91	8.30	14.04	25.20
CEO's stake	1.31	0.51	1.93	0.06	13.74	0.51	1.40	4.48	23.16
# of firms where CEO is not chairman			33						
Target									
Board Size	11.35	10.00	4.77	5.00	26.00	8.00	14.00	5.63	2.48
% outsiders	51.80%	50.00%	17.20%	0.00%	87.50%	40.00%	66.66%	-1.44	-0.41
% insiders	23.46%	22.22%	12.85%	0.00%	80.00%	13.64%	30.77%	6.56	7.76
Median Age	58.31	59.00	10.28	0.00	77.00	55.50	62.00	-18.45	49.63
Median Tenure	10.61	10.00	5.33	1.00	31.00	6.00	13.50	4.76	3.59
% Ownership	15.39	12.50	11.03	1.00	50.70	6.92	20.80	5.32	1.54
CEO's stake	3.23	1.98	4.84	0.00	37.80	0.60	4.09	4.56	25.62
# of firms where CEO is not chairman			69						

TABLE 17 – Comparison of acquirer board before and after merger

	N	Average	Median	Std.	Min.	Max.	25th %	75th %	Skewness	Kurtosis
Board Size										
Pre-Merger	141	14.62	13.5	4.41	7	26	11	18	2.45	-1.47
Post-Merger	141	16.21	16.0	4.59	7	28	13	20	1.43	-0.39
Change in board size	141	1.64	1.00	3.23	-6.00	18.00	0.00	3.00	8.13	15.25
% change in board size	141	0.142	0.083	0.278	-0.300	1.800	0.000	0.233	13.65	30.15
% Insiders										
Pre-Merger	141	0.169	0.162	0.092	0.038	0.556	0.098	0.226	6.25	7.15
Post-Merger	141	0.159	0.154	0.077	0.038	0.500	0.095	0.200	4.90	5.62
Change in % insiders	141	-0.009	0.000	0.048	-0.190	0.113	-0.025	0.010	-2.52	4.11
% change in % insiders	141	-0.015	0.000	0.373	-0.627	2.000	-0.190	0.101	11.81	23.24
% Outsiders										
Pre-Merger	141	0.610	0.600	0.157	0.083	0.933	0.500	0.739	-1.90	-0.04
Post-Merger	141	0.607	0.611	0.150	0.083	0.929	0.524	0.727	-1.90	0.43
Change in % outsiders	141	-0.004	0.000	0.095	-0.335	0.215	-0.050	0.054	-2.27	2.33
% change in % outsiders	141	-0.011	0.000	0.167	-0.478	0.484	-0.096	0.076	-1.03	2.18
Number from target	141	1.80	1.00	2.34	0.00	12.00	0.00	3.00	9.49	10.94
Number of new directors	141	3.48	3.00	3.03	0.00	17.00	1.00	5.00	7.94	10.96
1 if target CEO picked	141	0.40	0.00	0.49	0.00	1.00	0.00	1.00	2.06	-4.47

Number (%) of firms with at least one director from the target	85 (60.3%)
Number (%) of firms with a decrease in board size	25 (17.7%)

TABLE 18 – Determinants of the survivor board size

The market-to-book ratio of equity is the ratio of the market value of equity to the book value of equity. ROE is net income divided by the market value of equity. Acquirer (target) board ownership is the ownership of all acquirer (target) directors.

Dependent variable – log of survivor board size

Intercept	0.5730	-3.353
	(3.67)	(-2.36)
log(Acquirer Board Size)	0.7254	0.807
	(13.66)	(14.75)
log(Target Board Size)	0.1110	0.086
	(2.72)	(2.00)
log(Target Mkt. Val. of Equity) - log(Acquirer Mkt. Val. of Equity)		0.043
		(2.79)
log(Target market to book of equity)-log(Acquirer market to book of equity)		0.079
		(1.56)
log(Target ROE)-log(Acquirer ROE)		0.118
		(2.50)
log(Acquirer Mean Director Age)		0.550
		(1.85)
log(Target Mean Director Age)		0.392
		(1.85)
log(1+Acquirer Board Ownership)		0.011
		(0.46)
log(1+Target Board Ownership)		0.005
		(0.19)
Adjusted R-square	60.35%	67.89%
N	141	141
Heteroscedasticity consistent T-stats are in parentheses		

TABLE 19 – Logit model for the probability that at least one target director is hired

Same state dummy is a variable that take a value if the acquirer and target are headquartered in the same state, 0 otherwise. The market-to-book ratio of equity is the ratio of the market value of equity to the book value of equity. ROE is net income divided by the market value of equity. Stock return correlation is the correlation in monthly returns of the acquirer and target in the 60 months prior to the announcement of the merger.
Comp_distance = Abs(Fraction of loans to individuals acq. – fraction of loans to individuals target) + Abs(Fraction of real estate loans acq. – fraction of real estate loans target) + Abs(Fraction of industrial loans acq. – fraction of industrial loans target)
Loan_distance = Abs(Fraction of loans in total assets acq. – Fraction of loans in total assets target)

Intercept	-4.2199	-4.2881	-23619
log(Acquirer Board Size)	2.7262	1.3342	0.9882
	(2.61)	(0.81	(0.47)
log(Target Board Size)	-0.0267	-7.9644	-1.7772
	(-0.03)	(-0.87)	(-1.23)
log(Target Mkt. Val. of Equity) - log(Acquirer Mkt. Val. of Equity)	2.0484	5.7295	1.3351
	(4.84)	(3.65)	(2.45)
log(Target ROE)-log(Acquirer ROE)	2.1401	2.0799	5.3689
	(2.46)	(2.78)	(2.45)
log(Target market to book of equity)-log(Acquirer market to book of equity)	0.8852	10.4803	4.2546
	(0.95)	(3.10)	(2.05)
log(1+Acquirer Board Ownership)	0.6080	3.5267	0.6247
	(2.07)	(2.41)	(0.62)
log(1+Target Board Ownership)	-0.5116	2.4167	-0.1199
	(-0.94)	(-0.11)	(-0.14)
log(1+Target CEO ownership)	-0.1376	-2.2580	-0.5410
	(-0.22)	(-0.76)	(-0.67)
log(Acquirer Mean Director Age)	1.7088	5.0216	3.8504
	(0.32)	(0.22)	(0.37)
log(Target Mean Director Age)	-0.8708	5.3611	3.6834
	(-0.21)	(0.56)	(0.33)
Same state dummy	0.3554	0.7321	0.7836
	(0.56)	(0.43)	(0.64)
log(Stock Return Correlation)	-3.1401		
	(-2.10)		
loan_distance		-3.7564	
		(-2.39)	
comp_distance			-2.0660
			(-1.03)
Adjusted R-square	34.73%	49.42%	30.59%
N	141	46	46

T-stats are in parentheses

TABLE 20 – Determinants of the number of target directors hired

Same state dummy is a variable that take a value if the acquirer and target are headquartered in the same state, 0 otherwise. The market-to-book ratio of equity is the ratio of the market value of equity to the book value of equity. ROE is net income divided by the market value of equity. Stock return correlation is the correlation in monthly returns of the acquirer and target in the 60 months prior to the announcement of the merger.
Comp_distance = Abs(Fraction of loans to individuals acq. – fraction of loans to individuals target) + Abs(Fraction of real estate loans acq. – fraction of real estate loans target) + Abs(Fraction of industrial loans acq. – fraction of industrial loans target)
Loan_distance = Abs(Fraction of loans in total assets acq. – Fraction of loans in total assets target)

	Panel A			Panel B		
Intercept	-5.1052	1.2721	2.7799	-5.9869	5.2512	4.7590
log(Acquirer Board Size)	0.4879	0.2672	0.2434	0.4267	0.2537	0.2439
	(3.45)	(1.10)	(1.01)	(2.22)	(0.55)	(0.54)
log(Target Board Size)	0.2616	0.0205	-0.0393	0.4293	0.1396	0.1201
	(2.26)	(0.15)	(-0.27)	(2.61)	(0.43)	(0.38)
log(Target Mkt. Val. of Equity) - log(Acquirer Mkt. Val. of Equity)	0.4129	0.3503	0.3398	0.4500	0.3245	0.3253
	(9.54)	(5.45)	(5.36)	(7.85)	(2.42)	(2.51)
log(Target ROE)-log(Acquirer ROE)	0.4119	0.6717	0.7307	0.3294	0.5390	0.5514
	(3.33)	(2.77)	(3.03)	(3.01)	(1.75)	(1.56)
log(Target market to book of equity)- log(Acquirer market to book of equity)	0.2191	0.5964	0.6926	0.2224	0.5346	0.5231
	(1.75)	(2.27)	(2.69)	(1.88)	(1.01)	(0.94)
log(1+Acquirer Board Ownership)	0.1085	0.0744	0.0413	0.1171	0.1212	0.1214
	(1.51)	(0.78)	(0.41)	(2.26)	(0.96)	(0.98)
log(1+Target Board Ownership)	-0.1629	-0.1341	-0.1375	-0.1812	-0.1864	-0.1911
	(-2.10)	(-1.27)	(-1.83)	(-2.22)	(-2.07)	(-2.13)
log(1+Target CEO ownership)	0.0014	-0.1297	-0.1324	0.0346	-0.0954	-0.0937
	(0.02)	(-1.45)	(-1.50)	(0.25)	(-0.10)	(-0.22)
log(Acquirer Mean Director Age)	0.6513	-0.1447	-0.4396	0.7286	-0.8141	-0.8559
	(0.83)	(-0.12)	(-0.38)	(0.65)	(-0.21)	(-0.17)
log(Target Mean Director Age)	0.6357	0.1707	0.1771	0.7267	-0.1939	-0.1200
	(1.16)	(0.16)	(0.17)	(0.98)	(-0.40)	(-0.02)
Same state dummy	0.0404	0.1385	0.1435	0.0614	0.2166	0.2629
	(0.48)	(0.88)	(0.98)	(0.55)	(1.24)	(1.09)
log(Stock Return Correlation)	-0.7297			-0.8450		
	(-1.94)			(-1.81)		
loan_distance		-0.4468			0.2761	
		(-0.86)			(0.34)	
comp_distance			-0.2574			-0.0335
			(-1.24)			(-0.05)
Adjusted R-square	65.06%	78.11%	78.64%	73.85%	32.07%	31.78%
N	141	46	46	141	46	46

Heteroscedasticity consistent T-stats are in parentheses

TABLE 21 – Pooling multiple acquisitions by the same acquirer

PANEL A

Number of acquisitions	Frequency
1	60
2	11
3	9
4	4
5	2
6	1

PANEL B

	Survivor board size	Probability of representation	Extent of representation
Intercept	-1.5693	-2.6409	-5.8502
	(-1.01)		(-1.24)
log(Acquirer Board Size)	0.8151	2.9047	0.4374
	(11.77)	(1.83)	(2.08)
log(Target Board Size)	0.1038	0.3435	0.3699
	(1.90)	(0.21)	(2.00)
log(Target Mkt. Val. of Equity) - log(Acquirer Mkt. Val. of Equity)	0.0686	1.6495	0.3499
	(3.50)	(4.51)	(5.89)
log(Target market to book of equity)- log(Acquirer market to book of equity)	0.0979	1.3552	0.3419
	(2.85)	(0.77)	(1.51)
log(Target ROE)-log(Acquirer ROE)	0.1842	2.6	0.352
	(1.31)	(1.87)	(1.80)
log(Acquirer Mean Director Age)	0.307		0.4464
	(0.86)		(0.41)
log(Target Mean Director Age)	0.1721		0.9646
	(1.03)		(1.95)
log(1+Acquirer Board Ownership)	0.0672	1.2901	0.2272
	(2.28)	(1.73)	(2.53)
log(1+Target Board Ownership)	-0.0240	-1.2559	-0.2645
	(-0.59)	(-1.41)	(-2.13)
log(1+Target CEO ownership)		-0.1346	-0.026
		(-0.21)	(-0.20)
Adjusted R-square	72.73%	23.11%	61.65%
N	87	87	87

Heteroscedasticity consistent T-stats are in parentheses

TABLE 22 – Mode of payment used in the acquisition

Mode of payment	Frequency
No. of cash deals	4
No. of cash/stock deals	6
No. of cash & stock deals	5
No. of pure stock deals	126
Total	141

Figure 1A – Block ownership of Bestfoods and Corn Products

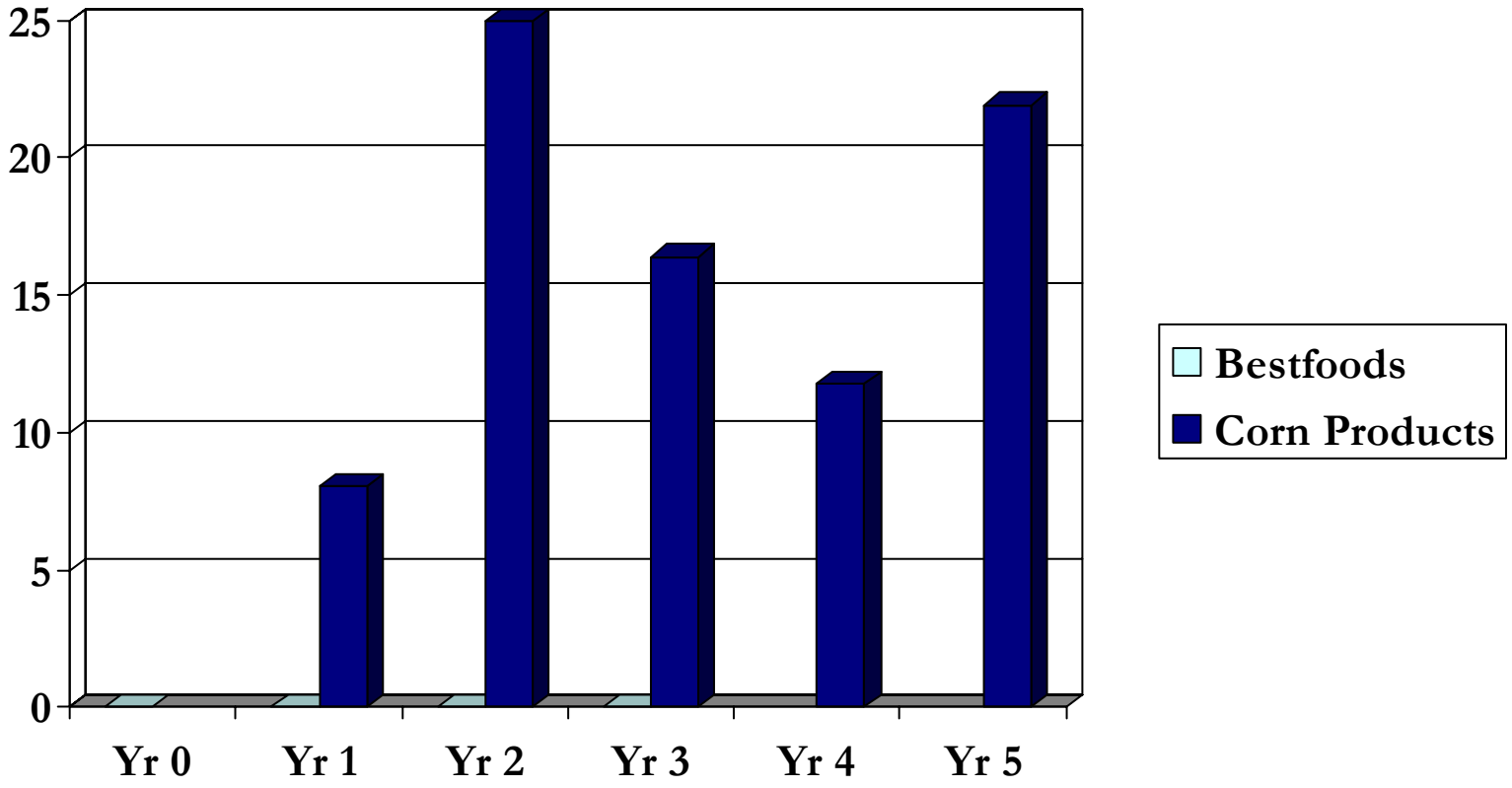

Figure 1B – Managerial ownership of Bestfoods and Corn Products

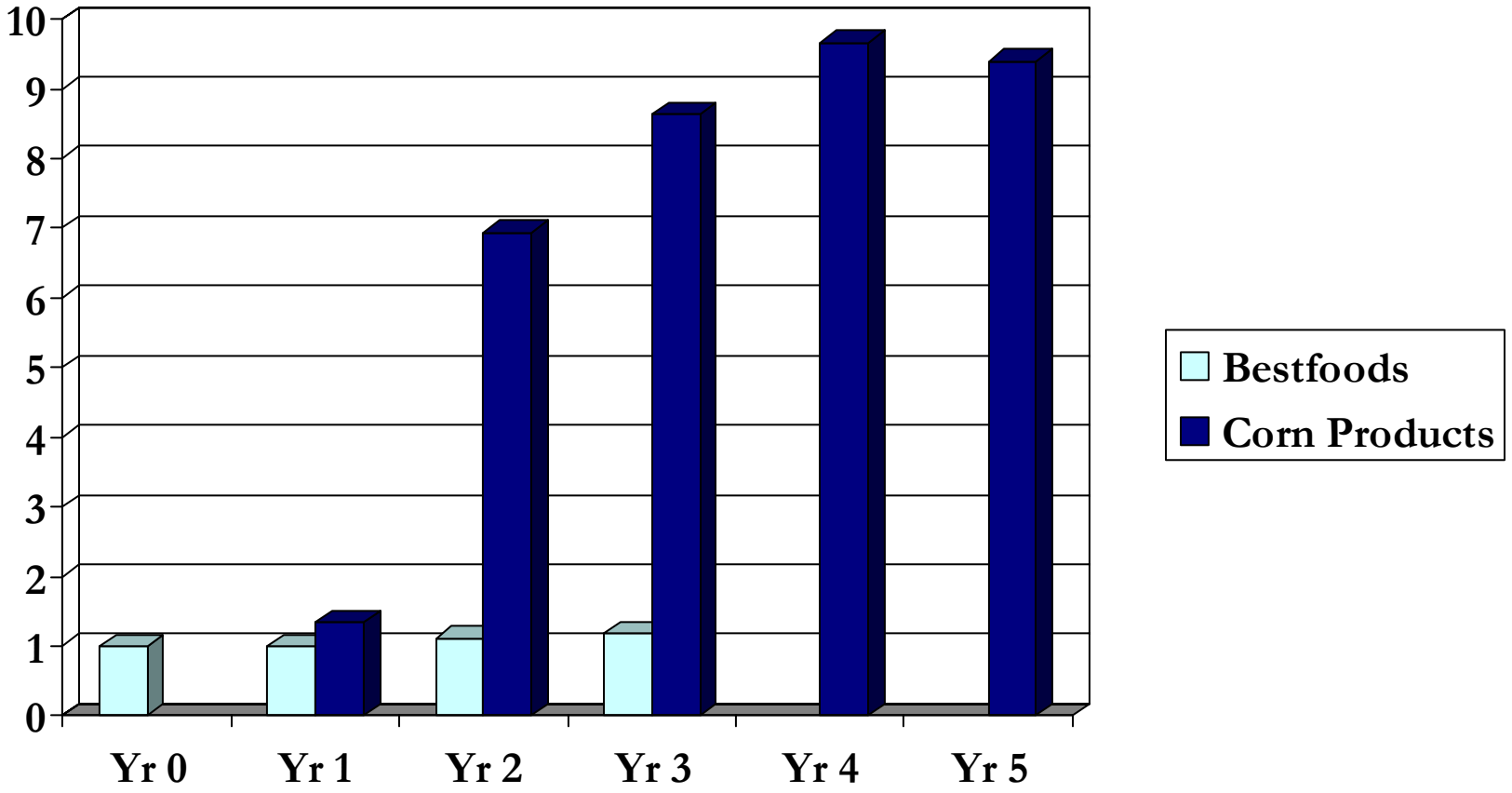

Figure 2A – CAR graphs for classes of spinoffs based on survival

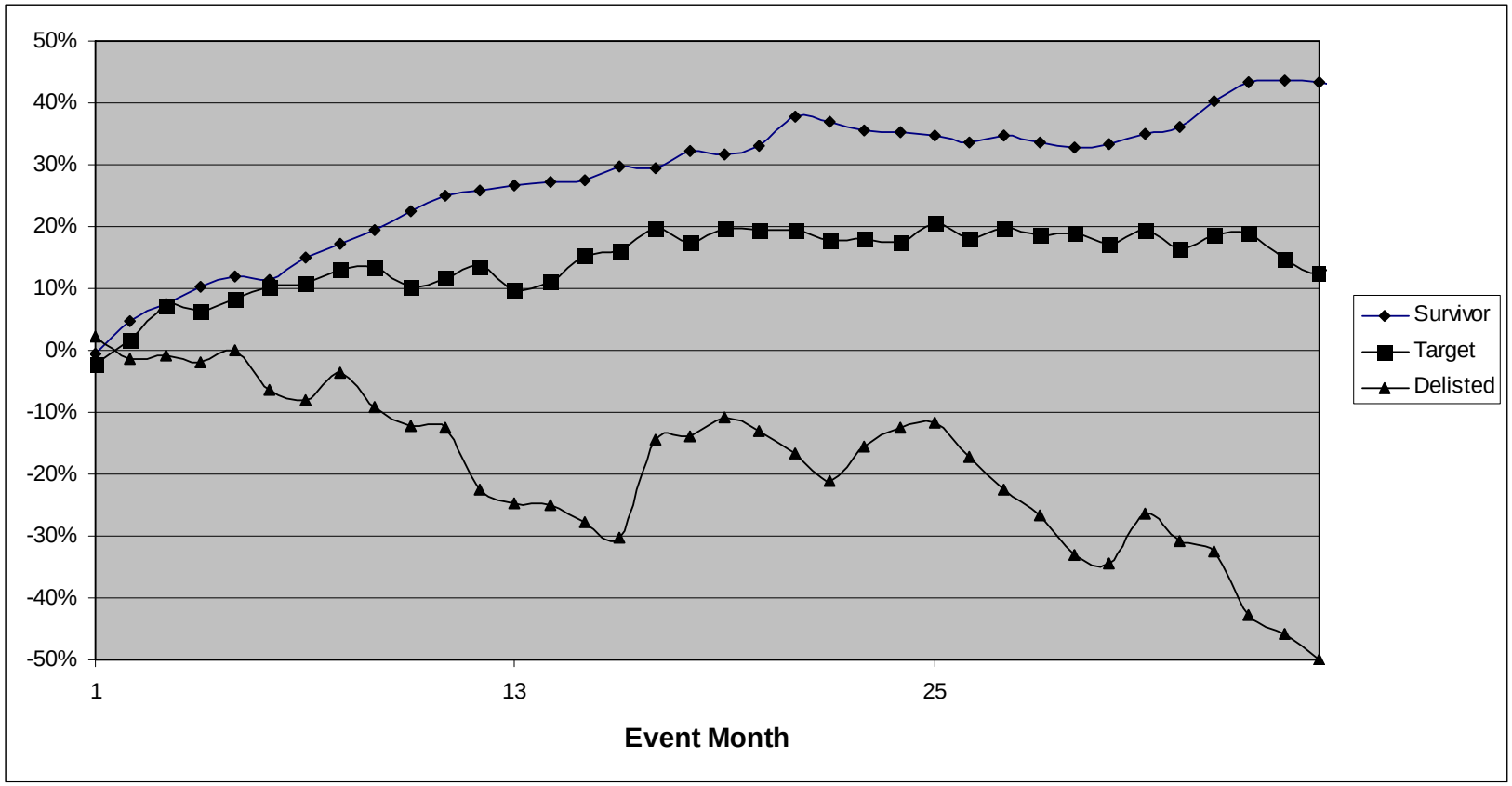

Figure 2B – CAR graphs for terciles of spinoffs (and corresponding matching firms) formed on the basis of 1 year changes in block ownership