

Are All Inside Directors the Same? CEO Entrenchment or Board Enhancement

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Abstract

Two opposing theories of the role of inside directors on corporate boards currently exist. One theory emphasizes the valuable information-sharing role of inside directors, while the other theory emphasizes the adverse effects of CEO influence over inside directors. Both views treat inside directors as homogenous without recognizing potential differences among insiders. We use the external labor market for directorships to distinguish among inside directors. We find that inside directors who hold an outside directorship, referred to as independent insiders, are more likely when firm specific information is important, as theory predicts, and less likely when a CEO is more influential. Independent inside directors are associated with significantly better firm performance and higher market-to-book ratios, especially when firm-specific information is more important. Independent inside directors add more value when there is a separate CEO and board chairperson or a majority of independent outside directors, both of which increase the board's need for firm-specific information. We also find evidence that independent inside directors enhance both the monitoring and advisory function of the board. Furthermore, if an inside director becomes independent, shareholder wealth increases and if an independent inside director departs, shareholder wealth decreases. These findings support the importance of the external labor market for directorships in identifying and rewarding valuable inside directors. This evidence helps (1) bridge the gap between the conflicting views of inside directors and (2) explain the mixed evidence on the benefits of having a larger percentage of outside directors.

1. Introduction

Fama and Jensen (1983) theorize that internal managers are the most influential board members due to the valuable firm specific information they possess. Recent theoretical research has emphasized the important role of non-CEO inside directors in enhancing the board's advisory and monitoring functions [Raheja (2005), Adams and Ferreira (2007) and Harris and Raviv (2008)] In contrast, most empirical research views insiders as under a CEO's influence and therefore associated with greater agency costs. Despite the growing theoretical understanding of the role of inside directors, there is little empirical evidence on their value to corporate boards.¹ In fact, most empirical research treats non-CEO inside directors as a homogeneous group, and uses the proportion of inside directors on the board to measure the degree of manager-shareholder agency problems. This approach ignores the implications of studies of outside directors, which uncover important differences among these directors that affect major corporate decisions, leading researchers to focus primarily on the percentage of independent outside directors as a measure of shareholder representation on the board.² Given the pivotal role played by inside directors, uncovering important differences among these directors can lead to a more accurate identification of director characteristics associated with better corporate governance and firm performance. In this study, we investigate a characteristic of inside directors that both affects their incentives and measures the quality of their managerial skills.

We argue that the market for corporate directors identifies non-CEO inside directors with valuable board attributes, which offers a useful way to distinguish among inside directors. There are at least two reasons that inside directors with outside directorships serve special roles on an employer's board. First, Fama and Jensen (1983) argue that holding a directorship indicates that an individual possesses valuable decision management skills, which are highly valued by other firms. Therefore, inside directors with outside directorships could be associated with better decision-making skills at their own firms, resulting in better firm performance. Second, when inside directors hold outside directorships, they are more visible to senior officers and outside directors at these other firms, enabling a better assessment of their managerial skills, which expands their career opportunities outside their own firms. This enhanced visibility weakens these inside directors' reliance on their current CEOs for career advancement, thereby making them less susceptible to CEO influence in the boardroom. These highly talented executives can also represent attractive CEO replacements, which can raise the level of

¹ Coles, Daniel, and Naveen (2008) is an exception. They find insiders are valuable in high R&D firms, where firm specific information is more important.

²For example, Mace (1971), Hallock (1997), Core et al. (1999), Shivdasani and Yermack (1999), Kaufman et. al. (2007), Larcker et al. (2005) and Fich and Shivdasani (2006), and see Hermalin and Weisbach (2003) for an insightful summary of this body of research.

competition CEOs experience. With greater independence, these officers can be more willing to share their proprietary knowledge and insights about firm operations with outside directors. For these reasons, we refer to non-CEO inside directors with outside directorships as *independent inside directors*.

Our analysis suggests that independent inside directors can facilitate better informed, more independent boards, which in turn can lead to reduced management entrenchment and lower agency costs. Greater information transparency within a board of directors combined with a less influential CEO, allow for more objective board decision-making that better serve shareholder interests. Thus, the existence of independent inside directors could be associated with better firm performance and higher stock valuations. However, while almost one in two firms has one or more non-CEO inside directors as of the end of 2003, only about one tenth of these non-CEO operating officer-directors hold outside directorships. This means that before we can investigate the effects of independent inside directors on firm performance and equity value, we must first study the factors that explain the selection of independent and non-independent inside directors.

As a first step in understanding the selection process for inside directors, we compare the characteristics of the two types of inside directors. At the director level, we find on average that independent inside directors have considerably shorter board tenure in their own firms, compared to other more dependent inside directors. This suggests that skill, rather than simply experience or tenure, of independent inside directors leads to outside directorships. The average board with independent inside directors also has more independent outside directors compared to boards with other more dependent inside directors. This suggests the former boards have better governance and CEO entrenchment is less likely to motivate the selection of inside directors in these firms. In firm-level panel regressions, we find evidence that independent inside directors are positively associated with firm size, greater growth opportunities, and higher levels of R&D. These findings are consistent with the greater importance of information transparency to these firms, which leads these firms to have independent inside directors on their boards [Raheja (2005)].

Since independent inside directors are more likely to sit on boards where firm specific information is important, but are less susceptible to CEO influence, these directors may enhance board effectiveness. Enhanced board monitoring and advisory capacity may ultimately be associated with better firm performance and lower agency costs. After controlling for a firm's decision to select inside directors, we find evidence that independent inside directors on boards are associated with better operating performance and greater market-to-book ratios. A change from a dependent to an independent inside director is associated with a 138 basis point increase in industry-adjusted annual operating performance. A similar increase in the percentage of independent insiders is also associated with a 5.8% increase in a firm's industry-adjusted market-to-book ratio. We also find independent inside directors are associated

with better operating performance prior to receiving their outside directorship(s) and the acquisition of their first directorships is associated with an increase in their firm's market-to-book ratio. These results suggest that outside directorships serve as useful signals of more talented operating officers and their appointment to the boards of their own firms is likely to enhance corporate governance.

We also study the ability of independent inside directors to enhance other board monitoring functions. Adams and Ferreira (2007) note, "unless boards are given better access to information, simply increasing board [outside] independence is not sufficient to improve governance." We examine the interaction of independent inside directors with (1) a majority of independent outside directors and (2) a separate CEO and Chair. We find some evidence that a board with a majority of independent outside directors benefits from the presence of independent inside directors. We also find that independent inside directors are associated with improved firm operating performance and market-to-book ratio when there is a separate CEO and Chair. Conversely, other more dependent inside directors are not associated with improved board decision making when a separate CEO and Chair exist. These results suggest independent inside directors are valuable when the board is chaired by a director less familiar with firm-specific information, but potentially independent of the CEO.

Our results also indicate that independent inside directors have a much stronger effect on measures of performance when information is more critical to board decision making. Because board decision-making falls into two separate functions of their advisory and monitoring roles, we examine the importance of information along two separate dimensions. First, boards must evaluate and make choices regarding the real options available to the firm. This requires the outside board members to have an understanding of the technical operations of the firm and the growth opportunities available. We label this dimension of firm-specific information as *Information Importance*. Using principle component analysis we calculate a summary measure of *Information Importance* for a firm based on its R&D/Assets and Capital Expenditures/Sales ratios and an indicator for firms in high tech industries, which we use to proxy for the importance of firm-specific information. The monitoring function of the board relies on its understanding of the operations of the firm. As the firm grows in size and diversity, becoming more complex, it becomes more difficult for outside directors to understand the full scope of operations of the firm making monitoring more difficult. We label this dimension of firm-specific information as *Complexity*. Again, we use principle component analysis to calculate a summary measure of *Complexity* for a firm based on its size, diversity and age.

We find independent inside directors, not dependent insiders, correlate positively with operating performance in both high and low complexity firms. However, the positive relationship between independent inside directors and firm value is much greater in highly complex firms, suggesting that independent inside directors are effective in enhancing their boards understanding of larger diverse firms.

Having an independent inside directors, rather than a dependent insider, is associated with a 8.1% greater industry adjusted market-to-book valuation. This greater information transfer allows for stronger monitoring and thus lower agency cost, reflected in higher valuations.

In firms with high *Information Importance*, we find independent inside directors are associated with better operating performance and market-to-book valuations when this measure of firm-specific information is closely associated with growth options. Specifically, changing from a dependent to an independent inside director is associated with an increase in industry adjusted annual operating performance of 225 basis points and a 7.7% increase in industry-adjusted market-to-book. Examining high R&D firms, we find a positive relationship between other more dependent inside directors and a firm's market-to-book ratio, but the economic magnitude is only half as large as when there is an independent inside director. We also find no relationship between dependent inside directors and operating performance in high R&D firms, whereas the relationship between independent inside directors and operating performance is positive and significant. These findings are robust to controls for other measures of firm information complexity such as firm size, various controls for endogeneity or the exclusion of outliers.

Finally, we examine shareholder wealth effects when a non-CEO inside director acquires an independent outside directorship and when inside directors leave their firms. When inside directors acquire an outside board seat, independent of their current firm or board, we find a significant positive average market reaction to these announcements, but no significant effect if the appointment is to an affiliated firm's board. In addition, the shareholder reaction is more favorable when information transfer is most critical to board decision making. Specifically, the wealth effect is greater in firms with high levels of R&D and/or a majority of independent outside directors or in large firms when the Chairperson is someone other than the CEO. Moreover, shareholders experience a significant negative wealth effect on announcements of departures by independent inside directors. Conversely, announcements of departures of dependent inside directors are associated with no significant shareholder wealth effects.

These findings extend the current literature in four key ways. First, many studies document the differing degrees of independence and competence among outside directors. However, we are unaware of any published research that examines similar variations among inside directors. Our findings suggest there are important differences among inside directors that future research should consider when evaluating board effectiveness. By considering one major difference among inside directors, namely outside directorships, we uncover empirical evidence which supports existing theories concerning when inside directors enhance shareholder wealth. Second, these findings contribute to our understanding of how board composition affects firm performance by uncovering important roles played by certain inside directors and how they interact with other board characteristics. Previous research, which focuses almost

exclusively on outside director characteristics and firm performance, has a mixed record of success. Our findings highlight the importance of considering additional characteristics of inside directors, when examining firm performance. Thirdly, this study furthers our understanding of the role of the managerial labor market for corporate directors in identifying an important group of skilled corporate officers.

Finally, using outside directorships to distinguish among inside directors has the advantage of relying on external certification mechanisms to assess an executive's ability. Because the identification mechanism is market determined and generally follows officer appointments to their own boards, it reduces the potential concerns about the endogeneity of this appointment decision. After correcting for the endogenous choice of a firm to have inside directors on its board using the Heckman (1979) two-step procedure, we are able to observe the impact on firm performance when the external labor market for directorships identifies some inside directors as being worthy of outside directorships.

Consistent with research that focuses on the importance of outside directors, many recent reforms in corporate governance have emphasized firms attaining greater outside representation on their boards with little consideration of the importance of inside directors. For example, the recent legal reforms put in place by the Sarbanes-Oxley Act of 2002 (SOX) emphasized the importance of greater outside representation, which implicitly discounts the role of inside directors.³ The cumulative effect of these legislative reforms, pressures from influential institutional investors,⁴ and revisions in exchange listing rules⁵ is to reduce insider representation on corporate boards.⁶ However, if certain inside directors are more valuable, we would expect firms to retain their more valuable insiders, even in the face of these recent regulatory pressures.⁷ Examining inside directors in the years surrounding the passage of the Sarbanes-Oxley Act, Figure 1 reveals a downward trend in the percentage of firms with non-CEO inside directors. Nevertheless, the percentage of firms with independent inside directors decreases only slightly prior to Sarbanes-Oxley and remains relatively flat thereafter. Panel B reveals that the percentage of firms with more dependent inside directors decreases significantly over the 2001-2003 period. Yet, the change in the percentage of firms with independent insiders is insignificantly different from zero. In 2003, over

³ Section 301 of the Sarbanes-Oxley Act of 2002 has reinforced the push toward increased numbers of outside directors by requiring the audit committees of all public U.S. firms to be solely composed of outside directors. See <http://www.fmcenter.aicpa.org/Resources/Sarbanes-Oxley+Act./Summary+of+the+Provisions+of+the+Sarbanes-Oxley+Act+of+2002.htm>

⁴ TIAA-CREF states, "a board should be comprised of a substantial majority of independent directors". Likewise, the California Public Employees Retirement System (CalPERS), a major public pension fund, advocates that a substantial majority of corporate board seats be comprised of independent directors and is believed to pressure firms where they hold substantial shares to reduce inside directors [Wu (2000)]. See <http://www.calpers-governance.org/principles/domestic/us/page04.asp> and http://www.tiaa-cref.org/pubs/pdf/governance_policy.pdf

⁵ <http://www.nyse.com/pdfs/section303Afaqs.pdf> and http://www.nasdaq.com/about/Corp_Gov_Summary101002.pdf

⁶ There is also international pressure for more outside directors. The Higgs Report of 2003 in the U.K. recommended, "at least half of the board be independent non-executives" [Hill (2005)].

⁷ Linck, Netter, and Yang (2008) find firms are keeping some insiders and adding outsiders to increase the number of independent outside directors.

7% of the largest 1,500 firms had at least one independent inside director on their board.⁸ This initial evidence suggests firms have responded to the requirements of SOX and other regulatory changes by reducing the overall number of inside directors, while retaining their more valuable inside directors, those with outside directorships.

Despite this momentum for greater outside director representation, some observers are concerned that important aspects of board structure continue to be overlooked. Becht et al. (2003) warns that regulation can affect board structure in ways that are unanticipated. For example, focusing on independent outside directors fails to consider the importance of firm specific and industry knowledge available to boards, which inside directors can provide.⁹ If the push for more outside directors either directly or indirectly reduces the presence of independent inside directors on boards, the resulting changes may not enhance corporate governance or firm performance, but instead have just the opposite effect and thus, may not be in the best interests of shareholders. Moreover, because these constraints and pressures increase the cost to some firms of adding inside directors, they can prevent many firms, where additional insight into firm specific information is valuable to the board, from optimally adjusting their board composition. Our findings suggest that having independent inside directors on the board is beneficial to shareholder wealth and firm performance, particularly in firms where information importance is high.

We review the related literature on boards, directors, and firm performance and develop the hypotheses in Section 2. Section 3 contains the sample description and summary statistics. We examine the determinants of inside director representation in Section 4. Section 5 contains an analysis of the relationship of inside directors with firm performance and valuation. We examine wealth effects of announcements of outside directorship appointments and departures of independent inside directors in section 6. Section 7 contains a discussion of several robustness tests and Section 8 summarizes our results.

2. Literature Review and Hypothesis Development

2.1 Empirical Literature on Inside Directors

Some recent empirical papers have examined the role of inside directors as a group and their association with firm performance. Klein (1998) examines board structure at the committee level and finds insiders on the board's finance and investment committees are associated with higher stock market returns. Similarly, Adams et al. (2004) finds the lack of insiders on the board is positively associated with increased CEO power as measured by increased volatility of performance. This perspective suggests

⁸ Twelve percent of the firms in the S&P 500 had at least one independent insider in fiscal year 2003.

⁹ Relying on executives of other firms in the industry can be problematic due to competitive concerns and because of the risk that courts could view such directors as evidence of price collusion among competitors that amounts to illegal price fixing under anti-trust laws.

insiders improve the board's decision-making. These studies, however, do not consider differences among inside directors.

In a closely related study, Perry and Peyer (2005) finds that when executives with two or more directorships receive an additional outside directorship, their primary employer experiences positive announcement returns on average provided that agency costs in the firm are low as indicated by a majority of independent outside directors on the board or greater executive ownership. They also note that non-CEO executives are associated with higher announcement returns. Their findings suggest shareholders benefit when their inside directors have outside directorships. However, only about 20% of the executives in the Perry and Peyer sample, which includes CEOs, have multiple outside directorships. This leaves open two questions. First, how do outside appointments of non-CEOs differ in their effects on stockholder wealth from outside appointments of CEOs? Second, given that many non-CEO executives hold one or two directorships, how do they differentiate themselves from other perhaps more dependent inside directors without outside directorships?

2.2 Different views of inside directors

We consider two basic objective functions in the choice of inside directors. The first view is an agency perspective that argues inside board members are chosen to maximize the welfare of the CEO, which we term the Board Capture view [Bebchuck and Fried (2003)]. The second optimal contracting perspective assumes that board members are chosen to maximize shareholder wealth by improving the capabilities and monitoring oversight over senior management. The conventional view of inside directors reflected in much of the current corporate finance literature is that they further CEO entrenchment since their compensation and continued employment are CEO determined, making them dependent on CEO support. Thus, they are unlikely to take positions that differ from the CEO in the boardroom. The importance of this career concern is intuitive and supported empirically by evidence of senior management turnover surrounding CEO successions [Helmich and Brown (1972), Helmich (1974), and Fee and Hadlock (2004)]. This view considers inside directors as evidence of greater agency conflicts with shareholders as it enables the CEO to exert greater influence over the board. Thus, from this viewpoint, inside directors do not enhance a board's functionality, as Fama and Jensen (1983) theorize; rather they serve to entrench the CEO and increase the agency conflicts with shareholders. Hermalin and Weisbach (1998) provide an elegant model of board evolution that illustrates the bargaining game between the CEO and the independent directors on the board and show how a CEO with greater bargaining power will over time lead to a board with fewer independent directors. Their model predicts that firms with influential CEOs should have relatively fewer independent directors on their boards. Greater tenure, ownership, and a track record of strong firm performance all contribute to greater CEO influence and therefore should be associated with fewer independent directors on the board. Thus, the

Board Capture hypothesis predicts that insiders are more likely when the CEO has more power and influence over the board.

Our first hypothesis takes an agency theory and board capture perspective. It presumes that a CEO if unchecked will pursue private benefits of control and that all inside directors enhance CEO power. We refine this perspective by recognizing that non-independent inside directors have weaker incentives to monitor and discipline the CEO. Thus, under our refinement of the Board Capture Hypothesis, namely that when CEOs can influence board selection, then non-independent inside board members should be the preferred candidates to be nominated to the board so as to further entrench the CEOs. This perspective is formally stated in the following hypothesis.

H1: CEOs not subject to independent board supervision can extract greater private benefits of control. Non-independent inside directors are more likely to be chosen in firms under CEO control, since these directors have greater incentives to support the CEO in the boardroom.

From a shareholder perspective, less independent boards make it easier for CEOs to pursue their private benefits of control at the expense of shareholder interests. Thus, more non-independent inside directors are predicted to adversely affect both firm performance and stock valuation. This argument is formalized in the following hypothesis.

H2: Non-independent inside directors have (1) greater incentives to support the CEO at the expense of maximizing shareholder value, which weakens management oversight by the board of directors and (2) these directors are also less talented and able than other directors chosen primarily for their capacity to enhance firm value. Thus, the presence of non-independent inside directors should be negatively associated with firm performance and valuation.

Fama and Jensen (1983) take a distinctly different perspective on inside directors. They argue that inside directors contribute firm-specific expertise and insight into a firm's activities that enhance a board's ability to monitor a firm's performance and set its strategic objectives. As such, they expect well functioning boards to "include several of the organization's top managers." Recent theoretical research has begun to explore the roles of inside directors more thoroughly. Raheja (2005) emphasizes that insiders, especially those receiving fewer private benefits, can improve board monitoring of the CEO by providing information regarding the outcomes of a CEO's investment decisions to outside directors. Adams and Ferreira (2007) present a model emphasizing a board's advisory role, and the importance of information transparency between the CEO and independent outside directors. Harris and Raviv (2008) develop a model of board control that balances the benefits of manager decision-making based on superior information against the costs of greater managerial agency costs. In their model, they emphasize the important role served by inside directors, even when outsiders control the board, and find that outside

directors will optimally delegate decision making to inside directors in some instances. These models highlight the important role of non-CEO inside directors in providing firm-specific information, which enhances both a board's monitoring and advisory roles.

Consistent with the importance of firm-specific information to effective board functioning, Raheja (2005) argues that inside directors are more likely when information transfers to the board are more critical, such as in larger, more complex, or high tech firms. We further refine this perspective by arguing that director incentives to improve operating efficiencies are stronger in firms not dominated by their CEOs, because CEOs have inherent incentives to extract private benefits of control as highlighted by hypothesis H1. Thus, we predict that in firms not dominated by their CEOs, inside directors are more likely to be appointed to improve the firm's operating efficiency and to better monitor firm performance and discipline managers.

While all inside directors are informed about firm operations and opportunities, those with outside directorships (independent inside directors) are likely to be more talented and have career opportunities independent of CEO approval, unlike most other insiders. Mobbs (2008) finds relative to other inside directors a significantly greater proportion of independent inside directors become a CEO¹⁰ and that holding an outside directorship significantly increases the likelihood of the inside director becoming a CEO. Given their greater talent and outside career opportunities, independent inside directors are a potential threat to CEOs by providing independent sources of firm-specific information, having external visibility and credibility and career paths independent of internal promotion and representing experienced replacements for CEOs. Thus, we have several strong reasons entrenched CEOs would not support appointments of independent inside directors. This analysis is formalized in our next hypothesis.

H3: Independent inside directors have strong decision management skills, incentives to act independently and are potential CEO replacements. Since independent inside directors can threaten CEO power, tenure and private benefits of control, they are more likely in firms without powerful or entrenched CEOs.

From an optimal contracting theory perspective, inside directors are chosen to improve the quality of board decision making. Hypothesis H3 posits that inside directors are not the same. Those directors with outside directorships have greater decision management skills and better incentives to act independently relative to other inside directors. Thus, independent inside directors not only have abilities to enhance board decision making, they also have better incentives to do so. Independent inside directors enhance the board's monitoring role by aiding the transfer of firm-specific information among directors and by enhancing the quality of board decision-making. It follows that if outside directorships serve to

¹⁰ During the 1997 to 2003 sample period, only 4.6% of the non-independent inside directors are promoted to CEO, whereas 8% of the independent inside directors were promoted to CEO during the same period (p-value<.01).

recognize talented operating officers and decision managers and strengthen their independence from the CEO, then we expect the association between independent inside directors and firm performance in the cross-section of firms to be positive. We formalize this in Hypothesis H4 below.

H4: Independent inside directors are positively associated with firm performance and stock valuation since they have greater incentives and abilities to maximize shareholder value and facilitate better firm decisions due to their experience and the competitive pressures they place on CEOs compared to other inside directors.

The two opposing views of the role of inside directors yield very different predictions about the determinants of insider representation on boards, and our refinements of these arguments suggest there are important differences among inside directors, which affect their abilities to fulfill these two roles. We use outside directorships as an external mechanism for identifying potentially important differences among non-CEO inside directors to develop more powerful tests of the contradictory predictions of these two hypotheses. Several papers find evidence that supports the important role played by the managerial labor market in identifying talented directors. For example, Brickley, Linck, and Coles (1999) report the managerial labor market identifies and rewards top performing CEOs with post-retirement directorships. Kaplan and Reishus (1990) find that poor firm performance manifested by dividend cuts reduces the likelihood of current executives receiving additional directorships. Fich and Shivdasani (2007) find that outside directors on average lose outside directorships when a firm where they are a director is involved in a financial fraud lawsuit.

Outside directorships not only identify highly skilled executives, they also provide these officers with additional incentives to act independently of the CEO. Insider incentives to share or conceal information that undermines a CEO's position hinge upon the existence of private benefits of control according to several existing theoretical models [Raheja (2005) and Harris and Raviv (2008)]. In these models, when non-CEO insiders expect to realize fewer private benefits, they are less inclined to conceal information and more willing to share valuable firm-specific knowledge with the board. When inside directors hold an outside board seat, they have greater exposure to external job opportunities with its associated benefits, which reduces the relative importance of private benefits expected from their current positions.

Larger, more complex and technologically sophisticated firms require more informed directors. Greater informational transparency within the board regarding firm investment opportunities and past performance should lead to better board decision-making. When we also take account of inside director incentives, as discussed in hypotheses H1 and H3, we predict that independent inside directors have a more positive effect on board decision-making. Consistent with this prediction, Coles et al. (2008) finds a larger proportion of inside directors in research-intensive firms is associated with higher firm values as

measured by Tobin's Q. This suggests that inside directors are valuable for firm decision-making when outside directors have poor alternative sources of firm-specific information to that provided by the CEO. We formalize this perspective in the next hypothesis.

H5: Independent inside directors are more likely in larger, more complex firms where firm-specific information is of high importance and highly capable board members are particularly important to board deliberations.

Since the presence of independent inside directors is less likely in CEO dominated boards where pursuit of private benefits of control is more common, the predictions of H5 can be reinforced by H3.

As the role of information transfer to a board becomes more critical to firm decision-making, it also plays a greater role in enhancing a board's monitoring and advisory roles, which should strengthen their positive association with firm performance and market-to-book value. Firm characteristics can provide insight into the importance of firm specific information. Several measures of the size of valuable growth options within a firm are used to proxy for the importance of firm-specific information. We use principle components analysis to extract the common component from three measures of firm complexity: R&D, capital expenditure, and a high-tech industries indicator to proxy for information importance within a firm. We then use the principle component of these variables as a proxy for *Information Importance* to a firm. We expect independent inside directors to be more important to a board's oversight function as a firm's *Information Importance* measure rises, as specified in the next hypothesis:

H6: Independent inside directors are more valuable to board decision making in firms where *Information Importance* is high. Independent inside directors in these firms should have a stronger positive association with firm performance and valuation than in other firms.

H6 differs from H4 in that it conditions on the importance of firm-specific information in board decision making. This subtle differences allows us to distinguish between whether the additional directorship simply serves as a signal of talent (consistent with H4) or if the directorship itself alters the incentives of the inside director in a manner that increases information transfer to the board. If the directorship is merely a signal, there should be no difference in its relationship with performance across high or low information important firms. However, if the directorship alters incentives of the inside director in a manner that increases their relative independence from the CEO making them more willing to share information, then we expect their presence to have a stronger impact when information transfer is most important (H6).

The prior hypotheses distinguish among inside directors based on firm and CEO characteristics. However, board characteristics may also dictate a varying need for firm-specific information. For example, a board dominated by outside directors may realize larger benefits from greater information

transparency than a board dominated by inside directors. Similarly, when the board chairperson is not the CEO, the board can realize greater benefits from an increased transfer of firm-specific information. In both instances, greater information transparency enhances the monitoring capabilities of outside directors and a separate board chairperson. The next hypothesis captures these predictions.

H7: Among firms with inside directors, independent inside directors are more likely in firms with a non-CEO board chairperson or a majority of independent outside directors given their greater need of objective firm-specific knowledge and experience. Independent inside directors, by facilitating board acquisition of proprietary firm-specific information, strengthens a board's oversight role, leading to a stronger positive association with firm performance and valuation in firms with an independent chairperson or a majority of outside directors.

Again, this hypothesis is likely to have much greater force, when the countervailing CEO entrenchment effect of H1 is weak.

The importance of information transfer among board members rises as board oversight becomes more critical to a firm's survival. Gillan et al. (2004) observes that product market competition raises the importance of information transfers among the board and finds that it serves to increase demand for strong corporate governance as these firms fight to survive. Gillan et. al. also finds that product market competition does not serve as a substitute for other governance mechanisms. Specifically, greater competition forces managers and directors to work harder and more efficiently to survive. As a board's role becomes more critical, information sharing between inside and outside directors has a greater effect on firm performance [Harris and Raviv (2008)]. Furthermore, in poorly performing firms, managers risk losing their jobs, while directors risk reduced demand for their corporate director services.

Competitive forces can also make these firms compete more aggressively for experienced managers. This strengthens the positive managerial performance incentives stemming from the external labor market. Thus, Raheja (2005) argues that inside directors have even stronger incentives to demonstrate their independent decision-making skills within their firms to improve their own competitive positions in the managerial labor market. Raheja also observes that executives of firms in competitive industries are likely to reap fewer private benefits from their current positions. Again, the reduction in private benefits further strengthens inside director incentive to share valuable information with the board beyond that provided by the CEO. This is especially true for independent inside directors as they have greater exposure to these forces via their outside job opportunities. Therefore, if independent insiders are indicative of stronger corporate governance, then we expect a higher frequency of independent inside directors and a stronger positive association with firm performance and valuation when competitive forces are stronger. Greater product market competition also serves to increase the importance of corporate governance since poorly performing firms risk experiencing bankruptcy and financial distress.

H8: Boards of directors have greater incentives to carefully monitor managers in the face of greater product market competition. Thus, independent inside directors become more important as providers of timely proprietary firm-specific information to accomplish this task. Independent inside directors strengthen a board's oversight role by facilitating board acquisition of proprietary firm-specific information, leading to a stronger positive association with firm performance and valuation in more competitive industries.

Again, this hypothesis is likely to have much greater force, when the countervailing CEO entrenchment effect of H1 is weak and when the conditions behind hypotheses H7 and H8 both obtain. While, boards with a large majority of independent outside directors or a non-CEO chairperson are more independent of the CEO, increasing their incentives to monitor the CEO carefully, these boards suffer from having less information about firm operations, which make board monitoring less effective. Such boards realize larger benefits from improved access to firm-specific information that independent inside directors can offer. Thus, if independent inside directors lead to better informed boards, then boards having characteristics that make them more independent while continuing to be well informed, should be associated with better firm performance and stock valuation.

3. Sample Selection and Data Description

3.1 Sample Selection

We extract director information from the Investor Responsibility Research Center (IRRC), firm financial statement data from Compustat and common stock return information from CRSP. The sample period is from fiscal years 1997 through 2003 and includes all firms whose information is available in these three databases. IRRC includes director information for approximately 1,500 firms each year, including the number of other directorships held, if any. IRRC identifies each director as either an employee of the firm, an outsider affiliated with the firm, or an independent outsider. IRRC also has a flag that indicates if the inside director is the CEO. There are 281 firm-years with no CEO listed. We accounted for a missing CEO by the following assignment priority. If the firm had an inside director listed as President, Chairman, or there was only one inside director listed for the firm, we assign that insider as CEO.¹¹ Inside operating officers are those listed as firm employees who are not CEO or Chairman of the board. When multiple observations occurred in the same year for a given firm, we used the most recent data.

¹¹ We excluded 24 firm-year observations with no insiders listed and 75 firm-year observations have multiple or co-CEOs.

From the IRRC database, we obtain information for 108,655 director-year observations for 2,901 firms, or 11,488 firm-years over the course of the seven-year sample. We discard firms when Compustat does not have information leaving 10,377 firm-year observations for 2,499 firms. Next, as with most studies of this nature, we exclude finance and utility firms because of their heavy regulations, which can affect firm performance.¹² Finally, Hermalin and Weisbach (1988) find that inside directors join the board prior to CEO succession. This evidence suggests grooming for succession may be a separate reason for including inside directors on the board. However, it is not clear how grooming an inside director by placing them on the board will affect board performance. It may be a manifestation of an entrenched CEO extending his or her control of the firm into retirement, in which case agency costs rise. Alternatively, it may be an efficient mechanism for selecting a successor, which enables the remainder of the board to make a more informed CEO selection decision, while minimizing transaction costs to the firm. Because it is not clear how inside directors affect performance near a succession, we exclude observations where the CEO is 64 years old or older from the analysis.¹³ The final sample consists of 7,455 firm-year observations for 1,987 firms from 1997 to 2003.

One advantage of the 1997-2003 sample period is that it includes periods of economy-wide prosperity and recession, which reduces any dependency in our results on macroeconomic factors. Perhaps more importantly, the sample period encompasses a period of increased scrutiny of boards of directors and increased pressure for more outside representation. This allows us to examine the influence of these forces on firm decisions to retain certain inside directors on their boards.

Our key dependent variables are industry-adjusted market-to-book ratio and industry-adjusted return on assets (ROA), measured by operating cash flow scaled by prior year-end total assets. Market-to-book value is defined as year-end book value of assets less book value of equity plus market value of equity, all normalized by total assets.¹⁴ We reduce the affect of outliers by using a natural logarithmic transformation. One concern with this measure of firm value is that it may also proxy for firm growth opportunities, rather than indicating the value created by current management. To avoid confounding the relationship between inside directors and firm value, we include other proxies for firm growth opportunities in the regressions to extract out this effect. We also analyze recent operating performance as another measure of firm performance that is not forward looking. We use operating cash flow (CF) rather than EBITDA (Compustat data item 13) because it is less susceptible to earnings management and is therefore more reflective of true operating performance. Fich and Shivdasani (2006) also use an

¹² Finance and Utility firms are excluded by excluding the Fama-French Industry Codes 31, and 45-48.

¹³ The results are qualitatively the same when including all these observations.

¹⁴ $MtB = (\text{Yearend Market Value of Equity} + (\text{Book value of assets} - \text{Book value of equity}))/\text{Total Assets} = (\text{data199} * \text{data25} + \text{data6} - \text{data60})/\text{data6}$ from Compustat.

operating cash flow over assets as their measure of operating performance.¹⁵ This measure is also industry adjusted by subtracting out the median operating performance of the public firms in the same Fama-French industry. In the following analysis, we control for other influences on these firm performance measures following prior studies of this area [Coles et. al. (2008), Anderson and Reeb (2003), Fich and Shivdasani (2006)].¹⁶ A list of all variable definitions is presented in the Appendix.

3.2 Data Description and Univariate Analysis

Table 1A presents descriptive statistics on the different classifications of inside and outside directors on the boards of our sample of firms. The sample includes 7,559 non-CEO inside director-years, of which 11% hold one or more outside directorships. There are several notable differences among insiders. First, we find independent inside directors have a greater frequency of more significant titles such as President and Chief Operating Officers. Conversely, these directors have a lower frequency of administrative titles such as Treasurer or Secretary. For the title of Chief Financial Officer, we find no significant difference in the frequency of its occurrence. Furthermore, independent inside directors have shorter tenures relative to other inside directors. Independent inside directors also have less ownership and are less likely to be founders or relatives of founding families than other inside directors, which is consistent with their appointments reflecting their valuable managerial skills and firm expertise and greater independence. In contrast, inside directors related to the founding family may be on the board primarily due to their family ties, rather than their managerial skills. To the extent that ownership and family connections serve as proxies for the degree inside directors receive private benefits from their own firms, these univariate results suggests independent inside directors have fewer private benefits relative to other inside directors. Both Harris and Raviv (2008) and Raheja (2005) show that insiders receiving fewer private benefits from their firms have greater incentives to share information with outside directors. Although independent inside directors are more likely to be from firms with a dual CEO and chairperson, they are employed by firms with relatively few other insiders on their boards, suggesting they are able to supply the necessary firm-specific information to their boards. Correspondingly, independent inside directors, on average, have a greater proportion of independent outside directors on their boards than do firms with other more dependent inside directors and are more likely to have a majority of independent

¹⁵ Operating Performance = (cash flow from operations) / beginning end of year assets = data308/lag(data6). This measure of cash flow from operations differs slightly from that used by Fich and Shivdasani (2006). They manually calculate cash flow from operations as operating income before depreciation plus the decrease in current assets and the increase in current liabilities. This measure however does not properly account for mergers or acquisition activity in determining the cash flows from operations. Compustat data item 308 provides cash flow from operations adjusted for any M&A activity. Our results are robust to the cash flow measured used in Fich and Shivdasani (2006) as well as to simply using EBITDA scaled by total assets (ROA).

¹⁶ Some studies use board size and the percentage of independent outside directors as explanatory variables, but we exclude them as controls given the endogenous relationship with other measures of board compositions. For robustness, we run the same analysis using these variables as additional controls and find that the results do not change.

outside directors. These initial findings suggest that independent inside directors are more valuable to independent boards than are other more dependent inside directors.

We next examine the characteristics of outside directorships held by independent inside directors, where we limit our analysis to firms within our S&P 1500 sample. Table 1B presents descriptive statistics for the sample of independent inside directors and their outside directorships. First, independent inside directors served on their own board an average (median) of 4 (2) years before receiving their first outside directorship. This suggests it takes a few years for the outside labor market to recognize valuable inside directors and to reward them with additional outside directorships. Their tenure on an outside board is between 4 to 5.5 years. However, 27% of independent inside directors acquire their outside directorships prior to joining their own boards. Eighty-three percent of independent inside directors sit on boards of firms in different Fama-French industries from their own firms. The boards on which they sit generally have a majority of independent directors and a significant portion of these firms employ non-CEO chairs for their boards. This evidence indicates that independent inside directors have greater career opportunities available and greater demand for their managerial skills. There is also evidence that they are valuable monitors in the firms where they serve as directors. Of the independent inside directors, 83% are independent directors, as opposed to gray directors, in the firms where they serve as outside board members, making them more credible monitors.

Table 1C, shows the number of non-CEO inside directors in our sample after making various exclusions. About one in ten non-CEO inside directors holds an additional directorship and the various exclusions (discussed later) do not alter this proportion.

Table 2A, shows the descriptive statistics for key characteristics of our sample firms. The average (median) firm had total assets of \$4.7 (\$1.0) billion per year with 3 (2) business segments with a board size of 9 consisting of about 6 independent outside directors, 1 affiliated director, 1 non-CEO insider and the CEO. This is similar to other studies such as Coles et al. (2008)'s that examines directors over the 1992-2001 period, which have mean sales of \$4.1 billion and a median of two segments. Board size is also in line with other studies and trends toward smaller boards. Bhagat and Black (2002) examine 934 firms from the 1985-1995 period with an average board size of 11.5 members and 3 inside directors. Denis and Sarin (1999) study a sample of 583 firms from the 1983-1992 period and find an average board size of 9.4 members. Coles et al. (2008) finds an average of one non-CEO insider on the board.

Average (median) CEO ownership and board ownership are 3.8% (1.3%) and 7.0% (1.9%) respectively. This is comparable to Bhagat and Black (2001) who find average CEO ownership is 3.8% and average officer and director ownership is 9% for their sample, and is smaller than the Denis and Sarin sample of smaller firms where average CEO ownership is 7.2% and officer and director ownership is

15.7%.¹⁷ Nine percent of the sample firms have at least one non-CEO inside operating officer and director with an outside board seat.

Table 2B contains the sample means of the sample of firms with non-CEO inside directors and compares two sub-samples; firms with and without independent inside directors. Firms with independent insiders are significantly larger, have more business segments, and are older and more financially stable. This evidence supports the hypothesis that inside directors with outside board seats have more expertise and/or specialized skills and are more likely to represent firms with less information transparency. This univariate analysis indicates that firms with independent inside directors on average have no significant difference in their mean capital expenditures or depreciation to sales ratios, R&D, or leverage relative to firms with dependent inside directors. However, boards with independent insiders on average have higher equity capitalization and better operating performance than do other firms with non-CEO inside directors.

Firms with independent inside directors have larger boards, which are typically associated with weaker governance [Yermack (1996)] and lower levels of CEO and board ownership, which are also associated with greater agency problems. However, Coles et al. (2008) finds that larger boards may be optimal for larger firms. Coles et al. argue that for larger boards to function optimally, they require greater firm transparency, which independent inside directors help provide. Firms with independent inside directors are also more likely to have a member of the founding family on the board, but less likely to have a founder on the board. Independent insiders are also associated with a greater percentage of independent outside directors, which is indicative of stronger governance and potentially lower agency costs. Nevertheless, independent insiders are also associated with a lower frequency of separate CEOs and chairs, which suggests that independent inside directors may act as a substitute for non-CEO board chairs. These apparently conflicting results concerning board independence make it difficult to assess the value of independent inside directors, especially relative to other inside directors, without turning to multivariate analysis.

4.0 Determinants of firms with Inside Directors

4.1 Control Variables

Since only a subset of firms choose to have non-CEO inside directors on their boards, it is important to examine the factors influencing a firm's choice of board composition prior to examining the impact of that composition on firm performance. Firm characteristics known to influence board composition are firm size, firm age, number of business segments, financial leverage, past firm performance, stock volatility and investment opportunities [Boone et. al. (2007), Linck et. al. (2008), and

¹⁷ They measure firm size with the market value of equity and report the mean firm size of their sample is 434 million. The mean market capitalization of our sample is 6.5 billion. This explains the differences in ownership.

Coles et. al. (2008)]. We follow these studies and implement similar controls. Specifically, the primary proxies for the importance of firm-specific information and growth opportunities include firm size, research and development expense and capital expenditures. We also control for the number of geographic business segments. CEO age, ownership and tenure serve as proxies for CEO influence, in addition to past firm performance. We also include indicator variables for the presence of a founder or a founding family member on the board.

Next, we introduce two new control variables in our analysis related to a firm's decision to have inside directors. First, to capture the increased push toward outside directors in recent years, we include an indicator variable for the post Sarbanes-Oxley Act (SOX) period, which equals one for observations occurring in year 2001 or later. Second, Denis and Sarin (1999) find past firm performance and corporate control activity can influence board structure. For example, if a firm recently acquired or merged with another firm, then top executives of a target firm could temporarily join the board of the acquirer to assist in the transition period to facilitate target integration into the acquirer and to maintain target capabilities. We control for this possibility through an indicator variable that equals one if a firm engages in any M&A activity within the past two years, as indicated in the SDC database.

4.2 Determinants of inside board representation

Table 3 reports the results of our analysis of the determinants of inside board representation. In model 1, the dependent variable is the percentage of non-independent inside directors on the board. Model 1 shows a negative association between the fraction of non-independent insiders on boards and firms with substantial growth options or valuable firm-specific information. Coles et al. (2008) reports a similar finding contradicting theories that predict insiders to be most valuable. On the other hand, we find a positive relationship between the percentage of non-independent inside directors and CEO tenure and share ownership, which are measures of CEO power. The positive association with CEO tenure is consistent with the Hermalin and Weisbach (1998) model of board evolution in which the longer a CEO remains in office, the greater his/her bargaining power over the board. They argue that longer tenure allows CEOs to reduce board independence by nominating new directors supportive of their positions. The positive association with CEO ownership and more inside directors is also consistent with the evidence of Coles et al. (2008) and Denis and Sarin (1999). The presence of a founder, but not a founding family member, on the board is also positively associated with the proportion of non-independent insiders. The likelihood of non-independent inside representation on the board also relates to past firm performance in a manner consistent with Hermalin and Weisbach (1998), who predict that good performance leads to greater CEO influence and less independent boards. Greater inside representation is also positively associated with recent M&A activity. Lastly, the SOX indicator is associated with a significant reduction in insider board representation since 2001.

In model 2, the dependent variable is the percentage of *independent* inside directors on the board. This model reveals distinct differences in the firm characteristics associated with the board representation of independent inside directors, relative to other inside directors, and especially characteristics that serve as proxies for CEO influence and the importance of firm-specific information. The relationship between CEO tenure and the percent of (independent) inside directors is positive for both model 1 and 2, but it is smaller in magnitude for the independent insiders in model 2. Moreover, a Wald test for the equality of the two coefficients is rejected at the 5% level. Examining the relationship to CEO ownership reveals a much greater difference in CEO influence. The relationship with inside directors as a whole is positive and significant, but the relationship with independent inside directors is not significant, but it is negative in sign. Following the reasoning of Hermalin and Weishbach's model, this is evidence that independent inside directors are in fact more *independent* of the CEO as they are less likely to hold board seats relative to other insiders, as the influence of the CEO rises. The presence of a founder is also positively associated with more non-independent inside directors in model 1, but is not significantly related to independent inside directors in model 2. While founders are definitely influential, it is unclear if they lead to greater agency costs, since Anderson and Reeb (2003) find family presence is associated with better firm performance. These results suggest that the presence of independent inside directors supports the monitoring role of outside directors, rather than representing greater CEO entrenchment.

It is noteworthy that Model 2 reveals that past firm performance is not related to the presence of independent inside directors. This evidence, combined with the results in Model 1, suggests that CEO influence arising from better performance may lead to greater *dependent* insider representation on boards, but it does not necessarily lead to greater representation by *independent* insiders. These results suggest that better past firm performance does not lead to inside directors acquiring more directorships. Thus, good firm performance does not necessarily result in inside directors acquiring additional outside directorships. For an outside board to appoint an inside director of a good performing firm to their board, the outside board must attribute at least part of the performance to an inside director's efforts and abilities.

The earlier negative association between insider representation and R&D or firm growth options found in model 1 is not evident in model 2. In fact, independent inside directors have a significant positive relationship with R&D and capital expenditures. Independent inside directors are also significantly more likely as firm size rises and its number of geographic segments increases. This is in contrast to model 1 and other studies [Coles et al. (2008) and Denis and Sarin (1999)], which report a negative relationship between all inside directors and firm size. Thus, in larger or more geographically diverse firms, where firm-specific information is more complex or more important, independent insider directors are more likely to be on the board than are other more dependent inside directors, consistent with hypothesis H5.

Finally, while the push towards greater outside director representation on boards is related to a lower portion of independent inside directors, the economic impact is lower than that for all insiders. A Wald test finds these two coefficients are significantly different at the 1% level. This is consistent with the trend illustrated in Figure 1 and suggests that firms optimally remove their least valuable inside directors first while retaining their most valuable inside directors, as long as the benefit of their presence is greater than the cost of removing them. This is consistent with Linck et al. (2008) finding that firms may add outside directors, rather than reduce inside directors to increase outside director representation.

Since many firms do not have non-CEO inside directors the dependent variable equals zero for these firms. To account for this truncation of the data we implement Tobit regressions in models 3 and 4 for the percentage of dependent and independent inside directors respectively. The resulting coefficient estimates and the implications are consistent with those of models 1 and 2. R&D remains positive in model 4, but is not longer significant. However, the other proxies for firm complexity and the importance of firm specific information remain significant and positive for independent inside directors and either negative or insignificant for dependent inside directors. Past operating performance is not significantly related to either type of non-CEO inside director in these models. Interestingly, model 3 show the coefficient for the presence of a founding family member on the board is significantly related to the likelihood of the firm having inside directors on the board. Relatives of the founder are less likely to possess the entrepreneurial skills of a founder and are more likely to increase agency costs. Model 4 reveals the presence of a founding family member is not significantly related to the likelihood of having independent insiders on the board.

It is possible that only one independent inside director is sufficient to enhance information transfer among the board. To address this, model 5 (model 6) reports logit regression estimates where the dependent variable equals one if the firm has at least one non-CEO insider (independent insider) on the board. The implication of the results remains the same as those in the earlier models. Together, the evidence in Table 3 underscores the importance of distinguishing between independent inside directors and other more dependent insiders in board of director research, as well as in policy decisions.

5.0 Relationship of Independent Inside Directors and Firm Performance

In this section, we estimate the relationships between inside directors and several standard firm performance measures. Since the decision to have inside directors can be influenced by some of the same factors that affect firm performance measures, we use a Heckman (1979) two-step procedure to produce consistent estimates that account for self-selection in the decision to have inside directors. This also allows us to control for a potential endogeneity problem of omitted variable bias. Specifically, if the private information leading to a firm's decision to have inside directors also affects the key performance

variables then not considering this information will bias our estimates. In our first stage regressions, we use a probit model with the same specification as the logit regression shown in model 3 of Table 3, where the dependent variable is one if the firm has inside directors and zero otherwise. The second stage regressions of firm performance are estimated for the subset of firm-years where inside directors are present. This regression includes control variables along with the inverse mills ratio from the first stage regression to control for the self-selection of inside directors. This inverse mills ratio is also a proxy for the unobserved information affecting a firm's decision to have inside directors. The non-linearity of the inverse mills ratio also helps to solve the identification problem in the system of two equations [Heckman and Navarro-Lazano (2004)]. However, the first stage also includes CEO tenure, which serves as an instrumental variable (IV) positively correlated with the presence of inside directors, but uncorrelated with firm market-to-book¹⁸. The regressions also include a second IV in the form of an indicator for the post Sarbanes-Oxley period, which is negatively correlated with the presence of inside directors, but is uncorrelated with both measures of firm performance.¹⁹

5.1 Independent inside directors and firm performance

Table 4 presents estimates for the Heckman two-stage procedure on the associations of industry-adjusted firm operating performance (model 1) and market-to-book ratio (model 2) with the percentage of independent inside directors on the board. In model 1, we see that independent inside directors are positively and significantly associated with firm operating performance. Changing from dependent to independent inside directors is equivalent to an 11-percentage point increase in independent insider representation. This change is associated with a 138 basis point increase in industry-adjusted operating performance. In model 2, we also find a positive and significant relationship between the percentage of independent inside directors and the market-to-book ratio. Adding an independent insider is associated with a 5.8% increase in the industry-adjusted market-to-book ratio.

Another interesting observation is the coefficient on the inverse mills ratio, which is negative in both models and statistically significant in model 1. Because this variable represents the unexplained portion of a firm's decision to have inside directors, one can view it as a proxy for the private information associated with this firm decision [Li and Prabhala (2006)]. The fact that it is significant for operating performance implies that the private information associated with a firm's decision to have inside directors has a negative impact on firm operating performance. One interpretation of this result is these firms are more difficult to operate relative to firms choosing all outside directors. This implies that firms with non-CEO inside directors have lower operating performance relative to firms without these inside directors,

¹⁸ The Spearman correlation coefficient between CEO tenure and industry adjusted operating performance is .02 (p-value=.02) and industry adjusted market-to-book is .01 (p-value=.23).

¹⁹ The Spearman correlation between SOX and industry adjusted operating performance is .005 (p-value=.61) and industry adjusted market-to-book is .006 (p-value=.55).

but that the former firms perform better with inside directors than they would without them. This is consistent with larger and more complex firms having inside directors.

The negative coefficient on inside directors in the market-to-book regressions implies that these firms have lower industry-adjusted performance ratios, relative to firms without inside directors. If lower market-to-book ratios reflect the presence of larger agency costs, then this interpretation suggests these firms on average have greater agency costs when they have inside directors. Although the coefficient on inside directors is negative, it is not significantly different from zero, which indicates that unobserved firm-specific private information captured by the inside director indicator is unrelated to a firm's market-to-book ratio. However, with either interpretation, when inside directors are independent, they are associated with significantly better operating performance and higher market-to-book ratios.

5.2 Do outside directorships add value?

The evidence thus far suggests outside directorships are an effective mechanisms for identifying differences among inside directors and that those officers with outside directorships are the inside directors associated with better firm performance and value. However, it is not clear, from the analysis presented thus far, whether the directorship serves merely as a signal to identify top performing executives or if the directorship itself serves to strengthen director's independence and improve firm corporate governance, which then translates into better firm performance and higher stock value. We examine these questions next taking two alternative approaches.

First, we consider if an outside directorship is a signal of a talented executive. Specifically, we examine the quality of independent inside directors *prior* to receiving their outside directorships. If these are a firm's most talented executives, their presence on the board should be associated with lower agency costs and better firm performance, reflected in a higher market-to-book ratio prior to their outside appointments. Alternatively, if the outside directorship is a source of improved governance, then the presence of inside directors prior to their outside appointments should have no positive impact on firm performance. The results of this test are shown in models 1 and 3 of Table 5. In the operating performance regression, we find results similar to that in model 1 of Table 4. The presence of these inside directors is associated with significantly higher operating performance prior to their outside appointments. However, in model 3, the coefficient is positive, but it is not significantly different from zero. Together these results suggest that the external labor market for directors is effective at recognizing a firm's most talented executives. However, the results in model 3 suggest these talented insiders alone are not sufficient to reduce agency cost. To examine the importance of outside board seats, we next examine the impact on firm performance when executives receive their first outside directorship appointment.

In models 2 and 4, the key independent variable is simply an indicator variable that equals one in the year an inside director first acquires an outside directorship. The dependent variables are *changes* in

the key performance variables. The change in operating performance is between the year prior and the year after the appointment year. The change in the market-to-book ratio is from the year prior to the current year. Model 2 reveals there is no immediate change in operating performance when the inside director acquires an outside directorship. Thus, an outside directorship itself does not appear to be associated with an immediate improvement in operating performance. However, model 4 reveals that acquiring an outside directorship is associated with improved market-to-book ratios, which captures the market's longer-term forecast of firm performance and indicates that agency costs are ultimately reduced. This is consistent with improved inside director incentives once they obtain outside directorships.

5.3 Independent inside directors with information-critical firms

5.3.1 Principle Component Analysis

In the following analysis, research and development expenses, capital expenditures and an indicator for high-tech industries serve as proxies for the importance of firm-specific information to the board decision making. They each capture slightly different perspectives, but we are most interested in the common factor of *Information Importance*. We employ principle component analysis (PCA) to extract a single factor representing a firm's information importance embedded in these three variables. We use this to generate a factor score, *Information Importance*, for each observation in our sample. Then we classify firms with a factor score above the median as those in which information is particularly important and for firms below the median as firms where information is relatively less important.

In Table 6, we examine if the relationship between independent inside directors and firm operating performance and market value varies by whether proprietary firm information is especially important. We interact the indicator for high *Information Importance* with independent inside director representation. Model 1 reveals a positive and significant relationship between independent inside directors and operating performance for firms in which information is more important. An increase of one independent inside director in high *Information Importance* firms is associated with a 225 basis point increase in industry-adjusted operating performance, or a 19.5% increase in the sample average return on assets. In model 2, we use the industry-adjusted market-to-book ratio to measure firm performance. In high *Information Importance* firms, the relationship with independent inside director representation is significant and positive, while it is also significant for low *Information Importance* firms, the economic impact and statistical significance are not as great. The first result indicates that an increase of one independent inside directors is associated with an 8% increase in a firm's industry-adjusted market-to-book ratio.

5.3.2 R&D Expenses

The previous evidence suggests independent inside directors are more important when firm-specific information is most critical. However, PCA does not capture a directly observable variable and

therefore the results may not be as useful in making governance reforms or evaluating existing corporate governance mechanisms. Therefore, for robustness, we focus on one of the proxies used in the PCA. Specifically, we look at R&D expenses (scaled by total assets) similar to the approach in Coles et al. (2008). We create a binary variable, High R&D, that equals one if the firm is in the top quartile of R&D expense and zero otherwise. *Low R&D* (i.e., the remaining 3 quartiles) is the complement of *High R&D*.²⁰

Table 7 shows the associations of both industry-adjusted operating performance (ROA) and firm market-to-book ratio with the interactions of inside director representation and high and low R&D firm indicators. Model 1 uses the percentage of dependent inside directors as the key measure of insider representation. It reveals that dependent inside directors are not associated with better operating performance in high or low R&D firms, in fact the association is negative and significant in low R&D firms. In contrast, model 2 reveals that independent insiders have a positive and significant relationship with better operating performance in high R&D firms, where firm-specific information matters most. Finally, model 3 includes both types of inside directors and finds similar results, especially in high R&D firms where the difference in the positive association with operating performance is significant at the 1% level.

Next, we examine the association of both types of inside directors and firm market-to book.²¹ In model 4, the results are consistent with those found by Coles et al. (2008), in that greater board representation by inside directors (those without outside directorships) is associated with higher market-to-book ratios in high R&D firms. Model 5 uses board representation of independent inside directors as the key measure of insider representation. Again, the relationship is positive and significant for the market-to-book ratio. However, the interesting result is that the economic impact of *independent* inside directors is twice that of dependent inside directors. Replacing one board member with an inside director, which is equivalent to an 11% increase in insider representation, is associated with a 5.7% increase in market-to-book for an inside director without an outside directorship and a 12% increase for an independent inside director. In model 6, we include both measures of inside directors. Although both types of inside directors have a positive association with firm market-to-book ratios, the relationship is much stronger for independent inside directors. Using a Wald test, we find the difference between independent inside directors and other more dependent inside directors is statistically significant at the 4% level in high R&D firms and at the 1% level for low R&D firms. These results suggest that independent inside directors are more valuable than other more dependent inside directors and that they are associated

²⁰ We use the complement of High R&D for Low R&D firms, because the bottom quartile observations of R&D for firms with inside directors are all zero.

²¹ We include finance and utility firms in models 1, 2 and 3 to follow Coles et al. (2008). The results are qualitatively the same when excluding them.

with better firm performance in all firms, although the relationship is stronger in high R&D firms, where proprietary firm-specific information is most critical.

5.4 Independent inside directors in Complex firms

Firm complexity is another dimension that captures the importance of firm-specific information transfer to the board. Older, larger and more diverse firms have a greater number of different sources and types of information for the board to process. While the information may not be as technical or as pivotal to understanding and valuing growth options available to the firm, being able to understand the complexity of the firm can be valuable to outside board members in their monitoring function. Information transfer is important in these firms, but for slightly different reasons. To capture this alternative dimension of complexity we again employ PCA to derive this common factor. Specifically, we use firm size, firm age, the number of business segments and the number of geographic segments to generate a *Complexity* factor score. Boone et al. (2007) also generate a similar factor score to test their *Scope of Operations* hypothesis. In addition to their measures, we introduce geographic segments as it also represents an additional type of diversity for firms. Similar to the information importance analysis in section 5.3.1, we classify firms with a factor score above (below) the median as high (low) complex firms.

In Table 8 model 1, we find that independent inside directors are still positively and significantly related to better operating performance in both low and high complexity firms. Moreover, an F-test of the equality of the two coefficients reveals they are not significantly different. Thus, measuring the importance of information transfer via firm complexity reveals that independent inside directors do not have a greater association with operating performance in more complex firms. In model 2, we examine whether dependent inside directors are associated with better performance in high or low complex firms. We find no evidence that dependent inside directors enhance operating performance in either case.

Given the evidence in model 1 combined with the results of the previous analysis, it seems that independent inside directors are more important to operating performance when measuring information transfer via the presence of growth opportunities. We test this directly in model 3. Indeed, the interaction with high information importance has a significantly greater association with better operating performance than does the interaction of independent inside directors with high complexity. Thus, independent insiders appear to play a greater role in enhancing the board's ability to evaluate a firm's real options as revealed in operating performance.

In models 4 through 6, we examine the same relationships with the firm's market-to-book valuation. Here we find different effects. First, model 4 reveals that independent inside directors have a much stronger relationship with firm value in highly complex firms relative to less complex firms. In addition, model 5 also reveals a positive relationship with dependent inside directors and firm value in

less complex firms. However, there is no evidence of dependent inside directors enhancing firm value in more complex firms when theory predicts additional inside information to be most valuable to boards. In less complex firms, however, outside directors can more easily monitor the firm reducing agency costs and making it possibly more advantageous to have other inside directors on the board.

In model 6, we examine the relationship of independent inside directors and firm value with both dimensions of the importance of information transparency for the board to see which has a first order effect. Interestingly, we find different results from operating performance. For firm value, independent inside directors have a stronger positive relations along the firm complexity dimension rather than along that of information importance (growth opportunities). This evidence suggests that when monitoring is more difficult (highly complex firms) then independent inside directors are more critical to enhance the outside board members understanding of the organization, enhancing board monitoring and reducing agency costs. Conversely, relaying a greater understanding of the growth options available to the firm to outside board members to gain better advice is more important in day-to-day operations.

5.5 Product market competition

The previous tests have considered the importance of information transfer by inside directors in firm's with technological or organizational complexity. Next, we examine the importance of information transfer in the context of firm survival. More directly, we examine the role of inside directors when governance matters most for firm survival. In highly competitive environments outside directors, motivated to maintain their reputational capital in the market for directorships, have greater incentive to make better board decisions that ensure the firm and their position as a director survive. Thus, to make decisions that are more informed they have incentives to seek out greater information about the firm and thus value independent inside directors more. Further, environments that are more competitive prevent CEOs from enjoying private benefits of greater control and influence in the boardroom as competition places pressure of them to operate the firm efficiently, limiting their ability to extract private benefits and reducing any entrenchment by through a heightened risk of bankruptcy. The incentives of outside directors to be better informed and the competitive pressures on a firm make having independent inside directors more valuable in competitive industries. In Table 9, we re-examine the firm performance and stock valuation regressions conditioning on product market competition. We measure product market competition using a Herfindahl Index for each Fama-French industry²². We classify industries with a Herfindahl Index below the median as facing strong competition and those above as facing relatively low

²² The Herfindahl Index is computed as $\sum_i (\text{sales}_i / \text{sales}_{\text{ind}})^2$, where i is the number of firms in the industry. Higher index values imply greater industry concentration and less competition. Excluding heavily regulated financial and utility firms, leaves 45 Fama-French industries.

competition. Models 1 and 2 reveal that independent inside directors have a much stronger relationship with firm operating performance and stock value in highly competitive industries compared to less competitive industries. This evidence is consistent with independent inside directors being more valuable for corporate governance in highly competitive industries.

5.6 Independent inside directors and board monitoring mechanisms

In Table 10, we examine the ability of independent inside directors to add incremental value to boards with a large majority of independent outsiders or a non-CEO chairperson by interacting independent insider board representation and indicators for these board-monitoring mechanisms. The first proxy for board independence is a binary variable that equals one if independent outside representation on the board is 60% or greater, and is zero otherwise. The second proxy for independent board monitoring is a binary variable that equals one if the CEO and chairman of the board are held by separate individuals. Reformers have long thought it beneficial to shareholder interests for these positions to be held separately. Nonetheless, a significant majority of publicly listed US companies today continue to have dual CEO and board chairpersons. Brickley, et al. (1997) argues that the cost of separation outweighs the benefits in large firms. One of potentially important cost, which they highlight, is the cost of transferring critical firm-specific information to the chairperson. Thus, in larger firms where information complexity is greater, separating these two roles can induce greater costs. If independent inside directors help transfer firm-specific information within the board, then when the CEO and board chair positions are separated we expect independent inside directors to be associated with enhanced firm performance.

Model 1 shows that a board with a substantial majority of independent outside directors is positively associated with firm performance. However, having a separate CEO and chairperson is not significantly associated with improved firm performance. In model 2, we test whether a separate chair or the presence of independent inside directors is more beneficial to a board with a majority of independent outside directors. We find evidence that independent inside directors have the same positive association with better firm performance whether or not the board has a majority of independent outside directors. However, contrary to our hypothesis, we find no evidence that independent inside directors enhance a board with a majority of independent outside directors. Interestingly, we also fail to find that firm performance is positively associated with separation of the CEO and chairperson and a majority of independent outside directors.

In model 3, we examine whether independent inside directors or a majority of independent outside directors enhances a board in firms with separate CEOs and chairpersons. We find no evidence that a majority of independent outside directors strengthens a board with a separate chair. However, we do find evidence that independent inside directors do strengthen boards with a non-CEO chair. Specifically, the coefficient on the interaction between independent inside director representation and an indicator for a

separate chairperson is positive and significant. The same result holds in model 4 when all the interaction terms are included in the regression. This evidence suggests independent insiders do enhance the positive association of having a non-CEO chair and firm performance. Likewise, the independent inside directors have a slightly stronger relationship with performance when the CEO has less influence over the board. The evidence for the market-to-book regressions is also consistent with this pattern of results. A non-CEO chair provides valuable independent oversight, but when information transfer to the chair is poor, the oversight can be less effective. One interpretation of the results in Table 10 is that independent inside directors enhance the information transfer to a non-CEO chair, facilitating improved oversight of senior management, which reduces the agency costs associated with the manager-shareholder conflict of interest. In all the above models, the association of a majority of independent outside directors and a separate chairperson with firm performance is statistically insignificant. This result is consistent with Adams and Ferreira's (2005) conjecture that greater incentives to monitor may be insufficient to ensure effective board oversight of management if a board lacks critical firm-specific information.

6.0 Shareholder Wealth Effects from Firm Announcements – Two Event Studies

6.1 Acquisitions of Outside Directorships by Non-CEO Inside Directors

The results of Table 5 revealed that top executives are positively associated with firm operating performance even before acquiring their first outside directorship. Thus, shareholders are aware of the executive's abilities and reflect this valuation in the stock price. Therefore, when an executive receives an outside directorship the stock price already reflects a portion of the value attributed to that director. However, if the exposure to the external labor market for directors alters directors' incentives in their own boardroom, enabling them to serve more independently of the CEO, then shareholders should respond favorably to these announcements. The result in model 4 of Table 5 is consistent with improved inside director incentives resulting in lower agency costs. We further explore this hypothesis by examining shareholder reaction to the announcement of a non-CEO inside director appointments to outside boards.

We first search for the earliest announcement of each independent inside director's appointment to an outside board on a public firm in our sample using firm SEC proxy statement filings to identify the appointing firm and Factiva to locate the earliest press release. We exclude director announcements dates in which the inside director's firm also reveals other firm/board changes that may elicit share price reactions.²³ We find 111 uncontaminated announcements of director appointments, of which 98 are appointments of independent outside directors and the remainder are director appointments in affiliated

²³ Excluded announcements included those in which the inside director's own firm also announced an M&A transactions, an earnings release or a director change on their own board.

firms or connected firms.²⁴ We compute the cumulative abnormal returns (CARs) over a 3-day window [-1,1], with the announcement occurring on day 0. We estimate a stock's abnormal return using a one-factor market model where the value-weighted CRSP index is our proxy for the market returns over days [-210,-10].

In the full sample of director appointment announcements, the mean (median) announcement effect CAR is .85% (.46%) and marginally significant. This result is slightly different from Perry and Peyer (2005) who examine a similar announcement effect for all executives, including the CEO, and find the mean cumulative abnormal return is negative, but not significantly different from zero.²⁵ Since the main difference in our sample is that we exclude outside appointments of CEOs, these different results suggest that shareholders are more concerned when their CEO takes on another directorship than they are when non-CEO inside directors take on outside directorships. This is consistent with Fich (2005) who finds that shareholders experience a negative wealth effect when their CEO accepts an outside directorship, if they are not near retirement age.

Because our main hypothesis focuses on whether or not outside directorships lead to greater independence of inside directors, we are primarily interested in outside directorships of non-CEO inside directors in firms independent of the officer's own firm. Table 11A shows the mean (median) 3-day CAR for these 98 announcements is 1.07% (.6%) and statistically significant at the 5% (1%) level.²⁶ These results indicate that outside board appointments are positively valued by shareholders. This is consistent with greater exposure to the labor market for directors increasing insider independence from his or her own firm. However, the shareholder wealth rise may simply be a reaction to the labor market signaling that a director is particularly talented. We explore these two possibilities in the next section.

Before turning to this question, we examine if shareholder reactions to outside director appointment announcements are different in the post-SOX sample period when firms face increased pressure to reduce the role of inside directors on their boards. This greater focus on board composition makes it more important for shareholders to identify the most valuable inside directors to keep on their boards. Thirty-two of the outside directorship announcements occurred in 2002 or later. The mean (median) 3-day CAR for these announcements is 2.1% (1%) (where both have p-value<.01). Thus,

²⁴ Of the 13 affiliated or connected announcements, 4 were cases where the sending firm owned at least 5% of the receiving firm, 3 were for appointments to affiliated firms, 2 were cases where the director was related to the sending firm CEO, 2 were interlocking and 2 preceded an acquisition.

²⁵ Reasons for why our findings differ from those of Perry and Peyer are: (1) our sample of outside directorship announcements is for non-CEO inside directors, whereas 55% of their announcements represent CEO director appointments, (2) our announcements are screened for additional extraneous information, unrelated to the appointment that can increase the noise in the announcement effect, and (3) for the main results we focus on outside directorships in unaffiliated firms and exclude any appointments at affiliated firms.

²⁶ The 3-day CAR for the 11 announcements to affiliated directorships is a negative -1.15%, but given the small sample size is not significantly different from zero (p-value=.115).

shareholder gains in recent years are greater when inside directors acquire independent outside directorships. Since the average market capitalization for our sample firms with non-CEO inside directors is approximately \$7.8 billion, it follows that an inside director's appointment to an outside board seat is equivalent to approximately \$78 million increase in shareholder wealth.

6.2 Multivariate analysis of 3-Day CAR of Inside Director Appointment to Outside Directorships

Table 11B examines market reactions to outside appointments after controlling for other differences in the samples using an OLS regression model. It reveals that other factors are also associated with shareholder reactions to appointments of non-CEO inside directors to outside directorships. Model 1 reveals that director age, prior outside directorships, and firm performance influence the magnitude of the shareholder reaction. The positive coefficient on the indicator for directors younger than 60 years old suggests that shareholders benefit more from an independent inside director when that director is not near retirement and thus has stronger career incentives. Model 1 also reveals that shareholders appear concerned that independent inside directors can be distracted by multiple outside directorships. When an executive receives their second outside directorship, the coefficient is negative, but not significant, suggesting that one directorship is sufficient to certify a director's talent and create incentives that improve governance in their own firm. Conversely, when a director becomes "busy" by being appointed to their third board (or greater) the shareholder reaction is significantly lower than the mean reaction, suggesting that investors are concerned about time commitments outside the firm. This interpretation is consistent with Perry and Peyer (2005), who find a negative shareholder reaction to outside director appointments of inside executives (including the CEO) who hold two or more directorships, where agency costs are likely to be greater. Lastly, model 1 reveals that investors may partially anticipate that the external labor market for directorships will recognize a firm's talented non-CEO inside directors. The negative coefficient for past operating performance reveals that better past performance leads to a lower market reaction to outside appointments. This suggests that part of the value shareholders attribute to the presence of an independent inside director already is reflected in a stock's current market price.

In models 2 and 3 of Table 11B, we further examine the relationship with proxies for firm complexity and the importance of information transfer to the board. Both models reveal that in isolation high R&D firms or firms with a majority of independent outside directors are not associated with higher or lower announcement returns. However, Model 4 reveals that both information complexity and board independence affect shareholders' reactions to an inside director appointment to an outside directorship. The F-tests in Table 11 reveal that firms with high levels of R&D and firms with a majority of independent outside directors are both associated with greater announcement effects. Moreover, the effect is greatest in firms *with high R&D and a majority of outside directorships*. In untabulated

regressions, we also examined the effect of a separate CEO and Chair in high R&D firms, but do not find any significant incremental effects.

In model 5, we consider whether a separate CEO and Chair is itself associated with different announcement returns. We find that simply having a separate CEO and Chair is not associated with different announcement returns. However, the cost of information transfer may differ across firms [Brickley et al. (1997)]. Finally, in model 6, we examine a separate CEO and Chair in large firms. The F-test reveals that on average having a separate CEO and Chair does not significantly affect the size of the announcement effect. However, in larger complex firms, shareholders react favorably when the market certifies an officer to be an independent inside director, who is likely to be willing to and able to transfer proprietary firm specific information to the board's leadership. Thus, shareholders gain when the external labor market for directorships recognizes a non-CEO inside director. Consistent with the previous analysis, this gain is greater in larger firms or when board decision making requires complex firm-specific information or when greater transparency is more important, such as when the board has a non-CEO Chair or a majority of independent outside directors. If the market reaction is due solely to a positive signal about the talent of an existing inside director, we would expect no difference in the reactions to these announcements between high/low complex firm or boards with greater/lesser information transparency needs relative to other firms. However, because the announcement effect is greater when information transfer among the board is more critical, these results support the hypothesis that the outside directorships increase inside director's independence from their CEO.

6.3 Departure of Independent Inside Directors

Since the market can often partially anticipate the value of an inside director with an outside directorship, prior to their receiving that directorship, the announcement effect only captures the incremental benefit to shareholders of having a talented inside director recognized by the market. However, when an independent inside director leaves the firm/board, shareholders lose the full value attributed to that director. Thus, examining departures may allow us to measure the full impact that independent inside directors have on shareholder wealth. On the other hand, when an executive's skills are more visible to the external labor market, other firms are more likely to hire the executive away. This greater demand may also lead to investors partially anticipating the departure of an independent inside director, which would still cause us to understate the effect of this independent inside director.

We next conduct an event study for departure announcements of independent inside directors. From our sample, we identify firm-year observations that have fewer independent inside directors than the prior fiscal year. We then searched for the earliest news announcement of the independent inside director's departure. We excluded announcements indicating the inside director was departing to head a

spin-off or if multiple board changes occur. The final sample consists of 123 announcements. We compute the cumulative abnormal returns (CARs) over a 3-day window $[-1,1]$ as above.

Table 12A reports the summary statistics for the CARs for these departure announcements. The mean (median) 3-day CAR for the full sample is negative and significant at the 1% (10%) level. The mean (median) change in shareholder wealth is -1.1% (-.6%). This is comparable to the 1.1% increase reported in Perry and Peyer (2005) when executives with multiple directorships and high ownership receive an additional directorship.

It is possible that investors are reacting to the departing executive's replacement, rather than the departure per se. To address this possibility we exclude announcements that simultaneously name the successor to the departing inside director. The mean and median CARs remain negative and are equal to -1.0% and -.5% respectively. Next, we separately examine shareholder reactions to these announcements when the reason for departure is given. Two frequent reasons for these departures are retirements or to "pursue other interests." The mean (median) 3-day CAR for retirement announcements is -.8% (-.9%) and significant. One interpretation of this negative announcement effect is that these departures reflect serious policy disagreements with the CEOs. In contrast, announcements indicating the director is leaving to become a CEO or to start their own venture are negative, but not significant at traditional levels.

Finally, we examine whether shareholder reactions to departures of independent inside directors are lower during the post-Sarbanes-Oxley era as firms face rising pressure to reduce the number of inside directors on their boards. Forty-seven departure announcements occurred during 2001 or later. The mean (median) CAR is -1.5% (-.7%) and significant. The negative impact on shareholder wealth when an independent inside director departs, especially in the midst of heightened pressure to reduce inside representation on boards, underscores the important role played by these directors on corporate boards.

In Table 12B, we examine similar departure announcements for "dependent" inside directors. Here we find very different results. There is no evidence that the departure of these inside directors negatively affects shareholder wealth. In fact, most of the mean and median CARs are not significantly different from zero and are positive in sign. Thus, while shareholders react negatively to departures of valuable independent inside directors, shareholders appear to be indifferent, if not positive, about the departure of less valuable "dependent" inside directors.

7.0 Robustness

7.1 Alternative measures of independent inside representation

It is possible that firms only need one good inside director willing to reveal additional information to the board to improve monitoring and advising. Thus, we use an indicator for firms with at least one independent insider on the board. Alternatively, the number of other more dependent insiders on

the board could affect the influence of independent insiders. If dependent inside directors merely echo the CEO's information and increase the CEO's influence, then independent insiders are most valuable when they are the only non-CEO inside director on the board and become less valuable if there are additional dependent inside directors. We use the ratio of independent inside directors to all other insiders including the CEO to capture this possible group dynamic. Interestingly, the results are essentially unchanged and our earlier conclusions remain. This suggests that other inside directors do not adversely affect independent inside director abilities to reveal valuable firm-specific information to outside directors.

7.3 Outliers in the data

One disadvantage of large data sets is the increased possibility of erroneous outliers skewing the data and biasing the results. For robustness, we estimate the firm valuation and performance specifications using a least absolute deviations (LAD) estimator, which is robust to outliers in the data. Separately, we Winsorized the data at the 1% and 99% levels to limit the effects of outliers. Both results suggest outliers in the data are not driving the findings, as the results are qualitatively the same.

7.4 Endogeneity

7.4.1 Self-Selection of different inside directors

When firms choose to have inside directors, this is clearly an endogenous decision. However, it is much less likely that they can choose independent inside directors. The external managerial labor market for directorships determines an independent inside director when it awards them an outside directorship. The inside directors a firm selects may be the most talented for the purposes of operating their company, but this does not necessarily translate into skills external firms' desire. However, if firms can predict whether a certain type of inside director eventually will or will not receive an outside directorship, then this decision is correlated with private firm-specific information. If this private information is also related to firm performance, then a selection bias may result, which depends on the type of inside director that is chosen. We explore this by repeating the analysis in Table 4 using different selection models in the first stage.

First, we estimate a selection model for undiscovered inside directors, those who later become independent inside directors within our sample. We then add the resulting inverse mills ratio into the second stage regressions, but we find that it is not significant in either the operating performance or the market-to-book ratio regressions. This suggests that the private information firms have when selecting inside directors, who eventually receive outside directorships, does not significantly related firm performance. Next, we consider firms appointing inside directors with pre-existing outside directorships. In these cases, firms are selecting a unique subset of independent inside directors known to be valuable in the labor market for directors. We again estimate a predictive model for these directors. The inverse mills ratio, which now represents the private information associated with a firm's decision to select these

unique independent inside directors to their board, is negative in the operating performance regression and is insignificant in the market-to-book ratio regressions. Again, the negative association with operating performance suggests that these firms are more difficult to operate. A possible reason for selecting some executives with prior directorships is that they were executives of acquired firms, who held other board seats, and following the merger became directors on the acquiring firm's board. Thus, these executives are more likely in larger firms, which are indeed more difficult to operate. Finally, we consider the private information associated with firms appointing more dependent inside directors, those who do not currently have, nor do they obtain an outside directorship within our sample period. We find the private information associated with these appointments is unrelated to firm operating performance, but it is negative and significantly related to a firm's market-to-book ratio. One interpretation of this result is that private information regarding a firm's decision to appoint a more dependent inside director to the board is associated with a higher level of agency cost, which is reflected in stock market valuations.

7.4.2 Instrumental Variables

The use of the Heckman two-step procedure addresses self-selection and the endogeneity issue of omitted variable bias associated with the private information underlying a firm's decision to have inside directors. However, other factors beyond their own private information may affect the percentage of independent inside directors and firm performance measures. Another technique for addressing the endogeneity issue is to regress the endogenous variable on a set of instruments correlated with independent inside director representation and yet uncorrelated with the error term in the performance regressions. We use the determinants from the model in Table 3 to derive an instrumented variable for the percentage of independent inside directors. As noted earlier, both CEO board tenure and the SOX indicator are correlated with the percentage of independent inside directors and yet are uncorrelated with firm performance. Using the remaining variables as well makes use of all available information within the system. The disadvantage of this approach is that it does not correct for the self-selection of inside directors and it forces all the control variables to have the same slope for firms with inside directors and those without inside directors.

Table 13 presents the results from a two-stage least squares (2SLS) instrumental variable approach. Models 1 and 3 are consistent with the previous findings. Independent inside directors have a positive association with operating performance and market-to-book ratios. In models 2 and 4, we incorporate firm level fixed effects as another means for controlling for the endogeneity problem of omitted variable bias.²⁷ The disadvantage of this method is the greater reliance upon within-firm variation for its explanatory power and if the key explanatory variables do not vary much, the power of the test will be weaker. The results from estimating models 2 and 4 reveal that after controlling for the unobserved

²⁷ This assumes the unobserved factor is invariant over the sample period.

fixed factors, the 2SLS instrumental variable approach still reveals a positive and significant association between independent inside directors and either firm operating performance or market-to-book ratio. In other unreported results, we instrument for the percentage of dependent inside directors and find a negative relationship with these directors and both measures of firm performance. While no one technique is robust to all variations of the endogeneity problem, these results suggest endogeneity is not driving our major results.

7.4.4 Board equilibrium and the transaction costs of having independent inside directors

If firms optimally choose their board structures, then there should be no significant relationship between measures of board composition such as independent inside directors and firm performance. However, as previously noted, independent inside directors are largely a result of an external market mechanism and thus, largely outside the control of the firm. Nonetheless, if firms do influence the appointment of independent inside directors, two types of costs can arise. First, with the recent regulatory pressure for greater outside representation, firms can face criticism for even appointing an insider to the board. This criticism could lead to reduced access to outside sources of capital from institutional investors increasing the cost of capital. Second, it may take several years (see Table 1 Panel B) for the outside labor market to recognize the value of a newly appointed inside director and award them an outside directorship. These costs of appointing an independent inside director imply that some firms, where such an appointment would be optimal, may be slow to adjust their boards accordingly; as such, we can still find cross-sectional associations between the presence of independent inside directors and measures of firm performance.²⁸

7.5 Causality

If directors of better performing firms are appointed by boards of other firms, regardless of the inside director's ability and given that a firm's performance can be serially correlated, then this outside appointment can induce a spurious positive correlation between independent inside directors and firm performance. However, the results in Table 3 uncover no strong relationship between past firm performance and outside directorship appointments, suggesting that this reverse causality argument lacks much empirical content. In addition, if past performance does cause inside directors to have outside directorships, then better past performance should be associated with more inside directors acquiring outside directorships. In untabulated results, we use Poisson regressions to estimate the number of inside directors with outside board seats. We find no evidence that past firm performance relates to the number of inside directors with outside directorships. Thus, our evidence does not support past firm performance leading to a greater presence of independent inside directors.

²⁸ See Coles et. al. (2008) for a nice discussion of other reasons boards may be slow to adjust to their optimal composition. For example, boards may want to delay board changes to coincide with annual shareholder meetings to minimize the negative impact on retiring director reputations.

8.0 Concluding Remarks

This study examines the differences among inside directors in an attempt to reconcile two very different views of the role of these directors on corporate boards. One view of inside directors is they are merely reflections of CEO influence, thus reflective of greater agency costs. The opposing view emphasizes valuable information-sharing role provided by inside directors. Until recently, researchers have largely ignored these varying roles of inside directors when examining firm performance and board composition and, at least implicitly, assumed all inside directors have similar effects. Improve on this earlier analysis by introducing a simple mechanism, outside directorships, for identifying inside directors more likely to be associated with the board enhancing view and less likely to be associated with the entrenchment view. We then also argue that certain firms will benefit much more from inside directors than others. Our main finding is that inside directors with outside directorships are associated with better firm operating performance and higher market-to-book ratios, after controlling for the self-selection in firms with inside directors. The evidence suggests that outside directorships serve to (1) identify the most talented officer-directors and (2) reduce the agency costs between shareholders and CEOs.

Moreover, the benefits of independent insiders are stronger in larger firms and in firms where firm specific information is most important, such as high-tech firms. On the other hand, we find no evidence that other inside directors are as valuable as independent inside directors. We also find evidence that independent inside directors improve the association between monitoring mechanisms of the board, specifically a separate CEO and chairperson, and firm performance. Stock market reactions to firm announcements of appointments and retirements of independent and dependent inside directors are also consistent with our other findings. Specifically, announcements of inside director appointments to unaffiliated or independent outside directorship have positive market reactions, while announcements of their retirements from boards have negative market reactions.

The recent corporate governance reforms, which strongly encourage increased outside representation on boards, have helped to highlight the differing benefits inside directors bring to a board. These reforms primarily resulted in reduced board representation by more dependent inside directors, while leaving most independent inside directors in place. These firm director decisions and the evidence in this study are consistent with inside directors varying significantly in the beneficial roles they play, depending on whether they hold outside directorships. Our evidence indicates that these are important distinctions, which researchers and practitioners should consider when evaluating firm governance structure and policy reform. Just as research has uncovered many varying degrees of independence among outside directors, it seems fruitful to examine further the varying degrees of independence among inside directors. The research presented here provides some useful guideposts for future research on boards of

directors. For example, we find in other research that independent inside directors pose a serious threat to a sitting CEO as a potential replacement and thus provide their boards with a valuable option should they need to replace the current CEO.

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Appendix: Variable Definitions²⁹

| Variable | Definition |
|--|--|
| <i>Performance Variables & Key Independent Variables</i> | |
| Operating Cash Flow (CF) | (Cash Flow from Operations) / Beginning-year Total Assets $\text{data308}/\text{lag}(\text{data6})$ |
| Market to Book (MtB) | (Total Assets – Book Equity + Market Value of Equity) / Total Assets $(\text{data6} - \text{data60} + \text{data199} * \text{data25}) / \text{data6}$ |
| Independent Insider | non-CEO operating officer and director who holds an outside directorship |
| Dependent Insider | non-CEO operation officer and director who does not hold an outside directorship |
| <i>Director Variables</i> | |
| Age | Director age is obtained from IRRC director database |
| Board Tenure | Number of years the director has been on the board is from IRRC |
| Ownership | Percent of common shares outstanding held by the director, including stock options is from IRRC |
| Owns more than 5% | Indicator variable: equals 1 if the director own more than 5% of the common shares outstanding and is 0 otherwise. Stock percentage ownership is from IRRC |
| Total number of insiders on the board | Number of non-CEO inside directors on the board is from IRRC |
| Percent Independent Outsiders on the board | Percentage of outside directors on the board identified in the IRRC directors database as having no affiliation with the firm |
| % Undiscovered Independent Insiders | Percentage of non-CEO operating officers on the board who later receive outside directorships, but currently have none |
| <i>Firm Complexity Variables</i> | |
| Information Importance | Factor score from Principle Component Analysis (PCA) using R&D/Assets, Capital Expense/ Sales, and Technical Industries |
| Complexity | Factor score from Principle Component Analysis (PCA) using the natural logarithm of sales, the natural logarithm of the number of business segments, the natural logarithm of the number of geographic segments and the natural logarithm of firm age. |
| R&D/Assets | $\text{Max}(\text{data46}, 0) / \text{Total Assets}$ |

²⁹ All dataxx variables refer to the corresponding variable identifiers in the COMPUSTAT annual data base

| | |
|--|---|
| Capital Expense/Sales | Capital Expenditure/Total Assets: $\text{data128}/\text{data12}$ |
| Depreciation Expense/Sales | Depreciation Expense/Total Sales: $\text{data14}/\text{data12}$ |
| Ln(Sales) | Natural logarithm of sales (data12) |
| Ln(Assets) | Natural logarithm of assets(data6) |
| Equity Capitalization | Market value of equity at year end. ($\text{data25} \times \text{data199}$) |
| Tangible Assets | Percentage of total assets that are tangible $(1 - \text{data33}/\text{data6}) \times 100\%$ |
| EBITDA | Earnings before interests, taxes, depreciation, and amortization data13 |
| Growth Rate of Assets | Growth rate in total assets from prior year to current year |
| Leverage | $(\text{Long-term Debt} + \text{Debt in Current Liabilities}) / \text{Total Assets}$ $(\text{data9} + \text{data34})/\text{data6}$ |
| Ln(# of Business Segments) | Natural logarithm of the number of business segments listed in COMPUSTAT |
| Ln(# of Geographic Segments) | Natural logarithm of the number of geographic segments listed in COMPUSTAT |
| <u><i>CEO & Board Variables</i></u> | |
| Ln(CEO Tenure) | Natural Logarithm of the number of years the CEO has served on the board |
| CEO Percent Ownership | Percent of common shares outstanding held by the CEO, including stock options, from IRRC |
| Board Ownership | Percent of common shares outstanding held by all directors of the board, excluding the CEO, including stock options from IRRC |
| Board Size | Number of directors on the board is from IRRC |
| Percent Independent Outside Directors | Percentage of independent outside directors on the board |
| >60% Independent Outsiders | Indicator variable: equals 1 if the percent independent outside directors is greater than 60% and is 0 otherwise |
| Percent Affiliated Directors | Percentage of "Linked" outside directors, identified in IRRC as having an affiliation with the firm |
| Separate CEO and Chair | Indicator variable: equals 1 if the CEO is not the chairperson and is 0 otherwise |

| | |
|-------------------------|--|
| Founder-Director | Indicator variable: equals 1 if the founder is on the board and is 0 otherwise |
| Founder Family Director | Indicator variable: equals 1 if a relative of the founder is on the board and is 0 otherwise |

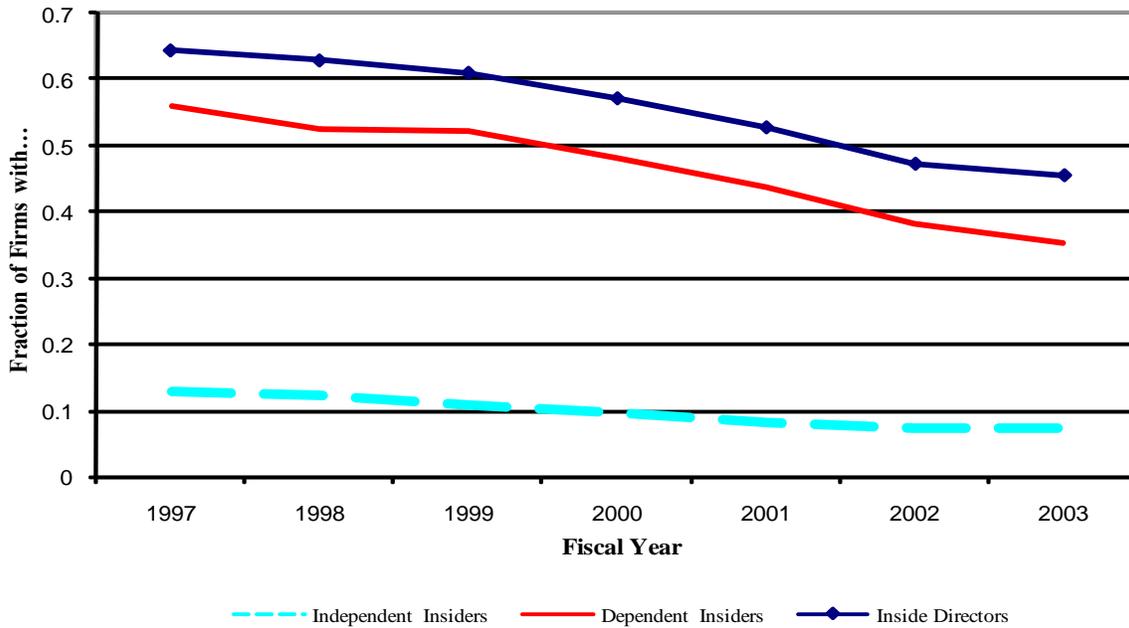
Other Firm & Industry Characteristics

| | |
|-----------------------------|---|
| Firm Age | Number of years the firm is listed in CRSP |
| Volatility | Standard deviation of most recent 3 years of monthly stock returns from CRSP |
| Recent M&A | Indicator variable: equals 1 if the firm engaged in M&A activity within the current or previous year from SDC |
| SOX | Indicator variable: equals 1 if the observations occurs in fiscal year 2002 or later and is 0 otherwise |
| High R&D | Indicator variable: equals 1 if the firm's R&D/Assets is in the top quartile of the industry and is 0 otherwise |
| Low R&D | Indicator variable: equals 1 if the firm's R&D/Assets is not in the top quartile of the industry and is 0 otherwise |
| High Information Importance | Indicator variable: equals 1 if the factor score for the firm is above the median factor score. The factor score is determined using Principle Component Analysis (PCA) of capital expenses/sales, R&D/assets, and high tech industry indicator and is 0 otherwise |
| Low Information Importance | Indicator variable: equals 1 if the factor score for the firm is below the median factor score. The factor score is determined using Principle Component Analysis (PCA) of capital expenses/sales, R&D/assets, and high tech industry indicator and is 0 otherwise |
| High Technical Industry | Indicator variable: equals 1 if the Fama-French industry code = 12(Medical Equipment), 13(Pharmaceutical Products), 14(Chemicals), 22(Electrical Equipment), 32(Communication), 35(Computer Hardware), 36(Computer Software), 37(Electronic Equipment), 38(Measuring and Control Equipment) and is 0 otherwise |
| High Competition | Indicator variable: equals 1 if the firm's industry is below the median Herfindahl Index, where the Herfindahl Index is calculated using all available firms for each of the Fama-French 49 industry definitions as $\sum_i (\text{data12}_i / \text{data12}_{\text{ind}})^2$, where i is the number of firms in the industry and is 0 otherwise |

Figure 1. Firms with Non-CEO Inside Directors during 1997-2003

The figure illustrates the trends in the portion of firms within the sample period of 1997-2003 with non-CEO inside directors. Panel A reports the trend in the percentage of firms with at least one inside director, those with at least one independent inside director and those with at least one other insider. Panel B reports the change in the percentage of firms with various inside directors during the years following the passage of the Sarbanes-Oxley Act of 2002. The passage of the Sarbanes-Oxley Act of 2002 occurred in July 2002, which is the end of the 2001 fiscal year for many firms.

Panel A: Trends in Firms with Inside Directors



Panel B: Changes Surrounding Sarbanes-Oxley

| | <u>2001</u> | <u>2003</u> | <u>Change</u> | <u>p-value</u> |
|---|-------------|-------------|---------------|----------------|
| % Firms with Inside Directors | 53% | 45% | 7%*** | 0.00 |
| % Firms with Independent Inside Directors | 8% | 7% | 1% | 0.46 |
| % Firms with Dependent Inside Directors | 44% | 35% | 9%*** | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 1. Director Level Univariate Analysis

The sample consists of 7,559 director-year observations for 1,987 firms from fiscal year 1997 through 2003, excluding finance and utility firms. The director data come from the IRRC director database. Inside directors are employees of the firm who are not the CEO. Independent insiders are operating officers on the board who hold at least one additional outside directorship. Dependent inside directors do not sit on another board. Outsiders are indicated within the IRRC data set as either affiliated with the firm ("linked") or independent. Panel C displays the number of director level observations of non-CEO inside directors.

| <i>Panel A: All Directors</i> | Non-CEO Insiders | | | Outsiders | |
|--|------------------|-------------|------------|------------|-------------|
| | Dependent | Independent | Difference | Affiliated | Independent |
| Number of Inside Director Observations | 6693 | 866 | | | |
| Percent of sample | 89% | 11% | | | |
| Number of Outside Director Observations | | | | 11487 | 46860 |
| Percent of sample | | | | 20% | 80% |
| <u>Director Characteristics</u> | | | | | |
| President | 0.20 | 0.36 | -0.16*** | | |
| Vice President | 0.09 | 0.04 | 0.05*** | | |
| Senior Vice President | 0.10 | 0.05 | 0.05*** | | |
| Executive Vice President | 0.21 | 0.20 | 0.02 | | |
| Chief Operating Officer | 0.19 | 0.30 | -0.11*** | | |
| Chief Financial Officer | 0.11 | 0.13 | -0.02 | | |
| Treasurer | 0.04 | 0.02 | 0.02*** | | |
| Secretary | 0.07 | 0.03 | 0.04*** | | |
| Age | 54.5 | 54.9 | -0.46 | 59.3 | 59.9 |
| Board Tenure | 12.0 | 7.8 | 4.18** | 11.3 | 7.6 |
| Ownership (%) | 3.0 | 1.4 | 1.64*** | 2.6 | 0.3 |
| Founder | 0.11 | 0.05 | 0.06*** | 0.05 | 0.001 |
| Founder Family Member | 0.08 | 0.04 | 0.04*** | 0.06 | 0.004 |
| Owns more than 5% | 0.14 | 0.06 | 0.08*** | 0.10 | 0.01 |
| Percent Independent Outsiders on the board | 50 | 58 | -7.6*** | 49 | 68 |
| >60% Independent Outsiders | 0.28 | 0.48 | -0.2*** | 0.29 | 0.70 |
| Separate CEO and Chairperson | 0.41 | 0.19 | 0.22*** | 0.61 | 0.68 |
| Total number of insiders on the board | 2.3 | 2.0 | 0.3*** | | |
| Insider Appointed During CEO Board Tenure | 0.72 | 0.84 | -0.13*** | | |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Panel B: Outside directorships of Independent Insiders

| | Mean | Median |
|--|-------|--------|
| Outside directorship prior to own board | 27% | 0 |
| Board Tenure Prior to Gaining Outside Directorship | 4.01 | 2 |
| Board Tenure on Outside Boards | 5.12 | 3 |
| % Ownership in Outside Firm | 0.23% | 0.02% |
| Different Fama-French Industry | 83% | 1 |
| Percent Independent Outsiders | 67% | 70% |
| Recognized as an Independent director | 83% | 1 |
| Recognized as Affiliated director | 17% | 0 |
| Separate CEO & Chair | 88% | 1 |

Table 1. continued*Panel C: Non-CEO Inside Director Observations*

| | Non-CEO Inside Directors | | |
|--|---------------------------------|-------------------------------------|----------|
| | Inside directors | Independent Inside Directors | % |
| Full Sample | 9737 | 1188 | 12% |
| Excluding Finance and Utility Firms | 7559 | 866 | 11% |
| Excluding Observations of CEO Near Retirement ⁺ | 6371 | 715 | 11% |
| Excluding Inside Chairman with Outside Directorships | 5925 | 715 | 12% |
| Excluding Inside Directors with Affiliated Outside Directorships | 5883 | 673 | 11% |

⁺ *Sample used in in remaining analysis*

Table 2. Descriptive Statistics of Sample Firms

The sample consists of 7,455 firm-year observations for 1,987 firms from fiscal year 1997 through 2003, excluding finance and utility firms. The ownership variables are winsorized at the 1% and 99% levels. *Assets* is the total assets of the firm as listed in Compustat. *Number of Business Segments* is the total number of business segments in which the firm operates. *Firm Age* is the number of years the firm has been listed in CRSP. *Leverage* is long-term debt plus debt in current liabilities divided by total assets. *R&D* is the maximum of either data46 from Compustat or zero. *Volatility* is the standard deviation of the past 3 years of monthly stock returns from CRSP. *CEO Ownership* is the percentage of outstanding shares owned by the CEO. *Equity Capitalization* is the market value of equity at fiscal year end. *Tangible Assets* is the percentage of total assets that are tangible. *EBITDA* is earnings before interest taxes depreciation and amortization. *Growth Rate of Assets* is the percentage change from beginning year assets to end of year assets. *Board Ownership* is the percentage of outstanding shares owned by the non-CEO board members. *Founder-Director* equals one if at least one of the directors is a founder. *Founding Family Director* equals one if a relative of the founder, excluding the founder, is on the board. *Board Size* is the number of directors on the board. *Percent Independent* and *Percent Affiliated* directors are the percentage of the respective directors on the board. *Separate CEO and Chair* equals one if the CEO is not the Chairman. *Independent Insider Present* equals one if the firm has at least one non-CEO operating officer and director who holds an outside directorship. Panel A displays the summary statistics for the full sample. Panel B displays the summary characteristics for the sub-sample of firms with non-CEO inside directors.

Panel A: Firm Level

| | N | Mean | Median | P25 | P75 |
|---|----------|-------------|---------------|------------|------------|
| <u>Firm Characteristics</u> | | | | | |
| Assets (\$1,000,000) | 7437 | 4,731 | 995 | 427 | 2,907 |
| Number of Business Segments | 7445 | 3 | 2 | 1 | 4 |
| Firm Age | 6734 | 21 | 15 | 7 | 30 |
| Leverage | 7412 | 0.2 | 0 | 0 | 0 |
| Capital Expense / Sales | 7337 | 0.14 | 0.05 | 0.03 | 0 |
| Depreciation Expense / Sales | 7402 | 0.09 | 0.04 | 0.03 | 0 |
| R&D / Assets | 7437 | 0.04 | 0.00 | 0.00 | 0.0 |
| Volatility | 7440 | 0.15 | 0.13 | 0.10 | 0.18 |
| Equity Capitalization (\$1,000,000) | 7431 | 6,632 | 1,177 | 487 | 3,614 |
| Tangible Assets as % of Total Assets | 6418 | 85 | 90 | 76 | 98 |
| EBITDA (\$1,000,000) | 7403 | 625 | 137 | 52 | 399 |
| Growth Rate of Assets (%) | 7429 | 26 | 9 | -1 | 23 |
| <u>Ownership and Board Characteristics</u> | | | | | |
| CEO ownership (%) | 7444 | 3.84 | 1.27 | 0.48 | 3.26 |
| Board Ownership (excluding CEO) (%) | 7444 | 7.00 | 1.89 | 0.52 | 6.64 |
| Founder-Director | 7445 | 0.20 | 0 | 0 | 0 |
| Founding Family Director | 7445 | 0.12 | 0 | 0 | 0 |
| Board Size | 7445 | 8.9 | 9.0 | 7.0 | 10.0 |
| Percent Independent Outside Directors (%) | 7445 | 63.3% | 66.7% | 50.0 | 77.8% |
| Percent Affiliated Directors (%) | 7445 | 15% | 12.5% | 0 | 23.1% |
| Separate CEO and Chair | 7445 | 0.37 | 0 | 0 | 1 |
| Independent Insider Present | 7445 | 0.09 | 0 | 0 | 0 |

Table 2. continued**Panel B: Sub-Sample Univariate Analysis: Firms with Non-CEO Inside directors**

| | Means | | Difference |
|---|------------------------------------|---------------------------------|--------------|
| | Firms without Independent Insiders | Firms with Independent Insiders | |
| <u>Firm Characteristics</u> | | | |
| Assets (\$1,000,000) | 4,096 | 12,076 | -7979.46*** |
| Number of Business Segments | 2.38 | 2.95 | -0.56*** |
| Firm Age | 19 | 30 | -11.11* |
| Leverage | 0.23 | 0.25 | -0.02 |
| Capital Expense / Sales | 0.12 | 0.12 | 0 |
| Depreciation Expense / Sales | 0.09 | 0.07 | 0.02 |
| R&D / Assets | 0.03 | 0.03 | 0 |
| Volatility | 0.15 | 0.12 | 0.03*** |
| Equity Capitalization (\$1,000,000) | 5925 | 18626 | -12700.28*** |
| Tangible Assets as % of Total Assets | 84.8 | 85.0 | -0.13 |
| EBITDA (\$1,000,000) | 527 | 1661 | -1133.78*** |
| Growth Rate of Assets (%) | 29 | 21 | 8.06 |
| <u>Ownership and Board Characteristics</u> | | | |
| CEO Ownership (%) | 5.16 | 2.97 | 2.19*** |
| Board Ownership (excluding CEO) (%) | 9.47 | 6.02 | 3.45*** |
| Founder on board | 0.28 | 0.22 | 0.06*** |
| Founding family member on board | 0.15 | 0.18 | -0.03** |
| Board Size | 9 | 11 | -1.91*** |
| Percent Independent Outside Directors (%) | 55 | 60 | -5.28*** |
| Percent Affiliated Directors (%) | 15.37 | 13.20 | 2.18*** |
| Separate CEO and Chair | 0.46 | 0.23 | 0.23*** |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 3. Determinants of Inside Director Board Representation

This table presents a multivariate regression analysis of the determinants of inside operating officer representation on corporate boards. The dependent variable in Models 1 and 3 (2 and 4) uses the percentage of all non-CEO non-independent inside directors (independent inside directors). Independent Inside directors are non-CEO operating officers who are also directors in other firms. Models 5 and 6 use binary indicator variables as the dependent variables in Logit regressions. In Model 5 the dependent variable equals one if the firm has at least one non-CEO insider on the board and zero otherwise. In Model 6, the dependent variable equals one if the firm has at least independent inside director on the board and zero otherwise. *Ln(Number of Geographic Segments)* is the natural logarithm of the number of geographic segments in which the firm operates. *Operating CF* is the cash flow from operations (data308) scaled by beginning year assets. *Recent M&A* is a binary variable that equals one if the firm was involved in any merger or acquisition within the previous or current year. *Sox* is a binary variable that equals 1 if the observation occurred in fiscal year 2001 or later. All models include year fixed effects. Models 1,2,5, and 6 include industry fixed-effects. The p-values are reported beneath each coefficient estimate. Standard errors are robust to heteroscedasticity (White 1980) and they are clustered by firm.

| | % Non-Independent Insiders | % Independent Insiders | % Non-Independent Insiders | % Independent Insiders | Presence of Insiders | Presence of Independent Insiders |
|--|----------------------------------|------------------------------|----------------------------------|------------------------------|-------------------------|-------------------------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| | OLS | OLS | Tobit | Tobit | Logit | Logit |
| <u>Information Importance & Complexity</u> | | | | | | |
| R&D/Assets ⁺⁺⁺ | -6.93** (0.019) | 1.35* (0.087) | -22.93*** (0) | 5.65 (0.491) | -0.024 (0.973) | 0.69 (0.65) |
| Capital Expenditure/Sales ⁺⁺ | -0.08*** (0) | 0.017*** (0.004) | -0.18 (0.268) | 0.23* (0.092) | -0.0065 (0.184) | 0.02*** (0) |
| Ln(Sales) ⁺⁺⁺ | -0.59*** (0) | 0.415*** (0) | -0.74*** (0) | 4.78*** (0) | 0.12*** (0.001) | 0.54*** (0) |
| Leverage ⁺⁺⁺ | -2.64** (0.03) | -0.43 (0.167) | -2.82** (0.033) | -1.02 (0.672) | -0.459* (0.073) | -0.19 (0.682) |
| Ln(Number of Business Segments) | -0.315 (0.258) | -0.043 (0.626) | -1.47*** (0) | -0.77 (0.188) | -0.135** (0.034) | -0.038 (0.72) |
| Ln(Number of Geographic Segments) ⁺ | -0.11 (0.747) | 0.27** (0.011) | -2.193*** (0) | 2.658*** (0) | -0.064 (0.403) | 0.33*** (0.009) |
| <u>CEO Characteristics</u> | | | | | | |
| Ln(CEO Tenure) ⁺⁺ | 1.26*** (0) | 0.32*** (0) | 3.08*** (0) | 3.29*** (0) | 0.25*** (0) | 0.41*** (0) |
| CEO Percent Ownership ⁺⁺⁺ | 0.23*** (0) | -0.01 (0.188) | 0.32*** (0) | -0.14** (0.04) | 0.02** (0.011) | -0.01 (0.238) |
| Board Ownership% ⁺⁺⁺ | 0.12*** (0) | 0 (0.959) | 0.229*** (0) | 0.019 (0.576) | 0.03*** (0) | 0 (0.818) |
| Founder Present ⁺⁺⁺ | 3.51*** (0) | 0.22 (0.177) | 6.77*** (0) | 2.75** (0.01) | 0.72*** (0) | 0.22 (0.242) |
| Founder Family Present | 0.66 (0.403) | 0.14 (0.522) | 2.309*** (0.002) | 1.701 (0.148) | 0.36** (0.033) | 0.232 (0.262) |
| <u>Firm Performance & Activity</u> | | | | | | |
| Volatility | 1.95 (0.551) | -0.34 (0.598) | 1.93 (0.607) | -3.23 (0.688) | -0.17 (0.779) | -1.62 (0.316) |
| Operating CF _(t-1) ⁺⁺⁺ | 0.01*** (0) | 0 (0.947) | 0.0979 (0.595) | -0.006 (0.928) | 0.01** (0.025) | 0 (0.799) |
| Recent M&A ⁺⁺⁺ | 0.54* (0.081) | 0.35*** (0.001) | 1.02* (0.054) | 3.51*** (0) | 0.19*** (0.007) | 0.35*** (0.001) |
| Post-SOX ⁺⁺⁺ | -2.14*** (0) | -0.53*** (0.001) | -6.95*** (0) | -6.97*** (0) | -0.5*** (0) | -0.801*** (0) |
| Number of Observations | 7082 | 7082 | 7082 | 7082 | 7073 | 6977 |
| Adjusted(Pseudo)-R ² | 20.65% | 7.10% | 3.68% | 5.88% | 11.08% | 14.97% |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively. +, ++, +++ indicate significance at the 10%, 5%, and 1% levels respectively for F-test comparing coefficients of a multivariate regression of models 1 and 2

Table 4. Firm Performance and Independent Inside Directors

The table presents the results from a multivariate Heckman (1979) two-stage regressions analysis of firm performance. The first stage regression estimates the likelihood of firms selecting to have non-CEO inside directors on the board. The second stage is a multivariate regression analysis of performance for firms selecting inside directors. The dependent variables are industry adjusted (Fama-French) operating performance and the natural logarithm of market-to-book ratio. Firm operating performance is measured as cash flow from operations (data308) scaled by beginning of year assets (CF). The market-to-book ratio is measured as the yearend market value of equity plus the book value of assets less the book value of equity all scaled by total assets. The inverse mills ratio from the first stage is included as a control variable in the second stage. Both models include year and industry fixed effects. The p-values are reported beneath each coefficient estimate. Standard errors are Heckman's efficient estimates.

| | CF | ln(M/B) |
|------------------------------------|----------------------|----------------------|
| | Model 1 | Model 2 |
| % Independent Insiders | 0.0013*** (0.002) | 0.005*** (0.005) |
| CEO Percent Ownership | -0.0018** (0.043) | -0.0132*** (0) |
| CEO Percent Ownership ² | 0.00001 (0.558) | 0.0004*** (0) |
| Board Ownership | 0 (0.981) | 0.001 (0.213) |
| Founder-Director | -0.036*** (0) | 0.021 (0.504) |
| Founding Family Director | -0.032*** (0) | -0.116*** (0) |
| CF | | 1.766*** (0) |
| CF _(t-1) | | 0.684*** (0) |
| CF _(t-2) | | -0.044*** (0.005) |
| <i>Firm Complexity</i> | | |
| Ln(Assets) | -0.008*** (0) | 0.018** (0.013) |
| Number of Business Segments | -0.002* (0.067) | -0.007 (0.117) |
| R&D / Assets | -0.37*** (0) | 2.14*** (0) |
| Depreciation Expense/Sales | -0.01*** (0) | |
| Capital Expense/Sales | | 0.05** (0.016) |
| Ln(Firm Age) | -0.005* (0.073) | -0.033*** (0.001) |
| Volatility | -0.22*** (0) | |
| Inverse Mills Ratio | -.127*** (0) | -0.123 (0.163) |
| Number of Observations | 6302 | 6312 |
| Censored | 3002 | 3002 |
| Firms with Inside Directors | 3300 | 3310 |
| Prob > χ^2 | 0.00 | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 5. Performance Regressions and Undiscovered Independent Insiders

This table presents a multivariate regression analysis within the Heckman (1979) two-stage framework to examine the affect of independent inside directors on firm performance prior to, and at the time of, their receiving their first outside directorship. The dependent variables are industry adjusted (Fama-French) operating performance and the natural logarithm of market-to-book ratio in models 1 and 3. The dependent variables in models 2 and 4 are changes in these variables. *% Undiscovered Independent Insiders* is the percentage of non-CEO operating officers on the board who later receive outside directorships, but currently have none. *Inside Director Acquires a directorship* is a binary variable that equals one if the board has an inside director who acquired their first outside directorship in the present year. All models include year and industry fixed effects. The p-values are reported beneath each coefficient estimate. Standard errors are Heckman's efficient estimates.

| | CF | Δ CF | ln(M/B) | Δ ln(M/B) |
|---|---------------------|---------------------|----------------------|----------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 |
| % Undiscovered Independent Insiders | 0.002*** (0.005) | | 0.003 (0.363) | |
| Inside director acquires a directorship | | 0.00812 (0.577) | | 0.062* (0.083) |
| CEO Percent Ownership | -0.002** (0.032) | 0.0002 (0.862) | -0.013*** (0) | 0 (0.935) |
| CEO Percent Ownership ² | 0.00001 (0.519) | 0.00001 (0.618) | 0.0004*** (0) | 0 (0.818) |
| Board Ownership | -0.00001 (0.95) | 0** (0.027) | 0.001 (0.256) | 0 (0.418) |
| Founder-Director | -0.038*** (0) | 0.041*** (0) | 0.018 (0.573) | 0.003 (0.91) |
| Founding Family Director | -0.032*** (0) | 0.015* (0.083) | -0.117*** (0) | 0.016 (0.482) |
| CF | | | 1.757*** (0) | 0.374*** (0) |
| CF _(t-1) | | | 0.693*** (0) | -0.5462*** (0) |
| CF _(t-2) | | | -0.043*** (0.006) | 0.04389*** (0) |
| <i>Firm Complexity</i> | | | | |
| Ln(Assets) | -0.007*** (0) | -0.0004 (0.872) | 0.021*** (0.004) | -0.0108 (0.102) |
| Number of Business Segments | -0.002* (0.085) | -0.0001 (0.928) | -0.007 (0.126) | -0.001 (0.849) |
| R&D / Assets | -0.368*** (0) | -0.197*** (0) | 2.149*** (0) | 0.042 (0.751) |
| Depreciation Expense/Sales | -0.012*** (0) | -0.006** (0.029) | | |
| Capital Expense/Sales | | | 0.05** (0.015) | -0.053*** (0.001) |
| Ln(Firm Age) | -0.005* (0.098) | 0.002 (0.632) | -0.032*** (0.001) | 0.031*** (0) |
| Volatility | -0.222*** (0) | -0.073 (0.151) | | |
| Inverse Mills Ratio | -.132*** (0) | 0.093*** (0.001) | -0.139 (0.117) | 0.044 (0.531) |
| Number of Observations | 6302 | 5719 | 6312 | 5536 |
| Censored | 3002 | 3002 | 3002 | 3002 |
| Firms with Inside Directors | 3300 | 2717 | 3310 | 2534 |
| Prob > χ^2 | 0.00 | 0.00 | 0.00 | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 6. Performance Regressions: Information Importance

This table presents a multivariate regression analysis within the Heckman (1979) two-stage framework to examine the interactive affect of independent inside directors and an indicator of firm-specific information importance on firm performance. The dependent variables are industry adjusted (Fama-French) operating performance in model 1 and the natural logarithm of market-to-book ratio in model 2. Principle component analysis is used to extract an information importance factor from capital expenditure to sales, R&D to assets, and an indicator for being in a high tech industry. The factor score is then estimated for each observation using the outcomes of this analysis. *High (Low) Information Importance* is a binary variable that equals one if the factor score for the observations is above (below) the median. Both models include firm and industry fixed effects. The p-values are reported beneath each coefficient estimate. Standard errors are Heckman's efficient estimates.

| | CF | ln(M/B) |
|--|----------------------|----------------------|
| | Model 1 | Model 2 |
| % Independent Insiders X High Information Importance | 0.002*** (0) | 0.007*** (0.004) |
| % Independent Insiders X Low Information Importance | 0.0001 (0.863) | 0.005* (0.07) |
| High Information Importance | 0.013* (0.098) | 0.262*** (0) |
| CEO Percent Ownership | -0.001 (0.177) | -0.015*** (0) |
| CEO Percent Ownership ² | 0.000003 (0.898) | 0.0005*** (0) |
| Board Ownership | 0.0001 (0.469) | 0.0001 (0.866) |
| Founder-Director | -0.038*** (0) | 0.045 (0.157) |
| Founding Family Director | -0.031*** (0) | -0.101*** (0) |
| CF | | 1.543*** (0) |
| CF _(t-1) | | 0.643*** (0) |
| CF _(t-2) | | -0.044*** (0.005) |
| <i>Firm Complexity</i> | | |
| Ln(Assets) | -0.006*** (0.003) | 0.007 (0.321) |
| Number of Business Segments | 0* (0.063) | -0.01** (0.019) |
| Depreciation Expense/Sales | -0.013*** (0) | |
| Ln(Firm Age) | -0.006** (0.049) | -0.045*** (0) |
| Volatility | -0.271*** (0) | |
| Inverse Mills Ratio | -0.127*** (0) | -0.083 (0.354) |
| Number of Observations | 6302 | 6312 |
| Censored | 3002 | 3002 |
| Firms with Inside Directors | 3300 | 3310 |
| Prob > χ^2 | 0.00 | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 7. Performance Regressions: High R&D Firms

This table presents a multivariate regression analysis within the Heckman (1979) two-stage framework to examine the interactive affect of independent inside directors and an indicator of firm-specific information importance (using R&D as a proxy) on firm performance. The dependent variables are industry adjusted (Fama-French) operating performance in models 1 through 3 and natural logarithm of market-to-book ratio in models 4 through 6. % *Dependent Insiders* is the percentage of non-CEO inside directors, who do not hold outside directorships, on the board. *High (Low) R&D* is an indicator variable that equals one if the firm's R&D/assets ratio is in the top quartile (bottom 3 quartiles) of the industry. Models 1 through 3 include finance and utility firms. All models include year and industry fixed effects. The p-values are reported beneath each coefficient estimate. Standard errors are Heckman's efficient estimates.

| | CF | CF | CF | ln(M/B) | ln(M/B) | ln(M/B) |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| % Dependent Insiders X High R&D | 0.0005 (0.18) | | 0.001** (0.016) | 0.005*** (0) | | 0.007*** (0) |
| % Dependent Insiders X Low R&D | -0.0004* (0.057) | | -0.0002 (0.27) | 0.0003 (0.733) | | 0.0014* (0.09) |
| % Independent Insiders X High R&D | | 0.005*** (0) | 0.005*** (0) | | 0.011*** (0.001) | 0.014*** (0) |
| % Independent Insiders X Low R&D | | 0.0002 (0.704) | 0.0001 (0.86) | | 0.005** (0.01) | 0.006*** (0.001) |
| R&D / Assets | -0.403*** (0) | -0.388*** (0) | -0.43*** (0) | 2.049*** (0) | 2.175*** (0) | 1.983*** (0) |
| CEO Percent Ownership | -0.002* (0.08) | -0.002* (0.071) | -0.001 (0.112) | -0.014*** (0) | -0.013*** (0) | -0.014*** (0) |
| CEO Percent Ownership ² | 0.00001 (0.763) | 0.00001 (0.679) | 0.000004 (0.846) | 0*** (0) | 0.0004*** (0) | 0*** (0) |
| Board Ownership | 0.00001 (0.965) | -0.00002 (0.891) | -0.00001 (0.943) | 0.001 (0.296) | 0.001 (0.231) | 0.001 (0.283) |
| Founder-Director | -0.038*** (0) | -0.035*** (0) | -0.035*** (0) | 0.01 (0.707) | 0.021 (0.424) | 0.016 (0.535) |
| Founding Family Director | -0.033*** (0) | -0.031*** (0) | -0.03*** (0) | -0.11*** (0) | -0.107*** (0) | -0.105*** (0) |
| CF | | | | 1.841*** (0) | 1.821*** (0) | 1.817*** (0) |
| CF _(t-1) | | | | 0.751*** (0) | 0.745*** (0) | 0.741*** (0) |
| CF _(t-2) | | | | -0.036** (0.018) | -0.035** (0.02) | -0.038** (0.011) |
| <i>Firm Complexity</i> | | | | | | |
| Ln(Assets) | -0.007*** (0) | -0.008*** (0) | -0.008*** (0) | 0 (0.97) | -0.006 (0.326) | -0.003 (0.6) |
| Number of Business Segments | -0.002* (0.072) | -0.002* (0.069) | -0.002* (0.058) | -0.004 (0.251) | -0.004 (0.258) | -0.004 (0.213) |
| Capital Expense/Sales | | | | 0.052*** (0.009) | 0.051** (0.01) | 0.051** (0.01) |
| Depreciation Expense/Sales | -0.012*** (0) | -0.012*** (0) | -0.012*** (0) | | | |
| Ln(Firm Age) | -0.005* (0.073) | -0.005* (0.051) | -0.006** (0.036) | -0.019** (0.034) | -0.022** (0.015) | -0.02** (0.022) |
| Volatility | -0.229*** (0) | -0.23*** (0) | -0.237*** (0) | | | |
| Inverse Mills Ratio | -0.132*** (0) | -0.119*** (0) | -0.119*** (0) | -0.155** (0.032) | -0.129* (0.074) | -0.117 (0.105) |
| Number of Observations | 6302 | 6302 | 6302 | 7327 | 7327 | 7327 |
| Censored | 3002 | 3002 | 3002 | 3493 | 3493 | 3493 |
| Firms with Inside Directors | 3300 | 3300 | 3300 | 3834 | 3834 | 3834 |
| Prob > χ^2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 8. Performance Regressions: Firm Complexity

This table presents a multivariate regression analysis within the Heckman (1979) two-stage framework to examine the interactive affect of independent inside directors and an indicator of firm-specific information importance (using firm Complexity as a proxy) on firm performance. The dependent variables are industry adjusted (Fama-French) operating performance in models 4 through 6 in models 1 through 3 and natural logarithm of market-to-book ratio. Principle component analysis is used to extract a complexity factor from sales, geographic and business segments and firmage. The factor score is then estimated for each observation using the outcomes of this analysis. *High (Low) Complexity* is a binary variable that equals one if the factor score for the observations is above (below) the median. *% Dependent Insiders* is the percentage of non-CEO inside directors, who do not hold outside directorships, on the board. All models include year and industry fixed effects. The p-values are reported beneath each coefficient estimate. Standard errors are Heckman's efficient estimates.

Table 8. continued

| | CF | CF | CF | ln(M/B) | ln(M/B) | ln(M/B) |
|--|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| %Independent Insiders X High Complexity | 0.001** (0.044) | 0.001 (0.152) | -0.001 (0.377) | 0.0074*** (0.002) | 0.007** (0.01) | 0.006 (0.104) |
| % Independent Insiders X Low Complexity | 0.0016** (0.023) | 0.002** (0.022) | | 0.00089 (0.756) | 0.0041 (0.172) | |
| %Dependent Insiders X High Complexity | | -0.0003 (0.385) | | | -0.001 (0.656) | |
| % Dependent Insiders X Low Complexity | | 0.0001 (0.705) | | | 0.004*** (0) | |
| %Independent Insiders X High Information Importance | | | 0.0021** (0.015) | | | 0.001 (0.778) |
| %Independent Insiders | | | 0.0005 (0.507) | | | 0.001 (0.662) |
| High Complexity | -0.004 (0.405) | 0.0015 (0.858) | -0.004 (0.412) | -0.031 (0.14) | 0.03968 (0.233) | -0.0545** (0.011) |
| High Information Importance | | | 0.012 (0.136) | | | 0.254*** (0) |
| CEO Percent Ownership | -0.002** (0.024) | -0.002** (0.024) | -0.001 (0.107) | -0.013*** (0) | -0.01494*** (0) | -0.015*** (0) |
| CEO Percent Ownership ² | 0 (0.475) | 0 (0.472) | 0 (0.778) | 0.00042*** (0) | 0*** (0) | 0.00045*** (0) |
| Board Ownership | 0 (0.809) | 0 (0.776) | 0 (0.346) | 0.00101 (0.128) | 0.001 (0.156) | 0.00033 (0.629) |
| Founder-Director | -0.042*** (0) | -0.042*** (0) | -0.044*** (0) | 0.005 (0.886) | -0.001 (0.962) | 0.024 (0.445) |
| Founding Family Director | -0.037*** (0) | -0.037*** (0) | -0.036*** (0) | -0.14*** (0) | -0.139*** (0) | -0.131*** (0) |
| CF | | | | 1.774*** (0) | 1.779*** (0) | 1.551*** (0) |
| CF _(t-1) | | | | 0.681*** (0) | 0.673*** (0) | 0.639*** (0) |
| CF _(t-2) | | | | -0.044*** (0.007) | -0.045*** (0.005) | -0.045*** (0.006) |
| Ln(Assets) | -0.009*** (0) | -0.009*** (0) | -0.007*** (0.001) | 0.011 (0.18) | 0.012 (0.137) | -0.0002 (0.984) |
| R&D / Assets | -0.371*** (0) | -0.3693*** (0) | | 2.16*** (0) | 2.198*** (0) | |
| Capital Expense/Sales | | | | 0.053** (0.01) | 0.055*** (0.008) | |
| Depreciation Expense/Sales | -0.012*** (0) | -0.012*** (0) | -0.013*** (0) | | | |
| Volatility | -0.196*** (0) | -0.194*** (0) | -0.24*** (0) | | | |
| Inverse Mills Ratio | -0.147*** (0) | -0.148*** (0) | -0.146*** (0) | -.186** (0.031) | -.183** (0.034) | -.161* (0.065) |
| <i>F-Test</i> | | | | | | |
| %IndependentXHigh Complex + % Independent =0 | | | -0.0002 (0.749) | | | 0.0076** (0.017) |
| %IndependentXHigh Information + % Independent =0 | | | 0.0026*** (0) | | | 0.0025 (0.481) |
| %IndependentXHigh Complex - %IndependentXHigh Information =0 | | | -0.0029** (0.027) | | | 0.0051 (0.358) |
| Number of Observations | 6302 | 6302 | 6302 | 6312 | 6312 | 6312 |
| Censored | 3002 | 3002 | 3002 | 3002 | 3002 | 3002 |
| Firms with Inside Directors | 3300 | 3300 | 3300 | 3310 | 3310 | 3310 |
| Prob > χ^2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 9. Performance Regressions: Firms in Highly Competitive Industries

This table presents a multivariate regression analysis within the Heckman (1979) two-stage framework to examine the interactive affect of independent inside directors and product market competition on firm performance. The dependent variables are Fama-French industry adjusted firm operating performance measured by operating cash flow and market-to-book ratio, transformed by natural logs. The Herfindahl Index based on the firm's Fama-French industry definition for COMPUSTAT covered firms measures competition. The Herfindahl Index is computed as $\sum_i (\text{sales}_i/\text{sales}_{\text{ind}})^2$, where i is the number of firms in the industry. All models include year and industry fixed effects. The p-values are reported beneath each coefficient estimate. Standard errors are Heckman's efficient estimates.

| | CF Model 1 | ln(M/B) Model 2 |
|---|----------------------|----------------------|
| % Independent Insiders X High Competition | 0.002*** (0) | 0.0102*** (0) |
| % Independent Insiders X Low Competition | 0.0004 (0.478) | 0.0018 (0.445) |
| High Competition | -0.002 (0.799) | -0.076* (0.052) |
| CEO Percent Ownership | -0.002*** (0.008) | -0.012*** (0) |
| CEO Percent Ownership ² | 0 (0.294) | 0.0004*** (0) |
| Board Ownership | -0.001*** (0) | 0.001 (0.473) |
| Founder-Director | -0.047*** (0) | 0.044 (0.122) |
| Founding Family Director | -0.033*** (0) | -0.098*** (0) |
| CF | | 1.772*** (0) |
| CF _(t-1) | | 0.676*** (0) |
| CF _(t-2) | | -0.047*** (0.002) |
| <i>Firm Complexity</i> | | |
| Ln(Assets) | -0.01*** (0) | 0.021*** (0.003) |
| Number of Business Segments | -0.002 (0.227) | -0.008* (0.068) |
| R&D / Assets | -0.361*** (0) | 2.134*** (0) |
| Depreciation Expense/Sales | -0.013*** (0) | 0.046** (0.025) |
| Capital Expense/Sales | | |
| Ln(Firm Age) | -0.01*** (0) | -0.037*** (0) |
| Volatility | -0.199*** (0) | |
| Inverse Mills Ratio | -.155*** (0) | -0.043 (0.54) |
| Number of Observations | 6618 | 6604 |
| Censored | 3294 | 3294 |
| Firms with Inside Directors | 3324 | 3310 |
| Prob > χ^2 | 0.00 | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 10. Performance Regressions and other Board Monitoring Mechanisms

This table presents a multivariate regression analysis within the Heckman (1979) two-stage framework to examine the interactive effect of independent inside directors and other board monitoring mechanisms on firm performance. The dependent variables are industry adjusted (Fama-French) operating performance in models 1 through 4 and the natural logarithm of market-to-book ratio in models 5 through 8. *>60% Independent Outsiders* is a binary variable equal to one if the board has at least 60% independent outside directors. *Separate CEO and Chair* is a binary variable that equals one if the CEO is not also the Chairman. All models include year and industry fixed effects. The p-values are reported beneath each coefficient estimate. Standard errors are Heckman's efficient estimates

| | CF | CF | CF | CF | ln(M/B) | ln(M/B) | ln(M/B) | ln(M/B) |
|--|----------------------|---------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|-----------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
| % Independent Inside Directors | 0.0013*** (0.002) | 0.0013** (0.034) | 0.0009* (0.071) | 0.0007 (0.263) | 0.005*** (0.006) | 0.005** (0.047) | 0.003 (0.117) | 0.003 (0.314) |
| >60% Independent Outsiders | 0.00652* (0.096) | 0.0069 (0.195) | 0.0076 (0.127) | 0.00674 (0.207) | 0.006 (0.714) | 0.006 (0.786) | 0.008 (0.695) | 0.005 (0.812) |
| Separate CEO and Chair | -0.0004 (0.923) | 0.0004 (0.94) | -0.002 (0.765) | -0.002 (0.736) | -0.007 (0.682) | -0.006 (0.785) | -0.015 (0.521) | -0.015 (0.503) |
| % Independent Inside Directors X 60% Independent Outsiders | | 0.0002 (0.841) | | 0.00035 (0.679) | | 0 (0.897) | | 0.001 (0.735) |
| Separate CEO and Chair X 60% Independent Outsiders | | -0.002 (0.813) | -0.002 (0.735) | -0.002 (0.786) | | -0.002 (0.947) | -0.005 (0.882) | -0.003 (0.923) |
| % Independent Inside Directors X Separate CEO and Chair | | | 0.0017* (0.08) | 0.0018* (0.074) | | | 0.007* (0.088) | 0.007* (0.083) |
| CEO Percent Ownership | -0.0017* (0.056) | -0.0017* (0.059) | -0.0017* (0.057) | -0.0017* (0.058) | -0.013*** (0) | -0.013*** (0) | -0.013*** (0) | -0.013*** (0) |
| CEO Percent Ownership ^z | 0.00001 (0.596) | 0.00001 (0.607) | 0.00001 (0.596) | 0.00001 (0.606) | 0.0004*** (0) | 0*** (0) | 0*** (0) | 0*** (0) |
| Board Ownership | 0.0001 (0.709) | 0.0001 (0.722) | 0.0001 (0.729) | 0.0001 (0.733) | 0.001 (0.177) | 0.001 (0.18) | 0.001 (0.184) | 0.001 (0.185) |
| Founder-Director | -0.035*** (0) | -0.035*** (0) | -0.035*** (0) | -0.035*** (0) | 0.025 (0.448) | 0.025 (0.445) | 0.026 (0.432) | 0.026 (0.427) |
| Founding Family Director | -0.032*** (0) | -0.032*** (0) | -0.032*** (0) | -0.032*** (0) | -0.114*** (0) | -0.114*** (0) | -0.115*** (0) | -0.115*** (0) |
| CF | | | | | 1.765*** (0) | 1.765*** (0) | 1.761*** (0) | 1.761*** (0) |
| CF _(t-1) | | | | | 0.684*** (0) | 0.683*** (0) | 0.684*** (0) | 0.683*** (0) |
| CF _(t-2) | | | | | -0.044*** (0.005) | -0.0438*** (0.005) | -0.0441*** (0.005) | -0.0441*** (0.005) |

Table 10. continued

| | CF | CF | CF | CF | ln(M/B) | ln(M/B) | ln(M/B) | ln(M/B) |
|--|--------------------|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 |
| <i>Firm Complexity</i> | | | | | | | | |
| Ln(Assets) | -0.008*** (0) | -0.008*** (0) | -0.008*** (0) | -0.0076*** (0) | 0.018** (0.014) | 0.018** (0.014) | 0.019** (0.012) | 0.019** (0.012) |
| Number of Business Segments | -0.002* (0.064) | -0.002* (0.063) | -0.002* (0.056) | 0* (0.053) | -0.007 (0.111) | -0.007 (0.11) | -0.007* (0.094) | -0.007* (0.091) |
| R&D / Assets | -0.373*** (0) | -0.373*** (0) | -0.372*** (0) | -0.37*** (0) | 2.138*** (0) | 2.137*** (0) | 2.139*** (0) | 2.137*** (0) |
| Depreciation Expense/Sales | -0.012*** (0) | -0.012*** (0) | -0.012*** (0) | -0.012*** (0) | | | | |
| Capital Expense/Sales | | | | | 0.05** (0.016) | 0.05** (0.016) | 0.049** (0.017) | 0.049** (0.017) |
| Ln(Firm Age) | -0.005* (0.056) | -0.005* (0.055) | -0.005* (0.056) | -0.005* (0.055) | -0.034*** (0.001) | -0.034*** (0.001) | -0.034*** (0.001) | -0.034*** (0.001) |
| Volatility | -0.223*** (0) | -0.223*** (0) | -0.22*** (0) | -0.221*** (0) | | | | |
| Inverse Mills Ratio | -.127*** (0) | -.126*** (0) | -.126*** (0) | -.126*** (0) | -0.119 (0.185) | -0.118 (0.118) | -0.113 (0.206) | -0.112 (0.21) |
| F-Test for % Independent Insiders & Board Monitoring | | 0.0014** (0.021) | 0.0026*** (0.002) | 0.0028*** (0.005) | | 0.005* (0.051) | 0.01*** (0.004) | 0.011*** (0.008) |
| Number of Observations | 6302 | 6302 | 6302 | 6302 | 6312 | 6312 | 6312 | 6312 |
| Censored | 3002 | 3002 | 3002 | 3002 | 3002 | 3002 | 3002 | 3002 |
| Firms with Inside Directors | 3300 | 3300 | 3300 | 3300 | 3310 | 3310 | 3310 | 3310 |
| Prob > χ^2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 11. Shareholder Wealth Effects: Non-CEO Insider Directorship Appointments

This table reports the analysis of the cumulative abnormal return (CAR) for the event window [-1,1] of 98 announcements of non-CEO inside director appointments to outside directorships of non-affiliated independent firms. Day 0 is the first announcement of the outside appointment. The market model is estimated using the value-weighted CRSP index as a proxy for the market returns over days [-210,-10]. The abnormal return is computed for each day in the event window by subtracting the expected return (market model) from the actual return. Panel A reports the mean and median 3-day CAR with p-values from two-tailed tests using a *t*-test for means and sign test for medians, reported below each estimate. The last column reports tests of the hypothesis that the fraction of positive CARs is 50% using a binomial test. *SOX* equals 1 if the announcement occurs after 2001. Panel B reports the results of regression analysis, where the dependent variable is the CAR. *Age <60* equals 1 if the director's age is < 60 years. *2nd Directorship* equals 1 if the appointment is the director's 2nd appointment. *Busy* equals 1 if the appointment is the 3rd or greater appointment. *Large Firm* equals 1 if the total assets are greater than the sample median.

| <i>Panel A</i> | | CAR | | |
|---------------------------------------|----|--------------------|---------------------|-------------------|
| | N | Mean | Median | %>0 |
| Independent Appointment Announcements | 98 | .0107** (0.03) | .006*** (0.01) | 63%*** (0.006) |
| SOX | 32 | .021*** (0.002) | 0.010*** (0.002) | 78%*** (0.001) |

| <i>Panel B</i> | | | | | | |
|---|----------------------|----------------------|----------------------|--------------------|---------------------|---------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
| High R&D | | 0.02 (0.158) | | -0.024* (0.066) | | -0.031** (0.026) |
| >60% Independent Outside directors | | | -0.01 (0.446) | -0.013 (0.235) | | -0.0171* (0.1) |
| High R&D X >60% Independent Outsiders | | | | 0.05** (0.037) | | 0.05** (0.016) |
| Separate CEO and Chair | | | | | -0.03 (0.151) | -0.05*** (0.009) |
| Separate CEO and Chair X Large Firm | | | | | | 0.05** (0.029) |
| Age < 60 Dummy | 0.029* (0.074) | 0.033* (0.094) | 0.027* (0.098) | 0.032 (0.103) | 0.033* (0.067) | 0.036* (0.09) |
| 2 nd Directorship | -0.005 (0.669) | -0.006 (0.656) | -0.006 (0.622) | -0.007 (0.559) | -0.004 (0.726) | -0.007 (0.555) |
| Busy (>2 Directorships) | -0.019** (0.036) | -0.015* (0.062) | -0.02** (0.045) | -0.015* (0.089) | -0.023** (0.044) | -0.022* (0.095) |
| Large Firm | 0.004 (0.768) | 0.004 (0.732) | 0.005 (0.686) | 0.008 (0.548) | 0.003 (0.817) | 0.004 (0.769) |
| Leverage | 0.0297 (0.549) | 0.0506 (0.28) | 0.0324 (0.533) | 0.0598 (0.229) | 0.0135 (0.788) | 0.031 (0.47) |
| Capital Expense/Sales | 0.035 (0.251) | 0.037 (0.22) | 0.032 (0.314) | 0.031 (0.322) | 0.059* (0.098) | 0.035 (0.296) |
| CF _(t-1) | -0.002*** (0.003) | -0.002*** (0.001) | -0.001*** (0.002) | -0.002*** (0) | -0.001** (0.026) | -0.001** (0.011) |
| SOX | 0.017 (0.196) | 0.019 (0.184) | 0.019 (0.169) | 0.021 (0.155) | 0.015 (0.222) | 0.017 (0.208) |
| Constant | -0.0334* (0.095) | -0.0477* (0.085) | -0.0279 (0.148) | -0.0435 (0.104) | -0.0305 (0.117) | -0.03 (0.242) |
| Number of Observations | 96 | 96 | 96 | 96 | 96 | 96 |
| R ² | 10.6% | 12.5% | 11.3% | 14.6% | 13.0% | 19.8% |
| F-Test for >60% Indep + High R&D X >60% Ind | | | | 0.04* (0.1) | | 0.04* (0.08) |
| F-Test for High R&D + High R&D X >60% Ind | | | | 0.02* (0.1) | | 0.02* (0.1) |
| F-Test for Separate CEO/Chair + Separate CEO/Chair X Large Firm=0 | | | | | | -0.01 (0.64) |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 12. Shareholder Wealth Effects from Departures of Inside Directors

This table reports the mean and median cumulative abnormal returns (CAR) for the event window [-1,1] of announcements of non-CEO inside director departures. Day 0 is the date of the first announcement of the departure of an inside director of the firm. The market model is estimated using the value-weighted CRSP index as a proxy for the market returns over days [-210,-10]. The abnormal return is computed for each day in the event window by subtracting the expected return (market model) from the actual return. p-values from two-tailed tests, using a *t*-test for means and sign test for medians, are reported below each estimate. The last column reports tests of the hypothesis that the fraction of negative CARs is 50% using a binomial test. *No Succession* reports the CARs only for the announcements that did not simultaneously announce a replacement. *Retirement* reports the CARs only for the announcements indicating the executive is departing due to retirement. *Outside Firm Promotions* reports the CARs only for the announcements indicating the executive is leaving to become CEO of another firm or start their own firm. *SOX* reports the CARs only for the announcements occurring after 2001. Panel A reports the CARs for the departure announcements of independent inside directors. Panel B reports the CARs for the departure announcements of dependent inside directors.

| <i>Panel A:</i> | | CAR | | |
|-----------------------------|----------|---------------------|-------------------|----------------|
| | <u>N</u> | <u>Mean</u> | <u>Median</u> | <u>%<0</u> |
| All Departure Announcements | 123 | -0.011*** (0.01) | -0.006* (0.1) | 58%* (0.1) |
| No Succession Announcements | 84 | -0.010* (0.07) | -0.005 (0.196) | 56% (0.16) |
| Retirement Announcements | 70 | -.008* (0.1) | -0.009 (0.18) | 59%* (0.09) |
| Outside Firm Promotions | 22 | -0.026 (0.11) | 0.003 (0.83) | 45% (0.74) |
| SOX | 47 | -0.015** (0.04) | -0.007 (0.14) | 62%* (0.07) |

| <i>Panel B:</i> | | CAR | | |
|-----------------------------|----------|--------------------|------------------|---------------|
| | <u>N</u> | <u>Mean</u> | <u>Median</u> | <u>%<0</u> |
| All Departure Announcements | 109 | -0.00067 (0.89) | 0.00062 (0.7) | 48% (0.71) |
| No Succession Announcements | 65 | 0.0003 (0.97) | 0.00026 (0.8) | 48% (0.68) |
| Retirement Announcements | 71 | 0.0031 (0.59) | 0.0037 (0.34) | 44% (0.87) |
| Outside Firm Promotions | 13 | 0.0113 (0.19) | 0.02 (0.58) | 38% (0.87) |
| SOX | 21 | 0.0085 (0.16) | 0.0099 (0.19) | 33% (0.96) |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively

Table 13. 2SLS Instrumental Variables Performance Regressions

This table presents a multivariate regression analysis using a two-stage least squares instrumental variable framework to examine the effect of independent inside directors on firm performance. The dependent variables are industry adjusted (Fama-French) operating performance in models 1 and 2 and the natural logarithm of market-to-book ratio in models 3 and 4. The p-values are reported beneath each coefficient estimate. Standard errors are robust to heteroscedasticity (White 1980) and they are clustered by firm, except in Models 2 and 4 that use firm fixed effects. All models include year fixed effects and models 1 and 3 include industry fixed effects.

| | CF | | ln(M/B) | |
|------------------------------------|----------------------|----------------------|---------------------|----------------------|
| | Model 1 | Model 2 | Model 3 | Model 4 |
| % Independent Inside Directors | 0.054*** (0) | 0.009** (0.031) | 0.068** (0.012) | 0.031** (0.037) |
| CEO Percent Ownership | -0.001 (0.585) | -0.001 (0.301) | -0.006 (0.227) | 0.0002 (0.966) |
| CEO Percent Ownership ² | 0.00002 (0.743) | 0.00002 (0.487) | 0.0003* (0.067) | -0.0001 (0.2) |
| Board Ownership | 0.00005 (0.883) | -0.001** (0.025) | 0.001 (0.375) | -0.002*** (0.006) |
| Founder-Director | -0.013 (0.239) | -0.01 (0.211) | 0.038 (0.197) | -0.078*** (0.002) |
| Founding Family Director | -0.018 (0.161) | 0.015 (0.173) | -0.081** (0.012) | 0.115*** (0.001) |
| CF | | | 1.561*** (0) | 0.845*** (0) |
| CF _(t-1) | | | 0.526*** (0) | 0.201*** (0) |
| CF _(t-2) | | | -0.04*** (0.004) | -0.107*** (0.006) |
| <i>Firm Complexity</i> | | | | |
| Ln(Assets) | -0.02823*** (0) | -0.012*** (0.007) | -0.008 (0.619) | -0.245*** (0) |
| Number of Business Segments | -0.003 (0.155) | 0.001 (0.583) | -0.015*** (0) | -0.0002 (0.962) |
| R&D / Assets | -0.566*** (0) | -0.364*** (0) | 2.32*** (0) | 0.153 (0.31) |
| Depreciation Expense/Sales | -0.014*** (0) | 0.012*** (0) | | |
| Capital Expense/Sales | | | 0.004*** (0) | -0.0004 (0.794) |
| Ln(Firm Age) | -0.014*** (0.002) | -0.037*** (0) | -0.045*** (0) | -0.152*** (0) |
| Volatility | -0.221*** (0.006) | -0.151*** (0) | | |
| Number of Observations | 6285 | 6285 | 6311 | 6311 |
| Prob >F | 0.00 | 0.00 | 0.00 | 0.00 |

*, **, *** indicate significance at the 10%, 5%, and 1% levels respectively