

The Impact of Directors' External Connections on Firm Performance: An Empirical Analysis

Sehan Kim
University of Houston – Clear Lake

The paper examines whether and how directors' external connections affect the operating performance of the firm for which they are board members. Using a large sample of directors and senior level executives, I map the social network of directors and executives, and construct a measure of directors' external connections capturing how connected an individual director is to directors and executives of other firms. I find a positive association between the extent of directors' external connections and firm performance. In addition, I find that firms experience efficiency gains through cost reductions in the presence of well-connected directors. Overall, my findings suggest that directors' external connections provide economic benefits to firms by increasing sales growth, lowering production costs, and improving firm profitability.

INTRODUCTION

A board of directors serves two main functions, monitoring management and providing resources. First, boards monitor top executives to ensure that they act in good faith and bring about firm performance that satisfies the interests of the owners. Second, boards provide resources in the form of advice and counsel, and bring their expertise and connections to meetings to help management improve firm performance. Most prior research seeking to understand how boards can influence firm performance has focused on the monitoring function.

This paper is about the second function, the provision of resources. I explore a mechanism by which boards help improve firm performance. Directors' external connections can provide channels for communicating important information between external organizations and the firm. Connections between directors in the corporate networks can facilitate access to resources, link the firm to important stakeholders or other important entities, and aid in the formulation of strategy or other important decisions. Moreover, directors' external connections could potentially affect the flow and the quality of information available to managers and create links among decision makers across firms, leading to better decision-making and management practices.

In this paper, I explore how the external connections of individual directors affect the operating performance of the firm for which they serve as board members. Using a large sample of 393,481 directors and executives from 7,627 companies over the time period from 2000 to 2010, I map the social network of directors and executives, and construct a measure of directors' external connections. The measure captures how connected an individual director is to other directors and executives in the network of firms.

I find a positive association between changes in directors' external connections and changes in the firm's sales revenue. This association holds after controlling for governance attributes, directors' human

capital, and other related firm characteristics. This suggests that, on average, the revenue of a firm increases after the firm brings well-connected individuals to the board. This is consistent with the view that relational capital is positively associated with the provision of resources by the board, which, in turn, is positively associated with firm performance. Prior literature suggests that the impact of managers' external ties on firm performance differs among firms in different stages of a firm's life cycle (Peng and Luo 2000; Larcker, So, and Wang 2013). Consistent with this prior literature, I find that the impact of the external connections is most pronounced among firms that have high growth potential and are at an earlier stage in their life cycle. I also examine the impact of directors' external connections on profitability. I find a positive association between changes in directors' external connections and changes in firm profitability. This suggests that the ROA of a firm increases after the firm appoints well-connected directors. I then examine whether firms experience efficiency gains through cost reductions in the presence of well-connected directors. I find that the extent of directors' external connections is negatively associated with cost of goods sold. Firms experience efficiency gains through production cost reductions after the firm appoints well-connected directors. Overall, my findings suggest that companies with well-connected boards have better operating performance than companies whose boards are less well-connected, thus directors' external connections provide economic benefits to firms by helping to increase sales growth, improve profitability, and lower production costs.

This paper contributes to the literature along several lines. First, this paper adds to the literature on the role of boards by complementing agency theory with resource dependence theory. Prior studies have examined the role of boards of directors, but the focus has primarily been on the monitoring function of the boards by examining the relationship between proxies for board incentives to monitor and firm performance. Results from this paper provide evidence that directors' external connections may help boost the role of directors in improving firm performance.

Second, this study integrates resource dependence and social network theories. Prior resource dependence studies focus primarily on the impact of one aspect of board capital, human capital, on firm performance. Building on social network theory, I examine the impact of another aspect of board capital, relational capital, on firm performance. This paper provides empirical evidence that directors' external connections enhance firm performance by providing access to resources and information to the firm.

Third, this paper also contributes to the growing literature on the impact of social networks among all board members. While much of the existing literature on social networks among board members has focused primarily on social ties of the chief executive officer (CEO), less attention has been paid to the social connections of other directors. My results will extend the existing literature that has largely focused on CEO's social ties.

Finally, this paper utilizes the most comprehensive measure of directors' external connections by examining directors and executives from over 7,000 companies. My measure captures several aspects of external connections including directors' employment history, educational background, and other social ties.

The remainder of the paper is organized as follows. Section 2 reviews the background literature. Section 3 describes the data and sample selections. Section 4 explains variables construction and research design, and presents descriptive statistics as well as empirical results, which are analyzed further in Section 5. Section 6 concludes.

BACKGROUND

The link between boards of directors and firm performance has been studied from two different perspectives, "agency theory perspective" and "resource dependence perspective". Agency theorists argue that a key activity for boards is monitoring management and effective monitoring can improve firm performance by reducing agency costs (Hillman and Dalziel 2003). These researchers explore the monitoring role of boards and examine the relationship between effective monitoring and firm performance (Dalton, Daily, Certo, and Roengpitya 2003; Dalton, Daily, Ellstrand, and Johnson 1998). A large number of studies have investigated the characteristics of the board and examined whether the

characteristics of the board affect board effectiveness in monitoring management and firm performance. However, prior research on this topic seems still inconclusive.

In contrast, resource dependence theorists focus on the board as providers of resources and contend that boards are chosen to maximize the provision of important resources to the firm (Pfeffer 1972; Pfeffer and Salancik, 1978; Klein 1998). In this research, scholars examine the relationship between boards' provision of resources and firm performance. Board research based on resource dependence perspective suggests that directors provide advice and counsel to top management (Lorsch and MacIver 1989), bring their own experiences, knowledge, and expertise to the firm (Baysinger and Hoskisson 1990), aid in the formulation of important firm decisions (Lorsch and MacIver 1989), and enable firms to gain linkages to important stakeholders or other important entities (Burt 1980).

Resource dependence theorists argue that board capital encompassing both human capital, such as directors' expertise, experience, knowledge, skill, reputation, and skills, and relation capital, such as directors' contacts to external organization and connections, can bring substantial resources to a firm. Prior empirical studies in this area suggest that board capital helps firm strengthen the linkages with the external environment by acquiring additional access or control over resources so that such board capital can positively affect a firm's performance (Pearce and Zahra 1992; Certo, Daily, and Dalton 2001).

Social network theory posits that social ties create trust, goodwill, or expectations of reciprocity, which enable the individual to obtain the needed resources from other (Aldrich and Cliff 2003; Coleman 1988). The influence of social networks on the provision of resources function of directors has received considerable attention through a series of articles (Agrawal and Knoeber 1996; Carpenter and Westphal 2001; Cohen, Frazzini, and Malloy 2008). Anecdotal evidence also shows that boards' connections and expertise help a start-up company lay the groundwork for growth. For example, directors' past professional connections have helped win key license to build a fixed wireless network, raised financing, and helped find strategic partners for the venture company (Lipin 1999). Recently, literature in finance and accounting investigates the impact of intra-board connections such as the links between CEOs and his or her board members on firms' economic outcomes (Hwang and Kim 2009; Liu 2010; Dey and Liu 2011; Fracassi and Tate 2012; Engelberg, Gao, and Parsons 2013).

Relatively fewer studies have provided empirical evidence to assess the economic consequences of directors' external connections, social ties to directors and executives in other firms, on firm performance. Geletkanycz and Hambrick (1997) find that top executives who held board appointments in different industries were more likely to initiate strategic change at their own firm, and top executives' external ties enhance the performance of 30 firms in the branded food and computer industries for 1983 – 1987. Using survey data, Peng and Luo (2000) document that managers' ties with top executives at other firms and with government officials help improve the performance of firms in China. Most recently, Larcker, So, and Wang (2013) examine whether the position of a firm in the boardroom network formed by shared directorates is associated with future stock price and firm performance. They find that centrally positioned firms in the boardroom network have higher future stock price returns and greater future profitability than non-centrally positioned firms. Prior literature studies relatively small-sample data (Geletkanycz and Hambrick 1997; Peng and Luo 2000), relies primarily on perceptual measures of external ties (Peng and Luo 2000), and focuses on shared director positions (Larcker, So, and Wang 2013) rather than the external connections of individual directors and executives. However, my study examines the breadth of social networks of all board members from over 7,000 companies to provide evidence that directors' external connections may play an important role as channels of information, advice, counsel, and access to essential resources enable a firm to accomplish higher economic outcomes, which improve firm performance.

DATA AND SAMPLE SELECTION

I construct executive and director networks from BoardEx database. The database contains executives and directors' current and past employment history (including positions held and the start and end dates of the position), educational background (including undergraduate, graduate and professional education and

degree information), other activities such as memberships in general social associations, organizations and charitable groups.

Financial data are obtained from COMPUSTAT. The key firm identification variable in BoardEx is “*Company ID*”. Since there is no existing link between “*Company ID*” as reported in BoardEx and identifiers from other commonly used databases (Engelberg, Gao, and Parsons 2013), I created links between the BoardEx database and COMPUSTAT and CRSP databases in multiple steps. Following Engelberg, Gao, and Parsons (2013), I, first, match “*Company ID*” as reported in BoardEx with GVKEY (S&P identifier) by ticker symbol, which is provided in the BoardEx database, and CUSIP which is derived from the International Security Identification Number (ISIN) in BoardEx database for companies that are currently trading. Second, for companies in the BoardEx database without ticker symbols and ISIN, I match the company name recorded in BoardEx with the name of a company on COMPUSTAT and CRSP using the name matching algorithm in SAS. All matches are manually checked. I also look up similar company names using similar name matching algorithms and verify such matches by checking their information from various sources. I collect corporate governance variables from the IRRC and BoardEx. This results in the final sample of 7,627 matched companies consisting of 393,481 executives and directors over the time period from 2000 to 2010.

EMPIRICAL ANALYSIS

Variable Descriptions

I construct a measure of directors’ external connections. The measure captures how connected an individual director is to other directors and executives in the boardroom networks. The external connections of a director r at year t is defined by

$$DEC_{r,t} = \sum Past\ Professional\ Connections + Educational\ Connections + Other\ Connections ,$$

where *Past Professional Connections* represent the number of directors and executives whom the director has worked with, or sat either on the board of directors or on the top management group in the past in the same company at the same time, *Educational Connections* represent the number of directors and executives with whom the director went to the same school and graduated within two years with the same undergraduate, professional, masters or doctorate degree, and *Other Connections* represent the number of directors and executives with whom the director shares membership in general social associations, organizations or charitable groups. A firm i ’s total external connections at year t is the sum of external connections belonging to all N board members of the firm, defined as

$$TDEC_{i,t} = \sum_{r=1}^N DEC_{r,t} .$$

My measure of firm i ’s directors’ external connections is the average of external connections belonging to N board members of the firm, defined as

$$ADEC_{i,t} = \frac{1}{N} \sum_{r=1}^N DEC_{r,t} .$$

Research Design

To examine the relationship between the extent of directors’ external connections and firm performance, I focus on the contemporaneous association between changes in directors’ external connections and changes in firm operational performance. I use various measures of firm performance: sales growth, ROA, and cost of goods sold. The empirical models are specified in the following equation:

$$\Delta SALES_{i,t} = \alpha + \beta_1 \Delta ADEC_{i,t} + \text{control variables} + \varepsilon_{i,t} \quad (1)$$

$$\Delta ROA_{i,t} = \alpha + \beta_1 \Delta ADEC_{i,t} + \text{control variables} + \varepsilon_{i,t} \quad (2)$$

$$\Delta COGS_{i,t} = \alpha + \beta_1 \Delta ADEC_{i,t} + \text{control variables} + \varepsilon_{i,t} \quad (3)$$

where, for each firm i and year t :

$$\Delta ADEC_{i,t} = \ln(ADEC_{i,t}) - \ln(ADEC_{i,t-1});$$

$$\Delta SALES_{i,t} = \ln(SALES_{i,t}) - \ln(SALES_{i,t-1});$$

$$\Delta ROA_{i,t} = \ln(ROA_{i,t}) - \ln(ROA_{i,t-1});$$

$$\Delta COGS_{i,t} = \ln\left(\frac{COGS_{i,t}}{SALES_{i,t}}\right) - \ln\left(\frac{COGS_{i,t-1}}{SALES_{i,t-1}}\right);$$

In these models, dependent variables are changes in financial performance measures. Using changes in financial performance measures allows for control of the level of financial performance measures prior to the test period, and I use a natural logarithmic transformation to control for skewness in the directors' external connections (*DEC*), although the results are similar when this transformation is not used.

The control variables I use in equations (1) through (3) are consistent with those used in prior research (Agrawal and Knoeber 1996; Dey and Liu 2011; Engelberg, Gao, and Parsons 2013; Larcker, So, and Wang 2013). For firm characteristic variables, I include firm size, the market-to-book ratio, firm age, and leverage ratio. I use a natural logarithm of total assets as a proxy for firm size. Larger firms tend to have larger boards. As a consequence, larger firms will likely have more directors with more extensive connections. I use a natural logarithm of the market-to-book ratio and firm age to control for the presence of high growth opportunities. The *market-to-book* ratio is calculated as the market value of equity divided by the sum of the book value of equity and deferred taxes. *Firm Age* is the age of the firm (years) based on the date in which a firm's share price first appeared on the CRSP. The inclusion of the market-to-book ratio and firm age reflects the fact that firms with high growth opportunities and firms in an early stage of their life cycle are more likely to benefit from the external connections of their senior executive and board members. Thus, I expect a positive association between directors' external connections and market-to-book ratio and a negative association between directors' external connections and firm age. *Leverage ratio* is computed as the fraction of long-term debt in total assets.

To control for the effectiveness of monitoring, I include board characteristic variables such as board size, the proportion of outside directors on the board, CEO and board chair duality, and the fraction of busy directors on the board. *Board size* is the number of directors on the board. The proportion of outside directors (*Outside Director*) is calculated as the percentage of directors defined as independent directors or non-employee directors. *CEOCHAIR* is a dummy variable that takes the value one when CEO is serving as chairman of the board. The fraction of busy directors (*Busy Director*) is calculated as the percentage of directors holding more than two directorships. Fich and Shivdasani (2006) find that boards with a majority of busy directors are associated with weak corporate governance and operating profits.

I construct two intra-board social connection variables to capture the degree of the relational capital among the board members, 1) social ties among board members and 2) social tie between CEO and independent directors. Social ties among board members (*Intra-Board Ties*) are measured by the number

of pairs of connected directors scaled by the number of pairs of board members. Social tie between CEO and independent directors (*Tie to the CEO*) is measured by the fraction of the independent directors having social tie to the CEO.

I also construct four variables to capture the board's human capital, 1) industry experience, 2) board experience, 3) graduate degrees, and 4) elite educations. Industry experience (*IndExp*) is computed as the proportion of the board members possessing the same industry experience. Board experience (*BoardExp*) is defined as the sum of the cumulative years directors have served as a director scaled by the number of board members. Graduate degrees (*Graduate*) is the fraction of directors holding graduate degrees such as MBA, Master, JD, MD, or PhD degree on the board. Elite education (*Elite*) is measured by the percent of directors who graduated from Ivy League undergraduate schools.

Finally, I include the new appointments of directors to the board in the year before, $\Delta ADEC_{i,t-1}$ as control variable to eliminate the lagging effect of external connections of directors who are appointed to the board in the previous year on firm performance because I focus on the contemporaneous association between changes in directors' external connections and changes in firm operational performance in this study.

Descriptive Statistics

Table 1 presents summary statistics of sample firms. It shows the number of sample firms and firm characteristics, expressed in million dollars from 2000 to 2010. It suggests that many small firms were added to the BoardEx database around the fiscal year of 2003.

TABLE 1
SUMMARY STATISTICS OF SAMPLE FIRMS

Fiscal Year	# of Firms	Total Assets (\$MN)		Sales (\$MN)	
		Mean	Median	Mean	Median
2000	1,287	10,012	1,575	4,305	1,073
2001	1,570	10,974	1,449	4,235	977
2002	1,618	11,509	1,507	4,154	961
2003	3,080	7,515	581	2,528	271
2004	3,664	7,360	480	2,484	235
2005	3,930	7,604	497	2,699	246
2006	4,079	8,449	560	2,956	279
2007	4,111	9,253	626	3,158	309
2008	3,823	9,461	667	3,382	324
2009	3,691	9,510	728	3,182	318
2010	3,458	12,316	826	3,780	408

Table 2 presents summary statistics on the directors' external connections that I construct. On average, a director has 372.2 external network connections to all other directors. The directors' external connections vary by types of directors. An employee director has an average of 247 external network connections. A grey director (affiliated non-executive directors) has an average of 326.8 external network connections. Independent directors have the biggest network connections, an average of 417.7 external network connections.

TABLE 2
SUMMARY STATISTICS OF DIRECTORS' EXTERNAL CONNECTION

Type of Director	N	Mean	Median	Max	StDev
Employee Directors	79,667	247.0	123	3038	315.2
Grey Directors	47,220	326.8	167	4563	419.1
Independent Directors	266,594	417.7	255	4688	477.7
Total	393,481	372.2	213	4688	447.9

Table 3 shows the descriptive statistics for the key variables included in the sample. In terms of board characteristics, the average firm in the sample has 8.7 directors on board, 68.7% are independent directors, and 17.3% are busy directors. 61.3% of CEOs serve as the chairperson of the firm of which he or she is the CEO. The average social ties among board members is 0.155 and 18.8% of board members have social connection with the CEO of the firm of which he or she sits on the board. In terms of board human capital, on average, 19.8% of directors have a specific industry experience, they have 14.7 years board experience, 52.2% of directors have graduate degrees, 30.4% of directors graduated from Ivy League undergraduate schools.

TABLE 3
DESCRIPTIVE STATISTICS OF KEY VARIABLES

Variable	Mean	Median	StDev	Q1	Q3
$\Delta ADEC$	0.020	0.000	0.201	-0.010	0.049
ΔAPC	0.027	0.000	0.216	-0.005	0.052
ΔAEC	0.006	0.000	0.359	-0.041	0.047
ΔAOC	0.008	0.000	0.620	-0.065	0.045
$\log(SALES)$	5.863	5.963	2.289	4.326	7.428
$\log(ROA)$	-3.248	-3.046	1.115	-3.925	-2.445
$\log(COGS/SALES)$	-0.545	-0.467	0.667	-0.842	-0.247
$\log(\text{Total Assets})$	6.493	6.558	2.222	4.998	7.919
$\log(\text{Market-to-Book})$	0.703	0.642	0.863	0.213	1.156
Leverage	0.339	0.298	0.268	0.000	0.409
Firm Age (year)	20.685	18.244	16.875	3.77	51.05
Board Size	8.668	8.000	2.824	7.000	10.000
# of Independent Directors	6.230	6.000	2.579	4.000	8.000
% of Independent Directors	68.69	74.85	0.158	35	100
% of Busy Directors	17.28	18.22	18.08	0	50
CEO/Chair Duality (%)	61.25				
Intra-Board Ties	0.155	0.069	0.299	0.011	0.499
Tie to the CEO (%)	18.79	10.14	0.202	2.44	80.01
Industry Experience (%)	19.82	17.79	0.199	4.06	28.83
Board Experience (year)	14.677	9.110	12.059	3.554	17.782
Graduate Degree (%)	0.522	0.398	0.412	0.055	0.600
Elite Education (%)	0.304	0.000	0.332	0.000	0.518
No. of Observations	34,857				

Empirical Results

Table 4 presents results from ordinary least squares regressions of changes in sales revenue on changes in directors' external connections. Column (1) reports the results of base regression. I find changes in directors' external connections at year t are significantly ($p < 0.01$) positively associated with changes in total sales revenue at year t . This association holds after controlling for the governance and other firm and board characteristic variables. This finding implies that the addition of directors with more extensive external connections to the board bring increases in total sales of the firm. The coefficient of market-to-book ratio is positive and significant ($p < 0.01$), and the coefficient of firm age is significantly negative, suggesting that firms with high growth opportunities and firms in an early stage of their life cycle are more likely to benefit from directors' external connections. Column (2) adds the control variable, changes in directors' external connections at year $t-1$. The results suggest that even after controlling for the addition of directors with more extensive external connections to the board in the year before, the relation between changes in directors' external connections at year t and changes in total sales revenue at year t is still significantly positive ($p < 0.01$). Year and Fama-French 49 industry controls are added in column (3) and (4). Similar to results in column (1) and (2), the coefficient of changes in directors' external connections at year t is significantly positive ($p < 0.01$), indicating that new appointments of directors with more extensive external connections to the board accrues value to the firm by boosting sales revenue of the firm.

TABLE 4
RELATIONSHIP BETWEEN CHANGES IN SALES AND CHANGES IN DIRECTORS'
EXTERNAL CONNECTIONS

	Dependent Variable: $\Delta SALES_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	0.082*** (7.30)	0.052*** (4.16)	0.076*** (6.79)	0.048*** (3.86)
$\Delta ADEC_{i,t-1}$		0.047*** (4.02)		0.040*** (3.45)
$\log(\text{Total Assets})_{i,t}$	0.005*** (3.58)	0.006*** (4.05)	0.005*** (3.64)	0.006*** (3.89)
$\log(\text{Market to Book})_{i,t}$	0.075*** (28.31)	0.070*** (26.38)	0.065*** (22.14)	0.061*** (19.95)
Leverage $_{i,t}$	2.255*** (4.62)	2.252*** (4.60)	2.042*** (4.04)	2.038*** (3.98)
Firm Age $_{i,t}$	-0.056*** (-5.12)	-0.054*** (-5.08)	-0.055*** (-5.04)	-0.051*** (-4.99)
Board Size $_{i,t}$	-0.003** (-2.51)	-0.002** (-2.50)	-0.003** (-2.58)	-0.002* (-2.47)
% Outside Directors $_{i,t}$	0.055*** (6.11)	0.052*** (6.10)	0.052*** (6.15)	0.048*** (6.10)
Busy Directors $_{i,t}$	0.008* (1.72)	0.007* (1.70)	0.007* (1.69)	0.006* (1.68)
CEO/Chair Duality $_{i,t}$	0.018 (0.68)	0.017 (0.66)	0.017 (0.66)	0.016 (0.64)
Intra-board Social Ties $_{i,t}$	0.125*** (5.11)	0.121*** (5.08)	0.131*** (5.12)	0.122*** (5.10)
Relationship with CEO $_{i,t}$	0.003*** (3.48)	0.003*** (3.44)	0.003*** (3.43)	0.002*** (3.42)
Industry Experience $_{i,t}$	0.111*** (4.10)	0.111*** (4.09)	0.108*** (4.02)	0.110*** (4.06)

Board Experience _{<i>i,t</i>}	0.911*** (4.62)	0.903*** (4.50)	0.909*** (4.54)	0.908*** (3.53)
Graduate Degree _{<i>i,t</i>}	0.042** (2.02)	0.039** (2.00)	0.040** (2.00)	0.038** (1.98)
Elite Education _{<i>i,t</i>}	0.033** (2.20)	0.032** (2.19)	0.030** (2.19)	0.029** (2.18)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	28,192	24,165	28,009	24,008
R ²	0.030	0.030	0.062	0.064

***, **, and * indicate significance at 1%, 5%, and 10% (two-tailed), respectively.

Next, I examine whether there is an association between the extent of directors' external connections and firm profitability. Table 5 presents results from regressing changes in ROA on changes in directors' external connections. Column (1) reports that changes in directors' external connections at year t are significantly ($p < 0.01$) positively associated with changes in ROA at year t , indicating that directors' external connections provide economic benefit to firms by improving profitability. Similar to the results in Table 4, the results suggest that controlling for the governance and other firm and board characteristic variables, firms with more well-connected directors show higher profitability than firms with less well-connected directors. The results also suggest that firms in an early stage of their life cycle are more likely to benefit from directors' external connections. Column (2) adds the control variable, changes in directors' external connections at year $t-1$. The results show that the coefficient of the change in directors' external connections at year $t-1$ is not statistically significant. After controlling for the change in directors' external connections at year $t-1$, the association between the change in directors' external connections at year t and the change in ROA at year t is marginally positive ($p < 0.1$). Column (3) and (4) show the result of the regression including year and Fama-French 49 industry controls. In the presence of both year and industry controls, the results are very similar to those reported in column (1) and (2). I find the coefficient of the change in directors' external connections at year t is significantly positive ($p < 0.01$) in column (3) and the coefficient of the change in directors' external connections at year t is marginally positive ($p < 0.1$) in column (4). The findings imply that new appointments of directors with more extensive external connections to the board help firms improve their profitability.

TABLE 5
RELATIONSHIP BETWEEN CHANGES IN ROA AND CHANGES IN DIRECTORS'
EXTERNAL CONNECTIONS

	Dependent Variable: $\Delta ROA_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	0.024*** (2.84)	0.015* (1.66)	0.025*** (2.92)	0.016* (1.69)
$\Delta ADEC_{i,t-1}$		0.003 (0.33)		0.003 (0.31)
log(Total Assets) _{<i>i,t</i>}	0.003*** (3.02)	0.003*** (2.90)	0.002** (2.31)	0.002** (2.30)
log(Market to Book) _{<i>i,t</i>}	0.020*** (10.26)	0.021*** (10.26)	0.020*** (9.98)	0.021*** (10.22)
Leverage _{<i>i,t</i>}	2.244*** (4.66)	2.268*** (4.91)	2.151*** (4.58)	2.263*** (4.82)
Firm Age _{<i>i,t</i>}	-0.056*** (-5.16)	-0.086*** (-5.92)	-0.053*** (-5.12)	-0.076*** (-5.83)
Board Size _{<i>i,t</i>}	-0.002* (-1.88)	-0.002* (-1.87)	-0.002* (-1.88)	-0.002* (-1.88)
% Outside Directors _{<i>i,t</i>}	0.055*** (6.15)	0.083*** (6.55)	0.050*** (6.11)	0.072*** (6.44)
Busy Directors _{<i>i,t</i>}	0.008* (1.76)	0.010* (1.79)	0.007* (1.74)	0.009* (1.77)
CEO/Chair Duality _{<i>i,t</i>}	0.018 (0.62)	0.027 (0.79)	0.016 (0.62)	0.024 (0.74)
Intra-board Social Ties _{<i>i,t</i>}	0.124*** (5.15)	0.121*** (5.12)	0.129*** (5.16)	0.124*** (5.14)
Relationship with CEO _{<i>i,t</i>}	0.003*** (3.52)	0.003*** (3.48)	0.003*** (3.47)	0.003*** (3.46)
Industry Experience _{<i>i,t</i>}	0.110*** (4.15)	0.109*** (4.13)	0.105*** (4.06)	0.101*** (4.04)
Board Experience _{<i>i,t</i>}	0.907*** (4.66)	1.009*** (4.98)	0.869*** (4.54)	1.356*** (5.92)
Graduate Degree _{<i>i,t</i>}	0.042** (2.06)	0.040** (2.05)	0.040** (2.05)	0.035** (2.02)
Elite Education _{<i>i,t</i>}	0.033** (2.25)	0.031** (2.23)	0.031** (2.23)	0.030** (2.22)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	27,469	23,756	27,273	23,587
R ²	0.004	0.005	0.017	0.018

***, **, and * indicate significance at 1%, 5%, and 10% (two-tailed), respectively.

To examine whether firms experience efficiency gains through cost reductions in the presence of directors with more extensive external connections, I investigate the relationship between the change in directors' external connections and the change in cost of goods sold for the firm. Table 6 presents the results from regressing changes in cost of goods sold on changes in directors' external connections. Column (1) reports the results of the base regression. I find that the association between the change in directors' external connections at year t and the change in cost of goods sold at year t is significantly ($p < 0.01$) negative, indicating that the firm experiences product cost reductions after the appointment of new directors to the board with more external connections. This association holds after controlling for the governance and other firm and board characteristic variables. The results also suggest that firms in an early stage of their life cycle are more likely to benefit from directors' external connections through cost reductions. Column (2) adds the change in directors' external connections at year $t-1$ as a control variable. The results suggest that even after controlling for the addition of directors with more extensive external connections to the board in the year before, the relation between the change in directors' external connections at year t and the change in cost of goods sold at year t is still negative, although the coefficient is marginally significant at a 10% significant level. These associations hold after controlling for the influence of industry and year fixed effects, shown in column (3) and (4).

To examine the relationship between changes in directors' external connections and changes in cost of goods sold, I use changes in cost of goods sold scaled by sales. Given my findings in Table 4 show that changes in directors' external connections are significantly positively associated with changes in sales revenue, it is possible that additional subtraction by the changes in sales measure captured in the changes in cost of goods sold measure may lead to strong negative association between changes in directors' external connections and changes in cost of goods sold in Table 6. To rule out this possibility, I estimate another model using a measure of cost of goods sold without scaling. The results (untabulated) from this analysis are qualitatively similar to those obtained from the analysis reported in Table 6.

TABLE 6
RELATIONSHIP BETWEEN CHANGES IN COST OF GOODS SOLD AND CHANGES IN
DIRECTORS' EXTERNAL CONNECTIONS

	Dependent Variable: $\Delta COGS_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	-0.031*** (-2.59)	-0.023* (-1.71)	-0.031*** (-2.59)	-0.024* (-1.81)
$\Delta ADEC_{i,t-1}$		-0.012 (-0.93)		-0.015 (-1.15)
$\log(\text{Total Assets})_{i,t}$	0.002 (1.14)	0.003 (1.21)	0.002 (1.17)	0.005** (2.07)
$\log(\text{Market to Book})_{i,t}$	-0.035*** (-12.31)	-0.035*** (-11.69)	-0.032*** (-10.19)	-0.033*** (-9.67)
Leverage $_{i,t}$	2.252*** (4.66)	2.233*** (4.65)	2.039*** (4.18)	2.009*** (4.01)
Firm Age $_{i,t}$	-0.056*** (-5.16)	-0.051*** (-5.12)	-0.050*** (-5.08)	-0.048*** (-5.03)
Board Size $_{i,t}$	0.000 (0.03)	0.000 (0.03)	0.000 (-0.16)	-0.001 (-0.51)
% Outside Directors $_{i,t}$	0.055*** (6.15)	0.070*** (7.51)	0.059*** (6.19)	0.062*** (6.22)
Busy Directors $_{i,t}$	0.008* (1.76)	0.008* (1.74)	0.007* (1.73)	0.007* (1.72)
CEO/Chair Duality $_{i,t}$	0.018 (0.72)	0.023 (0.75)	0.017 (0.70)	0.021 (0.73)
Intra-board Social Ties $_{i,t}$	0.125*** (5.15)	0.170*** (5.42)	0.131*** (5.16)	0.170*** (5.44)
Relationship with CEO $_{i,t}$	0.003*** (3.52)	0.003*** (3.48)	0.003*** (3.47)	0.003*** (3.46)
Industry Experience $_{i,t}$	0.111*** (4.15)	0.110*** (4.13)	0.108*** (4.06)	0.105*** (4.04)
Board Experience $_{i,t}$	0.910*** (4.66)	1.216*** (5.65)	0.908*** (4.58)	1.171*** (5.51)
Graduate Degree $_{i,t}$	0.042** (2.06)	0.052** (2.08)	0.040** (2.05)	0.049** (2.06)
Elite Education $_{i,t}$	0.033** (2.25)	0.043** (2.33)	0.030** (2.23)	0.037** (2.30)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	28,140	24,123	27,958	23,967
R ²	0.006	0.006	0.014	0.016

***, **, and * indicate significance at 1%, 5%, and 10% (two-tailed), respectively.

Taken together, my results suggest that the social capital captured in directors' external connections provides economic benefits to firms by increasing sales growth, lowering production costs, and improving profitability of firms.

ROBUSTNESS TEST

An alternative explanation for my main findings is that well-connected directors who develop reputations might acquire directorships in better performing firms. Directors seek to develop and maintain a favorable reputation as active representatives of shareholder welfare, thus enhancing their human capital on the boards on which they sit and increasing their attractiveness as candidates for board appointments at other firms (Zajac and Westphal 1996). Ferris, Jagannathan, and Pritchard (2003) examine whether the overall performance of a company affects the number of board seats secured by its outside directors under general and not extraordinary conditions. They find a positive association between performance and directors obtaining new board seats. To the extent to which this is the case, my findings of the better performance observed for firms with newly appointed well-connected directors may not be due to the resources that the directors bring to the firms but due to well-connected directors acquiring directorships only in firms with better prospects.

To rule out this alternative explanation, I restrict the sample to firms that experienced a decrease in sales revenue prior to appointing well-connected directors to the board. I also restrict the sample to firms whose profit (ROA) deteriorated before well-connected directors are appointed to the board. Using these two alternative sets of sample data, I repeat the main regression model (1) to (3), described in Section 4. Table 7 presents results from regressing changes in sales revenue on changes in directors' external connections using two alternative sets of sample data. Panel A of Table 7 shows the results of regression analysis based on the alternative sample of firms that experienced a decrease in sales revenue before director appointments. The coefficient of changes in directors' external connections on changes in sales revenue is positive and statistically significant. Panel B of Table 7 shows the results of regression analysis based on the alternative sample of firms whose profit deteriorated before the well-connected directors are appointed. The coefficient of changes in directors' external connections on changes in sales revenue is also positive and statistically significant.

TABLE 7
RELATIONSHIP BETWEEN CHANGES IN SALES AND CHANGES IN DIRECTORS'
EXTERNAL CONNECTIONS: ALTERNATIVE SAMPLES
PANEL A: FIRMS WITH SALES DECREASE BEFORE DIRECTOR APPOINTMENTS

	Dependent Variable: $\Delta SALES_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	0.038** (2.13)	0.029** (2.08)	0.034** (1.97)	0.025** (2.02)
$\Delta ADEC_{i,t-1}$		0.072*** (3.54)		0.067*** (3.39)
log(Total Assets) _{<i>i,t</i>}	0.029*** (13.11)	0.026*** (11.31)	0.027*** (11.49)	0.025*** (10.17)
log(Market to Book) _{<i>i,t</i>}	-0.013*** (-3.07)	-0.013*** (-2.88)	0.009* (1.89)	0.010** (2.03)
Leverage _{<i>i,t</i>}	1.052*** (4.65)	1.049*** (4.54)	1.028*** (4.27)	1.024*** (4.19)
Firm Age _{<i>i,t</i>}	-0.026*** (-5.15)	-0.020*** (-5.01)	-0.028*** (-5.07)	-0.021*** (-5.02)
Board Size _{<i>i,t</i>}	0.005*** (2.82)	0.005*** (2.75)	0.002 (1.14)	0.002 (1.29)
% Outside Directors _{<i>i,t</i>}	0.026*** (6.14)	0.028*** (6.19)	0.026*** (6.18)	0.028*** (6.19)
Busy Directors _{<i>i,t</i>}	0.004* (1.75)	0.005* (1.75)	0.004* (1.72)	0.005* (1.75)
CEO/Chair Duality _{<i>i,t</i>}	0.008 (0.71)	0.013 (0.79)	0.009 (0.69)	0.013 (0.78)
Intra-board Social Ties _{<i>i,t</i>}	0.058*** (5.14)	0.053*** (5.09)	0.066*** (5.25)	0.055*** (5.11)
Relationship with CEO _{<i>i,t</i>}	0.001*** (3.51)	0.001*** (3.47)	0.001*** (3.46)	0.001*** (3.45)
Industry Experience _{<i>i,t</i>}	0.052*** (4.14)	0.052*** (4.14)	0.054*** (4.15)	0.058*** (4.23)
Board Experience _{<i>i,t</i>}	0.415*** (4.65)	0.434*** (4.84)	0.428*** (4.77)	0.424*** (4.71)
Graduate Degree _{<i>i,t</i>}	0.020** (2.05)	0.020** (2.04)	0.020** (2.04)	0.020** (2.01)
Elite Education _{<i>i,t</i>}	0.015** (2.24)	0.014** (2.22)	0.015** (2.23)	0.014** (2.22)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	8,807	7,671	8,736	7,608
R ²	0.047	0.043	0.118	0.120

PANEL B: FIRMS WITH ROA DECREASE BEFORE DIRECTOR APPOINTMENTS

	Dependent Variable: $\Delta SALES_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	0.049*** (3.11)	0.034** (2.43)	0.045*** (2.88)	0.030** (2.21)
$\Delta ADEC_{i,t-1}$		0.068*** (4.15)		0.057*** (3.49)
$\log(\text{Total Assets})_{i,t}$	0.013*** (7.07)	0.014*** (7.08)	0.014*** (7.08)	0.015*** (7.10)
$\log(\text{Market to Book})_{i,t}$	0.057*** (15.83)	0.056*** (14.79)	0.049*** (11.99)	0.046*** (10.92)
Leverage $_{i,t}$	1.350*** (4.65)	1.338*** (4.64)	1.319*** (4.07)	1.305*** (4.01)
Firm Age $_{i,t}$	-0.034*** (-5.15)	-0.031*** (-5.11)	-0.036*** (-5.17)	-0.032*** (-5.12)
Board Size $_{i,t}$	0.001 (0.51)	0.001 (0.49)	0.001 (0.45)	0.000 (0.25)
% Outside Directors $_{i,t}$	0.033*** (6.14)	0.039*** (6.24)	0.034*** (6.18)	0.039*** (6.23)
Busy Directors $_{i,t}$	0.005* (1.75)	0.007* (1.83)	0.005* (1.72)	0.006* (1.81)
CEO/Chair Duality $_{i,t}$	0.011 (0.71)	0.011 (0.69)	0.011 (0.69)	0.010 (0.67)
Intra-board Social Ties $_{i,t}$	0.075*** (5.14)	0.069*** (5.11)	0.085*** (5.25)	0.065*** (5.08)
Relationship with CEO $_{i,t}$	0.002*** (3.51)	0.002*** (3.47)	0.002*** (3.46)	0.002*** (3.45)
Industry Experience $_{i,t}$	0.066*** (4.14)	0.060*** (4.02)	0.070*** (4.25)	0.063*** (4.09)
Board Experience $_{i,t}$	0.546*** (4.65)	0.553*** (4.68)	0.587*** (4.97)	0.529*** (4.31)
Graduate Degree $_{i,t}$	0.025** (2.05)	0.027** (2.08)	0.026** (2.07)	0.029** (2.11)
Elite Education $_{i,t}$	0.020** (2.24)	0.020** (2.22)	0.019** (2.22)	0.020** (2.21)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	13,744	11,854	13,652	11,776
R ²	0.024	0.026	0.068	0.078

***, **, and * indicate significance at 1%, 5%, and 10% (two-tailed), respectively.

Table 8 presents results from regressing changes in ROA on changes in directors' external connections using two alternative sets of sample data. Panel A of Table 8 shows the results of regression analysis based on the alternative sample of firms that experienced a decrease in sales revenue before director appointments. The coefficient of changes in directors' external connections on changes in ROA is positive and statistically significant. Panel B of Table 8 shows the results of regression analysis based on the alternative sample of firms whose profit deteriorated before the well-connected directors are appointed. The coefficient of changes in directors' external connections on changes in ROA is also positive and statistically significant.

TABLE 8
RELATIONSHIP BETWEEN CHANGES IN ROA AND CHANGES IN DIRECTORS'
EXTERNAL CONNECTIONS: ALTERNATIVE SAMPLES
PANEL A: FIRMS WITH SALES DECREASE BEFORE DIRECTOR APPOINTMENTS

	Dependent Variable: $\Delta ROA_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	0.032** (2.06)	0.027** (2.00)	0.032** (2.04)	0.025** (1.98)
$\Delta ADEC_{i,t-1}$		0.001 (0.03)		-0.007 (-0.32)
$\log(\text{Total Assets})_{i,t}$	0.018*** (7.30)	0.017*** (7.28)	0.015*** (7.26)	0.013*** (7.25)
$\log(\text{Market to Book})_{i,t}$	-0.001 (-0.28)	-0.001 (-0.25)	-0.001 (-0.25)	-0.000 (-0.16)
Leverage $_{i,t}$	2.992*** (4.66)	2.987*** (4.65)	2.601*** (4.38)	2.656*** (4.42)
Firm Age $_{i,t}$	-0.074*** (-5.16)	-0.075*** (-5.17)	-0.070*** (-5.08)	-0.072*** (-5.13)
Board Size $_{i,t}$	-0.003 (-1.57)	-0.003 (-1.60)	-0.004* (-1.81)	-0.004* (-1.78)
% Outside Directors $_{i,t}$	0.073*** (6.15)	0.070*** (6.11)	0.066*** (6.09)	0.066*** (6.08)
Busy Directors $_{i,t}$	0.011* (1.76)	0.011* (1.74)	0.009* (1.73)	0.012* (1.79)
CEO/Chair Duality $_{i,t}$	0.024 (0.72)	0.026 (0.74)	0.022 (0.70)	0.022 (0.70)
Intra-board Social Ties $_{i,t}$	0.166*** (5.15)	0.168*** (5.19)	0.167*** (5.16)	0.163*** (5.11)
Relationship with CEO $_{i,t}$	0.004*** (3.52)	0.004*** (3.48)	0.004*** (3.47)	0.004*** (3.46)
Industry Experience $_{i,t}$	0.147*** (4.15)	0.138*** (4.07)	0.138*** (4.06)	0.119*** (3.84)
Board Experience $_{i,t}$	1.209*** (4.66)	1.217*** (4.75)	1.158*** (4.38)	1.207*** (4.70)
Graduate Degree $_{i,t}$	0.056** (2.06)	0.053** (2.02)	0.051** (2.00)	0.056** (2.07)
Elite Education $_{i,t}$	0.044** (2.25)	0.048** (2.33)	0.038** (2.18)	0.048** (2.33)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	8,385	7,366	8,310	7,300
R ²	0.009	0.008	0.034	0.034

PANEL B: FIRMS WITH ROA DECREASE BEFORE DIRECTOR APPOINTMENTS

	Dependent Variable: $\Delta ROA_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	0.040*** (3.64)	0.036*** (2.98)	0.033*** (3.10)	0.029** (2.42)
$\Delta ADEC_{i,t-1}$		0.030*** (2.61)		0.020* (1.73)
$\log(\text{Total Assets})_{i,t}$	0.036*** (27.04)	0.035*** (25.24)	0.033*** (23.61)	0.032*** (21.74)
$\log(\text{Market to Book})_{i,t}$	-0.015*** (-5.93)	-0.012*** (-5.11)	-0.012*** (-5.12)	-0.009*** (-4.84)
Leverage $_{i,t}$	3.755*** (4.62)	3.668*** (4.51)	3.265*** (4.04)	3.291*** (4.11)
Firm Age $_{i,t}$	-0.093*** (-5.12)	-0.084*** (-5.00)	-0.088*** (-5.04)	-0.084*** (-4.99)
Board Size $_{i,t}$	-0.003*** (-2.75)	-0.003*** (-2.84)	-0.003*** (-2.74)	-0.003*** (-2.74)
% Outside Directors $_{i,t}$	0.092*** (6.11)	0.089*** (6.08)	0.083*** (6.01)	0.083*** (6.01)
Busy Directors $_{i,t}$	0.013* (1.72)	0.013* (1.73)	0.011* (1.69)	0.011* (1.63)
CEO/Chair Duality $_{i,t}$	0.030 (0.68)	0.035 (0.76)	0.027 (0.62)	0.030 (0.68)
Intra-board Social Ties $_{i,t}$	0.208*** (5.11)	0.236*** (5.58)	0.209*** (5.12)	0.230*** (5.51)
Relationship with CEO $_{i,t}$	0.005*** (3.48)	0.005*** (3.44)	0.005*** (3.43)	0.005*** (3.42)
Industry Experience $_{i,t}$	0.185*** (4.11)	0.198*** (4.49)	0.173*** (4.02)	0.175*** (4.05)
Board Experience $_{i,t}$	1.517*** (4.32)	1.406*** (4.21)	1.453*** (4.24)	1.468*** (4.28)
Graduate Degree $_{i,t}$	0.070** (2.02)	0.104** (2.11)	0.064** (2.01)	0.095** (2.08)
Elite Education $_{i,t}$	0.055** (2.21)	0.055** (2.20)	0.048** (2.16)	0.052** (2.19)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	13,679	11,790	13,582	11,707
R ²	0.078	0.076	0.125	0.123

***, **, and * indicate significance at 1%, 5%, and 10% (two-tailed), respectively.

Table 9 presents results from regressing changes in cost of goods sold on changes in directors' external connections using two alternative sets of sample data. Panel A of Table 9 shows the results of regression analysis based on the alternative sample of firms that experienced a decrease in sales revenue before director appointments. The coefficient of changes in directors' external connections on changes in cost of goods sold is negative and statistically significant. Panel B of Table 9 shows the results of regression analysis based on the alternative sample of firms whose profit deteriorated before the well-connected directors are appointed. The coefficient of changes in directors' external connections on changes in cost of goods sold is also negative and statistically significant.

TABLE 9
RELATIONSHIP BETWEEN CHANGES IN COST OF GOODS SOLD AND CHANGES IN
DIRECTORS' EXTERNAL CONNECTIONS: ALTERNATIVE SAMPLES
PANEL A: FIRMS WITH SALES DECREASE BEFORE DIRECTOR APPOINTMENTS

	Dependent Variable: $\Delta COGS_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	-0.043*	-0.045*	-0.039*	-0.039*
	(-1.94)	(-1.82)	(-1.80)	(-1.65)
$\Delta ADEC_{i,t-1}$		-0.054**		-0.041*
		(-2.15)		(-1.69)
log(Total Assets) $_{i,t}$	-0.018***	-0.016***	-0.010***	-0.009***
	(-6.68)	(-5.42)	(-3.45)	(-2.81)
log(Market to Book) $_{i,t}$	0.011**	0.028***	0.013**	0.012**
	(2.20)	(3.48)	(2.22)	(2.21)
Leverage $_{i,t}$	3.152***	3.265***	2.999***	3.279***
	(3.97)	(4.27)	(3.84)	(4.34)
Firm Age $_{i,t}$	-0.078***	-0.078***	-0.077***	-0.078***
	(-5.18)	(-5.14)	(-5.10)	(-5.15)
Board Size $_{i,t}$	-0.003	-0.004	-0.003	-0.004
	(-1.37)	(-1.42)	(-1.34)	(-1.48)
% Outside Directors $_{i,t}$	0.077***	0.088***	0.073***	0.087***
	(6.17)	(6.37)	(6.14)	(6.36)
Busy Directors $_{i,t}$	0.011*	0.011*	0.010*	0.011*
	(1.78)	(1.76)	(1.75)	(1.74)
CEO/Chair Duality $_{i,t}$	0.025	0.022	0.024	0.029
	(0.74)	(0.72)	(0.72)	(0.87)
Intra-board Social Ties $_{i,t}$	0.175***	0.237***	0.183***	0.238***
	(5.17)	(6.14)	(5.18)	(6.16)
Relationship with CEO $_{i,t}$	0.004***	0.004***	0.004***	0.004***
	(3.54)	(3.56)	(3.49)	(3.48)
Industry Experience $_{i,t}$	0.155***	0.211***	0.151***	0.199***
	(4.17)	(4.55)	(4.08)	(4.46)
Board Experience $_{i,t}$	1.273***	1.201***	1.270***	1.239***
	(4.68)	(3.87)	(4.66)	(4.09)
Graduate Degree $_{i,t}$	0.059**	0.058**	0.056**	0.056**
	(2.08)	(2.07)	(2.07)	(2.07)
Elite Education $_{i,t}$	0.046**	0.054**	0.042**	0.052**
	(2.27)	(2.30)	(2.25)	(2.28)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	8,786	7,656	8,715	7,593
R ²	0.013	0.012	0.090	0.089

PANEL B: FIRMS WITH ROA DECREASE BEFORE DIRECTOR APPOINTMENTS

	Dependent Variable: $\Delta COGS_{i,t}$			
	(1)	(2)	(3)	(4)
$\Delta ADEC_{i,t}$	-0.042*	-0.042*	-0.043*	-0.046*
	(-1.68)	(-1.85)	(-1.67)	(-1.86)
$\Delta ADEC_{i,t-1}$		-0.059**		-0.062**
		(-2.20)		(-2.39)
$\log(\text{Total Assets})_{i,t}$	-0.003	-0.002	-0.002	-0.004
	(-1.38)	(-1.38)	(-1.39)	(-1.54)
$\log(\text{Market to Book})_{i,t}$	-0.032***	-0.030***	-0.023***	-0.022***
	(-8.10)	(-7.45)	(-5.15)	(-4.78)
Leverage $_{i,t}$	1.582***	1.940***	1.433***	1.847***
	(4.68)	(5.67)	(4.10)	(5.34)
Firm Age $_{i,t}$	-0.039***	-0.051***	-0.039***	-0.046***
	(-5.18)	(-6.14)	(-5.10)	(-6.05)
Board Size $_{i,t}$	0.003	0.003***	0.001	0.001
	(1.64)	(1.51)	(1.11)	(1.05)
% Outside Directors $_{i,t}$	0.039***	0.049***	0.036***	0.043***
	(6.17)	(6.27)	(6.15)	(6.21)
Busy Directors $_{i,t}$	0.006*	0.006*	0.005*	0.005*
	(1.78)	(1.76)	(1.75)	(1.74)
CEO/Chair Duality $_{i,t}$	0.013	0.015	0.012	0.014
	(0.74)	(0.77)	(0.72)	(0.75)
Intra-board Social Ties $_{i,t}$	0.088***	0.119***	0.092***	0.120***
	(5.17)	(6.14)	(5.18)	(6.16)
Relationship with CEO $_{i,t}$	0.002***	0.003***	0.002***	0.002***
	(3.50)	(3.81)	(3.49)	(3.78)
Industry Experience $_{i,t}$	0.078***	0.106***	0.076***	0.100***
	(4.07)	(5.15)	(4.01)	(5.14)
Board Experience $_{i,t}$	0.639***	0.854***	0.638***	0.823***
	(4.68)	(5.97)	(4.68)	(5.90)
Graduate Degree $_{i,t}$	0.029**	0.037**	0.028**	0.034**
	(2.08)	(2.38)	(2.07)	(2.34)
Elite Education $_{i,t}$	0.023**	0.028**	0.021**	0.026**
	(2.22)	(2.29)	(2.20)	(2.25)
Year Fixed Effect	No	No	Yes	Yes
Industry Fixed Effect	No	No	Yes	Yes
Observations	13,721	11,835	13,630	11,758
R ²	0.005	0.005	0.027	0.030

***, **, and * indicate significance at 1%, 5%, and 10% (two-tailed), respectively.

Throughout this paper, I use a contemporaneous measure of directors' external connections, $\Delta ADEC_{i,t}$ as a baseline specification for my regression models. Given that the possibility of reverse causality, I estimate models using lagged variable of directors' external connections, $\Delta ADEC_{i,t-1}$ as a conservative baseline specification. The results (untabulated) from these models are qualitatively similar to those obtained from models using the contemporaneous measures of directors' external connections.

In summary, my results are robust to the alternative explanation and specification. I obtain similar inferences when using two alternative samples, and using a conservative specification, indicating that

relational capital captured in directors' external connections provides economic benefits to firms by helping to increase sales growth, improve profitability, and lower production costs.

CONCLUSIONS

In this paper, I examine the impact of directors' external connections on firm performance. Resource dependence theory suggests that directors provide critical resources to the firm through linkages with the external environment. I argue that relational capital captured in directors' external connections plays an important role as links that provides access to strategic inputs including raw materials and capital, information about the general environment, and knowledge of the industry and of the general business environment. I expect that well-connected directors in the boardroom networks create these benefits for the firm. Consistent with this, I find that directors' external connections help improve firm operating performance. Firms that appoint well-connected directors to the board experience significant increases in sales revenue, product cost reduction, and improvement in profitability, even after controlling for year and industry effects, and other control variables. I also find that firms that have high growth potential and are in an earlier stage of their business life cycle are more likely to benefit from directors' external connections.

This paper expands on our understanding of what boards do and how they affect firm performance by documenting that in addition to the common perspective that boards create value by monitoring management, the relational capital captured in directors' external connections provides economic benefits to firms. My results also extend the existing literature that has largely focused on the relationship between CEO's social ties and firm performance. As a study to provide empirical evidence on how, under what circumstance, and to what extent, directors' external connections affect firm operational performance, this paper opens up further questions in this area for future research. An interesting area of future research would be to provide an explanation of the processes whereby firms transform what well-connected directors bring into the boardroom into economic benefit to firms. For example, the connections between the respective directors of buyers and suppliers may have the implications of cost reductions for buyers. Another interesting area of future research would be to examine whether firms in financial trouble are likely to get directors with extensive connections. Comparing pre- and post-firm performance on the events such as sudden death of well-connected director is also left to future research.

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