Board Independence, Proprietary Information, and Firm Performance

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Abstract

Some theories predict that requiring boards to become independent might result in suboptimal board structure and reduce shareholder value. These predictions revolve around specific information environments where firm insiders possess valuable information. This paper examines whether Sarbanes-Oxley related regulations, by mandating board independence, negatively affected firms with high levels of proprietary information. My findings show that forced board independence improved performance of the firms with higher levels of proprietary information, suggesting that benefits from improved monitoring outweighed possible loss in value from switching to theoretically suboptimal board structure in those firms.

1. Introduction

The board of directors serve as an essential component of corporate governance in modern firms. The role of outside directors, in particular, has been viewed as especially important by academics, practitioners, and regulators. The main advantage of outside board members arises from the fact that their career is less dependent on the Chief Executive Officer (CEO), whom the board is supposed to advise and monitor on behalf of the firm's shareholders. Series of regulations in early 2000s – including the Sarbanes-Oxley Act (SOX) and NYSE and Nasdaq listing requirements – clearly illustrate the regulators' and the market's interests in outsider director representation on corporate boards.

A large literature in economics and finance examine the effect of outside director representation on firm performance but has produced inconclusive empirical results. Two main reasons exist. First, it has been well-documented that board composition is endogenous (e.g., Hermalin and Weisbach, 1998). For example, firms with poor performance may choose to adopt different board structures, in which case firm performance is driving the increase/decrease in outside board representation. There may also be some unobservable characteristic that affects both performance and board structure. Second, some studies predict that increasing outside director representation on boards may not always benefit firms. Harris and Raviv (2008), for example, show that shareholders can sometimes be better off with an insider-controlled board. In their model of optimal control of board of directors, shareholders prefer an insider-controlled board when benefits of retaining insiders' information outweigh the direct agency costs. Consequently, empirical studies that examine the relationship between board independence and firm performance have produced inconclusive results.

This paper utilizes the series of regulatory changes and updates on security exchange listing requirements in the early 2000s to provide a casual empirical evidence on *when* the effect of outside board representation on firm performance is positive. Previous studies also use this regulatory 'shocks' because they required boards to have majority independent directors (Duchin, Matsusaka, and Ozbas, 2010; Chen,

Cheng, and Wang, 2015; Guo and Masulis, 2015; Balsmeier, Fleming, and Manso, 2017).[1] This paper's main contribution is to provide empirical evidence on the theoretical prediction of Harris and Raviv (2008) that shareholders of firms with valuable insider information might be better off with insider-controlled boards. They argue that insiders are better able to exploit insiders' information and the net effect on shareholder value might be greater with insider-controlled boards despite the agency problem. The SOX-related regulatory changes present an ideal setting to test whether insider-controlled boards are better for shareholders in some cases. On the one hand, since the regulatory changes forced all listed firms to have majority independent boards, firms that were in optimal insider-controlled state should have lost value as a result of this change. On the other hand, if improved monitoring due to greater outside board representation outweighs the loss in value from switching from optimal inside-controlled board, then those firms may have gained value.[2] Thus, whether firms with important inside information ultimately gains or loses value as a result of an exogenous change in outside board representation becomes an empirical issue.

Using the two-stage least-squares (2SLS) approach, I find that exogenous increase in outside director representation on boards improves firm performance when the importance of insider information increases. The importance of insider information was proxied by firm-level innovation measure – which I call proprietary information – constructed by Kogan, Papanikolaou, Seru, and Stoffman (2017).[3] The results hold when firm performance is measured by Tobin's Q or ROA and when using different proxies of importance of insider information, subsampling based on insider information importance ranks, and subsampling based on industries. This suggests that the gain in value from improved monitoring outweighs the loss in value, for some firms, from switching to less-optimal board structures. My main result is somewhat surprising because Harris and Raviv (2008) predicted that firms with critical insider information

[1] Duchin et al. (2010) further shows that outside board's effectiveness depends on the cost of information acquisition of the directors.
[2] Board of directors also has an advisory function. However, the SOX-related regulatory changes mandated increase in monitoring committees of the boards – audit, compensation, and nominating committees. Thus, I assume there was no change in the advising capability of the boards due to these regulations.
[3] The innovation measure estimates the economic value of firms' patents by combining patent data and firm stock price movements. Further discussed in Section 2.3.

would benefit more from insider-controlled boards. Since all listed firms switched to or remained in majority independent board status, their prediction is not consistent with my results. This may be because in their model, the magnitude of agency costs does not vary systematically across firms with varying importance of insider knowledge. While insiders may utilize insider information much better than outsiders, the magnitude of agency costs might have been even greater in firms where insider information was critical. If this is true, my main findings can be explained.

This paper contributes to the literature in several important ways. First, it relates to the literature on outsider directors and provides causal evidence on whether and under what kind of information environment increased outsider representation on boards affect firm performance. Preliminary results suggest that increased representation of independent board members improved firm performance in firms with higher levels of proprietary information. Second, my empirical design tests the implications of Harris and Raviv (2008) that shareholders are likely to benefit from insider-controlled boards when insiders' private information is much valuable than the outsiders' information. Preliminary results seem to contradict their theoretical predictions.

The rest of the paper is organized as follows. Section 2 discusses the regulatory changes, identification strategy, and related research. Section 3 describes the sample and data. Section 4 presents the main analysis. Section 5 provides additional analysis, and Section 6 concludes.

2. Background and related research

2.1 Regulatory reforms and identification strategy

In my empirical analysis, I utilize a series of regulatory reforms in the late 1990s and early 2000s that affected the structures of corporate boards of directors. In response to growing concerns regarding financial misreporting, NYSE and NASD in 1999 required that listed firms maintain fully independent corporate audit committees. Prominent corporate scandals that soon followed (e.g., Enron, WorldCom, and Tyco)

substantiated the governance concerns and eventually led to the Sarbanes-Oxley Act (SOX) of 2002 and stricter listing standards for NYSE and Nasdaq. This series of regulations addressed the importance of dominant presence of independent directors on the boards and clarified the definition of director independence.[4] The SOX required public firms to maintain 100% independent audit committee, and the NYSE and Nasdaq listing rules further required majority independent board of directors as well as 100% (NYSE) and majority (Nasdaq) independent compensation and nominating committees.

This series of regulations provide an excellent framework to examine the effect of board independence on public firms. Similar to other studies that use this empirical setting (Duchin et al., 2010; Banerjee, Humphery-Jenner, and Nanda, 2015; Chen et al., 2015; Balsmeier et al., 2017), my identification strategy is based on the fact that only the firms that were not in compliance with these rules were forced to change the composition of their boards during this period. Therefore, firms that were already in compliance with the rules can be classified as the control group, and firms that were forced to increase outside board representation serve as the treatment group. In line with Duchin et al. (2010) and Chen et al. (2015), noncompliance status at the beginning of the regulatory change period serves as an instrument to identify the exogenous increase in outside board representation on the treated firms' boards of directors.

Figure 1 shows how independent director representation increased around the time of the regulations. In my sample of firms, roughly 80% of the firms had majority independent director representation on boards in the beginning of the regulations. That ratio increased to more than 95% by 2005 when all the regulations were adopted.[5] Thus, around 15% of the sample experienced a mandatory increase in outside director representation in their boards.

[4] Definitions of independence according to SOX and NYSE/Nasdaq listing rules are not precisely identical. However, in essence, a director is independent if the director does not accept any significant compensation (other than the director's fee) and is not an affiliated person of the firm or its subsidiaries.

[5] The primary reason for why about 5% of the firms did not became independent boards is because the definition of 'independent' directors is different for regulators, stock exchanges, and data providers.

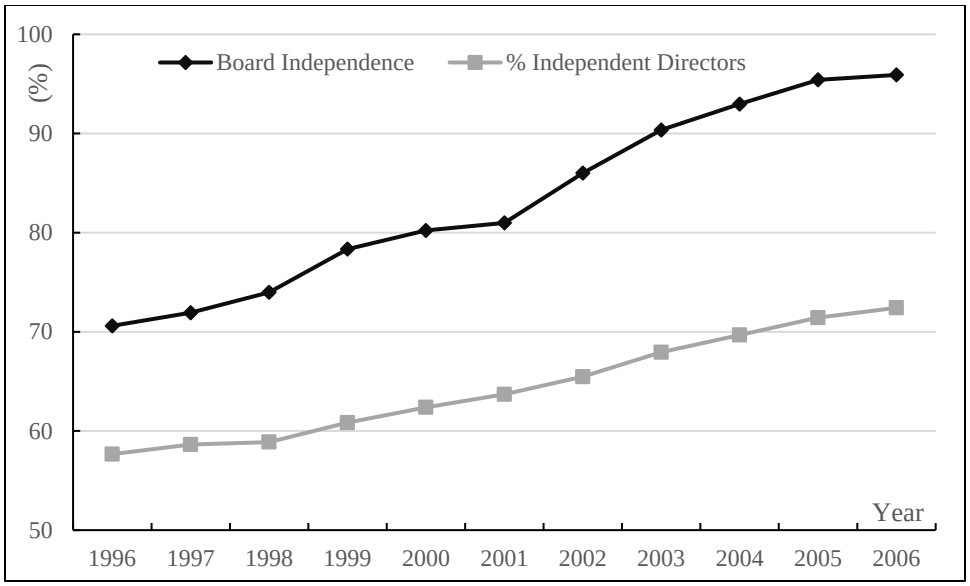

Figure 1. Changes in board structure from 1996 to 2006
The mean percentage independent directors and the percentage of independent boards in the final sample. The sample consists of firm-year observations with valid information on board characteristics, firm characteristics, and innovation measure.

Since the regulations spanned multiple years and had multiple regulatory requirements, a precise empirical design is not unambiguous. First, these SOX-related reforms affected the overall board independence as well as the full audit committee independence. Previous studies have used either criteria to identify treatment, but I use the overall board independence requirement to distinguish the treated and control groups. The main reason is that in the model of Harris and Raviv (2008), whether insiders or outsiders control the board is of the utmost interest. Moreover, reforms related to audit committee independence spanned a longer period and the implications are more subject to confounding factors (Chen et al. 2015). Second, the precise starting year and the ending year of the regulations are unclear. SOX-related regulatory reforms on corporate boards began in 1999, when the Blue Ribbon Committee (BRC) recommended that NYSE and Nasdaq require corporate boards to have fully independent audit committees. SOX was subsequently written into law in 2002. In 2003, the U.S. Securities and Exchange Commission (SEC) approved NYSE and Nasdaq regulations that required a majority of directors on the board to be independent. By 2005 all of the relevant requirements were phased in. I use 2001 as the year that identifies treatment status. That is, if a firm did not have majority independent board in 2001 the firm is assumed to have received ‘treatment’ and the subsequent increase in outsider board representation is presumed to be

exogenous. As the ending year, I use 2005 because almost all of the firms that were subject to these regulations became compliant by that time. Previous studies have used different combination of the years in their analysis, and my results yield qualitatively similar results when using various combinations.

2.2 Related research – explanation of both forces at play

A large literature in finance examines the role of board of directors in corporations (e.g., Hermalin and Weisbach, 1998; Adams and Ferreira, 2007; Fich and Shivdasani, 2006; Harris and Raviv, 2008; Coles, Daniel, and Naveen, 2008; Adams, Hermalin, and Weisbach, 2010). Much of the literature focuses on whether outside directors ultimately increase firm value. Proponents of SOX claim that increased outside director presence will improve monitoring function of the boards, leading to increased firm value. However, some scholars argue that it is not so clear and the interaction (i.e., information exchange) between insiders and outsiders must be considered when evaluating whether outside directors will effectively improve firm performance (Raheja, 2005; Adams and Ferreira, 2007; Harris and Raviv, 2008).

Earlier empirical studies were not able to produce conclusive results on the effect of board independence on firm value, mainly due to the endogeneity of board structure (Adams et al., 2010). Recent stream of research effectively deals with the endogeneity using the SOX framework. These studies have found that outside director representation improves firm performance when the outsiders' information acquisition cost is low (Duchin et al., 2015) and by mitigating the costs of CEO overconfidence (Banerjee et al., 2015). Other studies document other possible benefits of board independence such as reduced earnings management (Chen et al., 2015) and increased innovation output (Balsmeier et al., 2017).

This paper attempts to empirically document an information environment in which increase in outside director representation could negatively affect firm value. Harris and Raviv (2008), for example, argue that shareholders will prefer insider-controlled board when insider directors' knowledge is more valuable than that of the outsiders. That is, if the benefit of retaining insider information exceeds the agency costs from insider-control, shareholders will be better off with insider-controlled board. If this is true, SOX-

related changes that mandated board independence should have negatively impacted the firms that were in its optimal insider-controlled state.[6]

Although Harris and Raviv (2008)'s prediction could be true, the benefits from improved monitoring cannot be overlooked. For example, Guo and Masulis (2015) document a causal relation between board independence on CEO monitoring and Banerjee et al. (2015) document an increase in operating performance and market value of firms with overconfident CEOs for firms that were affected by SOX. With this recent empirical evidence that shows gain in value from adding outside directors to the boards, whether adding outside board members to firms with valuable insider information improves shareholder value needs to be evaluated empirically.

2.3 Innovation as a measure of importance of insider information

To assess the prediction of Harris and Raviv (2008), I must first identify firms whose insiders possess more valuable information compared to the outsiders. I proxy the importance of insider information by the firm's reliance on technological innovation. The logic is as follows. If technological innovation is very important to the firm, the information that insiders possess must be very valuable, especially until the value of the information is protected by patents. Thus, I classify firms with large innovation output as firms with large *proprietary information* (i.e. valuable insider information).

Kogan et al. (2017) recently proposed a new measure of innovation that captures the economic importance of innovation.[7] Unlike previous innovation measures that use only patent-related information, their new measure combines patent data with stock market response to news about those patents. Since this paper is mainly concerned with proprietary information that pertains to shareholder value, the new innovation measure by Kogan et al. (2017) seems more appropriate.

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[6] It should be noted that in their model, board control is not strictly determined by the proportion of inside or outside directors on the board. For example, even if the number of inside directors exceed the number of outside directors, a board could still be an outsider-controlled board if outside directors are given control over the decisions modeled in their paper.

[7] Data is available on the authors' website.

To proxy the level of proprietary knowledge for a firm at a given point in time, I use the average annual innovation score in the past 6 years.[8] The argument is that the average innovation output in recent years is probably highly correlated with the intensity of innovation in the given year. Since the intensity of innovation is unobservable until patents are realized, the historical annual average is used. Using the innovation score for the given year can produce misleading results because not all firms produce patents every year. Manual inspection of the data confirms that even innovation-active firms do not necessarily produce patents every year.

3. Sample and data

3.1 Description of the sample

To be included in the final sample, the firm must have the following information during the years when regulatory reforms occurred – board information, firm characteristics, and innovation score. Board information is obtained from Investor Responsibility Research Center (IRRC). Firm characteristics are obtained from Compustat, and innovation scores (proxying proprietary knowledge) are available from Kogan et al. (2017) website. As will be described in Section 3.2, my empirical design requires firms to have all the information in years 2001 and 2005, which are set as the beginning and ending years of the regulations. Firms in the financial and utilities industries are excluded from the sample. My final sample consists of 433 firms.

In this preliminary analysis, two measures of performance are examined: Tobin's Q and return on assets (ROA). Tobin's Q is the main variable of interest because it contains the shareholder value component of firm performance. Examination of ROA allows for an inference on whether there is an improvement in operation efficiency as well. In future analysis, stock returns will be included to directly

[8] I use the innovation measure that is scaled by firm size to make comparisons across firms (equation 10 of Kogan et al., 2017). The historical average annual proprietary knowledge from 1996-2001 is used. 6 years is arbitrarily chosen because board information starts in 1996. Results do not change when the timespan to calculate historical annual average is reduced.

see how the market reacted during this period. As in Duchin et al. (2010), Tobin's Q enters the regressions as log changes to have a percentage interpretation of the coefficients.

Since the empirical design closely follows Duchin et al. (2010), this paper uses the same set of control variables. Firm size, leverage ratio, and firm age are included to control for firm characteristics, and board size controls for board characteristics.[9] Industry-fixed effects (using 30 Fama-French industries) are also included to control for the possibility that the innovation measure is proxying some unobservable industry-level characteristic that affects firm value.

Table 1 reports the summary statistics for regulation-compliant vs. noncompliant firms in 2001 and 2005. Firms that already complied with the board independence requirement as of 2001 is classified as compliant. Panel A shows the characteristics of compliant and noncompliant firms in 2001. Other than the percentage of independent directors, firms do not systematically differ in any of the main variables. Panel B shows how the values changed after all the regulatory changes have phased in. There still seems to be no systematic difference in firm performance measures at first glance. However, it will be shown later that the innovation score measure moderates the relationship between independent director representation and firm performance.

[9] Firm size is the natural log of total assets. Leverage ratio is the book leverage ratio. Firm age is the years since the firm first appears on Compustat with valid asset information. And board size is the number of board of directors.

Table 1. Summary Statistics

Panel A reports the summary statistics of regulation-compliant vs. noncompliant firms as of 2001, the beginning year of the regulations. The compliance status was determined by whether the board of directors were independent at the time when the regulations were adopted. Tobin's Q is the market value of assets divided by the book value of assets. ROA is calculated as operating income before depreciation divided by book assets. Independent directors (%) is the number of independent directors divided by the total number of directors. Board size is the total number of directors. Firm size is measured as the natural log of total assets. Book leverage ratio is debt divided by book assets. Firm age is the number of years since the firm first appeared on Compustat with valid asset information. Innovation score is obtained from Kogan et al. (2017).

Panel B reports the summary statistics of regulation-compliant vs. noncompliant firms as of 2005, the year in which all the regulations were phased in.

Panel A. Comparison in 2001					
	Compliant (N = 374)		Noncompliant (N = 59)		t-stat for difference
	Mean	S.D.	Mean	S.D.	
Firm Value / Profitability					
Tobin's Q	2.20	1.61	2.26	1.38	-0.32
ROA (%)	13.38	9.50	11.86	9.35	1.16
Board Characteristics					
Independent Directors (%)	71.20	11.69	35.69	8.77	27.49
Board Size	9.43	2.73	8.75	2.81	1.74
Firm Characteristics					
Size (ln Asset)	7.85	1.69	7.50	1.65	1.50
Leverage	0.327	0.230	0.301	0.262	0.73
Firm Age	28.3	16.7	24.5	14.7	1.84
Innovation Score	0.273	0.538	0.210	0.363	1.16
Panel B. Comparison in 2005					
	Compliant (N = 374)		Noncompliant (N = 59)		t-stat for difference
	Mean	S.D.	Mean	S.D.	
Firm Value / Profitability					
Tobin's Q	2.02	1.00	2.11	1.01	-0.58
ROA (%)	0.14	0.08	0.13	0.09	0.86
Board Characteristics					
Independent Directors (%)	0.75	0.12	0.60	0.15	7.38
Board Size	9.40	2.06	8.80	2.27	1.93
Firm Characteristics					
Size (ln Asset)	8.10	1.61	7.90	1.65	0.89
Leverage	0.338	0.313	0.208	0.204	4.15
Firm Age	32.3	16.7	28.5	14.7	1.83
Innovation Score	0.254	0.491	0.220	0.386	0.39

3.2 Empirical design

The baseline empirical model assumes that firm value is determined by the following:

$$V_{it} = \beta_1 Indep_{it} + \beta_2 Prop_i + \beta_3 Indep_{it} \cdot Prop_i + Controls_{it} \cdot \beta + firm_i + year_t + e_{it} \quad (1)$$

where *i* indexes a firm, *t* indexes a year, *V* represents firm value / performance, *Indep* is the ratio of independent directors on board, *Prop* is the proxy for proprietary knowledge of the firm / insiders, and *firm* and *year* represent the firm- and year-specific effects. The level of proprietary knowledge is assumed to be constant over time for a given firm. While this may be a strong assumption when studying a long period of time, it seems reasonable given the short timespan examined in this paper. As the main purpose of this paper is to examine whether outside director presence improves firm performance when insiders possess valuable information, β_3 is the main coefficient of interest. Negative β_3 would support the prediction of Harris and Raviv (2008) that shareholders benefit from insider-controlled boards when insider knowledge is important. Again, this is because mandatory requirement of overall board independence would have moved firms with valuable insider information from their optimal board structure.

As in Duchin et al. (2010), I estimate the first difference of equation (1):

$$\Delta V_{it} = \beta_1 \Delta Indep_i + \beta_2 \Delta Prop_i + \beta_3 \Delta Indep_i \cdot Prop_i + \Delta Controls_i \cdot \beta + \Delta year_t + \Delta e_i \quad (2)$$

where the Δ indicates the difference between 2005 and 2001 values. Equation (2) removes firm-specific fixed effects as well as unobservable time-invariant factors. To be consistent with the measurement of the dependent variable, all control variables also enter the regression as first differences. Also, industry-fixed effects are included to capture any industry-wide effects on firm value during the time period.

As discussed in Section 2.1, these regulatory reforms are used to address the endogeneity of board structure. This paper adopts the two-stage least-squares (2SLS) approach. Specifically, regulation compliance status as of 2001 is used to identify exogenous changes in independent director ratio. The fitted value of independent director ratio from the first-stage regression is then used in the second-stage regression

as the main regressor. β_3 in equation (2) is then examined to see whether the exogenous increase in board independence affects firm value differently depending on the level of proprietary knowledge in the firm.

4. Main analysis

Tables 2 and 3 present the main results of this paper. The first two columns of Tables 2 and 3 show the relevance of the instrument, which is a dummy variable indicating noncompliance status as of 2001. The statistical significance and the magnitude of the coefficients suggest that the noncompliance dummy is a strong predictor of independent director ratio. The interacted instrument for the endogenous interaction variable is also statistically and economically significant. Column 3 runs regressions without the proprietary information measures. Consistent with prior literature, the effect of board independence on firm performance on average seems to be statistically insignificant.

Column 4 of Table 2 present the main result of this paper. The coefficient of the interaction term (β_3 in equation (2)) is positive and highly significant. Inconsistent with the prediction of Harris and Raviv (2008), firms with higher level of proprietary knowledge seems to have benefitted more by adding outside directors on their boards. Column 4 of Table 3 also suggest that increased outside director representation benefited, in terms of operational efficiency, firms with high level of proprietary knowledge.

5. Additional analysis

Rest of the analysis will focus on *why* firms with higher levels of proprietary knowledge benefitted more from board independence. Whether firms with more proprietary information experienced greater improvement in monitoring and the possibility that agency cost is a function of proprietary information need to be invested next.

Table 2. Regression of firm performance (Tobin's Q) on independent directors and proprietary knowledge
This table reports the coefficient estimates from regressing firm performance change during 2001-2005 on the change of independent director ratio. The first-stage results (columns 1 and 2) show the relevance of the instrument, noncompliance dummy in the beginning of the year. Columns 3 and 4 show the second-stage regression results of 2SLS. The fitted changes from the first-stage regressions are used as the main regressors. Column 3 regression doesn't include proprietary information variables, and its first-stage results are omitted for brevity. All regressions include industry fixed effects for the 30 Fama-French industries. Significance levels are indicated - *** = 1%, ** = 5%, * = 1%.

DV = Δ ln(Tobin's Q)	First Stage (1)	First Stage (2)	Second Stage (3)	Second Stage (4)
Noncompliance Dummy in 2001	0.217***	-0.006		
	(7.53)	(-0.43)		
Noncompliance Dummy x Proprietary Information	-0.047	0.205**		
	(-0.62)	(2.06)		
Δ Independent Directors (predicted values)			0.040	-0.192
			(0.19)	(-1.22)
Δ Independent Directors (predicted) x Proprietary Information				1.083***
				(3.93)
Proprietary Information	-0.001	0.024		-0.108**
	(-0.07)	(0.87)		(-2.38)
Δ Leverage	-0.069**	-0.024	0.293	0.311
	(-2.10)	(-1.29)	(1.41)	(1.52)
Δ Firm Size	-0.003	-0.011*	0.409***	0.409***
	(-0.32)	(-1.72)	(13.82)	(15.12)
Δ Board Size	-0.004	-0.004*	-0.027**	-0.023**
	(-0.87)	(-1.84)	(-2.35)	(-2.13)
ln(Firm Age)	-0.016	-0.005	-0.006	-0.001
	(-1.50)	(-0.87)	(-0.22)	(-0.05)
Constant	0.099**	0.029	-0.123	-0.124
	(2.01)	(1.56)	(0.11)	(-1.18)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.264	0.202	0.504	0.491
N	420	420	419	420

Table 3. Regression of operational efficiency (ROA) on independent directors and proprietary knowledge
This table reports the coefficient estimates from regressing firm operational efficiency change during 2001-2005 on the change of independent director ratio. The first-stage results (columns 1 and 2) show the relevance of the instrument, noncompliance dummy in the beginning of the year. Columns 3 and 4 show the second-stage regression results of 2SLS. The fitted changes from the first-stage regressions are used as the main regressors. Column 3 regression doesn't include proprietary information variables, and its first-stage results are omitted for brevity. All regressions include industry fixed effects for the 30 Fama-French industries. Significance levels are indicated - *** = 1%, ** = 5%, * = 1%.

DV = Δ ROA	First Stage (1)	First Stage (2)	Second Stage (3)	Second Stage (4)
Noncompliance Dummy in 2001	0.225***	-0.005		
	(8.75)	(-0.45)		
Noncompliance Dummy x Proprietary Information	-0.052	0.210**		
	(-0.73)	(2.21)		
Δ Independent Directors (predicted values)			0.015	-0.051
			(0.33)	(-1.07)
Δ Independent Directors (predicted) x Proprietary Information				0.264***
				(5.71)
Proprietary Information	-0.003	0.018		0.005
	(-0.34)	(0.74)		(0.57)
Δ Leverage	-0.075***	-0.027*	-0.044	-0.029
	(-2.75)	(-1.84)	(-1.04)	(-0.99)
Δ Firm Size	-0.007	-0.016**	0.043***	0.048***
	(-0.81)	(-2.33)	(6.50)	(8.52)
Δ Board Size	-0.002	-0.001	-0.001	0.001
	(-0.50)	(-0.33)	(-0.29)	(0.51)
ln(Firm Age)	-0.011	0.001	-0.007	-0.006
	(-1.18)	(0.26)	(-1.16)	(-1.08)
Constant	0.102**	0.011	-0.008	-0.013
	(2.19)	(0.65)	(-0.36)	(-0.56)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.285	0.171	0.161	0.166
N	498	498	498	498

6. Conclusion

I examine whether level of proprietary information in firms moderates the effect of board independence on firm performance. Harris and Raviv (2008) predicts that shareholder value will be greater with insider-controlled boards when the importance of insider information is much greater than that of outsider's

information. Using historical innovation value as a proxy for the level of proprietary information, I show that firms with higher levels of proprietary information experienced greater marginal gain in firm performance when outside director representation increased. This contradicts the predictions of Harris and Raviv (2008) because, according to their theory, the mandatory board independence requirement of SOX-related regulations should have negatively affected the firms that were in their optimal insider-controlled state. A possible explanation of this unexpected finding is that firms with more proprietary information had even greater agency costs, which were effectively addressed by increased monitoring capability of the boards. In other words, the loss from not being able to utilize proprietary information fully due to the switch to outsider-controlled boards was less in magnitude compared to the gain from enhanced monitoring. Next steps in the paper will address this possibility.

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