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Essays in Corporate Governance: Issues and Evidence from Equity Carve-Outs

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Essays in Corporate Governance: Issues and Evidence from Equity Carve-Outs

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This is dedicated to my children Andrea and Kelvin, and my mother Agnes

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Abstract

This dissertation consists of three essays examining the relation between corporate governance and firm performance. The theme of this study is that the widely documented long-term underperformance in equity carve-outs can be partly explained by weak corporate governance.

The first essay presented in Chapter 2 explores the effect of shareholder-rights protection on the performance of a sample of firms that initiated a carve-out during the period 1983-2004. Using the Gompers, Ishii, and Metrick (2003) index and Bebchuk, Cohen, and Ferrell (2004) entrenchment index, as proxies for the quality of shareholder-rights protection, I provide evidence that firms with better shareholder rights protection outperform those with weaker rights protection. Results indicate that the weaker the rights protection, the greater the degree of underperformance. Overall, the results are robust to measures of firm performance and to model specification.

The second essay presented in Chapter 3 examines the relation between firm performance and board structure. In particular, I study how board size, board independence, and CEO duality influence firm performance. I find that board size for non-financial firms is negatively related to firm performance but positively associated with performance for financial firms. Board independence is positively related to firm performance and CEO duality is negatively associated with performance for both financial and non-financial firms. These results are robust to various measures of firm performance. The conflicting evidence on board size, between financials and non-financials, seems to suggest that the scope and complexity of a firm's operations drives board size.

The third essay presented in Chapter 4 investigates corporate ownership and firm performance. I focus on insider ownership, outside blockholder ownership, and ownership concentration. Results show that insider ownership is negatively related to firm performance even at low levels of insider ownership levels. It is plausible that the combination of parent ownership and management ownership in the subsidiary exacerbate the entrenchment effect thus overwhelming the incentive alignment effects that theory posits. I document a positive relation between outside blockholder ownership and firm performance. And finally, I show that the level of ownership concentration increases (decreases) in anticipation of positive (negative) changes in firm performance.

JEL Classifications: G32, G34, G38, K22

Keywords: Carve-outs; GIM-Index; Entrenchment-index; Divisive restructurings; Anti-takeover Provisions; Corporate Boards; External Directors; Board Size; Board-insiders; Board Independence; Ownership Structure; Insider-Ownership; Managerial-Ownership; Blockholders.

Chapter 1

1. Introduction

This dissertation examines the relation between corporate governance and firm performance. The theme of the study is that the widely documented poor performance of equity carve-outs, following the announcement, can be partly explained by weak corporate governance. The first essay presented in Chapter 2 explores the effect of shareholder-rights protection on the performance of a sample of firms that announcement a carve-out during the period 1983-2004. Using the Gompers, Ishii, and Metrick (2003) index and Bebchuk, Cohen, and Ferrell (2004) entrenchment index, as proxies for the quality of shareholder-rights protection, I provide evidence that firms with stronger shareholder-rights protection outperform those with weaker rights protection. Results show that the weaker the rights protection, the greater the degree of underperformance. This evidence is robust to various measures of firm performance and to model specification.

The second essay presented in Chapter 3 examines the relation between board structure and firm performance. In particular, I explore the potential influence of board size, board independence, and CEO duality on firm performance and whether the cross-sectional variations in these attributes across the sample can explain inter-firm performance disparity. I find that board size for non-financial firms is negatively related to firm performance but positively associated with performance for financial firms. Board independence is positively related to firm performance and CEO duality is negatively associated with performance for both financial and non-financial firms. These results are robust to various measures of firm performance and to model specification. The conflicting evidence on board size between financial and non-financial firms suggests that board size may be largely driven by the scope and complexity of a firm's operations and should not be prescribed across firms.

The third essay presented in Chapter 4 investigates the relation between corporate ownership and firm performance. I explore to what extent insider ownership, outside block-holder ownership and ownership concentration moderate the relation between ownership structure and firm performance in equity carve-outs. I find that contrary to extant evidence positing a positive relation between insider ownership and firm performance at low levels of

ownership [0-5%], and a negative relation at higher levels of insider ownership is rejected in the case of equity carve-outs. A combination of parent ownership and insider ownership in the subsidiary seem to exacerbate the entrenchment effects and to overwhelm the incentive alignment effects at very low levels of insider ownership. I present evidence in support of the positive relation between outside blockholder ownership and firm performance. The presence of outside blockholders seems to significantly moderate the negative effects of a highly dominant parent firm. And lastly, I show that in the case of equity carve-outs, the level of ownership concentration seems to increase (decrease) in anticipation of positive (negative) changes in firm performance. Overall, these findings seem to suggest that dominant parent firms, at least in the case of equity carve-outs, exacerbate rather than mitigate the agency problem. As a matter of governance policy in the case of equity carve-outs, alternative control mechanisms may be necessary to moderate the behavior of dominant parent firms.

2. Motivation and Contributions

2.1 Motivation

Beginning with Adam Smith (1776) in the *Wealth of Nations*, and much later in a seminal exposition on the demerits of the corporate form by Berle and Means (1932), the idea of divorcing corporate ownership from corporate control and its implications for firm value has preoccupied financial economists. Berle and Means (1932) went as far as suggesting that the corporate form was an untenable form of organization. Despite this criticism, control and ownership of the modern public firm are still separated. Specialization, one of the basic tenets of free markets, suggests that atomistic owners with relatively small stakes in the firm may have neither the incentive nor the skills to run the firm. Consequently, shareholders (principals) are better off hiring professional managers (agents) to whom they delegate decision rights to pursue the objective of maximizing share value. Although in this organizational form the modern firm has proved to be a very efficient means for raising and deploying capital, this efficiency does not come without cost. When corporate ownership and control are separated agency conflicts invariably arise. The interests of the managers, acting as agents, may not necessarily be in alignment at all times with those of shareholders (principals) on whose behalf they are acting. These principal-agent conflicts are what constitute the fundamental problem that belies the notion of corporate governance.

Corporate governance can be defined as a complex system of mechanisms intended to overcome the conflict of interests inherent in the corporate form. The inability of the firm to establish an effective system of corporate governance therefore poses significant risk to outside investors and is detrimental to the survival of the firm itself. This critical importance of corporate governance has spawned an extensive literature. Some studies explore whether various governance mechanisms are optimally chosen to maximize shareholder wealth, others investigate whether governance mechanisms are chosen independent of each other or jointly to resolve conflicts of interest, and the rest examine the independent or joint influence of governance mechanisms on firm performance. In spite of these research efforts the existing evidence is still mixed and largely inconclusive for various reasons that I discuss below. The three essays re-examine the relation between corporate governance and firm performance by attempting to mitigate the major econometric problems that plague previous studies.

First, previous corporate governance studies have generally been hampered by a number of econometric issues. Chief among these are: the endogeneity problem, poor measurement of variables, omitted explanatory variables, selection bias, and lack of data. The main objective of this dissertation is to re-examine the relation between corporate governance and firm performance using methodological approaches that control for these problems. The goal is to run alternative estimation methods and successively increase their complexity with a view to discerning the effect on coefficients. The idea here is that if any statistically significant changes in the coefficients can be observed, then it is plausible that the choice of econometric models in earlier studies may partly explain the largely mixed evidence. To the extent that the choice of estimation models in this study is more reliable than simple OLS approaches implemented in the majority of earlier studies, I present new evidence that sheds light on whether and how corporate governance influences firm performance.

Second, the persistence of governance structures across time is well documented and often cited as one of the factors that weaken findings in previous studies. This auto-correlation renders empirical tests on the association between corporate governance and firm performance weak and unreliable. I argue that some of the conflicting evidence that exists may be due to this problem. To mitigate this persistence problem, I exploit the experimental setting presented by the

structural break in governance following the announcement of a carve-out transaction. Further investigation in this set up is likely to shed more light on the evolution of governance structures and whether these changes have any impact on firm performance.

Finally, although an extensive IPO literature exists that addresses market reaction and post firm performance [Eckbo, et al. (2000), Brav, et al. (2000), and Ritter and Welch (2002)], issues involving equity carve-outs are not directly addressed. Equity carve-outs are fundamentally different from traditional IPOs and spinoffs. The strong ties that continue to bind carve-out subsidiaries to their parent are non-existent in other IPO transactions. In addition, following most carve-outs the subsidiary gets new management with separate compensation and incentive structures. I argue that parent firms, with the approval of their boards, exercise significant discretion in this restructuring. It is reasonable to hypothesize that some of the performance issues raised following carve-out announcements can be partly attributable to agency conflicts between the parent firm and minority shareholders in the subsidiary. Considering that some of these costs are borne by the new minority shareholders, it raises the issue of minority shareholder-rights protection in equity carve-outs, which I investigate in the first essay. Further investigation of equity carve-outs is also likely to shed light on the merits and demerits of having a corporate blockholder with majority control. And to what extent other forms of ownership such as institutional ownership and the presence of external blockholders can moderate these potential agency problems. I attempt to answer these questions in the third essay.

In light of the foregoing, it is evident that a gap still exists in our understanding of how corporate governance in general, and the specific mechanisms in particular, influence firm performance. Denis (2001), in a survey "The Last 25-years of Corporate Governance Research', highlights our limited understanding of the influence of governance on firm performance and delineates areas for future research. She posits that our understanding of corporate governance requires further work in the following areas: (1) why various corporate governance mechanisms should be expected to mitigate the agency problem, (2) how these mechanisms interact with each other and with other important characteristics of the firm, (3) a need to develop theoretical inner workings of governance mechanisms such as the board. More importantly, she asserts that existing governance literature fails to establish an unambiguous link between the quality of

governance and firm performance. My dissertation attempts to fill this gap by focusing on three governance mechanisms: the quality of shareholder-rights protection, board structure, and corporate ownership.

2.2 Contributions

The three essays in this dissertation fit within the corporate restructuring strand on one hand, and corporate governance literature on the other. These essays make three important contributions to extant literature. First, in light of the severe econometric issues that confound earlier corporate governance studies, I present evidence supported by improved empirical techniques, in particular the instrumental variables approach (IV) and the generalized method of moments (GMM). Second, as discussed earlier the persistence of governance structures makes it harder to empirically discern changes in governance and the impact those changes may have on firm performance. In this study, I mitigate this issue by exploiting the experimental setting presented by the structural break in the governance structures of restructuring firms. This strategy also allows me to take an evolutionary approach to analyzing changes in corporate governance and their impact on firm performance. I present evidence that changes in shareholder-rights protection, board structure, and ownership structure have an impact on firm performance. Third, there is a dearth of evidence on the effects of blockholder ownership when the blockholder is a corporation. In the case of equity carve-outs, the parent firm happens to be the largest blockholder. I argue that the parent firm being also the largest blockholder puts it in too powerful a position that the interests of the fringe minority may be compromised. Consistent with this argument but contrary to extant evidence, results show a statistically significant negative relation between the level of control retained by the parent and the performance of the subsidiary following the announcement.

3. Background

3.1 The Agency Problem

The notion of corporate governance is a consequence of the fundamental agency problem created by the potential set of conflicts of interest amongst various stakeholders of the firm including managers (agents), shareholders (principals), directors, debt-holders, employees, and

suppliers. Most studies focus on three main conflicts of interest: manager-shareholder conflicts, shareholder-bondholder conflicts, and director-shareholder conflicts. In the following section I describe the main agency conflicts and discuss potential problems that are likely to arise in the absence of effective governance.

Conflicts of interest between managers and shareholders arise when managers, acting as agents on behalf of shareholders (principals), engage in activities that are detrimental to shareholders and inconsistent with the goals of shareholder value maximization. Four potential sources of conflict exist: managers' desire to remain in power even though it would be optimal to replace them, managers' choice of effort, managers being too risk averse, and the free cash flow problem. Conflicts of interest between directors and shareholders are important considering that corporate governance is highly reliant on a system of checks and balances. The shareholders (principals) who hire managers (agents) to run their firms cannot reasonably monitor them on a day-to-day basis. Instead, shareholders appoint a board of directors to which they delegate the responsibility of monitoring the managers to ensure that shareholders' interests are well served. A board that is independent of senior management is more likely to discharge this responsibility more effectively and objectively. Conflicts of interest between directors and shareholders arise when the former come to identify with managers' interests rather than shareholders'. In these circumstances, a board beholden to senior management will tend to exacerbate the manager-shareholder conflicts afore-mentioned. The issue of board independence and firm performance is the subject of my second essay.

3.2 Governance Mechanisms

Given the potential agency costs that separation of corporate ownership and control is likely to impose on shareholders, a system of mechanisms has evolved over time to help mitigate some of these costs. This system of mechanisms is what constitutes what is commonly referred to as corporate governance. Governance mechanisms can be broadly categorized as internal or external. Internal mechanisms are those checks and balances within the firm itself that are designed to align the interests of various stakeholders. Examples of internal mechanisms include: the board, managerial compensation and succession, capital structure, and ownership structure. Corporate boards, as one of the key internal stakeholder-interest alignment mechanisms in the

governance of the modern public firm, have attracted the interest of researchers for a long time. The board of directors is an instrument designed to ensure that the resources of the firm are used in the best long-term interest of the shareholders. To effectively perform that function board members must be independent, resourceful, and have the experience to judge the actions of senior management. Some of the big questions about boards that empirical research has attempted to answer include: (1) What factors affect the composition of boards; (2) Whether and how board characteristics, such as proportion of external-to-insider directors and board size affect firm performance; and lastly (3) How effectively corporate boards accomplish their intended role as an interest alignment mechanism. Managerial compensation and succession is another internal mechanism intended to align the interests of managers and those of shareholders and is one of the top responsibilities assigned to the board of directors. Two important questions that empirical research has grappled with for some time are the level of managerial compensation and its sensitivity to performance. The issues at hand are whether managers are fairly compensated or over-compensated. And perhaps more importantly, since compensation contracts are designed to align manager-shareholder interests, to what extent is compensation sensitive to firm performance?

External mechanisms include the market for corporate control, the judicial system, and product markets. In the event that a firm fails to institute an effective internal governance system, significant agency costs will be imposed on its shareholders. These costs will in turn be reflected in the firm's relative underperformance or low market valuation. Market participants outside the firm are likely perceive that as an opportunity to acquire the underperforming firm, replace bad management and create additional value for their shareholders by improving the operations and governance system. The judicial system plays an important role in disciplining managers and controlling the opportunistic behavior of other stakeholders. Systems of laws and regulations that govern a firm in a given jurisdiction have a significant impact on what managers and other stakeholders in a corporation can do and what they cannot do. Competitiveness in the product markets is another external disciplinary mechanism that aligns the interests of shareholders and management. Managers have a vested interest in the survival of the firm because their continued tenure depends on it. Ensuring that the firm they are managing not only survives but thrives in the product market necessitates that managers deploy the firm's resources efficiently and

productively. Even through the self-preservation motive may seem self-interested, shareholders are ultimately the beneficiaries of these actions when firm value increases. All these mechanisms are complementary in nature and none individually, is sufficient to mitigate the severity of potential agency conflicts. In this study, I focus on internal mechanisms and examine the influence of shareholder-rights protection, board structure, and corporate ownership on firm performance.

4. The Econometrics of Governance Studies

The main objective of corporate governance is to mitigate agency conflicts amongst stakeholders of a corporation and to ensure that the firm's resources are deployed in a manner that is consistent with shareholder value maximization. Empirical studies in corporate governance seek to understand the effectiveness of various governance mechanisms and their potential impact on firm value. In most of these studies some proxies of firm performance, say, return on assets (ROA) or Tobin's Q, is projected onto a set of explanatory variables that represent a set of governance mechanisms. It is noteworthy that the empirical evidence on corporate governance is largely a mixed bag and far from conclusive. The conflicting evidence can partly be attributed to a number of econometric problems. In this section, I present the major problems and describe various approaches that I implement in this study to mitigate them.

The first and perhaps most troublesome is the endogeneity problem. This problem manifests itself either as spurious correlation between the dependent and the explanatory variables or as reverse causality in regression models. In the first instance, spurious correlation confounds empirical results when no economic causal relation truly exists between the dependent and the independent variable but some unobserved variable is related to both the dependent variable and the independent variable. Empirically, we would observe a significant relation in our regression model between the dependent and independent variables, which however, is spurious and not causal. On the other hand, reverse causality taints regression results when we find a significant relation between the dependent and independent variables but there is no clarity on the direction of causality. Empirical results are likely to be biased and inconsistent without testing and effectively controlling for the potential endogeneity of explanatory variables. Moreover, it is plausible that the unobserved heterogeneity across sample firms could potentially

explain the differences observed in firm performance if systematic cross-sectional differences amongst firms somehow influence performance.

The omitted explanatory variable is the second problem that hampers empirical interpretation in corporate governance studies. In addition, lack of data and misspecified functional forms are known to exacerbate this problem. The omitted variable problem is difficult to resolve because it is not obvious which variables are missing or how many. Various approaches have been suggested. One approach is incorporate into the regression model an indicator variable for whether an explanatory variable is observed. Another approach is to stratify the model based on the range of values for an explanatory variable, with a separate stratum for those with missing explanatory variables. And lastly, inclusion of quadratic terms and the use of piece-wise regressions have also been shown to partially mitigate the problem.

Third, empirical governance studies are saddled with the issue of sample selection-bias. The majority of samples used in governance studies consist of firms that are large, publicly traded, more profitable, and better governed. These are firms that are most likely to be covered by major data vendors. It is arguable that firm characteristics typical of such samples induce a certain level of bias in firm behavior, stewardship, and governance structures that in turn may bias the findings in extant literature. My final sample of equity carve-outs consists of a broad selection of firms ranging from small to very large corporations [Table 2].

Fourth, serial persistence of governance structures across time is extensively documented in various studies such as Bhagat and Black (2001), Hermalin and Weisbach (1991), Yermack (1996), Himmelberg, Hubbard, and Palia (1999), and Madura and Nixon (2002). This empirical regularity tends to weaken the explanatory power of most econometric models implemented to ascertain the relation between governance and firm performance. In this study, I attempt to overcome this problem by exploiting the structural break in the governance system of firms which undergo restructurings, in particular equity carve-outs.

These empirical problems notwithstanding, a majority of previous governance studies take a simple OLS approach of projecting some measure of firm performance onto a set of

governance variables. The attempt to relate a complex set of inter-relationships via a simple linear model is likely to generate false evidence of causality in some instances where none exists or to negate causality when in fact it exists. More recent studies have implemented the simultaneous equations approach (SEM). The SEM approach ideally captures the notion of optimal joint-determination of governance mechanisms when it is appropriately identified. However, in the case of governance studies, this approach suffers from severe identification problems. Bhagat, et al. (*The Econometrics of Corporate Governance Studies*, 2005), assert that "…identification requires a combination of exclusion restrictions, assumptions about the distribution of the error terms, and strong restrictions on the functional form" which in their opinion is still an unresolved problem. Consequently, the evidence presented using the simultaneous equations method is also unsurprisingly mixed and in some cases contradictory.

Finally, variable measurement and definitional issues arise when attempting to reconcile extant evidence. It is true that corporate governance variables can only be measured imperfectly, however the issue is further complicated when variables are defined in different ways. Take for example, ownership, which is defined as 'ownership by the board'; 'insider ownership'; 'CEO ownership'; 'block-holder ownership'; or 'institutional ownership' in various studies. Measurement problems also arise when choosing proxies for firm performance. Return on assets (ROA), return on equity (ROE), and Tobin's Q have been widely used with equally contradictory results. Clearly these disparities in variable definition and measurement obscure the interpretation of findings and frustrate any attempts at reconciling findings from disparate studies. Is sum, all the above issues individually and in combination have contributed to our limited understanding of whether and how corporate governance influences firm performance and to the largely mixed evidence.

The rest of the dissertation is organized as follows. The first essay presented in chapter 2 investigates the effect of shareholder-rights protection on firm performance. The second essay examining the relation between board structure and firm performance is presented in chapter 3. And lastly, chapter 4 presents the third essay analyzing the evolution of ownership structure in equity carve-outs and the impact that these changes have on firm performance.

Chapter 2

Shareholder-Rights Protection and Firm Performance: Evidence from Equity Carve-Outs

Abstract

Using improved estimation methods and exploiting the experimental setting presented by the structural breaks in a firm's governance structure through equity carve-outs, I investigate the association between the quality of shareholder-rights protection and firm performance for the period 1983-2004. Consistent with extant evidence, I find that in the short-run markets react positively to carve-out announcements, however, in the longer run equity carve-outs underperform the control group. I document negative monthly excess returns of -0.23% (-0.07%) for the 36-month (60-month) value-weighted index and -0.17% (-0.03%) for the 36-month (60-month) for the equally-weighted index of sample firms. Within the carve-out sample, results indicate that firms with weaker rights protection underperform those with stronger protections. Increased transparency has been advanced as one of the motives for equity carve-outs. Within this subset, subsidiary firms with weaker shareholder-rights protection again underperform those with stronger protections. These results are consistent with Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004), and are robust to various measures of firm performance and to both proxies for the quality of shareholder- rights protection [GIM-index and the entrenchment index]. Overall, this evidence lends further credence to the notion that protecting shareholder-rights impacts firm performance, even in countries with strong judicial protections like the US.

JEL Classifications: G34, K22

Keywords: Carve-outs; GIM-Index; Entrenchment-Index; Divisive Restructurings; Anti-takeover Provisions.

1. Introduction

It well known that agency conflicts, resulting from the separation of corporate ownership and control, significantly imperil shareholder interests if a firm fails to establish a sound and effective system of corporate governance. As a result, various governance mechanisms have evolved over time to ensure the primacy of shareholder interests in the public corporate form. An extensive academic literature debates the efficacy of these mechanisms. Existing evidence, though inconclusive, suggests that when well intentioned and reasonably implemented these mechanisms in combination significantly mitigate the agency problem. Invariably, it begs the question: Does effective corporate governance result in improved firm performance? To date the evidence that conclusively suggests a direct link between corporate governance and firm performance is very scanty, at best. I re-examine the association between governance and firm performance by implementing improved estimation techniques with the goal of mitigating some of the econometric issues that have plagued earlier studies. In this essay I focus on whether and how the quality of shareholder rights protection impacts firm performance.

Governance mechanisms, even when in place, can still be subverted by management. A typical example is when management changes the by-laws or enacts provisions that erode or limit the rights of shareholders. Gompers, Ishii, and Metrick (2003), henceforth GIM, construct an index that ranks firms based on the quality of shareholder-rights protection using a set of 24 provisions. They show that firms with stronger rights protections earn abnormal returns of approximately 8.5% per year higher than those with weaker protections. In addition, such firms have higher market values, higher profits, and greater sales. Bebchuk, Cohen, and Ferrell (2004) on the other hand, construct a narrower index - the 'entrenchment index', using a set of six provisions [four 'constitutional' and two 'anti-takeover'] that are deemed to be more restrictive of shareholder-rights. These provisions include staggered boards; limits to amend the charter; super-majority voting provisions; golden parachutes; and poison pills. They show that increases in the index are monotonically related to reductions in firm value as measured by Tobin's Q.

Following GIM (2003) and Bebchuk, et al. (2004), I test the hypothesis that long-term under-performance in equity carve-outs is partly explained by weak shareholder-rights

protection. I find that strong shareholder-rights protection is associated with better firm performance. In particular, carve-out firms that exhibit stronger shareholder-rights protection exhibit moderate long-term underperformance while those with weaker shareholder-rights protection performed significantly worse than the control group. This study fits within both the corporate restructurings literature and the corporate governance strand linking governance to firm performance. I present new evidence linking the long-term underperformance observed in equity carve-outs to weak shareholder-rights protection. More generally, I present evidence linking corporate governance to firm performance. These results are consistent with findings by Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004) GIM (2003) and lend further credence to the notion that even in countries with strong investor legal protections such as the US, shareholder-rights protection remains important.

The rest of the essay is organized as follows. In section 2 I review the literature and develop the hypotheses. Section 3 describes the data and sample selection process. Empirical tests and findings are presented in section 4. Robustness tests are discussed in section 5 and section 6 concludes.

2. Literature Review and Hypotheses Development

In this section I review relevant theories on equity carve-outs and shareholder rights protection and their main predictions on firm performance to develop testable hypotheses. Then I discuss extant empirical evidence both in support and negation of the main predictions.

2.1 Theory on Equity Carve-outs

Various motives have been advanced for carve-out transactions and by extension to explain the widely documented positive market reaction following the announcement [Schipper and Smith (1986), Klein, Rosenfeld, and Beranek (1991), Mulherin and Boone (2000), Boone (2001), and Anand Vijh (2002)]. Initiating a carve-out is presumed to be a strategic move on the part of the parent firm to correct some past mistakes, take advantage of a new business environment, or to mitigate an information asymmetry problem. Evidence shows that the market

expects any one of these motives to generate gains for the initiating firm. The positive reaction is reflected in the initial average (median) return of 4.9% (2.1%) documented by Schipper and Smith (1986) for equity carve-outs compared to the average negative return of -2 to -3% when parent firms issue seasonal equity (Smith 1986 a, b). Theories in support of restructuring gains fall in two broad categories: the divestiture gains hypothesis and the information asymmetry hypothesis.

The divestiture gains theory postulates that when firms initiate a carve-out they are likely to realize gains from a number of sources including: the refinancing strategy, incentive alignment and corporate re-focusing strategy. The refinancing hypothesis suggests that raising equity capital is the primary reason for carve-outs. A capital constrained firm chooses to unbundle a business unit in order to alleviate its liquidity constraints. Consistent with this hypothesis, firms that initiate carve-outs exhibit higher leverage ratios, lower interest coverage ratios, and lower profit ratios than matched firms [Allen & McConnell (1998)]. The refinancing hypothesis predicts that both the parent and the subsidiary will show performance improvements resulting from less financial distress. The re-focusing hypothesis posits that value is created when previously over- diversified firms use carve-outs to re-focus their operations [Comment and Jarrell (1995), and Boone (2001)]. Moreover, corporate focus, it is argued, leads to more efficient contracting between managers and shareholders by enabling stock-based compensation that is more sensitive to firm performance than would be possible within a conglomerate. And lastly, the incentive alignment hypothesis posits that value is created in the subsidiary when managerial incentives in the unbundled unit are better aligned with those of shareholders in the subsidiary.

The information asymmetry hypothesis is couched in the spirit of signaling models in Myers and Majluf (1984). Parent firms perceiving an undervaluation of some of their business segments choose to unbundle these units so as to enhance their transparency and thus unlock hidden value. The overall prediction is that carve-out subsidiaries that are less related to the parent will elicit a stronger positive market reaction and to outperform subsidiary firms that are more closely related to the parent.

2.2 Theory on Shareholder Rights Protection

Motivated by agency theory, the strength of shareholder rights protection is deemed to moderate the negative consequences of separating corporate ownership and control. Gompers, Ishii, and Metrick (2003) construct the GIM-index to test the impact of shareholder rights protection on firm performance. The index is comprised of 24 governance characteristics identified by the Institutional Investors Research Center (IRRC) to proxy for the quality of governance. They show that firms with stronger shareholder protections earn abnormal returns of approximately 8.5%. The stronger performance, they argue, is explained by lower agency costs resulting from a closer alignment of manager-shareholder interests. Bebchuk, Cohen, and Ferrell (2004) on the other hand, construct a narrower index - the 'entrenchment index', using a set of six provisions [four 'constitutional' and two 'anti-takeover'] that are deemed to be more restrictive of shareholder-rights. These provisions include staggered boards; limits to amend the charter; super-majority voting provisions; golden parachutes; and poison pills. The higher the index the weaker is shareholder rights protection. They show that increases in the index are monotonically related to reductions in firm value as measured by Tobin's Q. A number of explanations are advanced. First, weak shareholder-rights protection may inhibit the removal of incompetent managers or board members thus prolonging mediocre performance. Second, given the entrenchment of current managers there will be limited scrutiny by the board, the market for corporate control, and much less by the rest of the shareholders. This lack of scrutiny invariably induces behaviors such as shirking, empire building, and perquisite consumption that increase a manager's private benefits on one hand but destroy shareholder value on the other. Therefore managers intent on continued enjoyment of private benefits are likely to shield themselves from disciplinary mechanisms by instituting charter amendments and bye-laws that restrict shareholder oversight. Overall, the prediction is that firm performance is positively related to the strength of shareholder right protection.

2.3 Hypotheses Development

In the context of a domineering corporate blockholder and a minority fringe, the notion of shareholder protection becomes highly imperative. The divestiture gains and incentive alignment

theories on equity carve-outs suggest that we should expect improved firm performance following the announcement of the transaction. Although empirical evidence shows positive market reaction upon announcement of equity carve-outs, in the longer-term carve-outs in general underperform matched firms. To test for the impact of shareholder rights protection on firm performance, I relate the quality of shareholder rights protection (measured by the GIM-index and the entrenchment index) to the performance of a sample of firms that initiated carve-out transactions during the period 1993-2004. I conjecture that carve-out firms with stronger shareholder protection will outperform those with weaker shareholder rights protection.

H_1: *Long-term carve-out performance is positively related to the quality of shareholder-rights protection.*

The corporate re-focus and information asymmetry theories, on the other hand, posit that value is created when previously over-diversified firms use carve-outs either to re-focus their operations [Comment and Jarrell (1995), and Boone (2001)]. In addition, corporate re-focus leads to more efficient contracting between managers and shareholders by enabling stock-based compensation that is more sensitive to firm performance than is possible within a conglomerate. Carve-out subsidiaries that are more closely related to the parent are predicted to earn larger abnormal returns upon announcement and to outperform those that are less related to the parent. To test the corporate refocus/information asymmetry hypotheses, I include a dummy variable (SIC) in the model specification coded as '1' if the subsidiary firm does not belong to the same 2-digit SIC code as the parent or '0' otherwise. I argue that subsidiaries that are less related to the parent are the ones likely to benefit the most from the reduction in information asymmetry. If the quality of shareholder rights protection significantly influences post-carve-out performance, then subsidiaries with stronger rights protection are likely to outperform those with weaker rights protection. Consequently the prediction on the SIC dummy variable should be positive and statistically significant.

H_2: *Carve-out subsidiaries that are less related to the parent firm and have stronger shareholder-rights protection will outperform subsidiaries that are less related to the parent and have weaker shareholder- rights protection.*

2.4 Empirical Evidence

2.4.1 Market Reaction to Equity Carve-outs

Extensive empirical evidence has been documented in support of the idea that markets react positively to the announcement of equity carve-outs. Schipper and Smith (1986) examine a sample of 76 carve-outs from 1963 to 1984 and show excess returns averaging 1.83%. Anand Vijh (2002) using a sample of 336 carve-outs from 1980 to 1997 document excess returns of approximately 4.92% in the case where the pre-carve out subsidiary's assets are greater than the non-subsidiary's and excess returns of approximately 1.19% in the case of transactions where the pre-carve out asset levels are lower than the non-subsidiary's. Allen and McConnell (1998) using a sample of 188 carve-outs for the time period 1978-1993, examine the effect that the use of proceeds has on post carve-out performance. They find that announcement period gains for firms that use proceeds to pay debt are higher than those of firms that retain the proceeds. Mulherin and Boone (2000) study a sample of 125 carve-outs for the time period 1990-1990 and document shareholder gains which they attribute to divestiture synergies. These results seem more compelling when compared to seasoned equity offerings (SEOs), a closely related transaction. For example, Masulis and Korwar (1986) find excess returns for SEOs to be -3.25% on average. Myers and Majluf (1984) attribute the negative reaction in the case of SEOs to information asymmetry. They posit that managers with superior private information only issue seasoned stock when their shares are favorably valued. Hence, rational investors aware of the inherent moral hazard appropriately discount the firms' shares upon an SEO announcement. Considering that equity carve-outs are very similar to SEOs, this discrepancy in market reaction is still not well understood. Byers & Lee (working paper) find that a change in top management prior to carve-out announcement is significant in explaining the favorable market reaction. Equity carve-outs involving incumbent management seem to elicit a similar reaction from the market as SEOs. They conjecture that the market views the capital raising efforts of new managers as a positive business strategy and less so if done by incumbent management.

2.4.2 Divestiture Gains

In spite of this extensive literature on potential gains from equity carve-outs, empirical evidence on long-term performance of carve-outs remains largely unfavorable. Madura and Nixon (2002) document a positive relation between the level of financial distress prior to carve-out announcement and the unfavorable long-term performance. Their cross-sectional results show that previously distressed parents and their subsidiaries significantly underperform previously non-distressed firms. Inter-temporal comparisons between these two carve-out types show cumulative buy-and-hold returns for parents ranging from -7.19% to -19.97% in the first year; -12.9% to -61.91% in the second year; and -39.6% to -153.61% in the third year relative to matched firms. For the subsidiaries, cumulative buy-and-hold returns range from -17.59% to -26.89% in the first year; -49.45% to -101.73% in the second year; and –62.41% to -192.13% in the third year. Mulherin and Boone (2000) study 125 equity carve-outs during the period 1990 – 1999 and conclude that the positive wealth effects are due to synergistic gains. Allen (1998) also examines the long-run stock performance of a set of equity carve-outs at Thermal Electron and concludes that the positive effects are due to divestiture gains. GIM (2005) among others, contend that the event-study approach cannot adequately identify the impact of changes in governance on firm value in the possible presence of other contemporaneous corporate events. GIM in their study avoid this problem by taking a long horizon approach to examining the effect of governance changes on firm value.

2.4.3 Information Asymmetry

The re-focusing and information asymmetry hypotheses suggest that managers engage in restructurings in order to mitigate an under-valuation problem. Business units within diversified firms are more likely to be fraught with severe information asymmetry leading to an undervaluation problem [Nanda (1991)]. Managers of such firms seek to unlock this hidden value by divesting the units into independently trading entities. The divestiture, for instance, necessitates a different set of books for the subsidiary and a separate set of analyst coverage. Both of these developments are likely to enhance the subsidiary's transparency and gradually lead to the convergence of market value to fundamental value. Consistent with this view, the

information asymmetry hypothesis predicts a gradual increase in the subsidiary's market value upon announcement. For example, Burch and Nanda (2003) posit that diversification discounts partly reflect a value loss due to the diversified nature of the firm itself rather than selection bias or measurement error. Gertner, Powers, and Scharfstein (2002) show that asset restructuring through spin-offs leads to efficient redeployment of the assets and improvements in investment efficiency. Gilson, Healy, Noe, and Palepu (2001) present evidence that there is less information asymmetry and increased transparency following spinoffs. Krishnaswami and Subramaniam (1999) empirically test the information hypothesis on a set of spin off firms. Consistent with the predictions of the hypothesis, they find that firms which engage in spin-offs are less transparent than their industry and size matched peers. Moreover, upon announcement of the spin-off such firms experience significant reduction in their information asymmetry. The authors also present evidence of a positive relation between gains around the spin-off and the severity of information asymmetry. Lastly, they show that firms with higher growth opportunities and those seeking external financing have a higher propensity to engage in spin-offs, suggesting that the mitigation of the transparency problem is in anticipation of accessing capital markets. Dale, Mehrotra, and Sivakumar (1997) test the prediction that cross industry spin-offs generate more value than within industry spin-offs. They find strong evidence that spin-offs of firms that belong to different 2-didgit SIC codes create significantly more value than own-industry spin-offs. Vijh (1999) presents evidence on equity carve-outs suggesting that long-term returns for carve-outs increase with the number of business segments of the pre-carve-out firm, which lends credence to both the re-focusing and information asymmetry hypotheses.

2.4.4 Shareholder-Rights Protection and Firm Performance

La Porta, Lopez-de-Salinas, Shleifer, and Vishny (2002) survey 27 developed countries on the basis of the quality of minority shareholder protections and present evidence that firms identified with better protections have greater market valuations. Klapper and Love (2003) on the other hand, examine firms from 14 emerging economies and present evidence suggesting a positive relation between the quality of shareholder-rights protection and both market valuations and firm performance. They posit that shareholder-rights protections seem to matter more in countries with weaker overall legal protections than those with stronger legal protections. Leuz,

Nanda, and Wysocki (2003) explore the relation between quality of shareholder–rights protection and earnings quality and show evidence that firms with weaker shareholder-rights protections have lower quality earnings. They posit that earnings management is likely to increase in environments where shareholders rights are relatively more restricted.

3. Sample Selection and Data

3.1 Sample Selection

The sample is compiled from the Securities Data Company's (SDC) United States IPO data and cross checked with *Lexis-Nexis, the Wall Street Journal*, the *Wall Street Journal Index* and the *Directory of Corporate Affiliations*. The initial sample comprises 421 firms (regulated and unregulated) that announced a carve-out transaction during the time period 1983 - 2004. For inclusion in the sample, a firm must be traded on the AMEX, NYSE, or NASDAQ and have coverage by CRSP and Standard & Poor's COMPUSTAT. In addition, the firm must have coverage in at least one of the volumes published by the Investor Responsibility Research Center (IRRC). Rights protection data for firms not covered by IRRC are collected from SEC filings in Edgar and/or the Fiche-Q files. Firms that constitute the final sample are then tracked individually from the date of announcement to the end of the sample period or when the firm ceases to exist, whichever comes first.

The sample period is selected to generate a sufficiently large sample but also allow sufficient time (at least 3 years prior to and following the announcement date) for operating performance data analysis. After the initial screening and deletion of firms with missing data points, the final sample includes 101 firms (both regulated and unregulated) that engaged in a carve-out transaction during the time period 1983-2004 and meet all the above selection criteria. To control for the regulatory and balance-sheet idiosyncrasies of financial firms (SIC 6000), I include a binary variable coded '1' if the firm is financial or '0' otherwise, in all regressions. For robustness, I construct two sub-samples. The first sub-sample includes 48 non-financial firms (industrials and utilities) and the second sub-sample includes 53 financial firms. Shareholder-rights protection data from the IRRC is published in seven volumes: 1990, 1993, 1995, 1998,

1999, 2002, and 2004. Each volume consists of roughly 1,400-1,800 firms, inclusive of all S&P 500 firms. IRRC publications are issued every three years, so following Gompers, Ishii, and Metrick (2003), missing data for the interceding years are filled with the most recent annual survey data. According to Core, et al. (2006) although this approach introduces autocorrelation in the data series they contend that the resulting measurement noise will be minimal given the general stability of the GIM-index across time.

Table 1 presents the sample distribution and size. Panel A shows the number of firms dropped and the reasons for their exclusion. Of the original sample of 421 firms, 144 firms were dropped either because they were unlisted or listed on exchanges other than AMEX/NASDAQ/NYSE. 105 firms were not covered by either CRSP or COMPUSTAT, and 61 firms had missing data points. Panel B shows the distribution of transaction announcements by year. The number of transactions announced per year ranges from 0 for 2003 to 12 for 1986 and 1993. Lastly, Panel C presents the distribution of transactions by industry (2-digit SIC for industrials, utilities, and financials). Financials had the highest number of transactions with 58 announcements. Manufacturing had 25, other services had 12, wholesale/retail had 7, there were 5 transactions for mining, lastly transportation, communications, and utilities reported 4 for a final sample of 111 firms.

3.2 Description of Variables

3.2.1 Proxies for Firm Performance

Table 4, presents descriptions of dependent and independent variables and how they are constructed. Dependent variables (firm performance), include Tobin's Q, return on assets (ROA), and return on equity (ROE). I use Tobin's Q, measured as the ratio of the firm's market value divided by the book value of its assets as a market based performance measure. Each firm's Tobin's Q is adjusted by subtracting the industry median. To ascertain the significance of the right skew in the distribution of firm value, I use log values of Tobin's Q as a robustness test. Return on assets (ROA) and return on equity are accounting based measures of firm performance. Both variables are adjusted by subtracting the industry median return on assets

(ROA) and median return on equity (ROE), respectively. ROA (ROE) is constructed by dividing the firm's EBIT by the firm's average assets (equity). Dependent variables for the quality of the firm's shareholder rights protection include the GIM-index [Gompers, Ishii, and Metrick (2003)] and the Entrenchment-index [Bebchuk and Cohen's (2005)]. Each of the performance measures has its merits and weaknesses. Demsetz and Villalonga (2001) argue that ROA, although as an accounting measure it avoids the influences of the psychology of investors it is backward looking. Moreover, it is significantly influenced by changes in accounting policies and managerial discretion on how certain accounting items are treated. Return on equity on the other hand, has less desirable distribution properties than the return on assets. Moreover, ROE may be affected by leverage, extraordinary items, and other discretionary items [Barber and Lyon (1996)]. Lastly, although Tobin's Q has the advantage of being forward looking, it is highly dependent on investor psychology and expectations. In addition, the numerator in Q includes estimates of intangible assets whereas the denominator excludes them. This feature is likely to distort comparisons between firms that do not similarly rely on intangible assets. For robustness I use all three measures.

3.2.2 Proxies for Shareholder-Rights Protection

I test the effect of shareholder rights on firm performance, using the GIM-index and the entrenchment index as proxies for the quality of shareholder rights protection. Gompers, Ishii, and Metrick (2003) construct the GIM-index using a set of 24 restrictions followed by the Institutional Investors Research Center (IRRC) that proxy for the quality of governance. The GIM-index represents the number of rights restrictions on a firm's books. A high index implies more rights restrictions and consequently weaker shareholder rights protection, lower governance quality, and higher agency costs. GIM characterize firms with an index falling in the highest decile as 'dictatorships' and those with an index falling in the lowest decile as 'democracies'. The sample GIM-index has a minimum (maximum) of 5 (16) provisions with a mean (median) of 8.2 (8.4) and a standard deviation of 2.69. I characterize firms that have a GIM-index equal to or greater than 8 as having weak shareholder rights protection and those whose index is lower than 8 as having strong shareholder rights protection. Bebchuk, Cohen, and Ferrell (2004) on the other hand, construct a narrower index - the 'entrenchment index'- using a

set of six provisions [four 'constitutional' and two 'anti-takeover'] that are deemed more restrictive of shareholder-rights. These provisions include staggered boards; limits to amend by-laws or charter; super-majority voting provisions; golden parachutes; and poison pills. The sample entrenchment index has a minimum (maximum) of 1 (6) provisions with a mean (median) of 3.9 (3.8) and a standard deviation of 1.02. Firms with an entrenchment index equal to or greater than 4 are deemed 'dictatorial' and those with an index lower than 4 are deemed 'democracies'.

3.2.3 Control Variables

Control variables include log of market value of equity (L_MVE), log of total assets (L_TA), leverage (LEV), an indicator variable 'SIC' for relatedness between the subsidiary and the parent, and a binary variable 'FIN' for financial firms (SIC 6000). Log of market value of equity (L_MVE) and the log of the firm's total assets (L_TA), are used to control for firm size. Leverage (LEV) is used to control for the firm's financial risk and is computed as total long-term debt divided by the firm's total assets. For financial firms (SIC 6000), I use price-to-book value (PBV) as the control variable in place of leverage. For robustness I also include the log of the firm's market capitalization (L_BVE) to control for firm size. If a firm belongs to the financial industry, the variable 'SIC' is coded '1' or '0' otherwise'. For relatedness between the parent and the subsidiary, SIC is coded '1' if both firms belong to the same 2-digit SIC code, or '0' otherwise. For long-run abnormal returns, I use the Fama-French three-factor model [Fama & French (1993)]. HML represents the monthly return for high book-to-market firms minus the monthly return for the low book-to-market firms provided by the Kenneth French website [Fama & French (1993)]. SMB is the monthly return for small capitalized firms minus the monthly return for the large capitalized firms also provided by the Kenneth French website [Fama & French (1993)]. Book-to-market value is a ratio of the firm's book value of assets divided by the firm's market value. The standard industry classification code (SIC) is used to proxy for the relatedness between the parent firm and the subsidiary.

Table 5 presents the correlation matrix between the main variables. Results show that the pairwise correlation between contemporaneous firm performance variables and the main

explanatory variables is much weaker than that between firm performance and lagged explanatory variables. Pairwise correlations between industry adjusted Tobin's Q and ROE with lagged GIM-index are both statistically significant at 0.05 and 0.10 levels. Pairwise correlations between industry adjusted Tobin's Q and ROE with the lagged Entrenchment index are both statistically significant at 0.10 level. As a robustness check and to complement the IV and GMM analyses, I also run granger-causality tests on all firm performance dependent variables and the main explanatory variables to ascertain the direction of causation.

3.3 Descriptive Statistics

A summary of the sample descriptive statistics is presented in Table 2.

There is significant variability in firm characteristics for both parent firms and subsidiaries. Table 2, Panel A presents descriptive statistics for subsidiary firms with total market value of equity ranging from a minimum of $3.4 to a maximum of $58,514 with a mean (median) of $985 ($197) and a standard deviation of $212. Leverage which is measured as total long-term debt divided by total assets ranges from 0.12 to 1.04 with a mean (median) of 0.41 (0.52) and a standard deviation of 0.18. Book-to-market ranges from a minimum of 0.21 to a maximum of 0.79 with a mean (median) of 0.39 (0.31) and a standard deviation of 0.22. Tobin's Q is measured as market value of equity divided by the book value of total assets ranges from 1.18 to 1.88 with a mean (median) of 1.44 (1.52). Return on assets is measured as earnings before interest and tax divided by total assets (EBIT/TA) and the minimum (maximum) for the sample is -0.03 (0.16) with a mean (median) of 0.09 (0.12) and a standard deviation of 0.11. Return on equity is measured as net earnings divided by total owners equity (Net Income/Common Stock) and ranges from a minimum of -0.06 to a maximum of 0.28 with a mean (median) of 0.21 (0.23) and a standard deviation of 0.18. The GIM-index has a minimum (maximum) of 5 (16) provisions with a mean (median) of 8.2 (8.4) and a standard deviation of 2.69. The Entrenchment index has a minimum (maximum) of 1 (6) provisions with a mean (median) of 3.9 (3.8) and a standard deviation of 1.02.

Table 2, Panel B presents descriptive statistics for parent firms whose total market value of equity ranges from a minimum of $4.2 to a maximum of $82,644 with a mean (median) of

$2,742 ($728) and a standard deviation of $582. Leverage for parent firms ranges from a minimum of 0.16 to a maximum of 1.07 with a mean (median) of 0.59 (0.58) and a standard deviation of 0.20. Book-to-market ranges from a minimum of 0.47 to a maximum of 0.88 with a mean (median) of 0.73 (0.58) and a standard deviation of 0.13. Tobin's Q ranges from 1.01 to 1.72 with a mean (median) of 1.56 (1.34) and a standard deviation of 1.28. The range for return on assets (ROA) for parent firms has a minimum (maximum) of -0.02 (0.13) with a mean (median) of 0.07 (0.09) and a standard deviation of 0.12. The return on equity (ROE) ranges from a minimum of -0.08 to a maximum of 0.24, with a mean (median) of 0.14 (0.16), and a standard deviation of 0.69. The GIM-index has a minimum (maximum) of 5 (16) provisions with a mean (median) of 10.1 (9.2) and a standard deviation of 2.07. The Entrenchment index has a minimum (maximum) of 1 (6) provisions with a mean (median) of 4.9 (4.1) and a standard deviation of 1.18. Although the sample period covered in this study is asynchronous with those of Schipper and Smith (1986), Klein, Rosenfeld, and Beranek (1991), Mulherin and Boone (2000), Boone (2001), and Anand Vijh (2002), sample characteristics presented here are fairly similar to those in these previous studies.

4. Methodology

In light of the afore-mentioned econometric problems, I argue that simple OLS approaches used in the many of the previous studies attempting to relate corporate governance to firm performance generate potentially biased and inconsistent estimates. It is plausible that this biasness and inconsistency in parameter estimation partly accounts for the largely mixed and inconclusive evidence. In this study, I use panel data and alternate estimation techniques (fixed effects, IV, GMM, and granger causality tests), with the goal of mitigating the major econometric issues inherent in corporate governance studies. The use of panel data also allows for more robust and dynamic modeling of firm heterogeneity.

First, as a frame of reference, I determine whether my sample is consistent with extant evidence that demonstrates positive initial market reaction to carve-out announcements. I use the Fama-French three-factor model to analyze three-year and five-year returns on calendar–time portfolios of sample firms following the announcement. Fama-French factor returns and related

data are obtained from Kenneth French's data library. The calendar-time method offers a number of advantages over the cumulative (CAR) and buy-and-hold (BHR) return methods. First, it minimizes the cross-sectional dependence among sample firms and secondly, the test statistics generated are more robust if the sample used is non-random. Additionally, the sample used in this study exhibits some degree of industry clustering with approximately 52% and 23% of the sample being financial and manufacturing firms, respectively. Lyon et al (1999) posit that the presence of industry clustering renders controls for size and book-to-market alone statistically insufficient when implementing the cumulative (CAR) and buy-and-hold (BHR) abnormal return methods. Thus the empirical rejection levels that are yielded under the two latter methods would exceed the theoretical rejection levels due to the presence of industry clustering in this sample. Monthly abnormal returns are calculated using both value-weighted and equal-weighted methods.

For each calendar month, I calculate the return on a portfolio composed of firms that were carved out within the last 36-month and 60-month periods. The calendar time return on these portfolios is used to estimate the following equation:

$$R_{pt} - R_{ft} = \alpha_i + ß_i (R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + \varepsilon_{it} \qquad (1)$$

Where R_{pt} is the simple monthly return on a calendar-time portfolio (equally-weighted and value-weighted); R_{ft} is the monthly return on three-month treasury bills; R_{mt} is the return on a value-weighted market index; SMB_t is the difference in the returns of value-weighted portfolios of small stocks and big stocks; and HML_t is the difference in the returns of high book-to-market stocks and low book-to-market stocks. The estimate of the intercept, α_i provides a test of the null hypothesis that the mean of the monthly excess return on the calendar-time portfolio is zero.

As an initial step, I run annual multivariate regressions using all three measures of firm performance. To test hypothesis H_1, I regress a proxy for firm performance [ROA, ROE, and Tobin's Q] on each of the proxies for shareholder rights protection [GIM-index, and the entrenchment index (ENT-index)]. I include as control variables the log of total assets (L_TA),

firm profitability (EBIT), and firm leverage (LEV). To capture potential idiosyncrasies of financial firms, I include a binary variable (FIN) coded as '1' if the firm is financial (SIC 6000) or '0' otherwise. To test hypothesis H_2, I add a dummy variable (SIC) coded as '1' if the subsidiary and the parent belong to different 2-digit SIC codes or '0' otherwise. I estimate the following model:

$$Adj\_ROA_{it} = \alpha + ß_1 GIM\text{-}index_{i,t-1} + ß_2 L\_TA_{i,t} + ß_3 EBIT_{i,t} + ß_4 LEV_{i,t} + ß_5 FIN_{i,t} + ß_6 SIC_{i,t} + \varepsilon_{it} \quad (2)$$

Considering that simple OLS regressions do not capture the cross-sectional heterogeneity within the sample, I implement the fixed effects model to take full advantage of my panel data as it allows for more robust and dynamic modeling of firm heterogeneity. Moreover, results from a Hausman test indicate that the shareholder-rights proxies are endogenous which implies that the coefficient estimates from OLS would be biased and inconsistent. Hence, as a next step, I implement instrument variables with shareholder-rights proxies lagged twice as the instruments.

I also implement GMM that does not require as stringent distributional assumptions and allows for convenient specification of heteroscedastic errors.

Lastly, the main objective of this study is to ascertain whether corporate governance has an impact on firm performance. In most of the earlier studies the direction of causation between governance variables and measures of firm performance was left indeterminate. In the presence of endogeneity, it still remains unclear whether good governance improves firm performance through closer monitoring or if in fact better performance leads to better governance. To determine the direction of causation between shareholder-rights protection and firm performance, I implement the granger causality test (Granger 1969). One of the advantages of Granger causality tests is that they do not require the use of instrument variables. In addition they allow for a wider range of changes in the explanatory variables than could be covered, say, in an event study. One weakness though, is that the presence of structural changes in the data can severely weaken the validity of the test results. To run Granger causality tests, I implement the following model:

$$ROA_t = \alpha_0 + \alpha_1 ROA_{t-1} + \alpha_2 ROA_{t-2} + \beta_1 GIM_{t-1} + \beta_2 GIM_{t-2} + \varepsilon_t \quad (3)$$

$$GIM_t = \varphi_0 + \varphi_1 GIM_{t-1} + \varphi_2 GIM_{t-2} + \beta_1 ROA_{t-1} + \beta_2 ROA_{t-2} + \nu_t \quad (4)$$

In equation (1), the null hypothesis is that the quality of shareholder-rights protection, as proxied by GIM-index, does not Granger cause firm performance (ROA). Rejection of the null hypothesis would mean that shareholder-rights protection granger causes firm performance. In equation (2), the null hypothesis is that firm performance (ROA) does not Granger cause shareholder rights protection (GIM-index). Rejection of the null hypothesis would imply that firm performance Granger causes shareholder-rights protection. I use the F-statistic/Wald-statistic to test the following condition, for all equations: $\beta_1 = \beta_2 = 0$

5. Empirical Results

5.1 Long-run Abnormal Returns

The intercept, $\alpha_{i,}$ in the Fama-French three factor model that I estimate provides a test of the null hypothesis that the mean of the monthly excess return on the carve-out calendar-time portfolio is zero. Table 6a, Panel A presents Fama-French three factor model results for parent firms during the 36-month period following the announcement for equally weighted and value weighted portfolios. The intercept for the equally-weighted (value-weighted) portfolio shows a -0.28% (-0.47%) excess rate of return per month which is statistically significant with t-statistics of -3.41 (-2.70), respectively. Panel B shows performance results for parent firms for the 60-month period for equally-weighted and value-weighted portfolios. The intercept for the equal-weighted (value-weighted) portfolio shows a 0.39% (-0.77%) per month. The equal-weighted portfolio has a positive and statistically significant coefficient while the value-weighted portfolio is negative and statistically significant (1.01 and -2.12, respectively). In both time periods, firm performance is worse for parent firms using value-weighted portfolios. Table 6(b), Panel A presents Fama-French three factor model results for subsidiary firms during the 36-month period following the announcement for equally weighted and value weighted portfolios. The intercept for the equally-weighted (value-weighted) portfolio shows a -0.17% (-0.23%) excess rate of return per month both of which are both statistically significant with t-statistics of -4.56 (-1.90), respectively. Panel B shows performance results for subsidiary firms for the 60-month period for equally-weighted and value-weighted portfolios. The intercept for the equally-weighted (value-

weighted) portfolio shows a -0.03% (-0.07%) per month. Both portfolios show negative returns and are statistically significant. The coefficients on MKT, SMB, and HML are all statistically significant. The coefficient on HML for the equally-weighted portfolio, however, changes signs from a negative sign for the 36-month period to a positive sign for the 60-month calendar period. Consistent with extant literature the results in general suggest that carve-out firms under-perform matched firms for both the 36-month and 60-month periods following the announcement.

5.2 Fixed -Effects Regressions

To ascertain which of the fixed effects or random effects model is appropriate, I run a Hausman test for the null hypothesis that the coefficients estimated by the random effects estimator are the same as the ones estimated by the fixed effects estimator. If the difference is significant, then the fixed effects model is preferred. Results show an F-statistic (P_value) of 7.86 (0.0001) suggesting that the fixed effects estimates are more consistent. I therefore implement the fixed effects model.

Table 7 presents results from a fixed-effects model. In Panel A, Model 1 presents estimated coefficients by regressing return on assets (ROA) on the GIM-index, parent-subsidiary relatedness (SIC) and financials (FIN). I control for firm size (L_TA), and firm profitability (EBIT), and leverage (LEV). The coefficient on GIM-index is -0.17 and statistically significant at a 0.01 level. The coefficient on SIC is 0.21 and also statistically significant at a 0.01 level. The sign for the coefficient on the indicator variable for financial firms is positive (0.12) but statistically insignificant. Model 2 presents estimated coefficients by regressing return on equity (ROE) on GIM-index, parent-subsidiary relatedness (SIC) and financials (FIN). I control for firm size (L_TA), and firm profitability (EBIT ratio), and leverage (LEV). The coefficient on GIM-index is -1.08 and is statistically significant at a 0.01 level. The coefficient on SIC is 1.01 and statistically significant at a 0.05 level. The binary variable for financial firms is positive, 0.33 and statistically significant at a 0.05 level. Model 3 in Panel A, presents estimated coefficients by regressing Tobin's Q (Adj. Q) on the GIM-index, parent-subsidiary relatedness (SIC) and financials (FIN). I control for firm size (L_TA), and firm profitability (EBIT ratio), and leverage (LEV). The coefficient on GIM-index changes sign to positive 0.09, but it is statistically

insignificant. The coefficient on SIC is 0.09 and statistically significant at a 0.05 level. The binary variable for financial firms is statistically insignificant.

In Panel B, Model 1 presents estimated coefficients by regressing return on assets (ROA) on the ENT-index, parent-subsidiary relatedness (SIC) and financials (FIN). I control for firm size (L_TA), and firm profitability (EBIT ratio), and leverage (LEV). The coefficient on ENT-index is 0.08 but statistically insignificant. The coefficient on SIC is -0.17 and statistically significant at a 0.01 level. The binary variable for financial firms is positive 0.31 but statistically insignificant. Model 2 presents estimated coefficients by regressing return on equity (ROE) on ENT-index, parent-subsidiary relatedness (SIC) and financials (FIN). I control for firm size (L_TA), and firm profitability (EBIT ratio), and leverage (LEV). The coefficient on ENT-index is -1.42 and statistically significant at a 0.01 level. The coefficient on SIC is 0.98 and statistically significant at a 0.05 level. The binary variable for financial firms is positive, 0.52 and statistically significant at a 0.05 level. Model 3 in Panel A, presents estimated coefficients by regressing Tobin's Q (Adj. Q) on the ENT-index, parent-subsidiary relatedness (SIC) and financials (FIN). I control for firm size (L_TA), and firm profitability (EBIT ratio), and leverage (LEV). The coefficient on ENT-index is -0.18 and statistically significant at a 0.01 level. The coefficient on SIC is 0.16 and statistically significant at a 0.05 level. The binary variable for financial firms is statistically insignificant.

Overall, the fixed effects results support hypotheses H_1 and H_2, positing a positive association between firm performance and the quality of shareholder rights protection. The lower the GIM-index and Entrenchment indices, the better protected are the shareholders and hence we should expect a negative sign on the proxy coefficients for the quality of shareholder-rights protection. These results are also consistent with Gompers, Ishii, and Metrick (2003) who present evidence that firms with weak shareholder-rights protection exhibit significant stock market under-performance of approximately 8.5% relative to firms with strong shareholder-rights protection and with Bebchuk, Cohen, and Ferrell (2004) who show that increases in the governance index are monotonically related to reductions in firm value (Tobin's Q).

5.3 Hausman Endogeneity Tests

Table 8 presents results from the Hausman endogeneity tests. Panel A provides coefficient estimates when GIM_Index$_{t-2}$ is used as an instrument. The coefficient (t-statistic) on GIM_Residuals is -0.04(-1.74) with an F-statistic (Wald-χ^2) of 63.96 (78.12) for ROA. The coefficient (t-statistic) on GIM_Residuals using ROE as the dependent variable is 0.01(2.04) with an F-statistic (Wald-χ^2) of 18.44 (24.06). The coefficient (t-statistic) on GIM_Residuals using Tobin's Q as the dependent variable is -0.37(-1.94) with an F-statistic (Wald-χ^2) of 33.08 (42.43). They are all statistically significant at the 0.05, 0.01, and 0.05 levels of significance, respectively. In all three models the null hypothesis that the coefficient on the GIM_Residuals is zero is rejected. This implies the presence of endogeneity and hence the inappropriateness of using the OLS method. Panel B provides coefficient estimates when ENT_Index$_{t-2}$ is used as an instrument. The coefficient (t-statistic) on ENT_Residuals is -0.08(-3.22) with an F-statistic (Wald-χ^2) of 44.37 (68.04) for ROA. The coefficient (t-statistic) on ENT_Residuals using ROE as the dependent variable is -0.13(-1.87) with an F-statistic (Wald-χ^2) of 33.23 (72.05). The coefficient (t-statistic) on ENT_Residuals using Tobin's Q as the dependent variable is -0.09 (-1.44) with an F-statistic (Wald-χ^2) of 22.67 (46.16). All coefficients are statistically significant at the 0.01, 0.05, and 0.10 levels of significance, respectively. The null hypothesis that the coefficient on the ENT_Residuals is zero is again rejected suggesting the presence of endogeneity. In the presence of endogeneity, the OLS coefficient estimates are likely to be biased and inconsistent.

5.4 Instrumental Variables Method (IV)

Table 9 presents results from IV regressions. In Panel A, Model 1 presents estimated coefficients for return on assets (ROA) using GIM_Index$_{t-2}$ as an instrument. I include a binary variable for industry relatedness between the parent and the subsidiary (SIC), and an indicator variable for financial firms (FIN). I control for firm leverage (LEV), firm size L_TA), and firm profitability (EBIT ratio). The coefficient (t-statistic) on the GIM-index$_{t-1}$ is -0.57 (-2.66) and statistically significant at a 0.01level. The coefficient (t-statistic) on SIC is 0.11 (3.19) and statistically significant at a 0.01 level. The coefficient (t-statistic) on FIN is 0.28 (0.22) but

statistically insignificant. Panel A, Model 2 presents coefficient estimates on GIM_Index using return on equity (ROE) as a proxy for firm performance. The coefficient (t-statistic) on the GIM-index$_{t-1}$ is -0.24 (-1.80) and statistically significant at a 0.05 level. The coefficient (t-statistic) on SIC is 0.03 (1.88) and statistically significant at a 0.01 level. The coefficient (t-statistic) on FIN is 0.34 (1.68) and statistically significant at a 0.05 level. Panel A, Model 3 presents estimates of coefficients from regressing return on Tobin's Q on GIM-index. The coefficient (t-statistic) on the GIM-index$_{t-1}$ is -0.71 (-2.24) and statistically significant at a 0.01 level. The coefficient (t-statistic) on SIC is 0.40 (1.97) and statistically significant at a 0.01 level. The coefficient (t-statistic) on FIN is 0.09 (1.07) but statistically insignificant.

Table 9, Panel B, presents coefficient estimates using the entrenchment index as a proxy for quality of shareholder-rights protection. Model 1 presents estimated coefficients from regressing the firm's ROA on Entrenchment-index (ENT_index$_{t-1}$). I control for firm leverage, firm size, and profitability. The coefficient (t-statistic) on the ENT_index$_{t-1}$ is -0.83 (-1.97). It is statistically significant at the 0.01 level and the signs on the coefficients are consistent with the prediction of hypothesis H_1 and the findings by Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004). The coefficient (t-statistic) on SIC is 1.04 (3.37) and statistically significant at a 0.01 level. The coefficient (t-statistic) on FIN is 1.07 (1.12) but statistically insignificant. Panel B, Model 2 presents coefficient estimates using ROE as the dependent variables and ENT_index$_{t-2}$ as an instrument. The coefficients (t-statistics) on the lagged Entrenchment index, ENT_index$_{t-1,}$ is -0.67 (-2.47) and statistically significant at a 0.01 level. The coefficient (t-statistic) on SIC is 0.21 (1.91) and statistically significant at a 0.05 level. The coefficient (t-statistic) on FIN is 0.81 (1.97) and statistically significant at a 0.01 level. Panel B, Model 3 presents coefficient estimates from the regression using Tobin's-Q and ENT_index$_{t-2}$ as an instrument. The coefficients (t-statistics) on the ENT_index$_{t-1}$ is 0.02 (1.73) and statistically significant at the 0.05 level but has the opposite sign as that predicted by hypothesis H1. The coefficient (t-statistic) on SIC is 0.57 (2.16) and statistically significant at a 0.01 level. The coefficient (t-statistic) on FIN is 0.34 (0.84) but statistically insignificant.

Overall, the signs on the coefficients and statistical significance from the IV regressions support the hypothesis that firm performance is influenced by the quality of shareholder-rights

protection. These findings are consistent with Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004). In addition, consistent with Comment and Jarrell (1995) and Boone (2001), the IV results support hypothesis H_2 which predicts that subsidiaries that are less related to the parent based on the 2-digit SIC code, will out-perform those subsidiaries that belong to the same 2-digit SIC code as the parent.

5.5 Generalized Method of Moments (GMM)

Table 10 presents results from GMM regressions. In Panel A, Model 1 presents estimated coefficients from regressing return on assets (ROA) using GIM_Index$_{t-2}$ as an instrument. I include a binary variable (SIC) for industry relatedness between the parent and the subsidiary, and an indicator variable for financial firms (FIN). I control for firm leverage (LEV), firm size L_TA), and firm profitability (EBIT ratio). The coefficient (t-statistic) on the GIM-index$_{t-1}$ is -0.43 (-2.74) and statistically significant at a 0.01 level. The coefficients (t-statistics) on SIC and FIN are 0.11(1.32) and 0.04 (1.08) respectively but both are statistically insignificant. Panel A, Model 2 presents coefficient estimates using return on equity (ROE) as the proxy for performance. The coefficient (t-statistic) on the GIM-index$_{t-1}$ is -0.22 (-2.67) and statistically significant at a 0.01 level. The coefficients (t-statistics) on SIC and FIN are 0.46 (1.81) and 0.32 (1.77), respectively. Both are statistically significant at a 0.05 level. Panel A, Model 3 presents estimates of coefficients using Tobin's Q as a proxy for firm performance and GIM-index$_{t-2}$ as an instrument. The coefficients (t-statistics) on the GIM-index$_{t-1}$ and SIC are 0.08 (1.98) and 0.05 (2.04), respectively. Both estimates are statistically significant at a 0.05 level. The coefficient (t-statistic) on FIN is 0.08 (1.17) but statistically insignificant.

Table 10, Panel B, presents empirical results using the entrenchment index as a proxy for quality of shareholder-rights protection. Model 1 presents estimated coefficients using ROA to proxy for firm performance and ENT_index$_{t-2}$ as an instrument. I control for firm leverage, firm size, and profitability. The coefficient (t-statistic) on ENT_index$_{t-1}$ is -0.72 (-2.48) and statistically significant at a 0.01 level. The signs on the coefficients are negative and support hypothesis H_1. These findings are consistent with the assertions by Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004). The coefficient (t-statistic) on SIC is 0.09

(1.04) but statistically insignificant. The coefficient (t-statistic) on FIN is 0.11 (1.67) and statistically significant at a 0.05 level. Panel B, Model 2 presents coefficient estimates using ROE as a proxy for firm performance and ENT_Index$_{t-2}$ as an instrument. The coefficient (t-statistic) on the ENT_index$_{t-1}$ is -0.22 (-2.27) and is statistically significant at a 0.01 level. The coefficient (t-statistic) on SIC is 0.13 (1.69) and statistically significant at a 0.05 level. The coefficient (t-statistic) on FIN is 0.52 (1.07) but statistically insignificant. Panel B, Model 3 presents coefficient estimates from the regression of Tobin's Q as a proxy for firm performance. The coefficients (t-statistics) on ENT_index$_{t-1}$ is 0.08 (-1.84) and statistically significant a 0.05 level. The coefficient (t-statistic) on SIC is 0.02 (2.04) and statistically significant at a 0.01 level. The coefficient (t-statistic) on FIN is 0.71 (1.26) and statistically significant at a 0.10 level. Overall, GMM results support hypotheses H_1 and H_2 and are consistent with Gompers, Ishii, and Metrick (2003); Bebchuk, Cohen, and Ferrell (2004); Comment and Jarrell (1995); and Boone (2001).

5.6 Empirical Results – Subset of Financial Firms (SIC 6000)

IV and GMM test results show a statistically significant coefficient on the indicator variable, FIN, for financial firms (SIC 6000). To examine whether there are any significant differences in the relation between shareholder-rights protection and firm performance for financials, I run separate IV and GMM regressions for only financial firms. Table 11(a) presents coefficient estimates using GIM_Index$_{t-2}$ as an instrument. I use ROA, ROE, and Tobin's Q as measures of firm performance in Models 1, 2, and 3, respectively. All the coefficients on the GIM-index have negative signs as predicted by hypothesis H_1 and H_2 are statistically significant at the 0.01, 0.05 and 0.10 level, with the exception of Tobin's Q in the case of GMM. The results are qualitatively similar to the full sample evidence and are consistent with Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004). Table 11(b) presents coefficient estimates using ENT_Index$_{t-2}$ as an instrument. I use ROA, ROE, and Tobin's Q as measures for firm performance in Models 1, 2, and 3, respectively. All the coefficients on the ENT-index$_{t-1}$ have negative signs as predicted by hypothesis H_1 and H_2 and are statistically significant at the 0.01, 0.05 and 0.10 levels. The findings are qualitatively similar to the full

sample evidence and are consistent with Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004).

In sum the quality of shareholder-rights protection is positively associated with firm performance and this relationship seems invariant to firm performance measurement and robust to estimation model choice.

5.7 Granger Causality Tests

Table 12 presents empirical results from bivariate granger causality tests. Model 1 tests causality between proxies for shareholder-rights protection [GIM-index and ENT_index] and return on assets (ROA). The F-statistic for the null hypothesis test that GIM-index does not Granger cause return on assets (ROA), is 8.420 with a p-value of 0.0000. Hence, the null hypothesis is rejected implying precedence and information content in past GIM-index values on firm performance as measured by ROA. The F-statistic for the test that ROA does not Granger cause GIM-index, is 1.203 with a p-value of 0.5480. Failure to reject the null hypothesis negates the presence of reverse causality in the Granger sense. Similarly, the F-statistic for the null hypothesis test that the ENT-index does not Granger cause return on assets (ROA), is 12.621 with a p-value of 0.0000. Rejecting the null hypothesis and implying precedence and information content in past ENT-index values on ROA. The F-statistic for the test that ROA does not Granger cause ENT-index, is 0.04 with a p-value of 0.2860. Failure to reject the null hypothesis precludes reverse causality in the Granger sense. The results for tests between the GIM-index and ROE and those between the ENT-index and ROE are qualitatively similar to those reported for ROA. Shareholder-rights protection seems to granger cause firm performance but the reverse is negated. The F-statistic for the null hypothesis test GIM-index (ENT-index) does not Granger cause firm performance as measured by Tobin's Q is 1.325 (2.920) with a p-values of 0.0500 (0.0600). The results weakly suggest that shareholder-rights protection Granger causes Tobin's Q. The F-statistic for the null hypothesis test that Tobin's Q does not Granger cause GIM-index (ENT-index) are 0.5720 (0.083) with a p-values of 0.2020 (0.7200). The null hypothesis in both cases is not rejected, suggesting that firm performance does not Granger cause shareholder-rights protection.

Overall Granger causality tests indicate that the quality of shareholder-rights protection has precedent information content for moderating future firm performance. The evidence is robust to measures of firm performance and to both proxies for shareholder-rights protection. Consistent with the findings by Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004), these results support hypotheses H_1 and H_2.

6. Robustness

There is wide cross-sectional variation in the sample characteristics as shown in Table 2. I test the robustness of my results to the use of alternative variable definitions/measures. First in place of Tobin's Q, I use investment intensity (INV), measured as R&D expenditures divided by total assets or the ratio of capital expenditures-to-total assets. The results are qualitatively similar to those reported using Tobin's Q. To ascertain whether there are any statistically significant differences between firms with higher Q values than those with lower Q values, I divide the sample into three sub-samples. The three sub-samples consist of firms that fall into the top 40%, firms in the lower 40%, and the rest in the middle 20%. I run the tests on the top 40% and the bottom 40%. Results obtained in both cases are qualitatively similar to those reported for the full sample. It is also likely that due to the wide ranges between the minimum and maximum sample descriptive statistics, outliers could be driving some of the reported results. I test for robustness by winsorizing the sample data at 1% and 5%. In both cases the results obtained using winsorized data are qualitatively similar to those obtained for the full sample. Lastly, I use the logarithm of Tobin's Q instead of levels to ascertain whether the effects based on changes may differ from the levels effect. Results from log Tobin's Q are qualitatively similar to thoise obtained using levels of Tobin's Q.

7. Conclusion

The main purpose of this essay was to examine whether the quality of shareholder-rights protection moderates firm performance. By implementing improved estimation methods and exploiting structural breaks in firms' governance systems, I attempt to mitigate inherent weaknesses in previous governance studies. Using governance indices constructed by Gompers,

Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004) to proxy for the quality of shareholder-rights protection, I find that strong shareholder-rights protection is associated with better firm performance. In particular, carve-out firms that exhibit stronger shareholder-rights protection exhibit moderate underperformance while those with weaker shareholder-rights protection performed relatively worse than the control group. Specifically, I present new evidence linking the long-term underperformance observed in equity carve-outs to weak shareholder-rights protection. More generally, I present evidence linking firm performance to corporate governance. These results are consistent with findings by Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen, and Ferrell (2004) GIM (2003) and lend further credence to the idea that even in countries with strong investor legal protections such as the US, shareholder-rights protection within the firm remains critical.

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Table 1: Sample Selection & Distribution

Table 1 presents sample distribution and size. Panel A provides a count of the firms comprising the final sample and the number and reasons for those screened out. For a firm to qualify for inclusion it must be listed on NYSE/AMEX/NASDAQ exchanges and be covered by COMPUSTAT, CRSP, and IRRC. Rights protection data for firms not covered by IRRC are collected from SEC filings in Edgar and/or the Fiche-Q files. Of the original 421 carve-out firms, 144 firms were dropped either because they are unlisted or listed on exchanges other than AMEX/NASDAQ/NYSE. 105 firms were dropped due to non-coverage by CRSP, COMPUSTAT, IRRC, SEC filings, and Fiche-Q files. And an additional 61 firms were dropped due to missing data points. The final sample count is 101 firms consisting of regulated firms (2-digit SIC codes 60 and 49) and unregulated/industrial firms. Panel B presents the sample distribution by year of transaction announcement and Panel C shows sample distribution by 2-digit industry SIC.

Panel A: Construction of the Sample	**# of firms**
Total no. of firms:	421
Firms not listed on NYSE/AMEX/NASDAQ:	(144)
Firms not covered by COMPUSTAT / CRSP:	(105)
Firms with missing data:	(61)
Final Sample Count:	111

Panel B: Distribution by Year	**# of firms**
1986	8
1987	6
1988	4
1989	3
1990	4
1991	3
1992	7
1993	13
1994	5
1995	6
1996	10
1997	5
1998	7
1999	5
2000	9
2001	7
2002	4
2003	3
2004	2

Panel C: Distribution by SIC	**Two-Digit SIC**	**# of firms**
Mining, Oil & Gas	10	5
Manufacturing	20-30	25
Transport, Comm., Utilities	40	4
Wholesale/Retail	50	7
Financials	60	58
Services (other)	70-80	12

*****Source**:** Security Data Company (SDC)

Table 2: Sample Descriptive Statistics

Table 2 provides descriptive statistics for subsidiary firms in Panel A and parent firms in Panel B. Some means are unusually low (high) due to the influence of outliers, this problem is mitigated in the regression analysis by using industry-adjusted numbers and by winsorizing the data at 1% and 99%. Nevertheless, results obtained with unadjusted data are qualitatively similar.

Panel A: Subsidiary Firms:

Variable	Mean	(Std. Dev)	Median	Min	Max
Market Value of Equity [a] ($M)	985	212	197	3.4	58,514
Leverage (LT. Debt/ TA)	0.41	0.18	0.52	0.12	1.04
Book-to-Market	0.39	0.22	0.31	0.21	0.79
Tobin's Q	1.44	1.07	1.48	1.18	1.88
Return on Assets	0.09	0.11	0.12	-0.03	0.16
Return on Equity	0.21	0.18	0.23	-0.06	0.28
GIM-Index (# of provisions)	8.2	2.69	8.4	5	16
Entrenchment Index - (# of provisions)	3.9	1.02	3.8	1	6

Panel B: Parent Firms:

Variable	Mean	(Std. Dev)	Median	Min	Max
Market Value of Equity [b] ($M)	2, 742	582	728	4.2	82,644
Leverage (LT. Debt/ TA)	0.59	0.20	0.58	0.16	1.07
Book-to-Market	0.73	0.13	0.58	0.47	0.88
Tobin's Q	1.56	1.28	1.34	1.01	1.72
ROA (EBIT/TA)	0.07	0.12	0.09	-0.02	0.13
ROE (EBIT/EQUITY)	0.14	0.69	0.16	-0.08	0.24
GIM-Index (# of provisions)	10.1	2.07	9.2	5	16
Entrenchment Index - (# of provisions)	4.9	1.18	4.1	1	6

Source: Standard & Poor's COMPUSTAT
CRSP, IRRC, Edgar, Fiche Q files

a The number of subsidiary shares outstanding after the announcement times price per share at end of first day of trading

b The number of parent shares outstanding after the announcement times price per share at end of first day of trading

Table 3: Governance Provisions

Table 3 provides the major governance categories and lists of related provisions that are used to construct the GIM-index and the Entrenchment Index. Detailed explanations of the categories and related provisions are available in the appendix of Gompers, Ishii, and Metrick (2003).

Category	Related Provisions
Delay:	Blank Check Classified Board Special Meeting Written Consent
Protection:	Compensation Plans Contracts Golden Parachutes Indemnification Liability Severance
Voting:	Bylaws Charter Cumulative Voting Secret Ballot Supermajority Unequal Voting
Other:	Anti-greenmail Directors' duties Fair Price Pension Parachutes Poison Pills Silver Parachutes
State:	Anti-greenmail Law Business Combination Law Cash-out Law Directors' Duties Laws Fair Price Law Control Share Acquisition Law

Source: Gompers, Ishii, and Metrick (2003).

Table 4: Variable Definitions and Sources

Table 4 provides definitions of the empirical variables and their related sources. Subscripts that appear on variables presented elsewhere relate to number of time lags.

Variable	Definition	Source
Adj_Q	Adjusted Tobin's Q – market value of equity divided by book value of assets	Tobin et al. (1977)
Adj_ROA	Adjusted return-on-assets – firm i's return on assets minus median industry return on assets	Compustat
Adj_ROE	Adjusted return-on-equity – firm i's return on equity minus median industry return on equity	Compustat
BME	Book-to-market value ratio	Compustat
B_EXTRN	Proportion of independent board members on board	IRRC, Edgar, Fiche Q files
B_SIZE	Total number of board members	IRRC, Edgar, Fiche Q files
CTRL	Parent majority control in subsidiary	SDC
EBIT Ratio	EBIT-to-total Assets ratio	Compustat
ENT-Index	Entrenchment Index	Bebchuk et al (2005)
FIN	Binary variable: '1' if financial firm or '0' otherwise	SIC Codes (6000 -6999)
GIM-Index	Corporate Governance Index	Gompers et al (2003)
HML	High book-to-market minus low book-to-market	Fama- French (1993)
LEV	Leverage: debt-to-total assets	Compustat
L_MVE	Log of firm's market value	Compustat
L_TA	Log of firm's total assets	Compustat
PBV	Price-to-book value	Compustat
ROA	Return-on-assets (EBIT/TA)	Compustat
ROE	Return-on-equity (EBIT/Common Equity)	Compustat
SIC	Standard Industry classification code	Compustat
SMB	the difference in the returns of small stocks and big stocks.	Fama- French (1993)

Table 5: Correlation Matrix

Table 5 provides pairwise correlations between the variables. For adjusted Tobin's Q, ROE, and ROA next period values (t+1), are also presented to account for the delayed impact of shareholder-rights protection proxies (GIM-index, Entrenchment_ index).

N=111	1	2	3	4	5	6	7	8	9	10	11
1. Adj_Q	1.00										
2. Adj_Q_{t+1}	0.96***	1.00									
3. ROE	0.21*	0.26**	1.00								
4. ROE_{t+1}	0.33*	0.42***	0.67*	1.00							
5. ROA	-0.01*	0.28*	0.03	0.61*	1.00						
6. ROA_{t+1}	0.07	0.01*	0.09*	0.01**	0.44	1.00					
7. GIM_Index	0.04	-0.04**	-0.37	-0.29*	0.55	0.21	1.00				
8. ENT_Index	-0.04*	-0.49**	0.10	-0.27*	0.32	-0.01	0.78**	1.00			
9. L_TA	-0.11*	-0.47*	-0.38	-0.29	-0.03*	-0.07	0.21*	0.44**	1.00		
10. LEV	-0.32*	-0.10*	-0.25	-0.02*	-0.04	-0.13	0.33*	0.12	-0.78*	1.00	
11. EBIT	0.88*	0.81**	0.92	0.97*	0.78	0.74	0.46**	0.63*	-0.52*	0.41*	1.00

Table 6a: Excess Return Factor Regressions (Calendar-time) – Parent Firms

Table 6a provides results from calendar-time factor regressions for the excess returns on equally-weighted and value-weighted sample portfolios. The portfolios are comprised of firms that initiated carve-out transactions during the sample period. Panel A presents estimated coefficients for a 36-month period for equally-weighted and value-weighted sample portfolios and Panel B presents estimated coefficients for the 60-month period for equally weighted and value weighted sample portfolios. I use the Fama-French three-factor model and obtain the factor returns for MKT, SMB, and HML from Kenneth French's website. The values in parenthesis are t-statistics.

Panel A: 36-month Period

	Equal-Weighted Returns	Value-Weighted Returns
α	-0.28*** (-3.412)	-0.47*** (-2.702)
MKT	1.38 (1.614)	1.09** (2.033)
SMB	0.71*** (5.240)	0.52* (2.142)
HML	-0.13*** (-9.120)	-0.07*** (-3.201)
Adj-R^2	0.78	0.92

Panel B: 60-month Period

	Equal-Weighted Returns	Value-Weighted Returns
α	0.39 (1.01)	-0.77** (2.12)
MKT	1.20* (1.874)	1.04** (2.362)
SMB	0.48*** (2.514)	0.72 (1.08)
HML	0.08** (2.019)	-0.15*** (-4.09)
Adj-R^2	0.87	0.90

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 6b: Excess Return Factor Regressions (Calendar-time) – Subsidiary Firms

Table 6b provides results from calendar-time factor regressions for the excess returns of equally weighted and value-weighted sample portfolios for subsidiary firms. The portfolios are comprised of subsidiary firms that were carved out and returns are observed from the first day of trading following the announcement. Panel A presents estimated coefficients for a 36-month period for equally- weighted and value-weighted sample portfolios and Panel B presents estimated coefficients for the 60-month period for equally weighted and value weighted sample portfolios. I use the Fama-French three-factor model and obtain the factor returns for MKT, SMB, and HML from Kenneth French's website. The values in parenthesis are t-statistics.

Panel A: 36-month Period

	Equal-Weighted Returns	Value-Weighted Returns
α	-0.17** (-4.560)	-0.23* (-1.902)
MKT	0.87 (1.614)	1.22** (2.154)
SMB	0.73*** (6.040)	0.34*** (3.142)
HML	-0.09*** (-6.331)	-0.13** (-2.401)
Adj-R^2	0.88	0.83

Panel B: 60-month Period

	Equal-Weighted Returns	Value-Weighted Returns
α	-0.03* (1.817)	-0.07** (2.438)
MKT	1.03** (2.874)	0.54** (2.311)
SMB	0.09*** (2.771)	0.66* (1.68)
HML	0.17** (2.201)	-0.32*** (-3.271)
Adj-R^2	0.79	0.92

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 7: Fixed-Effects Model

Table 7 provides coefficient estimates from the fixed effects model. Industry-adjusted ROA_t, industry-adjusted ROE, and industry-adjusted Tobin's Q are regressed on governance indices (Panel A: GIM_Index; and Panel B: Entrenchment index). I include a dummy variable for financial firms (FIN) and the degree of relatedness between the subsidiary and the parent (SIC), controlling for firm size (L_TA), profitability (EBIT), and leverage (LEV). The values in parenthesis are t-statistics and variable definitions are presented in Table 4.

	Dependent Variable		
Panel A	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	-1.21***	0.01	-0.19***
	(-8.04)	(0.63)	(-4.27)
GIM_index_{t-1}	-0.17***	-1.08***	0.09
	(2.35)	(3.78)	(1.27)
L_TA	-0.18***	0.33	-1.04***
	(3.88)	(0.91)	(2.77)
LEV	-0.01***	- 0.43***	0.02
	(14.2)	(2.34)	(1.21)
EBIT	0.11	0.73**	0.04
	(0.74)	(1.89)	(1.14)
SIC	0.21***	1.01**	0. 09**
	(2.48)	(1.88)	(1.77)
FIN	0.12	0.33**	0.27
	(0.29)	(1.68)	(1.02)

Panel B

	Dependent Variable		
	ROA_t	**ROE_t**	**Tobin's Q_t**
α	-0.97**	0.42	-0.43***
	(1.88)	(0.79)	(-2.56)
ENT_index_{t-1}	0.08	-1.42***	-0.18***
	(0.04)	(-3.44)	(-2.76)
L_TA	-0.23***	0.22	-1.08***
	(2.41)	(0.87)	(2.44)
LEV	-0.13***	0.03	-0.22**
	(2.44)	(1.03)	(1.72)
EBIT	0.48	1.09**	0.02
	(0.29)	(1.73)	(1.11)
SIC	0.17***	0.98**	0.16**
	(2.68)	(1.74)	(1.81)
FIN	0.31	0.52**	0.11
	(0.48)	(1.72)	(1.03)

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 8: Hausman Endogeneity Tests

Table 8 provides test results from the Hausman test for endogeneity on GIM_Index (Panel A) with the three firm performance dependent variables (ROA, ROE, and Tobin's Q) using GIM_Index_{t-2} as the instrument. I test the significance of the coefficient on the GIM_Index residuals. As exogenous variables, I include an indicator variables for financial firms (FIN) and relatedness between the subsidiary and the parent (SIC), controlling for firm size (L_TA), profitability (EBIT), and leverage (LEV).

	Dependent Variable		
Panel A	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	-1.32*	-0.97**	1.02
	(-1.34)	(-1.76)	(0.57)
GIM_index_{t-1}	-0.03**	-0.11*	0.23**
	(-1.67)	(-1.62)	(1.82)
GIM_Residuals	-0.04**	0.01***	-0. 37**
	(-1.74)	(2.04)	(-1.94)
L_TA	-0.22*	-0.03**	-2.19***
	(-1.54)	(-1.81)	(-3.41)
LEV	-1.07*	-0.83**	-0.07
	(-1.58)	(-1.68)	(-1.02)
EBIT	0.11*	0.82***	0.53
	(1.41)	(2.48)	(1.03)
SIC	0.07	0.29	0.02*
	(0.43)	(1.03)	(1.55)
FIN	1.19	0.93*	0.78*
	(1.12)	(1.63)	(1.34)
Adjusted R^2	0.14	0.07	0.11
F-Statistic	63.96	18.44	33.08
Wald (χ^2)	78.12	24.06	42.43

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

(Instrument: GIM_Index_{t-2})

Table 8: Hausman Endogeneity Tests…cont

Table 8 provides test results from the Hausman test for endogeneity on ENT_Index (Panel B) with the three firm performance dependent variables (ROA, ROE, and Tobin's Q) using GIM_Index_{t-2} as the instrument. I test the significance of the coefficient on the ENT_Index residuals. As exogenous variables, I include an indicator variables for financial firms (FIN) and relatedness between the subsidiary and the parent (SIC), controlling for firm size (L_TA), profitability (EBIT), and leverage (LEV).

Panel B	Dependent Variable		
	ROA_t	**ROE_t**	**Tobin's Q_t**
α	0.82 (0.76)	-0.04* (1.31)	-0.78* (-1.44)
ENT_index_{t-1}	-0.02 (-0.74)	-0.32 (-0.94)	0.05* (1.34)
ENT_Residuals	-0.08*** (-3.22)	-0.13** (-1.87)	-0.09* (-1.44)
L_TA	-0.01* (-1.48)	-0.23* (-1.27)	1.03 (0.57)
LEV	-0.43 (-0.58)	-0.05** (-2.17)	-0.07 (1.02)
EBIT	0.77* (1.38)	0.83 (0.78)	1.03* (1.53)
SIC	0.77* (1.31)	1.02** (1.73)	0.94* (1.28)
FIN	0.68 (1.22)	0.94* (1.55)	0.89* (1.38)
Adjusted R^2	0.16	0.08	0.14
F-Statistic	44.37	33.23	22.67
Wald **(χ^2)**	68.04	72.05	46.16

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

(Instrument: ENT_Index_{t-2})

Table 9: IV Regressions

Table 9 provides coefficient estimates from IV regressions of industry adjusted ROA on governance indices (Panel A: GIM_Index; and Panel B: Entrenchment index) using GIM_indext-2 and ENT_indext-2 as instruments, respectively. I include a dummy variable for financial firms (FIN) and the degree of relatedness between the subsidiary and the parent (SIC), controlling for firm size (L_TA), profitability (EBIT), and leverage (LEV). The values in parenthesis are t-statistics and variable definitions are presented in Table 4.

	Dependent Variable		
Panel A	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	1.17***	-0.44	-1.68***
	(3.14)	(1.03)	(-9.28)
GIM_index_{t-1}	-0.57***	-0.24**	-0.71**
	(-2.66)	(-1.80)	(-2.24)
L_TA	-0.08***	-0.02	1.03**
	(-2.48)	(-0.07)	(1.78)
LEV	-0.43	-0.05**	0.07
	(-0.58)	(-2.17)	(1.02)
EBIT	1.24**	0.83***	0.76**
	(1.77)	(2.48)	(1.83)
SIC	0.11***	0.03**	0.40**
	(3.19)	(1.88)	(1.97)
FIN	0.28	0.34**	0.09
	(0.22)	(1.68)	(1.07)
Adjusted R^2	0.38	0.15	0.27
F-Statistic	10.53	7.00	3.83
P-Values	[0.0018]	[0.0003]	[0.0520]
	Dependent Variable		
Panel B	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	1.02**	-0.76	-1.12***
	(2.16)	(0.97)	(-3.04)
ENT_index_{t-1}	-0.83**	-0.67***	0.02**
	(-1.97)	(-2.47)	(1.73)
L_TA	-0.41**	-0.38	0.93**
	(-2.01)	(-1.02)	(1.81)
LEV	-0.22	-0.05**	0.07
	(-0.58)	(-2.17)	(1.02)
EBIT	0.89**	0.47***	0.51
	(2.03)	(2.88)	(0.79)
SIC	1.04***	0.21**	0.57**
	(3.37)	(1.91)	(2.16)
FIN	0.07	0.81**	0.34
	(1.12)	(1.97)	(0.83)
Adjusted R^2	0.23	0.12	0.28
F-Statistic	10.28	9.70	14.04
P-Values	[0.0005]	[0.0005]	[0.0020]

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Instruments: Panel A: Constant, GIM_Index_{t-2}
Panel B: Constant, ENT_Index_{t-2}

Table 10: GMM Estimates

Table 10 provides coefficient estimates from GMM regressions of industry adjusted ROA, ROE, and Tobins_Q on governance indices (Panel A: GIM_Index; and Panel B: Entrenchment index) using GIM_index_{t-2} and ENT_index_{t-2} as instruments, respectively. I include a dummy variable for financial firms (FIN) and the degree of relatedness between the subsidiary and the parent (SIC), controlling for firm size (L_TA), profitability (EBIT), and leverage (LEV).

	Dependent Variable		
Panel A	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	0.69**	0.07***	-1.12**
	(1.81)	(2.33)	(-1.91)
GIM_index_{t-1}	-0.43***	-0.22***	0.08**
	(-2.74)	(-2.67)	(1.98)
L_TA	-0.14***	-0.03	-1.05**
	(-2.67)	(-1.02)	(-1.74)
LEV	-0.42	-0.07***	- 0.12**
	(-1.21)	(-2.37)	(-1.82)
EBIT	1.18**	0.87**	0.74
	(1.79)	(1.86)	(1.02)
SIC	0.11*	0.46**	0.05**
	(1.32)	(1.81)	(2.04)
FIN	0.04	0.32**	0.08
	(1.08)	(1.77)	(1.17)
R-Square	-14.00	-18.34	-16.37
Adj_R^2	-12.34	-18.41	-11.54
Durbin-Watson	4.78	3.79	4.07
J-Statistic	6.31E-06	2.84E-03	3.46E-03
	Dependent Variable		
Panel B	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	1.04**	0.12**	1.15
	(1.77)	(1.98)	(0.91)
ENT_index_{t-1}	-0.72***	-0.22**	-0.08**
	(-2.48)	(-2.27)	(-1.84)
L_TA	-0.01**	-0.09	-0.75**
	(-1.73)	(-0.84)	(-1.81)
LEV	-0.47	-0.08***	- 0.01**
	(-1.12)	(-2.41)	(-1.98)
EBIT	0.48**	0.53**	0.74**
	(1.79)	(1.86)	(2.12)
SIC	0.09	0.13**	0.02**
	(1.04)	(1.69)	(2.04)
FIN	0.11**	0.52*	0.71
	(1.67)	(1.07)	(1.26)
R-Square	-12.02	-10.12	-12.05
Adj_R^2	-10.82	-14.28	-9.34
Durbin-Watson	5.06	4.03	2.84
J-Statistic	4.32E-04	3.21E-02	6.93E-.2

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Instruments: Panel A: Constant, GIM_Index_{t-2}

Panel B: Constant, ENT_Index_{t-2}

Table 11a: IV and GMM Regressions for sub-set of financial firms (SIC 6000)

Table 11a provides coefficient estimates from IV and GMM regressions for a sub-set of financial firms (SIC 6000). I regress industry-adjusted ROA, ROE, and Tobins_Q on GIM_Index$_{t-1}$ using GIM_index$_{t-2}$ as an instrument. I include an indicator variable (SIC) for industry relatedness between the subsidiary and the parent (SIC). I control for firm size (L_TA), Price-to-book value (PBV), and firm profitability (EBIT).

	IV			**GMM**		
Model	1	2	3	1	2	3
	ROA_t	ROE_t	Tobin's Q_t	ROA_t	ROE_t	Tobin's_Q_t
Constant	0.03	0.24***	-1.06	-1.27	0.05	-1.04**
	(0.57)	(2.58)	(-1.04)	(-0.11)	(1.08)	(-1.66)
GIM-incdex$_{t-1}$	-0.98**	-0.91***	-0.24**	-0.03*	-0.62**	0.08**
	(-1.87)	(-2.77)	(-2.08)	(-1.41)	(-1.83)	(1.79)
L_TA	-0.32**	-1.01**	0.03	-0.74	-0.11**	-4.10**
	(-1.71)	(2.29)	(0.07)	(-0.42)	(-2.17)	(-1.78)
PBV	1.17**	2.22***	-	0.83**	0.62**	-
	(1.68)	(2.69)		(1.78)	(2.03)	
EBIT	0.04**	1.86**	0.81	0.14**	0.08	0.41**
	(2.08)	(1.75)	(1.07)	(2.02)	(0.17)	(1.88)
Adj.R^2	0.31	0.12	0.24	0.18	0.22	0.12
F-statistic	42.18***	18.22**	34.37***	22.10**	28.54**	16.64**
Model p-value	[0.0000]	[0.0001]	[0.0000]	[0.0000]	[0.0001]	[0.0000]

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 11b: IV and GMM Regressions for sub-set of financial firms (SIC 6000)

Table 11b provides coefficient estimates from IV and GMM regressions for a sub-set of financial firms (SIC 6000). I regress industry-adjusted ROA, ROE, and Tobins_Q on ENT_Index$_{t-1}$ using ENT_index$_{t-2}$ as an instrument. I include an indicator variable (SIC) for industry relatedness between the subsidiary and the parent (SIC). I control for firm size (L_TA), Price-to-book value (PBV), and firm profitability (EBIT).

	IV			**GMM**		
Model	1	2	3	1	2	3
	ROA_t	ROE_t	Tobin's_ Q_t	ROA_t	ROE_t	Tobin's_Q_t
Constant	0.74	0.63**	1.44**	-1.54	0.11*	-1.67*
	(1.02)	(1.92)	(2.04)	(-0.09)	(1.29)	(-1.42)
ENT-incdex$_{t-1}$	-0.53*	-0.08***	-0.37***	-0.43**	-0.22**	0.13*
	(-1.67)	(-3.68)	(-2.44)	(-1.67)	(-1.91)	(1.42)
L_TA	-0.04***	-0.78**	-0.03	-0.72	-0.41*	-3.87**
	(-2.71)	(1.99)	(-0.47)	(-0.56)	(-1.33)	(-1.68)
PBV	0.97**	1.09***	-	0.32**	0.34**	-
	(1.73)	(3.01)		(1.69)	(2.03)	
EBIT	0.28*	1.01*	0.82	0.07**	0.17	0.57**
	(1.69)	(1.71)	(1.33)	(2.11)	(0.53)	(1.93)
Adj.R^2	0.18	0.26	0.16	0.12	0.10	0.21
F-statistic	28.17	34.37***	22.10**	8.54**	16.64**	9.57**
Model p-value	[0.0000]	[0.0001]	[0.0000]	[0.0000]	[0.0001]	[0.0000]

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 12: Granger Causality Tests

Table 12 presents results from bi-variate granger causality tests between shareholder-rights protection [GIM-index and ENT-index] and firm performance. Firm performance is measured by Tobin's Q, ROE, and ROA along with their 1-period lag.

		F-Statistic	Probability
Model 1-(ROA)	GIM-index does not granger cause ROA	8.420	[0.0000]
	ROA does not granger cause GIM-index	1.203	[0.5480]
	ENT-index does not granger cause ROA	12.621	[0.0000]
	ROA does not granger cause ENT-index	0.044	[0.2860]
Model 2-(ROE)	GIM-index does not granger cause ROE	4.568	[0.0005]
	ROE does not granger cause GIM-index	0.941	[0.3680]
	ENT-index does not granger cause ROE	26.010	[0.0000]
	ROE does not granger cause ENT-index	1.045	[0.6200]
Model 3-(Adj_Q)	GIM-index does not granger cause Adj_Q	1.325	[0.0500]
	Adj_Q does not granger cause GIM-index	0.572	[0.2020]
	ENT-index does not granger cause Adj_Q	2.920	[0.0600]
	Adj_Q does not granger cause ENT-index	0.083	[0.7200]

Chapter 3

Board Structure and Firm Performance: The Case of Equity Carve-outs

Abstract

I investigate the effect of board structure on firm performance using a sample of carve-out firms for the period 1983-2004. The board as an internal governance mechanism is intended to align the interests of shareholders and those of management. An extensive literature attempting to evaluate how effectively boards perform this role exists; however, the evidence is mixed and largely inconclusive. In this essay I re-examine the effect of board structure on firm performance by implementing IV and GMM to ameliorate the empirical problems that plague past studies. I also exploit the experimental setting presented by the structural break in a firm's governance system through restructuring to mitigate the persistence of governance structures across time. Full sample results show that board size is negatively related to firm performance, board independence is positively associated with firm performance, and CEO duality is negatively related to firm performance. On the other hand, results from a sub-sample consisting of only financial firms board size is shown to be positively related to firm performance. In the case of board independence and CEO duality, results for financial firms are qualitatively similar to those for non-financial firms – indicating a positive relation between firm performance and the two variables. Although Granger causality tests suggest reverse causality between board size and firm performance, it is not clear what explains the distinction between financial and non-financial firms in the case of board size.

JEL Classifications: G34, G38

Keywords: Corporate Boards; External Directors; Board Size; Board-insiders; Board Independence.

1. Introduction

Corporate boards constitute one of the most important internal control mechanisms of the modern firm and have justifiably attracted significant interest from business researchers for a long time. The board as an internal control mechanism is tasked with overseeing, hiring, firing, and rewarding managers with the objective of aligning managers' interests with those of shareholders through its key committees – audit, compensation, and governance and nominations. Given the prominent role that boards play they have attracted significant attention, particularly, from empirical researchers. Some of the big questions that empirical research has attempted to answer include: (1) What factors affect the composition of boards; (2) Whether and how board characteristics such as the proportion of external-to-insider directors and board size affect firm performance; and thirdly (3) How effective corporate boards are in accomplishing their intended role as an interest alignment mechanism. As important as boards seem to be, though, Hermalin and Weisbach (2000) note a conspicuous dearth of formal theory on corporate boards. In the absence of formal theory on corporate boards, interpreting the extensive empirical findings is bound to be cloudy and subjective. This may partly explain the largely conflicting extant evidence.

Limited formal theory notwithstanding, Hermalin and Weisbach (2003) posit two alternative causes for the largely mixed evidence and present some interesting policy implications of their findings. First, they argue that empirical studies on corporate boards, like other governance studies are seriously hampered by the endogeneity or reverse-causality problem. It is still not clear whether good boards lead to better firm performance or whether past performance in fact influences the future composition of boards. Second, they posit that interpretation of the empirical results and related policy implications may vary depending on whether the empirical results are interpreted from an equilibrium or out-of-equilibrium perspective. For instance, they suggest that if the negative relation between board size and firm performance is perceived from an out-of-equilibrium perspective, it may imply causation and the encouragement of small boards. On the other hand, the equilibrium interpretation of these results may point to a spurious relation between board size and firm performance, and the implication that the two variables are driven by some other factor.

In addition to board size, board independence has attracted similar attention from scholars. It is very critical that boards as monitors of management not only be impartial but also be perceived as such. Consequently, the presence of outside/unaffiliated board members on the board and the CEO not doubling as the chairman of the board are perceived as indicators of the degree of independence between the board and management. Fama and Jensen (1983) posit that independent directors have an incentive to act as effective monitors in order to preserve their reputations. Hermalin and Weisbach (1998), on the other hand, posit that a board's independence depends on the relative bargaining powers of the CEO and the board. More recently, as a result of corporate scandals, board independence has taken on a regulatory dimension. Sarbanes-Oxley and new securities exchange requirements now mandate that a majority of board members be independent as well as all directors on key committees. These developments seem to implicitly suggest that the presence of outside directors on a board ensures its effectiveness. From a shareholder wealth perspective, a more interesting question to ask then becomes: Does an independent board necessarily improve firm performance? As alluded to earlier, extant evidence does not conclusively answer this question. Some evidence suggests a positive relation between firm performance and board independence, other evidence posits a negative relation, and yet other studies find no relation.

The majority of these earlier studies implement OLS regressions by projecting some measure of firm performance, say, return on assets (ROA), return on equity (ROE), or Tobin's Q on a given proxy for board size and independence (composition and leadership). Given the potential endogeneity of board characteristics and firm performance, results obtained from simple linear approaches are potentially likely to be misleading. I argue that the econometric issues that generally afflict governance studies coupled with the limited formal theory to inform empirical research on board structure and firm performance have to a degree constrained the current state of inquiry on boards, thus impeding our full understanding of whether the form that boards take has any influence on performance or vice versa.

The main objective of this essay is to re-examine the relation between firm performance and board structure using methodological approaches that control for the major econometric problems that plagued earlier studies. I argue that the largely mixed evidence on the effects of

board structure on firm performance can partly be attributable to inadequate methodological approaches used in these studies. To control for the potential endogeneity, I use panel data and start with pooled regressions. I then implement the instrumental variables method (IV), the generalized method of moments (GMM), and lastly I run granger causality tests between board structure and firm performance to ascertain the direction of causation. I successively increase the complexity of the models with a view to discerning the effect on my coefficients. The idea here is that if any statistically significant changes in the coefficients can be observed, then it is plausible that the choice of econometric models in earlier studies may partly explain the largely mixed evidence. I then attempt to reconcile my results with existing evidence.

Second, I exploit the experimental setting presented by equity carve-outs to analyze the effects of the restructuring 'shock' on board structure. Then following the announcement, I investigate to what extent board structure influences the performance of the carved-out subsidiaries. My prior is that if shareholder wealth maximization is the goal of management, then one would expect management of the parent company, with the approval of the board, to structure the subsidiary's board in ways most likely to maximize shareholder value. I investigate whether the parent firm's board structure has similarities with that of the newly created subsidiary. And if so, to what extent these similarities may influence the subsidiary's performance following the announcement.

I find that board size is negatively related to firm performance for non-financial firms, consistent with the findings by Yermack (1996), Eisenberg, Sundgren, and Wells (1998), Mak and Yuanto (2003), Coleman and Biekpe (2005), and Charu Raheja (2005). Board independence is positively associated with firm performance in support of the evidence presented by Charu Raheja (2005), Chung, Wright, and Kedia (2003), and Brewer III, et al., (2000). Consistent with Fama and Jensen (1983), Rechner and Dalton (1991), and Westphal and Zajac (1995) I find that CEO duality is negatively related to firm performance. Results from a sub-sample consisting of only financial firms (SIC 6000), show that board size is positively related to firm performance. The findings for financial firms support the evidence presented by Adams and Mehran (2005) and Mohamed Belkhir (forthcoming). A plausible explanation for the positive relation between board size and firm performance for financial firms is that banks being large holding companies,

the scope of operations is so complex that it requires larger boards provide a wider pool of expertise to run them. What accounts for the positive association between board size and firm performance though, is not so clear. One possibility, Adams and Mehran argue, is that board size may be endogenously determined following merger activity when the board of directors from the target firm is absorbed by the acquirer. In support of this view Granger causality test results indicate reverse causality between board size and firm performance.

The rest of the essay is organized as follows. In section 2, I review extant theory on board structure and firm performance, present the empirical evidence, and develop testable hypotheses. I present sample selection criteria, the data, and describe the variables in section 3. Section 4 discusses the empirical tests and results. Robustness test results are presented in section 5 and section 6 concludes.

2. Literature Review and Hypotheses Development

In this section, I review extant theory on board structure and discuss related predictions, then I present the empirical evidence, and lastly, I motivate and develop testable hypotheses. Although the relation between board structure and firm performance has defied conclusive evidence, more recently, Charu Raheja (2005) posits that… "Optimal board design maximizes the probability that the majority of board members will vote against inferior projects and replace them with higher value projects. He goes on to say that "board size and independence affect the incentives of board members and play a crucial role in board effectiveness"…thus directly linking the performance of the firm to the effectiveness of the board, through the board's approval of value increasing projects and rejection of bad projects. However, this assertion still leaves open the question of what constitutes an 'optimal' board. A number of theories have been advanced to explain the structure of corporate boards, namely: *the scope of operations hypothesis; the monitoring hypothesis; and the negotiation hypothesis.* I review each of these theories, present related empirical evidence, and develop testable hypotheses to ascertain the relation between firm performance and board structure.

2.1 Theory on Board Structure

2.1.1 The Scope of Operations Hypothesis

Fama and Jensen (1983) posit that as a firm's operations expand, its production processes become increasingly complex and its organization more hierarchical. The board which is charged with the stewardship of the firm and overseeing its senior managers, invariably also grows in size as its responsibilities increase. Coles, Daniel, Naveen (2006) make the same argument, positing a positive association between board size and the complexity of operations, but predicate the increase in complexity on the introduction of new products and expansion into new geographical markets. Crutchley, Garner, and Marshall (2004) and Lehn, Patro, Zhao (2004), on the other hand, argue that given the complexity of operations and wider span of control larger firms are likely to suffer from significantly more agency problems, consequently requiring more independent (outside) board members to mitigate these problems. The main predictions from the scope of operations hypothesis are that: (1) board size is positively related to the scope and complexity of the firm's operations; (2) the proportion of independent (outside) directors on the board is positively related to the scope and complexity of the firm's operations.

Yermack (1996) and Denis and Sarin (1999) present evidence that board size is positively related to firm size. Anderson, Bates, and Lemmon (2000) show that diversified firms have relatively more independent directors to monitor their extensive and varied operations. Boone, Field, Karpoff, and Raheja (2007) using firm size, age, and number of segments as proxies for firm complexity, also present evidence in support of the scope of operations hypothesis, for both board size and board independence.

2.1.2 The Monitoring Hypothesis

The notion that the effectiveness of the monitoring role played by boards diminishes as the board gets larger is modeled by Raheja (2005) and Harris and Raviv (2006) as a trade-off between the managers' consumption of private benefits and directors' monitoring costs. Hackman (1990) makes the same 'free-rider' and 'cost-benefit' argument. He argues that large

boards create incentive problems similar to a free-rider problem, which makes it difficult for individual board members to actively participate in their supervisory roles. Moreover, as the board grows in size the costs of group-decision making such as communication and coordination costs rise, while at the same time reputation benefits in the eyes of the individual board member diminish. The idea here is that optimal board size will be that number at which the verification and monitoring costs of individual board members begin to rise. The overall predictions under the monitoring hypothesis are that (1) Board size and independence are positively related to managers' private benefits, and (2) board size and independence are negatively related to directors' costs of monitoring. Lehn, Patro, Zhao (2004) show that firms with greater growth opportunities have smaller boards and fewer outside directors. Similarly, Coles, et al. (2006) present evidence that a firm's R&D expenditures are negatively related to the number of independent (outside) directors. Boone, Field, Karpoff, and Raheja (2007) present recent evidence of a positive relation between board size and managers' private benefits using industry concentration and the presence of take-over defenses as proxies for managerial private benefits. However, they show no relation between board independence and managers' private benefits and directors' costs of monitoring.

2.1.3 The Negotiation Hypothesis

One of the reasons advanced for the existence of boards is that of an equilibrium solution to the severe agency problems that exist between managers and shareholders. Independent (outside) directors are often viewed as playing the role of monitors within the overall governance framework. Proponents of the negotiation hypothesis take the view that board composition is an evolutionary process that is largely shaped by the bargaining game between the CEO and the independent directors on the board. Hermalin and Weisbach (1998) posit that in this negotiation, the CEO prefers a less independent board whereas the outside directors wish to maintain their independence. The CEO's main bargaining chip is her ability. The authors make the case that if the CEO demonstrates that she possesses a set of special abilities and therefore is not easily replaceable, the board's independence will likely decline. Conversely, when the CEO presides over poor performance her reputation and bargaining power with the board suffers likewise, and she is more likely to be replaced. More recently, Baker and Gompers (2003) argue that the longer

a CEO has been tenured and the better skilled she appears relative to potential replacements, the stronger will be her bargaining power and the less independent will be the board. Kieschnick and Moussawi (2004) reaffirm the negative relation between board independence and CEO influence and argue that board independence will grow with institutional investor influence. Boone, Field, Karpoff, and Raheja (2007) using CEO's stock ownership and job tenure as proxies for CEO influence find a negative relation between board independence and these two variables.

2.2 Board Structure and Firm Performance

Most empirical studies that investigate the relation between board structure and firm performance tend to appeal to agency theory. The rationale is that senior managers to whom decision-making authority is delegated by the share owners of a corporation are self-interested and may pursue actions that do not necessarily align with those of the owners. Hence, the board of directors, being one of the important internal control mechanisms, is looked upon as a mechanism to align managers' and shareholders' interests through close monitoring. Consequently, when boards perform their role effectively, it is argued that actions that managers take will be geared towards fulfilling their cardinal duty of maximizing shareholder wealth. On the other hand, proponent's of the stewardship role of corporate boards argue that directors play an advisory role to senior managers and engendering unity at the top and avoiding unnecessary power struggles may in fact be a good thing in terms of shepherding and deploying the firm's resources. The two polar views notwithstanding, some important questions that deserve attention when evaluating the impact of board structure on firm performance are: (1) What constitutes an effective board, and (2) How are the characteristics of an effective board related to firm performance? An extensive literature exists although it is still largely mixed.

2.2.1 Board Size

In the case of board size, there are studies that posit a positive relation between firm performance and board size; there are those that show a negative association, and others that support the null hypothesis that board size has no effect on firm performance. Mak and Yuanto (2003) and Coleman and Biekpe (2005) present international evidence of a negative relation

between firm performance and board size and for Singapore and Malaysia, respectively. Yermack (1996) and Eisenberg, Sundgren, and Wells (1998) also find a negative relation between board size and the market valuation of US firms. Charu Raheja (2005) argues that optimal boards maximize the probability that inferior projects will be rejected by the board and replaced with higher value projects, partly attributing the effectiveness of boards to small size. On the other hand, several management researchers, in particular Dalton, Daily, Johnson, and Ellstrad (1999) argue that large boards provide a wider pool of expertise that senior management can tap into thus predicting a positive relation between board size and firm performance. The null hypothesis between firm performance and board size is supported by Bhagat and Black (2002), Provost, et al., (2002), and Adams and Mehran (2002) who find no statistically significant relation between board composition and firm performance. In this study, I hypothesize that small boards are more effective and will have a more significant impact on firm performance:

H_1: Long-term carve-out performance is negatively associated with board size.

2.2.2 Board Independence

Part of Charu Raheja (2005) argument that optimal boards maximize the probability that inferior projects will be rejected by the board and replaced with higher value projects, is predicated on the notion that independent boards are more effective. This supports the notion that a positive association exists between firm performance and board independence. Chung, Wright, and Kedia (2003) study the relation between a firm's R&D expenditures and firm value and present evidence of a positive relation for those firms with more independent boards. Brewer III, et al., (2000) shows that banking firms with independent boards command higher premium in takeovers than those with less independent boards. On the other hand, Anderson, et al., (1998) show that the ratio of independent directors is negatively related to the price-to-sales ratio for mono-product line firms. Yermack (1996) using the simultaneous equations approach, also documents evidence of a negative relation between the firm's Tobin's Q and an independent board. The effect however, disappears in a fixed effects setup. Lastly, Bhagat and Black (2002), Provost, et al., (2002), and Adams and Mehran (2002) find no statistically significant relation

between board independence and firm performance. In view of the largely mixed evidence, I re-investigate the relation between firm performance and board independence. I hypothesize that independent boards are more effective monitors and hence will have a positive effect on firm performance:

H_2: Long-term carve-out performance is positively associated with the proportion of independent (outside) directors on the board.

2.2.3 CEO Duality

Related to board independence is the notion of board leadership. Separation of the role of CEO and board chairman has pre-occupied board scholars and regulators particularly following recent corporate scandals. Agency theory suggests that having the CEO also play the role of board chairman compromises the independence of the board and an ineffective board is likely to cause poor performance [Fama and Jensen (1983)]. Based on the monitoring hypothesis, it would seem obvious that the CEO who is supposed to be monitored by the board should not be the chair of the same board. Moreover, the negotiation hypothesis which posits that board structure is the result of bargaining between the CEO and the board, suggests that having the CEO act as chairman of the board bestows enormous bargaining advantage for the CEO over the board, invariably compromising its independence. Consistent with these views, Rechner and Dalton (1991) and Westphal and Zajac (1995) show evidence that firms which separate CEO and board chairman roles consistently outperform those with dual CEO/Chairman positions. On the other hand, proponents of the stewardship hypothesis suggest that the CEO is likely to be more informed about what is happening within the firm and therefore better placed to chair the board and act as the conduit for the exchange of critical information between the insiders and the outside directors on the board. This arrangement, they argue, minimizes the cost of information transfer and potential miscommunication between the board and management [Donaldson and Davis (1991)]. On the other hand, Baliga et al., (1996) and Dalton et al., (1998) find no significant association between CEO duality and firm performance. Given this dichotomous view on CEO duality, I include an indicator variable, (CEOt-1), coded ‘1’ if the CEO is also the chairman of the board or ‘0’ otherwise, and test the following hypothesis:

H_3: Long-term carve-out performance is negatively associated with CEO Duality.

2.2.4 Board Structure and Performance: Financial Firms

Adams and Mehran (2005) examine the relation between board structure and firm performance for US banking institutions and find that, contrary to the evidence for non-financial firms positing a negative (positive) relation between board size (board independence) and firm performance, board size is positively related to firm performance and no statistically significant association between board independence and firm performance. They argue that banks being large holding companies, the scope of operations hypothesis explains why they are likely to have larger boards. What accounts for the positive association between board size and firm performance though, is not so clear. One possibility, they argue, is that board size may be endogenously determined following merger activity when the board of directors from the target firm is absorbed by the acquirer. This argument is plausible, considering that their sample period, 1959-1999, was a period characterized by significant M&A activity in the banking industry. Mohamed Belkhir (forthcoming) studies board size and firm performance for US banks and Savings & Loans, for the period 1995-2002. Consistent with Adams and Mehran (2005), he finds a positive relation between board size and firm performance and no relation between board independence and firm performance.

To ascertain whether the relation between board structure and firm performance for financial firms differs from that documented for non-financial firms, I include a dummy variable (FIN), for financial firms in all full sample regressions. I also run separate IV and GMM regressions for financial firms.

3. Sample Selection and Data

3.1 Sample Selection

The sample is compiled from the Securities Data Company's (SDC) US IPO data and cross checked with *Lexis-Nexis, the Wall Street Journal*, the *Wall Street Journal Index* and the *Directory of Corporate Affiliations*. The initial sample comprises 421 firms (regulated and unregulated) that announced carve-out transactions during the time period 1983 - 2004. For inclusion in the sample, a firm must be traded on the AMEX, NYSE, or NASDAQ and be covered by CRSP and Standard & Poor's COMPUSTAT. Supplemental governance data is obtained from Q-files, Lexis-Nexis, Compact Disclosure CD-ROMs, The Corporate Library (TCL), and corporate proxy statements. For each year that a firm is in the sample, I gather complete data on the composition of the board, directors' relationships with the firm/senior management, and number of directors on the board. Firms that constitute the final sample are then observed for the entire sample period or until a given firm is re-acquired or summarily sold off. I use Weisbach (1998) methodology to classify directors as affiliated or non-affiliated. Directors who are current employees of the firm, retired, or their immediate families are classified as affiliated directors or insiders. Those whose only association with the firm is membership on the board are classified as unaffiliated or outside directors.

After the initial screening and elimination of firms that do not trade on AMEX/NASDAQ/NYSE, have missing data points, or are not covered by CRSP and COMPUSTAT 164 firms constitute the final sample (81 financials and 83 industrials). To control for the regulatory and balance-sheet idiosyncrasies of financial firms (SIC 6000), I include an indicator variable coded as '1' if the firm is financial or '0' otherwise, in all regressions. For robustness, I also run separate regressions on financial firms (SIC 6000).

Table 13 presents the size and distribution of the sample. Panel A shows the initial sample size and break- down of the number of firms screened out and the reasons for their exclusion. Of the original sample of 421 firms, 144 firms are dropped because they are not listed on AMEX/NASDAQ/NYSE. Additionally, 105 firms are not covered by CRSP and/or COMPUSTAT and 8 firms had missing data on the structure of their boards. Panel B shows the distribution of carve-out announcements by year. Firms that meet all requirements for inclusion, range from 5 for the years 1989, 1991, 2003, and 2004 to 14 for 2000. Panel C presents the distribution of announcements by industry (2-digit SIC). Financials (SIC 60), had the highest

number of transactions with 81 announcements, manufacturing (SIC 20-30) had 34, there were 17 announcements for other services (SIC 70-80), 14 for wholesale/retail (SIC 50), 9 for transportation, communications, and utilities (SIC 40), and 8 for mining, oil, and gas (SIC 10).

3.2 Descriptive Statistics

Table 14 presents sample descriptive statistics. Board size has a mean (median) of 10.74 (10.19) board members with a standard deviation of 2.31. The maximum (minimum) number of directors on the board is 18 (4). The proportion of independent directors to total directors on the board has a mean (median) of 73% (78%) with a standard deviation of 22%. The maximum (minimum) proportion of independent directors is 94% (31%). CEO/Chairman duality has a mean (median) of 0.26 (1.00) and a standard deviation of 0.52. The maximum (minimum) number for CEO/Chairman duality is 1.00 (0.00). Total market value of equity ranges from a minimum of $3.4 to a maximum of $58,514 with a mean (median) of $1,002 ($207) and a standard deviation of $244. Leverage which is measured as total long-term debt divided by total assets ranges from a minimum of 0.12 to a maximum of 1.06 with a mean (median) of 0.43 (0.54) and a standard deviation of 0.20. Book-to-market ranges from a minimum of 0.21 to a maximum of 0.79 with a mean (median) of 0.41 (0.39) and a standard deviation of 0.24. Tobin's Q which is measured as the market value of equity divided by the book value of total assets, ranges from 1.18 to 1.92 with a mean (median) of 1.48 (1.57) and a standard deviation of 1.12. Return on assets (ROA) is measured as earnings before interest and tax divided by total assets (EBIT/TA) and the minimum (maximum) for the sample is -0.03 (0.16) with a mean (median) of 0.17 (0.21) and a standard deviation of 0.13. Return on equity is measured as net earnings divided by total owners equity (Net Income/Common Stock) and ranges from a minimum of -0.06 to a maximum of 0.28 with a mean (median) of 0.17 (0.21) and a standard deviation of 0.24.

3.3 Description of Variables

3.3.1 Dependent Variables (ROA, ROE, Tobin's Q)

Table 15, presents descriptions of dependent and independent variables and how they are constructed. The dependent variable is firm performance. Three variables including Tobin's Q (Adj_Q), return on assets (Adj_ROA), and return on equity (Adj_ROE) are used to proxy firm performance. Tobin's Q, is measured as book value of assets minus the book value of equity plus the market value of equity divided by the book value of its assets. Each firm's Tobin's Q is then adjusted by subtracting the industry median. To ascertain the significance of the potential right skew in the distribution of firm value, I use log values of Tobin's Q as a robustness test. Return on assets (ROA) for each firm is calculated as the ratio of the firm's earnings before interest and tax (EBIT) to the book value of assets. Return on equity (ROE) measured as a firm's earnings before interest and tax divided by the firms total equity. Both variables are then adjusted by subtracting the industry medians for return on assets (ROA) and return on equity (ROE), respectively.

3.3.2 Explanatory Variables

Board size is measured as the total number of directors on the board. An indicator variable coded '1' if the CEO also serves as the chairman of the board or '0' otherwise. Board independence is the ratio of outside (unaffiliated) directors to the total number of directors on the board. Outside (unaffiliated) directors are defined as those non-executive board members who have no material relationship (either as partner, shareholder, or officer) with the company beyond their directorship. The IFC definition goes even farther and suggests that an independent director should be independent in character and judgment. It specifically states that, "…an independent director is one who is not, and has not been employed by the company or any of its related parties at any time during the past five years; is not, and has not been affiliated with a company that acts as an advisor or consultant to the company or its related parties, nor is not and has not himself acted in such capacity at any time during the past five years; is not, and has not been affiliated with any significant customer or supplier of the company or its related parties…" among others. For robustness, I also use the change in board independence (Outside directors *minus* inside directors), in place of the proportion of outsiders.

3.3.5 Control Variables

Control variables include book-to-market value (BME), log of market value of equity (L_MVE), and log of total assets (L_TA) used as control variables for firm size. Leverage (LEV), computed as total long-term debt divided by the firm's total assets, and Capital ratio are used to proxy for the indebtedness of non-financial and financial firms, respectively. For full sample regressions combining financial and non-financial firms, I include an indicator variable FIN for financials, to control for the regulatory and balance sheet differences. The sample distribution data presented in Table 13, Panel C depicts some degree of industry concentration particularly in manufacturing, services, and wholesale/retail. For robustness, I include an indicator variable for industry, SIC, based on the 2-digit SIC code.

Table 16 presents the correlation matrix between the main variables. Results show that the pairwise correlation between contemporaneous firm performance proxies and the main explanatory variables is much weaker than that between performance proxies and lagged explanatory variables. Pairwise correlations between industry adjusted Tobin's Q and ROE with lagged board size (B_SIZE) are negative and significant at the 5% and 10% level, respectively. Pairwise correlation between ROA and lagged B_SIZE is positive and insignificant. Correlations between Tobin's Q, ROE, and ROA and board independence are all positive and statistically significant at 5% level for Tobin's Q and ROE, and 10% for ROA. Pairwise correlations between performance measures and CEO Duality are all negative and statistically significant at the 10% level. For further analysis, I run granger-causality tests between the three performance measures and board structure proxies to determine the direction of causation.

4. Methodology

Following the discussion on the econometrics of governance studies, I argue that simple OLS estimation methods are unlikely to yield unbiased and consistent coefficient estimates. I use panel data which allows for more robust and dynamic modeling of firm heterogeneity. First, I start with annual univariate regressions and then successively increase the complexity of the models by implementing a fixed effects model, then the instrumental variables method (IV), and

lastly, the generalized method of moments (GMM). As a robustness check, I also run granger causality tests to determine the direction of causation between board structure and firm performance. To test hypotheses H_1, H_2, and H_3, I project an industry-adjusted performance measure [ROA, ROE, and Tobin's Q] on each of the proxies for board structure [B_SIZE, B_INDEP, and CEO]. I include as control variables the log of total assets (L_TA), firm leverage (LEV), and firm profitability (EBIT). To capture industry effects, I use a binary variable (FIN), coded as '1' if the firm is financial (SIC 6000) or '0' otherwise. For the IV and GMM models, I use 2 lags of board structure variables as instruments. I estimate the following model:

$$Adj\_ROA_{it} = \alpha + ß_1 B\_SIZE_{i,t-1} + ß_2 B\_INDEP_{i,t-1} + ß_3 CEO_{,i,t-1} + ß_4 LEV_{i,t-1} + ß_5 L\_TA_{i,t-1} + ß_6 FIN_{i,t} + \varepsilon_{it} \quad (1)$$

One of the econometric problems discussed earlier is reverse causality. In the case of board structure and firm performance, it is not clear whether effective boards result in better firm performance in the future or whether in fact good performance causes firms to establish effective boards. I implement granger causality tests (Granger 1969) to test whether changes in board structure are followed by systematic changes in firm performance or vice versa. Granger causality tests have the advantage of not requiring the use of instrumental variables. I test the following models for each of the board structure proxies and measures of firm performance:

$$Adj\_ROA_t = \alpha_0 + \alpha_1 ROA_{t-1} + \alpha_2 ROA_{t-2} + \beta_1 B\_SIZE_{t-1} + \beta_2 B\_SIZE_{t-2} + \varepsilon_t \quad (2)$$

$$B\_SIZE_t = \varphi_0 + \varphi_1 B\_SIZE_{t-1} + \varphi_2 B\_SIZE_{t-2} + \beta_3 ROA_{t-1} + \beta_4 ROA_{t-2} + \nu_t \quad (3)$$

In equation (2), the null hypothesis is that: *board size (B_SIZE) does not granger cause firm performance (ROA)*. Rejection of the null hypothesis suggests that board size granger causes firm performance. In equation (3), the null hypothesis is that: *firm performance does not granger cause board size.* Rejection of the null hypothesis would imply that firm performance granger causes board size. The F-statistic/Wald-statistic is used to test the following condition, for all equations: $\beta_1 = \beta_2 = 0$

5. Empirical Results

5.1 OLS Regressions

Table 17 presents test results from annual OLS regressions. Model 1 uses industry-adjusted ROA as the dependent variable, Model 2 uses industry-adjusted ROE, and Model 3 uses industry-adjusted Tobin's Q, controlling for firm profitability (EBIT), leverage (LEV), firm size (L_TA), and whether the firm is financial or non-financial (FIN). The coefficients on board size (B_SIZEt-1) are mostly negative and range from -0.87 to 0.19 with levels of significance ranging from 0.01 in year 1998, to 0.05 in 1988, 1990, and 2004, and 0.10 in 1984, 1985, 1989, 1992, 1993, 1997, 1999, and 2004. The coefficients on board independence (B_INDEP) are mostly positive and statistically significant at the 0.05 level for the years 1983, 1991, 1992, 1998, 2002, and 2003, and significant at the 0.10 level for the years 1984, 1986, 1989, 1997, and 2000. The coefficients on CEO duality (CEO) are mostly negative and range from -1.42 to 0.91 with levels of significance ranging from 0.05 in 1983, 1986, 1989, 1995, 1999, and 2004, and 0.10 in 1992. Model 2 uses adjusted return on equity (ROE) as a measure of firm performance. The coefficients on board size (B_SIZE) are mostly negative and range from -0.54 to 0.22 with levels of significance ranging from 0.05 for years 1988, 1992, and 1996, to 0.10 in 1983, 1984, 1987, 1989, 1991, 1995, 1997, 1999, 2000, 2002, and 2004. The coefficients on board independence (B_INDEP) are mostly positive ranging from -0.11 to 0.94 and statistically significant at the 0.05 level for the years 1989, 1997, 1998, and significant at the 0.10 level for the years 1985, 1987, 1990, 1993, 2002, and 2004. The coefficients on CEO duality (CEO) are mostly negative and range from -1.20 to 0.85 with levels of significance ranging from 0.05 in 1985, 1991, 1994, 2001, and 2003, and 0.10 in 1997. Model 3 uses adjusted return on equity (ROE) as a measure of firm performance. The coefficients on board size (B_SIZE) are mostly negative and range from -0.34 to 0.48 with levels of significance ranging from 0.05 for year 2003, to 0.10 for years 1986, 1988, 1991, 1993, and 1998. The coefficients on board independence (B_INDEP) are mostly positive ranging from -0.11 to 0.87 and statistically significant at the 0.10 level for the years 1985, 1988, 1992, 1998, and 2003. The coefficients on CEO duality (CEO) are mostly negative and range from -1.18 to 0.37 with a 0.10 significance level for years 1983, 1988, 1996, and 2000.

In general, though inconclusive, OLS multivariate results show a positive association between firm performance and board independence, a negative relation between CEO-duality and firm performance, and a negative relation between firm performance and board size. These

preliminary results support hypotheses H_1, H_2, and H_3, and are consistent with the results presented by Charu Raheja (2005), Chung, Wright, and Kedia (2003), and Brewer III, et al., (2000). The results negate the findings by Bhagat and Black (2002) and Provost, et al., (2002), who document no relation between firm performance and board composition, and those of Yermack (1996) who shows a negative relation between firm performance and board independence.

5.2 Fixed Effects Model

I test the appropriateness of the fixed effects and a random effects model using a Hausman endogeneity test. Results show an F-statistic (P_value) of 12.43 (0.0000) suggesting that the fixed-effects coefficient estimates are more consistent. Hence, I implement a fixed effects model. Table 18, Model 1 presents estimated coefficients using return on assets (ROA) as the dependent variable. Board size (B_SIZE) has the opposite sign from that predicted by hypothesis H_1 and the coefficient is statistically insignificant. The coefficient on board independence (B_INDEP) has a positive sign as predicted by H_2 but is also statistically insignificant. Consistent with hypothesis H_3, the coefficient on CEO duality is negative and statistically significant at the 0.05 level. The indicator variable for financial firms is also statistically significant suggesting that association between firm performance, as measured by ROA, may be different for financials that non-financial firms. Overall, results from the fixed effects model, using ROA as the measure for firm performance, do not support hypotheses H_1 and H_2 but are consistent with hypothesis H_3, which predicts a negative relation between firm performance and CEO-duality. The results on CEO duality are consistent with Fama and Jensen (1983), Rechner and Dalton (1991), and Westphal and Zajac (1995). Model 2 uses return on equity (ROE) as a measure for firm performance. The coefficient on board size (B_SIZE) is -1.08 and is statistically significant at the 0.01 level. The coefficient on board independence (B_INDEP) is negative but statistically insignificant. The coefficient on CEO duality is negative and statistically significant at the 0.10 level. The pooled regression results using ROE as a measure of firm performance support hypothesis H_1 and H_3. Results are also consistent with the evidence presented by Charu Raheja (2005), Coleman and Biekpe (2005), Mak and Yuanto (2003), Eisenberg, Sundgren, and Wells (1998), and Yermack (1996). The indicator variable for

financial firms is positive and statistically significant suggesting that the relation between firm performance and board structure may differ from that of non-financial firms. Model 3 uses Tobin's Q (Adj_Q) as a measure of firm performance. The coefficient on board size (B_SIZE) is -0.13 and statistically significant at the 0.01 level. The coefficient on board independence (B_INDEP) is 0.28 and statistically insignificant at a 0.05 level. The coefficient on CEO duality is negative, -0.21, and statistically significant at the 0.01 level. Results support hypotheses.

Overall, the fixed effects results support hypotheses H_1, H_2, and H_3 which posit a negative relation between firm performance and board size; positive relation between firm performance and board independence, and a negative relation between CEO duality and firm performance, respectively.

5.3 Hausman Endogeneity Test

Table 19 presents results coefficient estimates when B_SIZE_{t-2}, B_INDEP_{t-2} and CEO_{t-2} are used as instruments. The coefficient (t-statistic) on B_SIZE Residuals is -0.34(-1.41) with an F-statistic (Wald-χ^2) of 7.44 (24.06) for ROA. The coefficient (t-statistic) on B_SIZE Residuals using ROE as the dependent variable is -0.06(-1.41) with an F-statistic (Wald-χ^2) of 8.62 (32.16). The coefficient (t-statistic) on B_SIZE Residuals using Tobin's Q as the dependent variable is -0.11(-0.73) with an F-statistic (Wald-χ^2) of 2.03 (4.18). The coefficients on the residuals for ROA and ROE are statistically significant at the 0.05. The coefficients on the residuals for Tobin's Q are statistically insignificant. The null hypothesis that the coefficient on the B_SIZE Residuals is zero is rejected for the first two models (ROA and ROE). This implies the presence of endogeneity and hence the inappropriateness of using the OLS method. The coefficient (t-statistic) on B_INDEP Residuals is 0.21(1.59) with an F-statistic (Wald-χ^2) of 6.32(16.38) for ROA. The coefficient (t-statistic) on B_INDEP Residuals using ROE as the dependent variable is 0.43(2.77) with an F-statistic (Wald-χ^2) of 26.72 (42.06). The coefficient (t-statistic) on B_INDEP Residuals using Tobin's Q as the dependent variable is 0.57(1.66) with an F-statistic (Wald-χ^2) of 9.72 (27.03). The coefficients on the residuals for all the dependent variables are statistically significant at the 0.05 level. The null hypothesis that the coefficient on the B_INDEP Residuals is zero is rejected, which suggests the presence of endogeneity and

hence the inappropriateness of using the OLS method. The coefficient (t-statistic) on OWN_CON Residuals is -2.63(-1.88) with an F-statistic (Wald-χ^2) of 8.62 (32.16) for ROA. The coefficient (t-statistic) on OWN_CON Residuals using ROE as the dependent variable is -0.09(-3.41) with an F-statistic (Wald-χ^2) of 18.12 (22.01). The coefficient (t-statistic) on OWN_CON Residuals using Tobin's Q as the dependent variable is -0.28(-1.37) with an F-statistic (Wald-χ^2) of 8.02 (24.92). The null hypothesis that the coefficient on the OWN_CON residuals is zero is rejected for all models, suggesting the presence of endogeneity. In the presence of endogeneity, the OLS coefficient estimates are likely to be biased and inconsistent.

5.4 Instrumental Variables Method (IV)

Table 20 presents results from IV regressions. The instruments for board structure variables are the 2 lags of B_SIZE, B_INDEP, and CEO. Model 1 presents estimated coefficients using return on assets (ROA) as a measure of performance. All the coefficients on board structure proxies B_SIZE_{t-1}, B_INDEP_{t-1}, and CEO_{t-1} are statistically significant at 0.10, 0.10, and 0.05 levels, respectively. The signs on the coefficients are also consistent with the predictions of hypotheses H_1, H_2, and H_3. Consistent with extant evidence board size is negatively associated with firm performance, while board independence is positively related to performance, and CEO duality is negatively related to firm performance. The indicator variable for financial firms is statistically insignificant. These results are also consistent with the evidence presented by Charu Raheja (2005), Chung, Wright, and Kedia (2003), and Brewer III, et al., (2000) in the case of board independence, and Coleman and Biekpe (2005), Mak and Yuanto (2003), Eisenberg, Sundgren, and Wells (1998), and Yermack (1996) in the case of board size, and Fama and Jensen (1983), Rechner and Dalton (1991), and Westphal and Zajac (1995), in the case of CEO duality. Model 2 presents test results using ROE as the performance measure. Board size and CEO duality have the predicted signs and are statistically significant at 0.01 and 0.10, respectively. Board independence has the opposite sign from that predicted by hypothesis H_2 and is statistically insignificant. The results for board size and CEO duality are consistent with the evidence presented by Coleman and Biekpe (2005), Mak and Yuanto (2003), Eisenberg, Sundgren, and Wells (1998), and Yermack (1996), in the case of board size. In the case of CEO duality, they are consistent with Fama and Jensen (1983), Rechner and Dalton (1991), and

Westphal and Zajac (1995). Model 3 presents estimated coefficients using Tobin's Q (Adj_Q) as the performance measure. All coefficients on board structure proxies B_SIZE_{t-1}, B_INDEP_{t-1}, and CEO_{t-1} are statistically significant at 0.05, 0.05, and 0.10 levels, respectively. The signs on the coefficients are also consistent with the predictions of hypotheses H_1, H_2, and H_3. Board size is shown to be negatively associated with firm performance, while board independence is positively related to performance, and CEO duality is negatively related to firm performance. The indicator variable for financial firms is statistically insignificant. Results are consistent with the evidence presented by Charu Raheja (2005), Chung, Wright, and Kedia (2003), and Brewer III, et al., (2000) in the case of board independence, and Coleman and Biekpe (2005), Mak and Yuanto (2003), Eisenberg, Sundgren, and Wells (1998), and Yermack (1996) in the case of board size, and Fama and Jensen (1983), Rechner and Dalton (1991), and Westphal and Zajac (1995), in the case of CEO duality.

5.5 Generalized Method of Moments (GMM)

Table 21 presents GMM test results. As instruments, I use 2 lags of board structure variables: B_SIZE, B_INDEP, and CEO Duality. Model 1 presents results using ROA as the performance measure. All coefficients on B_SIZE_{t-1}, B_INDEP_{t-1}, and CEO_{t-1} are statistically significant at 0.10, 0.05, and 0.10 levels, respectively. The signs on the coefficients are also consistent with the predictions of hypotheses H_1, H_2, and H_3. Board size is negatively associated with firm performance, while board independence is positively related to performance, and CEO duality is negatively related to firm performance. The indicator variable for financial firms is statistically insignificant. These results are also consistent with the evidence presented by Charu Raheja (2005), Chung, Wright, and Kedia (2003), and Brewer III, et al., (2000) in the case of board independence, and Coleman and Biekpe (2005), Mak and Yuanto (2003), Eisenberg, Sundgren, and Wells (1998), and Yermack (1996) in the case of board size, and Fama and Jensen (1983), Rechner and Dalton (1991), and Westphal and Zajac (1995), in the case of CEO duality. Model 2 presents results using ROE as the performance measure. Again, all three coefficients on B_SIZE_{t-1}, B_INDEP_{t-1}, and CEO_{t-1} are statistically significant at 0.10, 0.05, and 0.10 levels, respectively. The signs on the coefficients are also consistent with the predictions of hypotheses H_1, H_2, and H_3. Model 3 uses Tobin's Q as the performance measure and still all three

instruments for board structure are statistically significant at 0.01, 0.05, and 0.10 levels, respectively. The signs on the coefficients are also consistent with the predictions of hypotheses H_1, H_2, and H_3. Model 2 presents results using ROE as the performance measure. All coefficients on board structure proxies are statistically significant at 0.10, 0.05, and 0.10 levels, respectively. The signs on the coefficients are also consistent with the predictions of hypotheses H_1, H_2, and H_3. Board size is shown to be negatively associated with firm performance, while board independence is positively related to performance, and CEO duality is negatively related to firm performance. The indicator variable for financial firms is statistically insignificant. These results are consistent with the evidence documented by Charu Raheja (2005), Chung, Wright, and Kedia (2003), and Brewer III, et al., (2000) in the case of board independence, and Coleman and Biekpe (2005), Mak and Yuanto (2003), Eisenberg, Sundgren, and Wells (1998), and Yermack (1996) in the case of board size, and Fama and Jensen (1983), Rechner and Dalton (1991), and Westphal and Zajac (1995), in the case of CEO duality. All three models are also shown to be significant. All three models are statistically significant with J-statistics of 4.37E-03 for ROA, 6.72E-03 for ROE, and 2.48E-03 for Tobin's Q.

Overall, the signs and significance of the coefficients on board structure proxies suggest that firm performance is negatively associated with board size, positively related with board independence, and negatively related with CEO duality.

5.4 Empirical Results - Subset of Financial Firms (SIC 6000)

Full sample results indicate a statistically significant coefficient on the indicator variable, FIN, for financial firms (SIC 6000). Consistent with Adams and Mehran (2005) and Mohamed Belkhir (forthcoming), this suggests that the association between board structure and firm performance for financial firms may be distinct from that for non-financial firms. To ascertain what the differences are and whether the differences are statistically significant, I run separate IV and GMM regressions for financial firms. Table 22 presents the empirical results. For the instrumental variables approach (IV), Model 1 uses return on assets (ROA) as the performance measure. The coefficient on board size (B_SIZE_{t-1}) has the opposite sign as that predicted by

hypothesis H_1 and it is statistically insignificant. The coefficient on board independence (B_INDEP_{t-1}) is positive as predicted by hypothesis H_2, and statistically significant at the 0.10 level. CEO duality is negatively related to firm performance and statistically significant at the 0.10 level, consistent with hypothesis H_3. Model 2 uses return on equity (ROE) as the performance measure. The coefficient on board size (B_SIZE_{t-1}) is negative, contrary to hypothesis H_1 and it is statistically significant at the 0.10 level. The coefficient on board independence (B_INDEP_{t-1}) is positive as predicted by hypothesis H_2, and statistically significant at the 0.10 level. CEO duality is negatively related to firm performance but statistically insignificant. Model 3 uses Tobin's Q (Adj_Q) as the performance measure. Contrary to hypotheses H_1 and H_2, the coefficients on board size (B_SIZE_{t-1}) and board independence (B_INDEP_{t-1}) are both negative, and statistically insignificant. CEO duality is negatively related to firm performance and statistically significant at the 0.05 level, consistent with hypothesis H_3.

For GMM, I use return on assets (ROA) as the performance measure in Model 1. The coefficient on board size (B_SIZE_{t-1}) is negative as predicted by hypothesis H_1 but statistically insignificant. The coefficient on board independence (B_INDEP_{t-1}) is positive as predicted by hypothesis H_2, and statistically significant at the 0.10 level. CEO duality is negatively related to firm performance and statistically significant at the 0.05 level, consistent with hypothesis H_3. Model 2 uses return on equity (ROE) as the performance measure. The coefficient on board size (B_SIZE_{t-1}) is negative, as predicted by hypothesis H_1 but statistically insignificant. The coefficient on board independence (B_INDEPt-1) is positive as predicted by hypothesis H_2, but statistically insignificant. CEO duality is negatively related to firm performance and statistically significant at the 0.10 level. Model 3 uses Tobin's Q (Adj_Q) as the performance measure. The coefficient on board size (B_SIZE_{t-1}) is negative as predicted by hypothesis H_1 but statistically insignificant. The coefficient on board independence (B_INDEP_{t-1}) is positive as predicted by hypothesis H_2, and statistically significant at the 0.10 level. Contrary to hypothesis H_3, CEO duality is positively related to firm performance but statistically insignificant.

Overall, results for the relation between board size and firm performance for financial firms seem to contradict hypothesis H_1, which posits a negative relation between board size and firm performance. This evidence, however, is consistent with the findings by Adams and Mehran

(2005) and Mohamed Belkhir (forthcoming) which posit a positive association between board size and firm performance for banking institutions. Results for board independence (B_INDEP_{t-1}) and CEO duality for financial firms are consistent with hypotheses H_2 and H_3. Board independence is positively related to firm performance and CEO duality is negatively related to firm performance.

5.5 Granger Causality Tests

Table 23 presents empirical results from bi-variate granger causality tests. Model 1 tests causality between board structure variables [board size, board independence, CEO duality] and return on assets (ROA). The F-statistic for the null hypothesis test that board size (B_SIZE) does not granger cause return on assets (ROA), is 5.183 with a p-value of 0.0001. The F-statistic for the test that ROA does not Granger cause board size (B_SIZE), is 7.011 with a p-value of 0.0000. Thus the reverse causality between ROA and board size cannot be rejected. The F-statistic for the null hypothesis test that board independence (B_INDEP) does not Granger cause return on assets (ROA), is 6.801 with a p-value of 0.0050. The F-statistic for the test that ROA does not Granger cause board independence (B_INDEP), is 1.021 with a p-value of 0.4210. The results suggest that ROA does not Granger cause board independence but board independence Granger causes ROA. The F-statistic for the null hypothesis test that CEO duality (CEOt-1) does not Granger cause return on assets (ROA), is 5.118 with a p-value of 0.0000. The F-statistic for the test that ROA does not Granger cause CEO duality (CEOt-1) is 0.975 with a p-value of 0.2732. The results suggest that ROA does not Granger cause CEO duality but CEO duality Granger causes ROA.

Model 2 presents test results for bi-variate causality between board structure and return on equity (ROE). The null hypothesis test that board size (B_SIZE) does not granger cause return on equity (ROE), has an F-statistic of 3.840 and a p-value of 0.0050. The F-statistic for the test that ROE does not Granger cause board size (B_SIZE), is 12.001 with a p-value of 0.0000. Results suggest that we cannot reject reverse causality between ROE and board size. The F-statistic for the null hypothesis test that board independence (B_INDEP) does not Granger cause return on equity (ROE), is 4.648 with a p-value of 0.0000. The F-statistic for the test that ROE

does not Granger cause board independence (B_INDEP) is 1.008 with a p-value of 0.2839. The results suggest that ROE does not Granger cause board independence but board independence Granger causes ROE. The F-statistic for the null hypothesis test that CEO duality (CEO) does not Granger cause return on equity (ROE), is 8.246 with a p-value of 0.0001. The F-statistic for the test that ROE does not Granger cause CEO duality (CEO) is 0.320 with a p-value of 0.3392. The results suggest that ROE does not Granger cause CEO duality but CEO duality Granger causes ROE.

Model 2 presents test results between board structure and Tobin's Q (Adj_Q). The null hypothesis test that board size (B_SIZE) does not granger cause Tobin's Q has an F-statistic of 1.121and a p-value of 0.0520. The F-statistic for the test that Tobin's Q does not Granger cause board size (B_SIZE), is 4.056 with a p-value of 0.0002. Results suggest that board size does not Granger cause Tobin's Q but Tobin's Q Granger causes board size. The F-statistic for the null hypothesis test that board independence (B_INDEP) does not Granger cause Tobin's Q is 5.820 with a p-value of 0.0005. The F-statistic for the test that Tobin's Q does not Granger cause board independence (B_INDEP) is 0.872 with a p-value of 0.6040. Results suggest that Tobin's Q does not Granger cause board independence but board independence Granger causes Tobin's Q. The F-statistic for the null hypothesis that CEO duality (CEO) does not Granger cause Tobin's Q is 7.004 with a p-value of 0.0000. The F-statistic for the test that Tobin's Q does not Granger cause CEO duality (CEO) is 0.048 with a p-value of 0.5722. These results suggest that Tobin's Q does not Granger cause CEO duality but CEO duality Granger causes Tobin's Q.

Overall, Granger causality tests suggest the presence of reverse causality between board size and firm performance, which may partly explain the mixed evidence reported. In the case of board independence and CEO duality, results show that both of these variables Granger cause firm performance but the reverse is rejected. It is important, though, to note that these results do not necessarily imply a causal relation between board independence or CEO duality and firm performance but rather precedence of information content i.e. past changes in the two board structure proxies can explain the latter.

6. Robustness

I test the robustness of these results to the use of alternative thresholds for defining independent boards. All results with thresholds above 50%, outside directors yield qualitatively similar results. I also test the robustness of my results to the use of alternative measures of firm performance/value. I use investment intensity (INV), measured as R&D expenditures divided by total assets and the ratio of capital expenditures-to-total assets. In both cases, results are qualitatively similar to those reported using Tobin's Q. To ascertain whether there are any statistically significant differences between firms with higher Q values than those with lower Q values, I divide the sample into three sub-samples. The three sub-samples consist of firms that fall into the top 40%, firms in the lower 40%, and the rest in the middle 20%. I run the tests on the top 40% and the bottom 40%. Results obtained in both cases are qualitatively similar to those reported for the full sample. Lastly, I winsorize the sample data at 1% and 5% to mitigate the potential influence of outliers. In both cases the results obtained using winsorized data are qualitatively similar to those obtained for the full sample.

7. Conclusion

In this essay I investigate the relation between board structure and firm performance. Consistent with prior findings by Yermack (1996), Eisenberg, Sundgren, and Wells (1998), Mak and Yuanto (2003), Coleman and Biekpe (2005), and Charu Raheja (2005) I find a negative relation between board size and firm performance for non-financial firms. Contrary to this finding, board size for a sub-sample of financial firms is shown to be positively associated with firm performance. The findings between board size and performance for financial firms support the evidence presented by Adams and Mehran (2005) and Mohamed Belkhir (forthcoming). I also find that board independence is positively related to firm performance for both financial and non-financial firms. These results are consistent with the findings by Charu Raheja (2005), Chung, Wright, and Kedia (2003), and Brewer III, et al., (2000). In support of the evidence presented by Fama and Jensen (1983), Rechner and Dalton (1991), and Westphal and Zajac (1995) I find that CEO duality is negatively related to firm performance. Results from a sub-sample consisting of only financial firms (SIC 6000), show that board size is positively related to

firm performance. These results are robust to various measures of firm performance. Results from winsorized and non-winsorized data are also qualitatively similar.

The findings for financial firms support the evidence presented by Adams and Mehran (2005) and Mohamed Belkhir (forthcoming). A plausible explanation for the positive relation between board size and firm performance for financial firms is that banks being large holding companies, the scope of operations is so complex that it requires larger boards provide a wider pool of expertise to run them. What accounts for the positive association between board size and firm performance though, is not so clear. One possibility, Adams and Mehran argue, is that board size may be endogenously determined following merger activity when the board of directors from the target firm is absorbed by the acquirer. In support of this view Granger causality test results indicate reverse causality between board size and firm performance. Industry concentration does not seem to significantly influence the results, either.

In general, the results suggest that board size is largely driven by the scope of operations hypothesis and hence attempts at regulating 'optimal' board sizes may be misplaced. On the other hand, the positive association between board independence, CEO duality, and firm performance seems to be robust to industry classification and to various measures of performance suggesting that these variables contribute significantly to board effectiveness which ultimately translates into superior performance.

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Table 13: Sample Selection & Distribution

Table 13 presents sample distribution and size. Panel A provides a count of the firms comprising the final sample and the number and reasons for those screened out. For a firm to qualify for inclusion it must be listed on NYSE/AMEX/NASDAQ exchanges and be covered by COMPUSTAT, CRSP. Of the original 421 carve-out firms, 144 firms were dropped either because they are unlisted or listed on exchanges other than AMEX/NASDAQ/NYSE. 105 firms were dropped due to non-coverage by CRSP, COMPUSTAT, SEC filings, and Fiche-Q files. And an additional 8 firms were dropped due to missing data points. The final sample count is 164 firms consisting of 81 financial firms (SIC 6000) and 83 industrial firms. Panel B presents the sample distribution by year of announcement and Panel C shows the industry distribution by 2-digit SIC.

Panel A: Construction of the Sample	**# of firms**
Total number of firms:	421
Firms not listed on NYSE/AMEX/NASDAQ:	(144)
Firms not covered by COMPUSTAT / CRSP:	(105)
Firms with missing data:	(8)
Final Sample Count:	164

Panel B: Distribution by Year	**# of firms**
1986	10
1987	9
1988	7
1989	5
1990	6
1991	5
1992	9
1993	16
1994	7
1995	8
1996	13
1997	8
1998	9
1999	8
2000	14
2001	12
2002	8
2003	5
2004	5

Panel C: Distribution by SIC	**Two-Digit SIC**	**# of firms**
Mining, Oil & Gas	10	8
Manufacturing	20-30	34
Transport, Comm., Utilities	40	9
Wholesale/Retail	50	14
Financials	60	82
Services (other)	70-80	17

*****Source**:** Security Data Company (SDC)

Table 14: Descriptive Statistics

Table 14 provides the sample descriptive statistics. Some performance means are unusually low (high) due to the influence of outliers, this problem is mitigated in the regression analysis by using industry-adjusted numbers and by winsorizing the data at 99% and 1%. Results obtained from industry-adjusted and unadjusted data are qualitatively similar.

Variable	Mean	(Std. Dev)	Median	Min	Max
Board Size	10.74	2.31	10.19	4.00	18.00
Independent Directors (%)	0.73	0.22	0.78	0.31	0.94
CEO	0.26	0.52	1.00	0.00	1.00
Book-to-Market	0.41	0.24	0.39	0.21	0.79
Tobin's Q	1.48	1.12	1.57	1.18	1.92
Market Value of Equity ($M)	1,002	244	207	3.4	58,514
Leverage (LT. Debt/ TA)	0.43	0.20	0.54	0.12	1.06
Return on Assets	0.08	0.13	0.11	-0.03	0.15
Return on Equity	0.17	0.24	0.21	-0.06	0.28

Source: Standard & Poor's COMPUSTAT
CRSP, IRRC, Edgar, Fiche- Q files

Table 15: Variable Descriptions

Table 15 provides descriptions of the variables used and related sources. Subscripts that appear on variables presented elsewhere relate to number of time lags.

Variable	Description	Source
Adj_Q	Adjusted Tobin's Q – market value of equity divided by book value of assets	Tobin et al. (1977)
Adj_ROA	Adjusted return-on-assets – firm i's return on assets minus median industry return on assets	Compustat
Adj_ROE	Adjusted return-on-equity – firm i's return on equity minus median industry return on equity	Compustat
BME	Book-to-market value ratio	Compustat
B_INDEP	Proportion of independent board members on board	Edgar, Fiche Q Files
B_SIZE	Total number of board members	Edgar, Fiche Q Files
EBIT Ratio	EBIT-to-total Assets ratio	Compustat
Capital Ratio	Tier 1 leverage ratio for financial firms	10-K Reports
CEO	Indicator variable: '1' = CEO/chairman '0' = otherwise	Edgar, Fiche Q Files
FIN	Indicator variable: '1' = financial firm '0'= otherwise	SIC Codes (6000 -6999)
LEV	Leverage: debt-to-total assets	Compustat
L_MVE	Log of firm's market value	Compustat
L_TA	Log of firm's total assets	Compustat
PBV	Price-to-book value	Compustat
ROA	Return-on-assets (EBIT/TA)	Compustat
ROE	Return-on-equity (EBIT/Common Equity)	Compustat
SIC	Standard Industry classification code	Compustat

Table 16: Correlation Matrix

Table 16 presents pairwise correlations between the main variables. For performance variables (adjusted Tobin's Q, ROE, and ROA), the following period values (t+1), are included to capture the potential delayed impact of board structure (B_SIZE, B_INDEP, and CEO) on firm performance.

N=164	1	2	3	4	5	6	7	8	9	10	11	12
1. Adj_Q	1.00											
2. Adj_Q_{t+1}	0.93**	1.00										
3. Adj_ROE	0.31*	0.28*	1.00									
4. Adj_ROE_{t+1}	0.38**	0.43***	0.78**	1.00								
5. Adj_ROA	0.04*	0.23*	0.11	0.64*	1.00							
6. Adj_ROA_{t+1}	0.07	0.17*	0.12*	0.04*	0.47	1.00						
7. B_SIZE	0.06	-0.02**	-0.33	-0.25*	0.73	0.31	1.00					
8. B_INDEP	0.02*	0.47**	0.22	0.28**	0.33	0.07*	0.56*	1.00				
9. CEO	-0.09*	-0.18**	-0.03*	-0.12*	-0.16*	-0.54*	0.71*	-0.62*	1.00			
10. L_TA	-0.14*	-0.52*	-0.41	-0.27	-0.13*	-0.11	0.27*	0.51*	0.28	1.00		
11. LEV	-0.38*	-0.13*	-0.22	-0.10*	-0.08	-0.14	0.29*	0.08	0.11	-0.66*	1.00	
12. EBIT Ratio	0.81*	0.74*	0.91	0.93*	0.81	0.72	0.51*	0.68*	-0.24	-0.44*	0.38*	1.00

Table 17: OLS Regressions

Table 17 presents estimated coefficients on board size (B_SIZEt-1) and board independence (B_INDEPt-1) from annual OLS regressions using ROA (model 1), ROE (model 2), and Tobin's Q (model 3) as measures of firm performance. In Model 1, ROA is regressed on B_SIZE and B_INDEP, controlling for CEO-Duality, log of total assets (L_TA), Leverage (LEV), and firm profitability (EBIT). In Model 2, ROE is regressed on B_SIZE and B_INDEP, controlling for CEO-Duality, log of total assets (L_TA), Leverage (LEV), and firm profitability (EBIT). And in Model 3, Tobin's Q is regressed on B_SIZE and B_INDEP, controlling for CEO-Duality, log of total assets (L_TA), Leverage (LEV), and firm profitability (EBIT). Reported results are median regressions by year from 1983 to 2004.

	Model 1: Adj_ROA			**Model 2: Adj_ROE**			**Model 3: Adj_Tobin's Q**		
Year	B_SIZE	B_INDEP	CEO	B_SIZE	B_INDEP	CEO	B_SIZE	B_INDEP	CEO
1983	-0.13	0.89**	-1.04*	-0.18*	0.64	-0.42	0.02	-0.11	-0.02*
1984	-0.08*	0.71*	-0.37	-0.23*	1.01	-0.09	0.13	0.43	-1.03
1985	-0.51*	-0.42	0.02	0.02	0.48*	-1.01*	-0.12	0.26*	-0.42
1986	-0.17	1.03*	-0.71*	-0.37	-0.02	-0.22	-0.34*	0.08	0.11
1987	0.38	0.07	-0.84	0.13*	0.47*	0.10	0.77	0.19	0.07
1988	-0.11**	1.21	0.04	-0.54**	0.53	-1.24	-0.27*	1.03*	-0.22*
1989	-0.32*	1.08*	-1.11*	0.08*	0.94**	0.85	0.44	0.87	-1.18
1990	-0.73**	0.58	0.23	0.12	0.37*	-0.81	-0.19	0.59	0.37
1991	-0.87	0.92**	-0.19	-0.14*	0.87	-0.33*	-0.07*	0.11	0.08
1992	-0.33*	0.67**	-0.44**	-0.27**	0.67	0.52	0.02	0.07*	-0.49
1993	-0.81*	-0.02	0.17	0.22	0.09*	-0.91	0.11	0.98	-0.55
1994	-0.24	1.25	0.52	-0.09	0.28	-1.20*	-0.08*	0.47	0.36
1995	0.19	0.87*	-0.87*	0.63*	0.78	-0.78	0.21	0.04	0.25
1996	0.15	1.01	-0.38	-0.44**	0.61	0.34	-0.03	0.71	-0.40*
1997	-0.42*	0.78*	0.56	-0.29*	1.02**	-0.49**	0.48	0.34	-1.07
1998	-0.02***	0.49**	0.04	0.10	0.74**	0.81	-0.23*	0.27*	-0.03
1999	-0.07*	0.47	-0.83*	0.08*	-0.11	-0.72	0.08	-0.02	0.21
2000	0.06	1.119*	0.01	-0.05*	0.39	-1.03	0.15	0.06	-0.09*
2001	- 0.12*	0.61	0.27	0.14	0.74	-0.55*	-0.33	0.23	-0.77
2002	-0.08	0.78**	-1.42*	-0.55*	0.44*	0.04	0.04	0.19	0.02
2003	0.17	1.14**	0.91	0.07	0.29	-0.11*	-0.22**	0.21*	-0.11
2004	-0.28**	-0.07	0.03	-0.47*	0.33*	0.02	0.16	0.09	-0.47
Time Series mean	-0.28**	0.81**	-0.67*	-0.42*	0.74***	0.62*	-0.38*	0.56	-0.44
Time series σ:	0.44	0.64	0.77	0.58	0.87	0.82	0.49	0.67	0.48
T-statistic	-2.88	1.99	2.47	-1.75	3.02	1.67	-1.68	1.07	1.53

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 18: Fixed Effects Model

Table 18 presents coefficient estimates from a fixed effects model. Using industry-adjusted ROA_t, industry-adjusted ROE, and industry-adjusted Tobin's Q to proxy for firm performance. Explanatory variables include board size (B_SIZEt-1) and board independence (B_INDEPt-1) . I include an indicator variable, CEO, coded '1' if the CEO also holds the chairmanship of the board or '0' otherwise. I control for financial firms (FIN), leverage (LEV), and firm size (L_TA). The values in parenthesis are t-statistics.

	Dependent Variable		
	ROA_t	**ROE_t**	**Tobin's Q_t**
α	0.71***	2.01	0.05**
	(8.04)	(0.73)	(2.92)
B_SIZE_{t-1}	0.17	-1.08***	- 0.13***
	(1.36)	(3.78)	(-11.27)
B_INDEP_{t-1}	0.08	-1.42	0.28**
	(1.05)	(-1.44)	(2.31)
CEO_{t-1}	-0.34**	0.03*	-0. 21***
	(-2.48)	(1.92)	(-5.77)
L_TA	-0.49*	-0.33	-1.04***
	(1.86)	(-0.98)	(7.77)
LEV	-0.01***	0.43*	0.08***
	(-14.2)	(1.88)	(9.21)
FIN	0.44*	0.39*	0.20
	(1.83)	(1.71)	(1.02)

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 19: Hausman Endogeneity Tests

Table 19 provides test results from the Hausman test for endogeneity on B_SIZE, B_INDEP, and CEO. Dependent variables are ROA, ROE, and Tobin's Q. I use 2 lags of board size, board composition, and CEO duality as instruments (B_SIZE_{t-2}, B_INDEP_{t-2}, and CEO_{t-2}) and test the significance of the coefficients on the residuals.

ROA	Variable	Coefficient (t-statistic)	F-Statistic	Wald (χ^2)
	B_SIZE	-1.11(-1.35)	7.44	24.06
	B_SIZE Residuals	-0.34 (-1.41)		
	B_INDEP	1.63 (1.77)	6.32	16.38
	B_INDEP Residuals	0.21 (1.59)		
	CEO	-2.07(-1.49)	8.62	32.16
	CEO	-2.63 (-1.81)		
ROE	**Variable**	**Coefficient (t-statistic)**	**F-Statistic**	**Wald (χ2)**
	B_SIZE	-0.98(-1.04)	6.88	12.14
	B_SIZE Residuals	-0.06 (-2.87)		
	B_INDEP	2.11 (4.38)	26.72	42.06
	B_INDEP Residuals	0.43 (2.77)		
	CEO	-1.14 (-2.69)	18.12	22.01
	CEO	-0.09 (-3.41)		
Tobin's Q	**Variable**	**Coefficient (t-statistic)**	**F-Statistic**	**Wald (χ2)**
	B_SIZE	-0.03(-0.57)	2.03	4.18
	B_SIZE Residuals	-0.11(-0.73)		
	B_INDEP	2.44 (1.80)	9.72	27.03
	B_INDEP Residuals	0.57 (1.66)		
	CEO	-0.34(-1.55)	8.02	24.92
	CEO	-0.28 (-1.37)		

Table 20: IV Estimates

Table 20 provides coefficient estimates from IV regressions of industry adjusted ROA, ROE, and Tobin's Q on board size (B_SIZE) and board independence (B_INDEP) using their corresponding 2 lags as instruments. I include an indicator variable, CEO, coded '1' if the CEO also holds the chairmanship of the board or '0' otherwise. I control for financial firms (FIN), leverage (LEV), and firm size (L_TA). The values in parenthesis are t-statistics.

	Dependent Variable		
Panel A	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	3.71*	1.09	2.05**
	(1.84)	(0.73)	(2.33)
B_SIZE_{t-1}	-1.11*	-2.04***	-0.81**
	(-1.73)	(-9.78)	(-2.21)
B_INDEP_{t-1}	0.08*	-0.04	0.24**
	(1.92)	(-0.38)	(2.02)
CEO_{t-1}	-1.17**	-0.03*	-0. 13*
	(-2.03)	(-1.91)	(-1.77)
L_TA	-2.09*	-1.33**	-1.04
	(1.75)	(-1.98)	(-0.77)
LEV	-0.51***	0.78*	0.08***
	(-11.32)	(1.82)	(3.21)
FIN	0.44	0.05*	0.20
	(1.04)	(1.84)	(0.96)
Adjusted R^2	0.28	0.18	0.31
F-Statistic	11.17	9.22	8.17
P-Values	[0.0000]	[0.0004]	[0.0052]

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 21: GMM Estimates

Table 21 presents GMM coefficient estimates of industry adjusted ROA, ROE, and Tobin's Q on board size (B_SIZE) and board independence (B_INDEP) using their corresponding 2 lags as instruments. I include an indicator variable, CEO, coded '1' if the CEO also holds the chairmanship of the board or '0' otherwise. I control for financial firms (FIN), leverage (LEV), and firm size (L_TA). The values in parenthesis are t-statistics.

	Dependent Variable		
Panel A	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	0.33	2.89	1.11**
	(1.44)	(1.03)	(2.02)
B_SIZE_{t-1}	-0.74*	-1.19*	-1.20***
	(-1.85)	(-1.73)	(-3.44)
B_INDEP_{t-1}	1.13**	0.28**	0.51*
	(1.98)	(2.38)	(1.84)
CEO_{t-1}	-2.44*	-1.69*	-0. 79**
	(-1.70)	(-1.68)	(-2.33)
L_TA	-0.78	-1.02	-1.04
	(1.54)	(-1.39)	(-0.77)
LEV	-1.23*	-0.97	0.11**
	(-1.74)	(-1.14)	(2.28)
FIN	0.12*	1.79	0.04*
	(1.77)	(1.01)	(1.86)
R^2	0.21	0.08	0.16
Adjusted R^2	0.24	0.11	0.18
Durbin-Watson	7.92	9.22	6.83
J-Statistic	4.37E-04	6.72E-03	2.48E-03

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 22: IV and GMM Regressions - Financial Firms (SIC 6000)

Table 22 provides estimated coefficients for a subset of financial firms from IV and GMM regressions on the B_SIZE and B_INDEP using their corresponding 2 lags as instruments. I control for CEO-Duality, firm size (L_TA), capital ratio, and Price-to-book value (PBV). Dependent variables are industry adjusted ROA, ROE, and Tobin's Q for models 1, 2, 3 respectively.

	IV			**GMM**		
Model	1	2	3	1	2	3
	ROA_t	ROE_t	Tobin's Q_t	ROA_t	ROE_t	Tobin's_Q_t
α	-2.24	1.01**	0.98	0.38*	0.92*	-2.01*
	(-1.57)	(1.97)	(1.35)	(1.68)	(1.88)	(-1.70)
B_SIZE_{t-1}	0.22	0.49*	0.06	-0.78	-0.01	-0.08
	(-1.03)	(1.74)	(1.19)	(-1.63	(-1.77)	(1.03)
B_INDEP_{t-1}	1.14*	0.59*	-0.08	1.08*	0.32	0.17*
	(1.82)	(1.66)	(-1.02)	(1.78)	(1.58)	(1.89)
CEO_{t-1}	-1.31*	-0.92	-0.89**	-0.02**	-1.15*	0.01
	(1.81)	(-1.46)	(-1.98)	(2.32)	(-1.67)	(1.04)
L_TA	.0.32	1.01**	0.46**	-0.68	1.12*	-0.27
	(-1.23	(2.27)	(2.07)	(-0.42)	(1.57)	(-1.18)
Capital Ratio	0.03**	0.43*	0.06	0.54*	0.07*	1.01
	(2.11)	(1.85)	(0.97)	(1.80)	(1.69)	(1.37)
PBV	1.02*	1.09*	-	0.88*	0.52**	-
	(1.65)	(1.79)		(1.81)	(2.27)	
Adj.R^2	0.12	0.24	0.16	0.18	0.28	0.08
F-statistic	16.24**	6.58**	44.38*	8.64*	13.52**	24.34**
Model p-value	[0.0000]	[0.0001]	[0.0000]	[0.0000]	[0.0001]	[0.0000]

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 23: Granger Causality Tests

Table 23 presents results from bi-variate granger causality tests between board structure [B_SIZE, B_INDEP, and CEO] and firm performance. Firm performance is measured by Tobin's Q, ROE, and ROA along with their 1-period lag.

		F-Statistic	Probability
Model 1-(ROA)	B_SIZE does not granger causes ROA	5.183	[0.0001]
	ROA does not granger causes B_SIZE	7.011	[0.0000]
	B_INDEP does not granger causes ROA	6.801	[0.0050]
	ROA does not granger causes B_INDEP	1.021	[0.4210]
	CEO does not granger causes ROA	5.118	[0.0000]
	ROA does not granger causes CEO	0.975	[0.2732]
Model 2-(ROE)	B_SIZE does not granger causes ROE	3.840	[0.0050]
	ROE does not granger causes B_SIZE	12.001	[0.0000]
	B_INDEP does not granger causes ROE	4.648	[0.0000]
	ROE does not granger causes B_INDEP	1.008	[0.2839]
	CEO does not granger causes ROE	8.246	[0.0001]
	ROE does not granger causes CEO	0.320	[0.3392]
Model 3-(Adj_Q)	B_SIZE does not granger causes Adj_Q	1.121	[0.5200]
	Adj_Q does not granger causes B_SIZE	4.056	[0.0020]
	B_INDEP does not granger causes Adj_Q	5.820	[0.0005]
	Adj_Q does not granger causes B_INDEP	0.872	[0.6040]
	CEO does not granger causes Adj_Q	7.004	[0.0000]
	Adj_Q does not granger causes CEO	0.048	[0.5722]

Chapter 4

An Empirical Analysis of Ownership Structure and Firm Performance in Equity Carve-outs

Abstract

This essay examines the relation between ownership structure and the performance of a sample of firms that initiated equity carve-outs during the period 1983-2004. The evidence presented in previous studies on ownership structure and firm performance is largely mixed and inconclusive. Various econometric issues such as the endogeneity problem, variable measurement, unobserved heterogeneity, and the serial persistence of ownership structures that plague empirical studies on governance have been partly to blame. I mitigate the afore-mentioned problems by exploiting the structural break in the ownership structure of firms following equity carve-out announcements and implementing alternative estimation methods, in particular the IV, GMM, and Granger causality tests. I find that contrary to extant evidence that posits a positive relation between insider ownership and firm performance at low levels of ownership [0-5%], and a negative relation at higher levels of insider ownership is rejected in the case of equity carve-outs. A combination of parent ownership and insider ownership in the subsidiary seems to exacerbate the entrenchment effects which overwhelm the incentive alignment benefits at low levels of insider ownership documented in other studies. Consistent with extant literature, I present evidence in support of the positive relation between outside blockholder ownership and firm performance. The presence of outside blockholders seems to significantly moderate the negative effects of a highly dominant parent firm. And lastly, results show that the level of ownership concentration, in particular ownership by the parent firm, seems to increase (decrease) in anticipation of positive (negative) changes in firm performance.

JEL Classifications: G32, G34

Keywords: ownership structure; insider-ownership; managerial-ownership, blockholders.

1. Introduction

The idea of divorcing corporate ownership from corporate control and its implications for firm value and performance has preoccupied financial economists since the seminal paper on the subject by Berle and Means (1932), suggesting an inverse relation between diffuse ownership and firm performance. Morck et al., (1988), McConnell and Servaes (1990), and Holderness et al., (1999), present evidence suggesting an inverse relation between diffuse ownership and firm performance. On the other hand, Hermalin and Weisbach (1988), Himmelberg et al., (1999), and Demsetz and Villalonga (2001) find no relation between ownership and firm value. Interestingly, Cho (1998), using the system of equations approach finds that firm value as proxied by Tobin's Q affects corporate ownership and not vice versa.

As is the case with most governance studies, a number of empirical issues arise when attempting to relate corporate ownership to firm performance. First, corporate ownership is measured in several different ways such as ownership by the board; insider ownership; CEO ownership; block-holder ownership; and institutional ownership. This disparity in definition and measurement is likely to complicate any attempts to reconcile the results presented in various studies. Secondly, several studies such as Demsetz (1983), Jensen and Warner (1988), Seyhun (1998), and Himmelberg et al. (1999) show that corporate ownership and firm performance are endogenous. This endogeneity problem if not empirically tested and controlled for, invariably confounds the findings. Third, it is plausible that the so called unobserved heterogeneity problem explains the differences observed in firm performance if systematic cross-sectional differences amongst firms, such as size, affect ownership and performance. Lastly, the disparity in empirical proxies used for firm performance, such return on assets (ROA), return on equity (ROE), Tobin's Q, and Market-to-book ratio most likely also account for some of the inconsistency in the empirical studies that attempt to relate corporate ownership to firm performance. Moreover, the persistence of governance structures, including ownership, across time that is alluded to by a number of researchers, such as Bhagat and Black (2001), Hermalin and Weisbach (1991), Yermack (1996), Himmelberg, Hubbard, and Palia (1999), and Madura and Nixon (2002), would tend to weaken the explanatory power of many econometric models intended to ascertain the relation between ownership and firm performance.

To my knowledge, Sukesh Patro (2005), is the first study that takes an evolutionary approach to examining ownership structure and firm performance. He exploits the structural break in the ownership structure of spun-off firms during the period 1981-2000, to investigate what changes occur in the ownership structure, the determinants of those ownership changes, and the impact of these changes on firm performance. He finds that on average block ownership of spun-offs increases by approximately 7% and a significant proportion of that change, approximately 60%, occurs during the first year. He also finds that the ownership structure in these firms reaches a steady-state, on average, in 3 years from the date of announcement. In terms of the determinants of structural changes in ownership, he posits that parent-unit relatedness, firm size, and market-to-book ratio are significantly related to changes in ownership changes. Consistent with extant literature he concludes that, in general, ownership structures exhibit serial correlation but when circumstances warrant, ownership can significantly change to a new equilibrium.

In this essay, I exploit the structural break in the ownership structure of equity carve-outs to re-examine the relation between ownership and firm performance. Patro's findings cannot necessarily be generalized to equity carve-outs due to the fundamental differences in their ownership structures. In the case of equity carve-outs, parent firms retain a significant ownership stake in the subsidiary, unlike spin-offs. This set-up essentially makes the parent firm a dominant blockholder in the subsidiary. I hypothesize that the monitoring benefits argument that is made for block-holdership in the presence of diffuse ownership may be compromised when the blockholder is also the parent. Considering that parent firms in equity carve-outs tend to be distressed while the subsidiaries have better growth opportunities, it may not be a stretch to argue that the interests of the minority shareholders in the carve-out subsidiary although they may compromised. I argue that these structural differences between carve-outs and spin-offs are likely to induce ownership changes that are dissimilar from those observed by Patro (2005). Focusing on equity carve-outs in this study is likely to generate new insight on the relation between ownership and firm performance, in particular the role played by a majority block-holder when that blockholder is the parent firm.

The objectives of this study are threefold. First, with a view to reconciling extant literature, I attempt to mitigate the econometric problems that confound previous studies to re-examine the relation between corporate ownership and firm performance, the monitoring role that blockholders are deemed to play in the stewardship of the modern firm, and whether corporate ownership reverts to some optimal level over time. In particular, I implement the instrumental variables approach, generalized method of moments, and run Granger causality tests to control for the potential endogeneity of ownership and firm performance. Second, there is wide disparity in the definition and measurement of corporate ownership. Given the existing mixed evidence, it is arguable that test results are not necessarily invariant to the definition and measurement of corporate ownership. Various studies have defined ownership as managerial ownership, CEO ownership, officer and director ownership, insider ownership, closely held shares, or institutional ownership. The results from these disparate studies are equally varied. For robustness in this essay, I implement alternative measures of ownership to ascertain what impact if any, different ownership proxies have on the empirical results obtained. Third, to ascertain if measures of performance partly explain the mixed findings, I use both accounting and market based proxies for firm performance [return on assets (ROA), return on equity (ROE), and Tobin's Q]. I then attempt to reconcile the results from all four models with the extant evidence.

This study makes a number of contributions to extant literature. First, contrary to extant evidence that posits a positive relation between insider ownership and firm performance at low levels of ownership [0-5%], and a negative relation at higher levels of insider ownership is rejected in the case of equity carve-outs. A combination of parent ownership and insider ownership in the subsidiary seem to exacerbate the entrenchment effects and overwhelm the incentive alignment effects at very low levels of insider ownership. I present evidence in support of the positive relation between outside blockholder ownership and firm performance. The presence of outside blockholders seems to significantly moderate the negative effects of a highly dominant parent firm. And lastly, I show that in the case of equity carve-outs, the level of ownership concentration seems to increase (decrease) in anticipation of positive (negative) changes in firm performance. These findings seem to suggest that dominant parent firms, at least in the case of equity carve-outs, exacerbate rather than mitigate the agency problem. As a matter

of governance policy in equity carve-outs, alternative control mechanisms may be necessary to moderate the behavior of dominant parent firms.

The rest of the paper is organized as follows. In section 2, I review related theoretical and empirical literature. Section 3 develops the hypotheses. Sample selection, data, and descriptive statistics are presented in section 4. Methodology is discussed in section 5. Section 6 presents the empirical results. I discuss robustness test results in section 6. And section 7 concludes.

2. Literature Review

2.1 Theories of Ownership

An extensive literature linking corporate ownership and firm performance has evolved along two main dimensions. The first strand attempts to link the type of ownership to the performance of the firm. Major studies present evidence on insider ownership (officers & directors), managerial ownership, CEO ownership, institutional ownership, and corporations. The second strand links ownership concentration to performance. Concentration of ownership has been proxied by blockholder ownership - defined as a 5% share ownership in a corporation or greater and the Herfindahl Index of ownership concentration measured as the sum of squared ownership shares. Both research strands base their empirical investigations on four salient hypotheses: (i) the incentive alignment hypothesis; (ii) the entrenchment effects hypothesis; (iii) Reverse causality – insider rewards and investments, (iv) the non-monotonous hypothesis; and lastly (v) the economics of natural selection.

Jensen and Meckling (1976) advance the incentive alignment argument which is rooted in agency theory. They argue that managers are self-interested agents who, if left alone and in the presence of asymmetric information [Hart and Holmstrom (1987)], will pursue their own interests to the detriment of the shareholders of the firm. The incentive alignment hypothesis posits that granting managers an equity ownership stake in the firm is likely to improve firm performance due the alignment of the monetary incentives between principals [shareholders] and the agent [manager]. The main predictions under the incentive alignment hypothesis are twofold.

First, one would expect to observe a positive relation between managerial share ownership and firm performance. Second, the higher the information asymmetry problem by a given firm the higher managerial ownership is likely to be.

Although, the incentive alignment hypothesis asserts that managerial share ownership in the firm mitigates principal-agent conflicts, the entrenchment hypothesis posits that beyond a certain threshold, increased managerial ownership may in fact be sub-optimal. Beyond this optimal threshold, the entrenchment effects overwhelm the incentive effects when powerful managers extract private benefits in the form of perquisite consumption, pet projects, and engaging in empire building to the detriment of the shareholder, contrary to the incentive alignment hypothesis [(Morck, Shleifer and Vishny (1988)]. The prediction here is that at low levels of managerial ownership [5%], the incentive alignment effects dominate the entrenchment argument however, at higher levels of managerial ownership [30% or higher], the relation reverses and the entrenchment prediction prevails.

Contrary to the above hypotheses, the reverse causality hypothesis assumes that the direction of causality flows from ownership structure to firm performance. This hypothesis posits that firm performance may in fact be causing the changes in ownership that are observed. The idea is that when managers perform well firms reward them by granting them equity ownership [Kole (1996)]. One should therefore observe a positive relation between firm performance and managerial ownership. On the other hand, Cho (1998) asserts that managers may prefer stock compensation when they expect their firm to over perform in the future. So, managerial share ownership is likely to be positively related to the firm's market value. Lastly, the insider investment argument predicates observed changes in managerial ownership on managers' expectations of their firm's future performance. Managers' share holdings are predicted to increase when they have favorable expectations and to decrease when they expect poor future performance [Loderer and Martin (1997)].

And finally is the economics of natural selection hypothesis which posits that ownership is an endogenously determined governance structure [Demsetz [1983], Demsetz and Lehn [1985] and Kole and Lehn [1997]. Predicated on the notion that financial performance determines

ownership, poorly performing firms will have inefficient ownership structures and soon or later will cease to exist. The prediction here is that in the long-run ownership in surviving firms should converge to the optimal structure.

In the next section I discuss the empirical evidence on the association between corporate ownership and firm performance. The evidence has evolved along two major research strands. The first strand examines the effect of ownership concentration on performance and the second focuses on how the type of ownership impacts firm performance.

2.2 Empirical Evidence

Extant empirical evidence on ownership and firm performance falls into two strands, namely: the concentration of ownership and type of ownership. In the case of the former, why some investors are motivated to concentrate a significant portion of their wealth in a single firm seems to contradict the tenets of modern portfolio theory. Various theories have been presented to explain this investment choice. First, the shared benefits argument is advanced to explain ownership concentration as a means to resolving the principal-agency problem. Large block ownership bestows to the owner monitoring and decision-making rights in form of directorships or company officer positions in which they can influence company decisions arguably for the benefit of all shareholders. Second, is the private benefits hypothesis. Blockholders can use their voting powers to access corporate resources for their own private benefit.

A number of empirical studies relating ownership to firm performance use 'block ownership' - defined as large shareholders who own at least 5% of the company's shares, to measure corporate ownership. Recent evidence on the relation between block ownership and firm performance is presented by Demsetz and Villalonga (2001), Anderson and Reeb (2003), Holderness (2003) and Thomsen, Pedersen, and Kvist (2005). Consistent with earlier evidence presented by Demsetz and Lehn (1985) for US firms, that no statistically significant relation exists between ownership and firm performance, Demsetz and Villalonga (2001) using a system of simultaneous equations, model ownership endogenously in their study and distinguish between managerial ownership and other outside blockholders. They use the proportion of the

five largest blockholders as the proxy for ownership. They assert that ownership is endogenously determined but find no evidence that ownership affects firm performance (measured as Tobin's Q). Anderson and Reeb (2003) also find no relation between ownership and firm performance using a single regression approach and using Tobin's Q as a measure for firm performance. Holderness (2003) surveys the literature on blockholders and firm performance and concludes that ownership concentration has little, if any impact on firm performance. He makes two important observations: (i) that insider and outsider blockholders have disparate private benefit/shared benefit incentives; and that corporation blockholders present a set of governance issues not found with individual blockholders. Since in the case of carve-outs the most significant blockholder is a corporation, this essay attempts to determine the set of firm governance issues that corporation blockholders present and the impact, if any, that these issues may have on firm performance. Thomsen and Pedersen (2000) investigate the relation of blockholder ownership and firm performance using samples of US, UK, and Continental European firms. They find no relation between ownership and firm performance for the US and UK firms but find a statistically significant negative relation between ownership and firm performance for Continental European firms.

On the other hand, an extensive literature presents evidence relating firm performance to the type of corporate ownership. Important studies on ownership and firm performance use managerial ownership, insider ownership, officers & director ownership, CEO ownership, and corporation ownership as types of ownership, among others. McConnell and Servaes (1990) investigate insider and blockholder ownership. They report a positive relation between insider ownership and firm performance but find no statistically significant relation between blockholder ownership and firm performance. Loderer and Martin (1997) use a simultaneous equations approach to examine insider ownership and firm performance. They find that insider ownership does not predict Tobin's Q but Tobin's Q has a negative relation with insider ownership. Cho (1998) also uses a system of equations approach to investigate managerial ownership and firm performance. He finds no causation from ownership to Tobin's Q but Tobin's Q affects ownership structure. Himmelberg et al., (1999) implement a fixed effects model and the instrumental variables approach using officers' and directors' ownership. They control for fixed firm effects and find no statistically significant relation between officer and directors' ownership

and Tobin's Q. Moreover, when they control for the endogeneity, they find a quadratic relation between ownership and firm performance. Holderness et al., (1999) confirm the endogeneity of managerial ownership and they document a positive relation between firm performance and managerial ownership in the 0-5% ownership range.

Various studies examine the relation between institutional owners and firm performance. Institutional investors are in general expected to influence on firm performance because corporate monitoring is costly and given the significant investment stakes they are likely to hold, it is reasonable to assume that they have the incentive and the wherewithal to monitor managers, [Shleifer and Vishny (1986), Grossman and Hart (1980)]. However, the empirical evidence presented is largely mixed. It is not clear what makes some institutional owners better monitors and others less so. Bushee (1998) attempts to characterize institutional investors based on their investment horizon outlook on the firms in which they buy ownership sakes and their trading styles. He delineates three groups: Institutional owners that frequently trade and diversify their portfolios are termed 'transient'. They are less likely to be effective corporate monitors. The second group comprises institutional owners who hold large and stable stakes in the firms they invest in. Because of the large stakes and long-term investment view, these institutional investors are assumed to be better monitors. Earlier studies that document a positive relation between institutional ownership and firm performance include McConnell and Servaes (1990), Nesbitt (1994), Smith (1996), and Del Guercio and Hawkins (1999) who document a positive relation between institutional investor ownership and firm performance. More recent evidence of a positive relation between institutional stock ownership and firm performance is presented by Hartzell and Starks (2003), Almazan et al., (2005), Borokhovich et al., (2006) and Cornett et al., (2007). On the other hand, Agrawal and Knoeber (1996), Karpoff et al. (1996), Duggal and Miller (1999), and Faccio and Lasfer (2000) find no significant relation. Thus, the impact of institutional investor stock ownership on firm performance is still unclear.

Lastly, there seems to be a dearth of research on the effects of concentrated ownership when the blockholder is another corporation. Holderness (2001) observes that "Blockholders that are corporations present a set of issues not found with individual owners…". To my knowledge no study specifically examines the effect that blockholders that are corporations have on firm

performance. This study using a sample of carve-out firms makes an additional contribution to extant literature by investigating the potential effects that a dominant blockholder that is also a corporation may have on the performance of another firm.

3. Hypotheses Development

In this section I develop three testable hypotheses to determine, first, whether ownership structure in equity carve-outs moderates their long-term performance. Second, to examine whether the concave relation documented in the case of insider ownership is supported in the case of equity carve-outs. And third, to test whether evidence of ownership reversion to some optimal level over time that is documented in various studies is supported in the case of equity carve-outs. Descriptive statistics show that the majority of the parent firms in the sample maintain a majority stake in the subsidiary in excess of 70%. The data also suggest that parent ownership levels in the subsidiary change very slowly over time. Approximately 35% of the subsidiaries are re-acquired, 20% of the parents' ownership stake increases following the announcement, and in the rest of the cases the parents' ownership stake decreases gradually or the subsidiaries are summarily spun-off.

Various studies on insider ownership are surveyed in Murphy (1999), Core et al., (2001), and Holderness (2001). The evidence suggests that firm performance improves at lower levels of insider ownership but declines at higher levels of insider ownership. Other studies that control for the endogeneity problem, discussed earlier, find no relation between ownership and firm performance. These findings seem to support the incentive alignment hypothesis at lower levels of ownership but are more consistent with the entrenchment effect at higher levels. I test the following hypothesis.

H_1: *Performance in subsidiary firms is inversely related to the level of insider ownership.*

Vishny (1997) and Holderness (2003), among others present evidence that the presence of an outside blockholder has a moderating effect on the actions of management and ultimately

on firm performance. A blockholder is defined as any shareholder who holds at least a 5% stake in the firm. The idea is that ownership of a 5% or greater interest in the firm is sufficient incentive to monitor and influence managerial decision-making. I argue that in the case of equity carve-outs, where you have a dominant corporate blockholder (parent firm), the moderating effect of an outside blockholder is likely to be even more beneficial. I test the following hypothesis.

H_2: *Long-term performance of subsidiary firms is positively related to the presence of outside blockholders or institutional shareholders.*

Whether or not firms target an optimal level of insider ownership still remains an empirical question. Zhou (2001) asserts that insider ownership changes so slowly and in some cases not at all. Core and Lacker (2001) suggest that adjusting ownership structure involves costs and when these costs are substantial there will be a tendency for ownership structures to depart from the optimal target. Patro (2005) observes that ownership is fairly stable but when circumstances warrant it does significantly change. He concludes that changes in ownership are endogenous to firm characteristics. Frye and Smith (2003), on the other hand, present evidence of faster changes in ownership in a sample of IPO firms. They report average increases in block ownership of 8% during the 4 years following the IPO. The insider investment argument predicts that insider ownership will change based on insider expectations about future firm performance [Loderer and Martin (1997)]. In the case of carve-outs, the dominant parent is likely to increase its stake in the subsidiary when it has favorable expectations about future performance and reduce it when the future looks bleak. I hypothesize that positive (negative) changes in the parent's ownership in the subsidiary precede improved (weaker) subsidiary performance.

H_3: *Positive (negative) changes in a parent's ownership stake in the subsidiary precede improved (weaker) subsidiary performance.*

4. Sample Selection and Data

4.1 Sample Selection

The initial sample is compiled from the Securities Data Company's (SDC) US IPO data. Ownership data is compiled from Thompson Financial, Compact Disclosure, and proxy statements. I cross check with *Lexis-Nexis, the Wall Street Journal*, the *Wall Street Journal Index* and the *Directory of Corporate Affiliations*. For those firms with data preceding 1987, I obtain data from the microfilm collection of proxy statements. The initial sample comprises 421 firms (regulated and unregulated) that announced carve-out transactions during the time period 1983 - 2004. For inclusion in the sample, a firm must be traded on the AMEX, NYSE, or NASDAQ and be covered by CRSP and Standard & Poor's COMPUSTAT. Supplemental governance data is obtained from Q-files, Lexis-Nexis, Compact Disclosure CD-ROMs, The Corporate Library (TCL), and corporate proxy statements. For each year that a firm is in the sample, I gather complete data on insider ownership, the percent of parent ownership in the subsidiary, outside blockholders, and institutional ownership. The final sample is then observed for the entire sample period or until a given firm is re-acquired or summarily sold off.

The final sample is 170 firms comprising 83 financials and 87 non-financial firms. For all full sample regressions I control for the regulatory and balance-sheet idiosyncrasies of financial firms (SIC 6000) by including an indicator variable coded '1' if the firm is financial or '0' otherwise. For robustness, I also run separate regressions for only financial firms (SIC 6000).

Table 21, presents the sample selection and distribution data. Panel A shows the number of firms dropped from the initial sample and the reasons for their exclusion. Of the original sample of 421 firms, 144 firms are dropped because they are not listed on AMEX/NASDAQ/NYSE. Additionally, 105 firms are not covered by CRSP and/or COMPUSTAT and 2 firms had missing data on ownership. Panel B shows the sample distribution by year of announcement. Firms that meet all requirements, range from a minimum of 5 firms for the years 1989, 1991, 2003, and 2004 to a maximum of 14 firms for 2000. Panel C presents the sample distribution by industry (2-digit SIC). Financials (SIC 60), had the highest number of transactions with 82 announcements, manufacturing (SIC 20-30) had 37, 19 announcements for other services (SIC 70-80), 14 for wholesale/retail (SIC 50), 9 announcements for transportation, communications, and utilities (SIC 40), and 9 transactions for mining, oil, and gas (SIC 10).

4.2 Descriptive Statistics

Table 22 presents sample descriptive statistics. Parent ownership in their subsidiaries has a mean (median) of 64.9% (71.1%) with a standard deviation of 8.9%. The maximum (minimum) proportion of parent ownership is 94.3% (8.2%4). Insider ownership, which is defined as the officers and directors in the subsidiary firm, has a mean (median) of 7% (6%) with a standard deviation of 2%. The maximum (minimum) insider ownership is 9% (2%). Outside blockholders are defined as non-executive/non-parent owners who hold at least 5% of the total outstanding shares of the firm. The mean (median) outside blockholder ownership is 28% (23%) with a standard deviation of 14%. The maximum (minimum) proportion owned by outside blockholders is 31% (8%). Ownership concentration is defined as the total proportion of outstanding shares owned by the officers and directors of the subsidiary firm, the parent firm, and outside blockholders. The mean (median) of ownership concentration is 81% (92%) and a standard deviation of 16%. The maximum (minimum) ownership concentration is 100% (14%). Leverage which is measured as total long-term debt divided by total assets ranges from a minimum of 12% to a maximum of 106% with a mean (median) of 43% (54%) and a standard deviation of 20%. Book-to-market ranges from a minimum of 0.21 to a maximum of 0.79 with a mean (median) of 0.41 (0.39) and a standard deviation of 0.24. Tobin's Q which is measured as the market value of equity divided by the book value of total assets, ranges from a minimum of 1.18 to a maximum of 1.92 with a mean (median) of 1.48 (1.57) and a standard deviation of 1.12. Return on assets (ROA) is measured as earnings before interest and tax divided by total assets (EBIT/TA) and the minimum (maximum) for the sample is -0.03 (0.15) with a mean (median) of 0.0.08 (0.11) and a standard deviation of 0.13. Return on equity is measured as net earnings divided by total owners equity (Net Income/Common Stock) and ranges from a minimum of -0.06 to a maximum of 0.28 with a mean (median) of 0.17 (0.21) and a standard deviation of 0.24.

4.3 Description of Variables

4.3.1 Dependent Variables (ROA, ROE, Tobin's Q)

Table 23, presents descriptions of dependent and independent variables and how they are constructed. The dependent variable is firm performance. Three variables including Tobin's Q (Adj_Q), return on assets (Adj_ROA), and return on equity (Adj_ROE) are used to measure firm performance. Tobin's Q, is measured as book value of assets minus the book value of equity plus the market value of equity divided by the book value of its assets. Each firm's Tobin's Q is then adjusted by subtracting the industry median. To ascertain the significance of the potential right skew in the distribution of firm value, I use log values of Tobin's Q as a robustness test. Return on assets (ROA) for each firm is calculated as the ratio of the firm's earnings before interest and tax (EBIT) to the book value of assets. Return on equity (ROE) measured as a firm's earnings before interest and tax divided by the firms total equity. Both variables are then adjusted by subtracting the industry medians for return on assets (ROA) and return on equity (ROE), respectively.

4.3.2 Explanatory Variables

Parent ownership (PAR_OWN) is defined as the proportion of outstanding shares in the subsidiary that are owned by the parent firm. Insider ownership (IN_OWN) is defined as the proportion of shares in the subsidiary firm that are owned by officers and directors. Outside blockholders (OUT_BLOCK) are defined as non-executive/non-parent owners who hold at least 5% of the total outstanding shares of the subsidiary firm. And Ownership concentration (OWN_CON) is defined as the combined proportion of outstanding shares owned by the officers and directors of the subsidiary firm, the parent firm, and outside blockholders.

4.3.5 Control Variables

To control for firm size, I use one of three variables - book-to-market value (BME), log of market value of equity (L_MVE), and log of total assets (L_TA). Leverage (LEV), computed as total long-term debt divided by the firm's total assets and Capital ratio are used to proxy for the indebtedness of non-financial and financial firms, respectively. For full sample regressions that combine financial and non-financial firms, I include an indicator variable 'FIN' for financials (SIC 6000), to control for the regulatory and balance sheet idiosyncrasies of financials.

The sample distribution data presented in Table 1, Panel C depicts some degree of industry concentration particularly in manufacturing, services, and wholesale/retail. For robustness, I include an indicator variable for industry, to ascertain whether industry effects have any statistical significance.

Table 24 presents the correlation matrix between the main variables. Results show that the pairwise correlation between contemporaneous measures of firm performance and the main explanatory variables is much weaker than that between performance measures and lagged explanatory variables. Pairwise correlations between contemporaneous and lagged insider ownership and industry adjusted Tobin's Q are both negative and statistically significant at the 0.10 level. Lagged insider ownership is negative and statistically significant at the 0.10 level. Pairwise correlations between lagged outside blockholder ownership and adjusted Tobin's Q, ROA, and ROE are all positive and statistically significant at the 0.10 level. Pairwise correlations between both contemporaneous and lagged ownership concentration and industry adjusted Tobin's Q are ROE are all negative and statistically significant at the 0.10 level. The correlation between lagged ownership and ROA is positive and statistically significant at the 0.10 level.

5. Methodology

To provide some preliminary evidence on the relation between corporate ownership and firm performance, I run annual multivariate regressions. Then in light of the econometric issues that plague previous studies, I successively increase the complexity of the models to mitigate some of these problems by implementing a fixed effects model, then the instrumental variables methodology (IV), and lastly, the generalized method of moments (GMM). As a robustness check, I also run granger causality tests to determine the direction of causation between ownership and firm performance. To test hypotheses H_1, H_2, and H_3, I project a measure of firm performance [ROA, ROE, and Tobin's Q] on various proxies for ownership [IN_OWN, $(IN\_OWN)^2$, OUT_BLOCK, and (IN_OWN x PAR_OWN)]. I control for firm size using log of total assets (L_TA), firm leverage (LEV), and firm profitability (EBIT), and whether the firm is financial or non-financial by including an indicator variable coded as '1' if the firm is financial (SIC 6000) or '0' otherwise. I estimate the following model:

$$Adj\_ROA_{it} = \alpha + ß_1 IN\_OWN_{i,t-1} + ß_2 (IN\_OWN)^2_{i,t-1} + ß_3 OUT\_BLOCK_{,i,t-1} + ß_4 OWN\_CON_{i,t-1}\ ß_5 LEV_{i,t-1} + ß_6 L\_TA_{i,t-1} + ß_7 FIN_{i,t} + \varepsilon_{it} \quad (1)$$

To test hypothesis H_3, I use ownership concentration (OWN_CON) as one of the explanatory variables and include a lagged variable of the dependent performance variable as the other explanatory variable. The coefficient on $ß_4$, captures the effect of changes in ownership concentration on firm performance can be interpreted as a measure of the impact on performance resulting from a change in the ownership concentration. I test the following model:

$$Adj\_ROA_{it} = \alpha + ß_1 OWN\_CON_{i,t-1} + ß_4 (Adj\_ROA_{it-1}) + ß_5 LEV_{i,t-1} + ß_6 L\_TA_{i,t-1} + ß_7 FIN_{i,t} + \varepsilon_{it} \quad (2)$$

For the IV and GMM models, I use 2 and 3 lags of the ownership variables as instruments. Lastly, I implement granger causality tests (Granger 1969) to ascertain whether changes in ownership structure are followed by systematic changes in firm performance or vice versa. I test the following models:

$$Adj\_ROA_t = \alpha_0 + \alpha_1 ROA_{t-1} + \alpha_2 ROA_{t-2} + \beta_1 IN\_OWN_{t-1} + \beta_2 IN\_OWN_{t-2} + \varepsilon_t \quad (3)$$

$$IN\_OWN_t = \varphi_0 + \varphi_1 IN\_OWN_{t-1} + \varphi_2 IN\_OWN_{t-2} + \beta_1 ROA_{t-1} + \beta_2 ROA_{t-2} + \nu_t \quad (4)$$

I test the following null hypothesis in equation 2: *Inside ownership (IN_OWN) does not Granger cause firm performance (ROA).* Rejection of the null hypothesis suggests that inside ownership Granger causes firm performance. In equation (3), I test the null hypothesis that: *firm performance does not Granger cause inside ownership.* Rejection of the null hypothesis would imply that firm performance granger causes board size. The F-statistic/Wald-statistic is used to test the following condition, for all equations: $\beta_1 = \beta_2 = 0$

6. Empirical Results

6.1 Annual OLS Regressions

Table 28 provides coefficient estimates from annual OLS regressions. Model 1 uses adjusted ROA as the dependent variable, Model 2 uses adjusted ROE, and Model 3 uses adjusted Tobin's Q, controlling for firm leverage (LEV), firm size (L_TA), and whether the firm is financial or non-financial (FIN). In the annual regressions, the coefficients on Insider ownership (IN_OWN) and all three measures of performance [ROA, ROE, and Tobin's Q] are mostly negative at various levels of significance. The initial interpretation may be that for equity carve-outs, the threshold at which the entrenchment effects begin to overwhelm the incentive alignment effects is much lower. For outside blockholders (OUT_BLOCK) the coefficient estimates are mostly positive for all performance measures, with levels of significance ranging from 0.05 to 0.10. The initial explanation may be that outside blockholders help moderate the potential entrenchment effects from insider owners. And for ownership concentration (OWN_CON), which is defined as the combined proportion of outstanding shares owned by officers and directors in the subsidiary firm, the parent firm, and outside blockholders, the coefficient estimates are mostly negative for all measures of performance. The preliminary interpretation may be that outside blockholders are not able to counteract the combined entrenchment effects from both insider owners and the parent firm.

Table 28, Model 1 presents estimated coefficients using return on assets (ROA) as the dependent variable. Explanatory variables include Insider ownership (IN_OWN), the square of insider ownership $(IN\_OWN)^2$, outside blockholders (OUT_BLOCK), and ownership concentration (OWN_CON). I control for firm leverage and firm size. To control for the regulatory and balance-sheet idiosyncrasies of financial firms, I include an indicator variable 'FIN' coded '1' if the firm is financial or '0' otherwise. For all three performance measures [ROA, ROE, and Tobin's Q], insider ownership (IN_OWN) has a negative sign as predicted by hypothesis H_1 and all the coefficients are statistically insignificant at the 0.10 level. Contrary to previous studies that show a convex relation between insider ownership and firm performance, the square of insider ownership $(IN\_OWN)^2$, has mixed signs and none of the coefficient estimates is statistically significant. Consistent with the prediction in hypothesis H_2, coefficient estimates on outside blockholders (OUT_BLOCK), have positive signs and are statistically significant at the 0.05 and 0.10 levels for all performance measures. Ownership concentration coefficients are all negative but statistically insignificant. The coefficient estimates on the

indicator variable, FIN, is positive and statistically significant at the 0.10 level in the models using ROA and ROE as the dependent variable. The significance of the coefficient on the indicator variable for financials may suggest that the association between firm performance, as measured by ROA and ROE, and ownership may be different for financials.

Overall, OLS results support hypotheses H_1, H_2, and H_3. In the case of insider ownership, the evidence is consistent with Loderer and Martin (1997) who find that insider ownership does not predict Tobin's Q but Tobin's Q has a negative relation with insider ownership. I find no quadratic relation between officers and directors' ownership that is reported by Himmelberg et al., (1999). Contrary to the findings by Holderness et al., (1999) of a positive relation between insider ownership and firm performance in the 0-5% ownership range, the evidence in this study does not suggest likewise. The explanation in the case of equity carve-outs may be that the existing parent ownership may affect firm performance the same way officers' and directors' ownership in the subsidiary does, hence negating the 0-5% threshold on which the Holderness et al., findings are predicated. Results for outside blockholders support hypothesis H_2. Consistent with Vishny (1997) and Holderness (2003), the evidence suggests that outside blockholders moderate the entrenchment effects of concentrated insider ownership. The coefficient estimates on ownership concentration are all negative but statistically insignificant. No conclusions can be drawn regarding its effect on firm performance or the prediction made in hypothesis H_3.

6.2 Fixed Effects Model

Table 29 presents coefficient estimates from a fixed effects model. I test the appropriateness of the fixed effects and a random effects model using a Hausman endogeneity test. Results show an F-statistic (P_value) of 28.86 (0.0001) suggesting that the fixed-effects coefficient estimates are more consistent. Hence, I implement a fixed effects model. Table 29, Model 1 presents estimated coefficients using return on assets (ROA) as the dependent variable. IN_OWN has the opposite sign from that predicted by hypothesis H_1 with a coefficient (t-statistic) of -1.38 (-1.69) and is statistically significant at a 0.05 level. The coefficient (t-statistic) on $(IN\_OWN)^2$ is 0.17 (1.36) with an opposite sign to that predicted. The coefficient (t-statistic) on OUT_BLOCK is 1.24(1.72). It is statistically significant at the 0.05 level and consistent with

the prediction of hypothesis H_2. OWN_CON has a coefficient (t-statistic) of -0.22 (-0.87) and is statistically insignificant. Overall, the fixed effects results using ROA as the measure for firm performance do not support hypotheses H_1 but are consistent with H_2. Model 2 presents coefficient estimates when ROE is the measure of performance. The coefficient (t-statistic) on insider ownership is -0.79 (-1.71) suggesting a negative relation between IN_OWN and ROE. The estimate is statistically significant at the 0.10 level as predicted in H_1. Consistent with the prediction in hypothesis H_2, the coefficient estimate on outside blockholders is positive and statistically significant at the 0.05 level. The coefficient estimate on ownership concentration is negative and statistically significant at the 0.10 level, as predicted in hypothesis H_3. Model 3 uses industry-adjusted Q as the measure for firm performance. The coefficient estimate (t-statistic) on insider ownership (IN_OWN) is -0.04 (-1.65) has the opposite sign as that predicted by H_1. Consistent with the prediction in hypothesis H_2, the coefficient estimate (t-statistic) on outside blockholders is 0.98 (1.81) and statistically significant at the 0.15 level. Ownership concentration is shown to be negatively associated with adjusted Q and the estimate is statistically significant at the 0.10 level as predicted in H_3. The coefficient estimates on inside ownership (square of insider ownership) are negative (positive) for all three measures of firm performance which does not support the interest alignment hypothesis at lower levels of inside ownership nor the notion of a convex relation between insider ownership and firm performance.

Overall, the fixed effects results support H_2 but do not support hypotheses H_1 and H_3. The findings negate the findings summarized by Murphy (1999), Core et al., (2001), and Holderness (2001), suggesting improvements in firm performance at low levels of insider ownership and decreasing performance at higher levels of insider ownership.

6.3 Hausman Endogeneity Test

Table 30 presents coefficient estimates when IN_OWN_{t-2}, OUT_BLOCKB_{t-2} and OWN_CON_{t-2} are used as instruments. The coefficient (t-statistic) on IN_OWN Residuals is -0.06(-3.08) with an F-statistic (Wald-χ^2) of 9.68 (44.07) for ROA. The coefficient (t-statistic) on IN_OWN Residuals using ROE as the dependent variable is -0.08(-2.87) with an F-statistic (Wald-χ^2) of 11.03 (28.06). The coefficient (t-statistic) on IN_OWN Residuals using Tobin's Q

as the dependent variable is -0.48(-0.78) with an F-statistic (Wald-χ^2) of 11.94 (22.63). The coefficients on the residuals for ROA and ROE are statistically significant at the 0.01. The coefficients on the residuals for Tobin's Q are statistically insignificant. The null hypothesis that the coefficient on the IN_OWN Residuals is zero is rejected for the first two models (ROA and ROE). This implies the presence of endogeneity and hence the inappropriateness of using the OLS method. The coefficient (t-statistic) on OUT_BLOCK Residuals is 2.11(2.38) with an F-statistic (Wald-χ^2) of 7.48(14.96) for ROA. The coefficient (t-statistic) on OUT_BLOCK Residuals using ROE as the dependent variable is 0.02(1.68) with an F-statistic (Wald-χ^2) of 9.24 (18.76). The coefficient (t-statistic) on OUT_BLOCK Residuals using Tobin's Q as the dependent variable is 0.04(1.92) with an F-statistic (Wald-χ^2) of 10.22 (19.07). The coefficients on the residuals for all the dependent variables are statistically significant at the 0.01 and 0.05 levels. The null hypothesis that the coefficient on the OUT_BLOCK Residuals is zero is rejected, which suggests the presence of endogeneity and hence the inappropriateness of using the OLS method. The coefficient (t-statistic) on OWN_CON Residuals is 0.03(0.74) with an F-statistic (Wald-χ^2) of 4.64 (17.14) for ROA. The coefficient (t-statistic) on OWN_CON Residuals using ROE as the dependent variable is -0.11(-2.27) with an F-statistic (Wald-χ^2) of 6.98 (20.04). The coefficient (t-statistic) on OWN_CON Residuals using Tobin's Q as the dependent variable is -0.55(-2.17) with an F-statistic (Wald-χ^2) of 8.56 (23.08). The null hypothesis that the coefficient on the OWN_CON residuals is zero is rejected for ROE and Tobin's Q but is statistically insignificant for ROA. In the presence of endogeneity, OLS coefficient estimates will be biased and inconsistent.

6.2 Two-Stage Least Squares (IV)

Table 31 presents results from IV regressions. The instruments for corporate ownership are the 2 lags of the proxies for ownership: Insider ownership (IN_OWN), the square of insider ownership $(IN\_OWN)^2$, outside blockholders (OUT_BLOCK), and ownership concentration (OWN_CON). Model 1 presents estimated coefficients using return on assets (ROA) as a measure of performance. Consistent with the prediction in hypothesis H_1, the coefficient estimate on insider ownership is negative and statistically significant at the 0.05 level. The sign and statistical significance of the coefficient on OUT_BLOCK suggests a positive relation between

blockholder ownership and firm performance which is also significant at the 0.05 level, consistent with hypothesis H_2. The coefficient estimate on ownership concentration is negative and statistically significant at the 0.01 level, as predicted in hypothesis H_3. Model 2 presents coefficient estimates when ROE is the measure of performance. Insider ownership is shown to be negatively associated with ROE and the estimate is statistically significant at the 0.10 level as predicted in H_1. Consistent with the prediction in hypothesis H_2, the coefficient estimate on outside blockholders is positive and statistically significant at the 0.01 level. The coefficient estimate on ownership concentration is negative and statistically significant at the 0.10 level, as predicted in hypothesis H_3. Model 3 uses industry-adjusted Q as the measure for firm performance. The coefficient estimate on insider ownership (IN_OWN) has the opposite sign as that predicted by H_1 but statistically insignificant. Consistent with the prediction in hypothesis H_2, the coefficient estimate on outside blockholders is positive and statistically significant at the 0.10 level. Ownership concentration is shown to be negatively associated with adjusted Q and the estimate is statistically significant at the 0.10 level as predicted in H_3. The coefficient estimates on the square of insider ownership $(IN\_OWN)^2$ are positive for all three measures of firm performance which does not support the notion of a convex relation between insider ownership and firm performance.

In sum, the evidence from IV does not support the findings summarized in Murphy (1999), Core et al., (2001), and Holderness (2001), suggesting improvements in firm performance at low levels of insider ownership and decreasing performance at higher levels of insider ownership. A plausible explanation is that in the case of equity carve-outs, parent ownership in the subsidiary plays the role of insider ownership as measured in previous studies. So combining officers' and directors' ownership in the subsidiary with the existing parent ownership causes the entrenchment effects of insider ownership to overwhelm the incentive alignment effects, thus negating the potential benefits of officers' and directors' ownership in the 0-5% ownership range that is documented in previous studies. On the other hand, IV results for blockholder ownership support the findings by Vishny (1997) and Holderness (2003). The presence of an outside blockholder seems to have a moderating effect on the actions of insider owners (subsidiary management) and the parent firm and ultimately on firm performance. The investment argument predicts that insider ownership will increase (decrease) in anticipation of

positive (negative) changes in future firm performance [Loderer and Martin (1997)]. The negative coefficients on lags of insider ownership (IN_OWN) do not seem to support this view.

6.3 Generalized Method of Moments (GMM)

Table 32 presents GMM coefficient estimates. The instruments are the 2 lags of the ownership variables: Insider ownership (IN_OWN), the square of insider ownership $(IN\_OWN)^2$, outside blockholders (OUT_BLOCK), and ownership concentration (OWN_CON). The signs on the coefficients for all the main explanatory variables are consistent with the H_1, H_2, and H_3 predictions. Coefficient estimates for insider ownership are statistically significant at the 0.01 level for ROA and at the 0.10 level for ROE and adjusted Q. The square of insider ownership is shown to be positive contrary to previous findings. Coefficient estimates for outside blockholder ownership are statistically significant at the 0.01 level for ROA and at the 0.10 level for ROE and adjusted Q. Ownership concentration is shown to be negative and statically significant at the 0.01 for ROA and 0.05 for ROE and adjusted Q. All three models are statistically significant with J-statistics of 5.487E-03 for ROA, 3.89E-05 for ROE, and 2.57E-04 for Tobin's Q.

Overall, in the case of insider ownership, GMM results do not support the findings summarized in Murphy (1999), Core et al., (2001), and Holderness (2001). In the presence of significant parent ownership, entrenchment effects seem to overwhelm the incentive effects even at modestly low levels of officers' and directors' ownership in the subsidiary. The evidence for blockholder ownership supports the findings by Vishny (1997) and Holderness (2003). The presence of an outside blockholder has a moderating effect on insider ownership (subsidiary management and the parent firm) and ultimately on the subsidiary's performance. Consistent with Loderer and Martin (1997), parent firms seem to increase (decrease) their ownership in the subsidiary firm in anticipation of strong (weak) future performance.

6.4 Empirical Results - Subset of Financial Firms (SIC 6000)

Some of the IV and GMM results show statistically significant coefficients on the indicator variable, FIN, for financial firms (SIC 6000). To ascertain whether the relation between ownership and firm performance differs for financials, I run separate regressions for a subset of financial firms. Empirical results are presented in Table 30. In both IV and GMM regressions, performance measures [ROA, ROE, and adj_Q] are projected onto a set of ownership proxies [(IN_OWN), the square of insider ownership $(IN\_OWN)^2$, outside blockholders (OUT_BLOCK), and ownership concentration (OWN_CON)] with 2 lags, controlling for firm size, capital ratio, and price-to-book value. The results are qualitatively similar to those for the full sample. Consistent with the predictions in hypothesis H_1, H_2 and H_3 insider ownership is negatively associated with firm performance contrary to the findings summarized in Murphy (1999), Core et al., (2001), and Holderness (2001). The coefficients on blockholder ownership are positive for all performance measures and statistically significant at the 0.10 level, in support of the evidence presented by Vishny (1997) and Holderness (2003). Ownership concentration is negatively related to firm performance with statistically significant coefficients in support of Loderer and Martin (1997). These results in combination seem to suggest that the impact of corporate ownership on firm performance is not necessarily driven by industry characteristics but may be endogenous to the firm.

6.5 Granger Causality Tests

Table 31 presents empirical results from bi-variate granger causality tests. Model 1 tests Granger causality between insider ownership and various measures of firm performance [return on assets (ROA), return on equity (ROE) and adjusted Tobin's Q]. The F-statistic for the null hypothesis test that insider ownership (IN_OWN) does not Granger cause return on assets (ROA), is 17.21 with a p-value of 0.0000. The F-statistic for the test that ROA does not Granger cause insider ownership (IN_OWN), is 4.68 with a p-value of 0.0000. Thus the reverse causality between ROA and insider ownership cannot be rejected. The F-statistic for the null hypothesis test that insider ownership (IN_OWN) does not Granger cause return on equity (ROE), is 6.88 with a p-value of 0.0050. While the F-statistic for the test that ROE does not Granger cause insider ownership (IN_OWN), is 1.32 with a p-value of 0.0840. These results seem to suggest that past values of insider ownership have information precedence about future performance as measured by ROE but not the other way round. The F-statistic for the null hypothesis test that

insider ownership (IN_OWN) does not Granger cause adjusted Tobin's Q (adj_Q), is 8.98 with a p-value of 0.0001. While the F-statistic for the test that adj_Q does not Granger cause insider ownership (IN_OWN), is 11.04 with a p-value of 0.0000. These results also seem to suggest the endogeneity of insider ownership and Tobin's Q.

Model 2 tests Granger causality between outside blockholder ownership and various measures of firm performance [return on assets (ROA), return on equity (ROE) and adjusted Tobin's Q]. The F-statistic for the null hypothesis test that outside blockholder ownership (OUT_BLOCK) does not Granger cause return on assets (ROA), is 7.42 with a p-value of 0.0000. The F-statistic for the test that ROA does not Granger cause outside blockholder ownership (OUT_BLOCK), is 5.33 with a p-value of 0.0000. Thus the reverse causality between ROA and insider ownership cannot be rejected. The F-statistic for the null hypothesis test that outside blockholder ownership (OUT_BLOCK) does not Granger cause return on equity (ROE), is 4.08 with a p-value of 0.0005. While the F-statistic for the test that ROE does not Granger cause outside blockholder ownership (OUT_BLOCK) 0.87 with a p-value of 0.3400. These results seem to suggest that past firm performance has information precedence about future outside blockholder ownership and not the other way round. The F-statistic for the null hypothesis test that outside blockholder ownership (OUT_BLOCK) does not Granger cause adjusted Tobin's Q (adj_Q), is 4.47 with a p-value of 0.0001. While the F-statistic for the test that adj_Q does not Granger cause outside blockholder ownership (OUT_BLOCK), is 6.82 with a p-value of 0.0000. These results also seem to suggest the endogeneity of outside blockholder ownership and Tobin's Q.

Model 3 tests Granger causality between ownership concentration (OWN_CON) and various measures of firm performance [return on assets (ROA), return on equity (ROE) and adjusted Tobin's Q]. The F-statistic for the null hypothesis test that ownership concentration (OWN_CON) does not Granger cause return on assets (ROA), is 9.72 with a p-value of 0.0052. The F-statistic for the test that ROA does not Granger cause ownership concentration (OWN_CON), is 4.38 with a p-value of 0.0000. Thus the reverse causality between ROA and ownership concentration cannot be rejected. The F-statistic for the null hypothesis test that ownership concentration (OWN_CON) does not Granger cause return on equity (ROE), is 1.12

with a p-value of 0.0015. While the F-statistic for the test that ROE does not Granger cause ownership concentration (OWN_CON), is 9.81 with a p-value of 0.2800. These results seem to suggest that past values of ownership concentration have information precedence about future performance as measured by ROE but not the other way round. The F-statistic for the null hypothesis test that ownership concentration (OWN_CON) does not Granger cause adjusted Tobin's Q (adj_Q), is 6.07 with a p-value of 0.0000. While the F-statistic for the test that adj_Q does not Granger cause ownership concentration (OWN_CON) is 3.89 with a p-value of 0.0050. These results suggest that ownership concentration and Tobin's Q may be endogenous.

7. Robustness

I test the robustness of these results to alternative measures of firm performance/value. I use investment intensity (INV), measured as R&D expenditures divided by total assets and the ratio of capital expenditures-to-total assets. In both cases, results are qualitatively similar to those reported using Tobin's Q. To ascertain whether there are any statistically significant differences between firms with higher Q values than those with lower Q values, I divide the sample into three sub-samples. The three sub-samples consist of firms that fall into the top 40%, firms in the lower 40%, and the rest in the middle 20%. I run the tests on the top 40% and the bottom 40%. Results obtained in both cases are qualitatively similar to those reported for the full sample. And lastly, results obtained from winsorized sample data at 1% and 5%, are qualitatively similar to those obtained for the full sample.

8. Conclusion

There were three main objectives for this study. First, with a view to reconciling extant literature, I sought to mitigate the econometric problems that have confounded previous studies to ascertain which of the largely mixed extant evidence is supported. Second, due to the wide disparity in the definition and measurement of corporate ownership, one could argue that the mixed evidence is simply a reflection of differences in variable measurement. For robustness in this study, I implement alternative measures of ownership to ascertain what impact if any, different ownership proxies may have on firm performance. And third, to ascertain whether measures of performance partly explain the mixed findings, I use both accounting and market

based proxies for firm performance [return on assets (ROA), return on equity (ROE), and Tobin's Q] to reconcile the empirical with the extant evidence.

I find that contrary to extant evidence, insider ownership contrary to extant evidence that posits a positive relation between insider ownership and firm performance at low levels of ownership [0-5%], and a negative relation at higher levels of insider ownership is rejected in the case of equity carve-outs. A combination of parent ownership and insider ownership in the subsidiary seem to exacerbate the entrenchment effects and overwhelm the incentive alignment effects at very low levels of insider ownership. These findings seem to suggest that dominant parent firms, at least in the case of equity carve-outs, exacerbate rather than mitigate the agency problem. As a matter of governance policy for equity carve-outs, alternative control mechanisms may be necessary to moderate the behavior of dominant parent firms. In addition, these results raise an interesting question. Why in the majority of carve-out transactions do parent firms retain 70 - 99% majority control in the subsidiary, when in fact empirical evidence shows it to be sub-optimal? Assuming that the goal of management in the parent firms is value-maximization that ownership structure indeed reverts to the mean, other things being equal, one would expect to observe a gradual reversion of parent ownership in the subsidiary towards the 51% level. I find no evidence to support this argument. Ownership decisions in the case of equity carve-outs may be driven by other strategic considerations. Second, I present evidence in support of the positive relation between outside blockholder ownership and firm performance. The presence of outside blockholders seems to significantly moderate the negative effects of a highly dominant parent firm. And lastly, I show that in the case of equity carve-outs, the level of ownership concentration seems to increase (decrease) in anticipation of positive (negative) changes in firm performance.

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Table 24: Sample Selection & Distribution

Table 24 presents sample distribution and size. Panel A provides a count of the firms comprising the final sample and the number and reasons for those screened out. For a firm to be included it must be listed on NYSE/AMEX/NASDAQ exchanges and be covered by COMPUSTAT and CRSP. Of the original 421 carve-out firms, 144 firms were dropped either because they are unlisted or listed on exchanges other than AMEX/NASDAQ/NYSE. An additional 105 firms were dropped due to non-coverage by CRSP, COMPUSTAT. Two firms were dropped due to missing ownership data. The final sample consists of 170 firms of which 82 are financial firms (SIC 6000) and 88 are non-financial firms. Panel B presents the sample distribution by year of announcement and Panel C shows the industry distribution by 2-digit SIC.

Panel A: Construction of the Sample	**# of firms**
Total number of firms:	421
Firms not listed on NYSE/AMEX/NASDAQ:	(144)
Firms not covered by COMPUSTAT / CRSP:	(105)
Firms with missing data:	(2)
Final Sample:	170

Panel B: Distribution by Year	**# of firms**
1986	10
1987	9
1988	7
1989	5
1990	7
1991	8
1992	9
1993	16
1994	7
1995	8
1996	13
1997	8
1998	10
1999	8
2000	14
2001	13
2002	8
2003	5
2004	5

Panel C: Distribution by SIC	**Two-Digit SIC**	**# of firms**
Mining, Oil & Gas	10	9
Manufacturing	20-30	37
Transport, Comm., Utilities	40	9
Wholesale/Retail	50	14
Financials	60	82
Services (other)	70-80	19

*****Source**:** Security Data Company (SDC)

Table 25: Descriptive Statistics

Table 25 presents sample descriptive statistics. Some performance means are unusually low (high) due to the influence of outliers, this problem is mitigated in the regression analysis by using industry-adjusted numbers and by winsorizing the data at 99% and 1%.

Variable	Mean	(Std. Dev)	Median	Min	Max
Parent Ownership (%)	0.65	0.09	0.71	0.08	0.94
Insider Ownership (%)	0.02	0.01	0.03	0.01	0.03
Outside Blockholder Ownership (%)	0.14	0.05	0.12	0.05	0.18
Ownership Concentration	0.81	0.16	0.92	0.14	1.00
Book-to-Market	0.41	0.24	0.39	0.21	0.79
Tobin's Q	1.48	1.12	1.57	1.18	1.92
Market Value of Equity ($M)	1,002	244	207	3.4	58,514
Leverage (LT. Debt/ TA)	0.43	0.20	0.54	0.12	1.06
Return on Assets	0.08	0.13	0.11	-0.03	0.15
Return on Equity	0.17	0.24	0.21	-0.06	0.28

Source: Standard & Poor's COMPUSTAT, SDC,
CRSP, Thompson Financial, Proxy Statements.

Table 26: Variable Descriptions

Table 26 provides descriptions of the variables used and related sources. Subscripts that appear on variables presented elsewhere relate to number of time lags.

Variable	Description	Source
Adj_Q	Adjusted Tobin's Q – market value of equity divided by book value of assets	Tobin et al. (1977)
Adj_ROA	Adjusted return-on-assets – firm i's return on assets minus median industry return on assets	Compustat
Adj_ROE	Adjusted return-on-equity – firm i's return on equity minus median industry return on equity	Compustat
BME	Book-to-market value ratio	Compustat
EBIT	EBIT-to-total Assets ratio	Compustat
CAP	Capital ratio or Tier 1 leverage ratio for financial firms	10-K Reports
FIN	Indicator variable: '1' = financial firm '0'= otherwise	SIC Codes (6000 -6999)
IN_OWN	Proportion of shares owned by officers & directors, and parent firm	Thompson Financial/ Proxy Stats.
$(IN\_OWN)^2$	The square of proportion of shares owned by officers & directors and parent firm	Thompson Financial/ Proxy Stats.
LEV	Leverage: debt-to-total assets	Compustat
L_MVE	Log of firm's market value	Compustat
L_TA	Log of firm's total assets	Compustat
OUT_BLOCK	Proportion of shares owned by outside block-holders (equal to or greater than 5%)	Thompson Financial/ Proxy Stats.
OWN-CON	Proportion of shares owned by all blockholders (equal to or greater than 5%)	Thompson Financial/ Proxy Stats.
PBV	Price-to-book value	Compustat
ROA	Return-on-assets (EBIT/TA)	Compustat
ROE	Return-on-equity (EBIT/Common Equity)	Compustat
SIC	Standard Industry classification code	Compustat

Table 27: Correlation Matrix

Table 27 presents pairwise correlations between the main dependent variables (adjusted Tobin's Q, ROE, and ROA), and explanatory variables (IN_OWN, OUT_BLOCK, PAR_OWN).

	N=170	1	2	3	4	5	6	7	8	9	10	11	12
1. Adj_Q	1.00												
2. Adj_Q_{t+1}	0.93**	1.00											
3. Adj_ROE	0.31*	0.28*	1.00										
4. Adj_ROE_{t+1}	0.38**	0.43***	0.78**	1.00									
5. Adj_ROA	0.04*	0.23*	0.11	0.64*	1.00								
6. Adj_ROA_{t+1}	0.07	0.17*	0.12*	0.04*	0.47	1.00							
7. IN_OWN	-0.05*	-0.17*	-0.03	-0.72*	0.28	-0.05	1.00						
8. OUT_BLOCK	0.11	0.39*	0.48	0.66*	0.17	0.61*	0.07	1.00					
9. OWN_CON	-0.01*	-0.04*	-0.12	-0.02*	-0.53*	-0.78*	0.05	-0.13	1.00				
10. L_TA	-0.14*	-0.52*	-0.41	-0.27	-0.13*	-0.11	0.27*	0.51*	0.28	1.00			
11. LEV	-0.38*	-0.13*	-0.22	-0.10*	-0.08	-0.14	0.29*	0.08	0.11	-0.66*	1.00		
12. EBIT	0.81*	0.74*	0.91*	0.93*	0.81	0.72	0.51*	-0.068*	-0.24	-0.44*	0.38*	1.00	

Table 28: OLS Regressions

Table 28 presents estimated coefficients on ownership proxies [IN_OWN, OUT_BLOCK, and OWN_CON]. The dependent variables are ROA, ROE, and Tobin's Q in Models 1, 2, and 3, respectively. I control for firm size (L_TA), Leverage (LEV), and industry (FIN). Reported results are median regressions by year from 1983 to 2004.

	Model 1: Adj_ROA			**Model 2: Adj_ROE**			**Model 3: Adj_Tobin's Q**		
Year	IN_OWN	OUT_BLOCK	OWN_CON	IN_OWN	OUT_BLOCK	OWN_CON	IN_OWN	OUT_BLOCK	OWN_CON
1983	-1.24	2.28*	-0.81	0.06	0.02	-0.21	0.14	3.27	-2.08
1984	-0.84	1.46	0.22	-1.43**	2.28*	-1.04	-0.98*	1.01*	-1.21*
1985	-0.07**	0.48	1.23	0.66	0.12	-2.47	-2.07	0.98	-0.93
1986	-1.02	1.03	-1.41*	-1.24	3.05	-4.01*	-1.12	0.57	0.42
1987	0.73	3.38*	-0.01	-0.25	0.11*	2.16	0.05	1.04	0.68
1988	-2.14*	1.01	0.98	-0.89*	0.92	-0.08	-0.68*	0.73	-1.33
1989	-0.92*	0.78*	-0.06*	0.02	1.34*	0.32	-0.47	0.12	-2.10*
1990	-1.05	1.73*	0.55	0.63	0.64*	-0.62*	-0.51	2.41	0.56
1991	0.04	0.87	0.68*	-0.57*	0.03	-0.04	-0.69	0.77*	-0.87
1992	0.06*	2.44*	-0.77	-2.08*	0.81	1.13	-1.21*	1.02	-0.35
1993	-0.54*	0.06	0.53	0.64	1.01*	-0.22	-0.32	0.48	-0.67*
1994	-0.88	1.17	2.09*	-0.84	0.54	-1.38	-1.78*	0.03	-1.12
1995	0.02	0.36*	-0.13	-0.40*	0.09	-0.29*	0.03	1.29	0.58
1996	-1.23*	0.02	0.28	0.11	2.01	0.01	-0.55	0.35*	-0.28*
1997	-0.71*	0.63*	0.07	1.08	0.17*	-2.31*	-0.44	0.52	-1.44
1998	-0.06	2.49	1.17	2.17	0.76*	0.77	-0.54	1.07	0.01
1999	-2.56*	0.77	-0.05*	-0.31*	0.42	-0.15	0.01	2.07	0.83
2000	0.04	1.29*	0.21	-0.78*	0.06	-0.88	-0.97*	0.05	-1.04*
2001	-0.27*	0.81	0.89	0.28	2.14	-0.17*	-0.51	0.44	-0.24
2002	-0.11	0.04*	-0.51*	-0.36*	0.67*	0.36	0.68	0.72*	0.87
2003	0.57	2.54	0.04	0.04	0.04	-0.04	-0.77*	1.04	-0.08*
2004	-0.49*	-1.06	0.22	-0.09	2.07*	-1.09*	0.09	0.38	-0.31
Time Series mean	-0.67***	1.02***	-0.34**	-0.08*	0.68*	-0.62*	-0.33	0.74*	-0.69*
Time series σ:	0.56	0.77	0.77	0.46	0.92	0.76	0.58	0.84	0.76
T-statistic	-3.92	6.23	-2.09	-1.67	4.04	-3.08	-1.31	1.81	1.73

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 29: Fixed Effects Model

Table 29 presents coefficient estimates from a fixed effects model using industry-adjusted performance measures [ROA, ROE, and Tobin's Q] on ownership proxies [IN_OWN, $(IN\_OWN)^2$, OUT_BLOCK, OWN_CON]. I control for financial firms (FIN), leverage (LEV), and firm size (L_TA). The values in parenthesis are t-statistics.

	Dependent Variable		
	ROA_t	**ROE_t**	**Tobin's Q_t**
Constant	6.23***	11.32***	2.19*
	(4.33)	(6.04)	(1.88)
IN_OWN_{t-1}	-1.38*	-0.79*	- 0.04*
	(-1.69)	(-1.71)	(-1.65)
$(IN\_OWN_{t-1})^2$	0.17	-0.04	0.42
	(1.36)	(-1.17)	(1.28)
OUT_BLOCK_{t-1}	1.24*	2.37**	0.98*
	(1.72)	(2.02)	(1.81)
OWN_CON_{t-1}	-0.22	-0.41	-0. 06
	(-0.87)	(-1.07)	(-1.14)
L_TA	-0.22*	-1.01	-0.07*
	(-1.66)	(-1.57)	(-1.72)
LEV	-1.32*	-0.43*	-0.08**
	(-1.88)	(-1.72)	(-2.04)
FIN	0.21*	0.07*	0.03
	(1.68)	(1.75)	(1.04)

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 30: Hausman Endogeneity Tests

Table 30 provides test results from the Hausman test for endogeneity on IN_OWN, OUT_BLOCK, and OWN_CON. Dependent variables are ROA, ROE, and Tobin's Q. I use 2 lags of insider ownership, outside blockholders, and ownership concentration as instruments (IN_OWN_{t-2}, OUT_BLOCK_{t-2}, and OWN_CON_{t-2}) and I test the significance of the coefficients on the residuals.

ROA	Variable	Coefficient (t-statistic)	F-Statistic	Wald (χ^2)
	IN_OWN	-0.73(-2.44)	9.68	44.07
	IN_OWN Residuals	-0.06 (-3.08)		
	OUT_BLOCK	4.79 (3.12)	7.48	14.96
	OUT_BLOCK Residuals	2.11 (2.38)		
	OWN_CON	0.22(1.02)	4.64	17.14
	OWN_CON Residuals	0.03 0.74)		
ROE	**Variable**	**Coefficient (t-statistic)**	**F-Statistic**	**Wald (χ2)**
	IN_OWN	-1.14(-1.97)	11.03	28.06
	IN_OWN Residuals	-0.06 (-2.87)		
	OUT_BLOCK	0.48 (2.37)	9.24	18.76
	OUT_BLOCK Residuals	0.02 (1.68)		
	OWN_CON	-0.47 (-1.57)	6.98	20.04
	OWN_CON Residuals	-0.11 (-2.27)		
Tobin's Q	**Variable**	**Coefficient (t-statistic)**	**F-Statistic**	**Wald (χ2)**
	IN_OWN	-1.03(-3.14)	11.94	22.63
	IN_OWN Residuals	-0.48(-0.78)		
	OUT_BLOCK	0.68 (2.39)	10.22	19.07
	OUT_BLOCK Residuals	0.04 (1.92)		
	OWN_CON	-1.37(-2.09)	8.56	23.08
	OWN_CON Residuals	-0.55 (-2.17)		

Table 31 – Instrumental Variables Regression

Table 31 presents IV coefficient estimates of ownership instruments [IN_OWN, $(IN\_OWN)^2$, OUT_BLOCK,(OWN_CON)] using 2 lags of the original variables as instruments. The dependent variables are industry- adjusted ROA, ROE, and Tobin's Q. I control for financial firms (FIN), leverage (LEV), and firm size (L_TA). The values in parenthesis are t-statistics.

	Dependent Variable		
Panel A	**ROA_t**	**ROE_t**	**Tobin's Q_t**
α	0.67	2.31*	1.19*
	(1.03)	(1.66)	(1.92)
IN_OWN_{t-2}	-3.47**	-0.94*	-0.03
	(-2.15)	(-1.69)	(-1.23)
$(IN\_OWN_{t-1})^2$	1.28*	0.02	0.78*
	(1.71)	(1.44)	(1.81)
OUT_BLOCK_{t-1}	0.11**	0.54**	0.07*
	(2.04)	(2.48)	(1.93)
$(OWN\_CON)_{t-1}$	-2.39***	-1.04*	-2.33*
	(-4.98)	(1.68)	(-1.87)
L_TA	-1.02**	-0.78*	-0.64
	(1.97)	(-1.83)	(-1.33)
LEV	-0.07	-0.42*	-0.19**
	(-1.41)	(-1.72)	(-2.15)
FIN	0.04	0.23*	0.54
	(1.02)	(1.74)	(0.91)
Adjusted R^2	0.34	0.24	0.22
F-Statistic	8.12	3.78	12.03
P-Values	[0.0000]	[0.0052]	[0.0002]
Panel B	Dependent Variable		
	ROA_t	**ROE_t**	**Tobin's Q_t**
Constant	1.02*	0.98	1.22
	(1.73)	(1.18)	(1.03)
IN_OWN_{t-3}	-2.05	-0.15*	-0.37*
	(-1.04)	(-1.66)	(-1.72)
$(IN\_OWN_{t-3})^2$	0.48*	0.59*	0.01
	(1.82)	(1.69)	(1.16)
OUT_BLOCK_{t-3}	1.02	0.06*	0.28*
	(1.18)	(1.77)	(1.80)
$(OWN\_CON)_{t-3}$	-0.15**	-0.83	-0.05
	(-3.28)	(1.52)	(-1.31)
L_TA	-0.97*	-0.33*	-0.09*
	(1.67)	(-1.72)	(-1.69)
LEV	-1.13	-0.88	-0.64*
	(-1.08)	(-1.51)	(1.75)
FIN	0.21*	0.51*	0.04
	(1.68)	(1.79)	(1.53)
Adjusted R^2	0.34	0.27	0.18
F-Statistic	4.88	6.09	5.39
P-Values	[0.0001]	[0.0054]	[0.0042]

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 32: GMM Estimates

Table 32 presents GMM coefficient estimates of ownership instruments [IN_OWN, $(IN\_OWN)^2$, OUT_BLOCK, (OWN_CON)].In Panel A, 2 lags of the original ownership proxies are used as instruments. The dependent variables are industry- adjusted ROA, ROE, and Tobin's Q. I control for financial firms (FIN), leverage (LEV), and firm size (L_TA). The values in parenthesis are t-statistics.

	Dependent Variable		
Panel A	**ROA_t**	**ROE_t**	**Tobin's Q_t**
Constant	1.22*	2.79	3.83*
	(1.68)	(1.03)	(1.81)
IN_OWN_{t-1}	-4.62***	-2.31*	-1.19*
	(-7.28)	(-1.74)	(-1.68)
$(IN\_OWN_{t-1})^2$	3.87*	1.51	4.66
	(1.74)	(1.18)	(1.23)
OUT_BLOCK_{t-1}	1.47***	2.15*	1.03*
	(3.68)	(1.71)	(1.66)
$(OWN\_CON)_{t-1}$	-3.78*	-2.94**	-4.11*
	(-2.98)	(1.98)	(-2.12)
L_TA	-0.04*	-0.13**	-0.56
	(1.68)	(-2.09)	(-1.01)
LEV	-0.11*	-0.07	-0.33*
	(-1.82)	(-1.51)	(-1.74)
FIN	1.13*	0.94*	0.33
	(1.68)	(1.76)	(1.29)
R^2	0.12	0.18	0.27
Adjusted R^2	0.18	0.26	0.31
Durbin Watson	6.44	4.78	8.39
J-Statistic	5.48E-03	3.89E-05	2.57E-04

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 33: IV and GMM Estimates - Financial Firms (SIC 6000)

Table 33 presents IV and GMM coefficient estimates for a set of ownership proxies [IN_OWN_{t-1}, $(IN\_OWN_{t-1})^2$, OUT_BLOCK_{t-1}, $(OWN\_CON)_{t-1}$] using 2 lags of the original variables as instruments, for a sub-sample of financial financials. I control for price-to-book value, capital ratios, and log of total assets. Dependent variables are industry adjusted ROA, ROE, and Tobin's Q for models 1, 2, 3 respectively.

	IV			**GMM**		
Model	1	2	3	1	2	3
	ROA_t	ROE_t	Tobin's Q_t	ROA_t	ROE_t	Tobin's_Q_t
Constant	-1.37	1.86*	0.77*	2.23*	0.88	-4.02*
	(-1.01)	(1.66)	(1.68)	(1.72)	(1.02)	(-1.66)
IN_OWN_{t-1}	-2.16***	-0.58*	-1.05*	-1.82*	-3.14*	-0.72*
	(-3.27)	(-1.70)	(-1.90)	(-1.68)	(-1.71)	(-1.82)
$(IN\_OWN_{t-1})^2$	0.72	0.31*	0.55	2.22*	0.11	0.09
	(1.44)	(1.86)	(1.11)	(1.65)	(1.07)	(1.54)
OUT_BLOCK_{t-1}	1.71*	1.73**	2.83	0.81	0.78**	2.03
	(1.81)	(2.04)	(1.12)	(0.54)	(2.33)	(1.03)
$(OWN\_CON)_{t-1}$	-1.47	-0.65	-0.36*	-4.11*	-1.22	0.47
	(-2.63)	(-1.13)	(-1.72)	(-3.98)	(-1.03)	(1.11)
L_TA	0.66	-0.04*	-0.22*	-0.03	0.42*	-0.13
	(-1.40)	(-1.93)	(-1.74)	(-1.35)	(1.65)	(-1.03)
Capital Ratio	-0.17*	-0.39*	-0.24	-0.37*	-0.67*	-0.87**
	(-1.74)	(-1.65)	(-1.57)	(-1.90)	(-1.80)	(-2.13)
PBV	1.41*	0.79*	-	2.52*	0.85**	-
	(1.81)	(1.68)		(1.69)	(2.31)	
Adj.R^2	0.34	0.22	0.18	0.26	0.14	0.23
F-statistic	8.04	3.87	6.22	3.34	4.18	7.14
Model p-value	[0.0000]	[0.0005]	[0.0000]	[0.0000]	[0.0001]	[0.0004]

*significant at 0.10 level, **significant at 0.05 level, ***significant at 0.01 level

Table 34: Granger Causality Tests

Table 34 presents results from bi-variate granger causality tests between ownership structure [IN_OWN, OUT_BLOCK, and OWN_CON] and firm performance [Adj_Q, ROE, and ROA].

		F-Statistic	Probability
Model 1-(ROA)	IN_OWN does not granger cause ROA	17.21	[0.0000]
	ROA does not granger cause IN_OWN	4.68	[0.0000]
	OUT_BLOCK does not granger cause ROA	6.88	[0.0050]
	ROA does not granger cause OUT_BLOCK	1.32	[0.0840]
	OWN_CON does not granger cause ROA	8.98	[0.0001]
	ROA does not granger cause OWN_CON	11.04	[0.0000]
Model 2-(ROE)	IN_OWN does not granger cause ROE	7.42	[0.0000]
	ROE does not granger cause IN_OWN	5.33	[0.0000]
	OUT_BLOCK does not granger cause ROE	4.08	[0.0005]
	ROE does not granger cause OUT_BLOCK	0.87	[0.3400]
	OWN_CON does not granger cause ROE	4.47	[0.0001]
	ROE does not granger cause OWN_CON	6.82	[0.0000]
Model 3-(Adj_Q)	IN_OWN does not granger cause Adj_Q	9.72	[0.0052]
	Adj_Q does not granger cause IN_OWN	4.38	[0.0000]
	OUT_BLOCK does not granger cause Adj_Q	1.12	[0.0015]
	Adj_Q does not granger cause OUT_BLOCK	9.81	[0.2800]
	OWN_CON does not granger cause Adj_Q	6.07	[0.0000]
	Adj_Q does not granger cause OWN_CON	3.89	[0.0050]

VITA

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