

The Effect of Sarbanes–Oxley (SOX) Act on Retired CEO Director Quality

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Abstract

We analyze the effect of the Sarbanes–Oxley (SOX) Act on the quality of boards, defined with social capitals and human capitals of outside directors. Firstly, the average number of outside directorships held by retired CEOs with more (less) social capitals significantly decreases (increases) after SOX; the increased popularity of retired executives on boards after SOX found by Linck, Netter and Yang (2009) is mainly driven by retired CEOs with less social capitals. Secondly, the majority of CEOs (50% in pre-SOX period and 55% in post-SOX period) hold outside directorships at the similar-size firms as their original firm after retirement. However, 22% of CEOs in pre-SOX period and 28% in post-SOX period move to greater firms as outside directors than their original firms, and 29% in pre-SOX period and 18% in post-SOX period move to smaller firms. In addition, per increase in the log size of CEOs original firm yields 12.8% increase in average probability that the CEO will hold outside directorships during pre-SOX period, while about indicating 9.5% increase during post-SOX period. Overall, the average quality of boards as measured by social capitals of outside directors fell after SOX. Finally, retired CEOs with higher pre-retirement compensation hold more outside directorships even after pre-retirement accounting and stock price performances are controlled. It implies that pre-retirement compensation for retired CEO is a good proxy for human capitals in the market for directors.

JEL Classification: D23, G34, G38, L10, M40

Keywords: Sarbanes Oxley, Quality of Boards, Board Reform, Corporate Governance, Director Liability

1 Introduction

An act to protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws, and for other purposes.

- Sarbanes-Oxley Act

Sarbanes-Oxley Act (SOX) is enacted in 2002 to prevent Enron or Worldcom type scandal by improving corporate governance system. The intention of the enactment is well described in the interview with Senator Paul S. Sarbanes, "We have set standards for honest, transparent, and ethical business practices in our great public companies and established the safety mechanisms to keep them in place."

Many studies investigate how SOX has affected firms. The assessment on the benefit and cost of SOX is mixed. On the one hand, stock returns increased significantly after the uncertainty about the final provisions and enforcement is resolved. SOX could improve information quality of financial statement. In addition, SOX tends to lead investors to expect more board independence and less earnings management (Li, Pincus and Rego, 2008). Similarly, SOX legislation improves internal control effectiveness, which produces high quality financial information (Ashbaugh-Skaife, Collins and Kinney, 2008). SOX can also increase market liquidity by reducing information asymmetry in financial market (Jain, Kim and Rezaee, 2008). In sum, SOX can change the expectation of investors, so stock returns.

On the other hand, many researchers have noted the negative side of SOX. Neither corporate governance nor firm performance may have improved after SOX despite its provisions about independent audit committees, non-audit services by public accounting firms, executive loans, and financial report certifications (Romano, 2005). The less compliant a firm is on the SOX provisions, the better they can perform (Chhaochharia and Grinstein, 2007). The benefit of SOX can be smaller than direct and indirect costs of passing SOX. Corporate fraud has not decreased clearly after the enactment of SOX (Butler and Ribstein, 2006). Instead, SOX can decrease firm value by increasing information asymmetry between executives and boards (Adams and Ferreira, 2007). The Act can decrease listing in US market and induce firms to go private (Engle, Hayes and Wang, 2008). SOX can be particularly costly to small firms by requiring management reports (Iliev, 2010).

The enactment of SOX can change many other practices of firms. CEO salary and bonus has increased while, option-based pay has decreased after SOX. CEOs have decreased research and development expenditures and capital investments (Cohen, Dey and Lys 2007). SOX increase board independence and change its structure (Linck, Netter and Yang, 2008).

There are several sections related to boards of director in SOX. For example, section 101 requires that a financial expert be on board. In addition, a full-time director is also recommended by section 101. Section 301 specifies more responsibility and Independence standards for the audit committee of a board; it is unlawful for directors to influence the monitoring of financial statements. Section 306 requires a restriction on equity security trade for directors during blackout period. Section 402 prohibits personal loans for directors. Section 403 states that directors need to report their equity holdings of the firm whenever there is a change. Section 404 stipulates that annual reports need to contain internal control reports indicating structure and effectiveness of internal controls.

On the supply side, higher-quality directors will be reluctant to hold directorships because of the heavier workload and riskier director positions that are effects of the enactment of SOX. In addition, increased director pay is less likely to motivate retired CEOs to hold director positions, considering the compensation differences between CEOs and directors. On the demand side, firms need to satisfy the independent board requirement. To that end, firms do not want to hire current executives but instead hire retired executives due to the increased risk and heavier workload. Overall, I expect the disappearance of or decrease in activities of high-quality retired CEO directors in contrast to the increased activities of low-quality retired CEO directors after SOX legislation.

Our paper is close to Linck, Netter and Yang (2009) and Lee (2011) about the effect of SOX on the demand and the supply of corporate directors. Linck, Netter and Yang (2009) find that directors face increased workload and risks after SOX. Board meetings (audit and nominating committees) occur significantly more often. Director & Officer insurance premiums rose notably; 22% increase during the 1998-2001 period and 264% increase from 2001 to 2004. Boards become more independent – not by reducing insiders but by adding outsiders. Director compensation and board size increased, so they conclude that increased demand dominates decreased supply. Lee (2011) analyzes directorships held two years after retirement by CEOs of large U.S. firms. Retired CEOs from large U.S. firms became less common on boards after SOX. The size of retired CEO' s original firm explains the number of outside directorships in 1990s, but the effect disappears after SOX. Similarly, our paper also analyzes the effect of SOX on the market for directors. However, we provide direct evidences for how the quality of boards changes after SOX.

1.1 Core concepts: director quality

The board of directors is an important governance mechanism of a firm. Finkelstein,

Hambrick and Cannella (2009) identify two roles of a board of directors: externally directed and internally focused. The external role of a board of directors includes connecting an organization to important resources in the environment and to critical information in director network. The internal role of a board of directors covers setting strategies, monitoring executives, and appointing new CEOs. Based on these two different roles of boards of directors, we can define two dimensions of director quality: human capital and social capital.

First, human capital represents managerial skills and abilities. Human capital enables a board of directors to evaluate new strategies, provide advice about corporate business to executives, monitor the use of executives' discretion, and fire or hire new executives more efficiently. How investors perceive the human capital of boards can affect stock market performance, awareness and organizational legitimacy (Certo, 2003). Stewardship theory of corporate governance, which stresses the altruism of managers, discusses the value of director human capital (Donaldson and Davis, 1991, 1994).

Second, social capital usually refers to the value of social network. For directors, social capital can mean social similarities showing a shared affiliation as well as a personal network (Belliveau, O' reilly and Wade, 1996). The benefits of the social capital come from better information, power, and solidarity (Adler and Kwon, 2002). Social capital enables a board of directors to obtain timely and adequate information and to influence other parties related to the business of a firm. The larger firm a director is retired from, the more social capital the director is likely to own. The size of a firm from which a director retired as CEO explains both the size and quality of social capital (Bourdieu, 1986). The number of outside directorship of a CEO has depends on the size of a firm that the CEO retired from because such CEOs have better social network (Booth and Deli, 1996).

In order to facilitate measuring the quality of directors, we focus on the directors formerly retired as CEOs (See Brickley, Linck and Coles, 1999; Lee, 2011). The social capital of retired CEOs consists of the social network and elite connections built through tenure. The size of the firms where directors are originally from ('original firm' hereafter) can proxy social capital of directors. An important element of human capital is managerial knowledge and capabilities acquired throughout the career of directors. Pre-retirement performance is likely to be correlated with such knowledge and capabilities (Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece and Winter, 2007), so eventually approximate the value of human capital. We construct samples for CEOs who hold at least one directorship two years after retirement during 1997-2007.

We apply the model developed by Gabaix and Landier (2008) in order to investigate the

change in director quality. They propose a simple model in which CEO market competitively assign CEOs to firms and determines CEO compensation. CEOs have heterogeneous talent and are matched to heterogeneous firms. The managerial impact of CEO talent increases with the value of the firm under her/his control. Hence best CEOs go to largest firms because largest firms need high quality CEOs most and pay most to them. Their empirical findings support these predictions. CEO pay increases with the size of a firm and the size of an average firm in the economy; the most important determinant of the CEO compensation is the size of a firm, especially market capitalization. The role of boards is to monitor and to advise the CEO. Thus, just as the size of a firm matters in the CEO market, so firm size determines the pattern of assigning directors to firms in the director market. Similarly, as the quality of CEO matters more at bigger firms, so the quality of directors matters more in sizable firms. Since big firms could give more reputational value and monetary value to corporate directors, best retired CEOs (the retired CEO with the largest social or human capital) go to largest firms to work as outside directors as well.

1.2 Main findings and contribution

The main contribution of our paper is to investigate the important dimension of boards, i.e. the quality of directors, which has been largely ignored in the literature. The vast body of theoretical (Hermalin and Weisbach, 1998; Raheja, 2005; Adams and Ferreira, 2007) and empirical literature (Adams, 2003; Lehn, Patro and Zhao, 2004; Linck, Netter and Yang, 2008, Linck, Netter and Yang 2009 ; Lee, 2011) addresses corporate boards. However, the literature focuses on the size, composition, workload, risk, supply and demand of boards, not the social or human capital of directors. Moreover, we provide direct evidences that institutional change such as SOX can lower the quality of directors significantly.

First, the average number of outside directorships of retired CEOs decreases significantly after the enactment of SOX. This finding is close to Lee (2011). However, while Lee (2011) only analyzes the large U.S. firms, we take a look at small firms (S&P smallcap 600 and no S&P major index firms) as well as big firms (S&P 500 and S&P midcap 400 firms).

Second, the average number of outside directorships held by former CEOs retired from big firms decreases significantly after SOX. On the other hand, the average number of outside directorships held by former CEOs retired from small firms increases significantly after SOX. Thus, the apparent increase of the popularity of retired executives as directors after SOX in 2000s found by Linck, Netter and Yang (2009) is mainly driven by retired CEOs with less social capitals (measured by the size of their

original firms; i.e. lower-quality retired CEO). This also suggests that low-quality retired CEOs dominate high-quality retired CEOs in the overall director markets; a firm hires smaller number of high-quality former CEOs, but more firms appoint low-quality retired CEOs as directors after SOX in the overall director markets. To remind, as Gabaix and Landier (2008) validate both theoretically and empirically, the quality of a former CEO is positively correlated with the size of firm that the CEO formerly worked for.

Third, our result indicates that 50% of retired CEOs in pre-SOX period and 55% in post-SOX period hold outside directorships at the firms whose size are similar to the CEO' s original firms. However, 22% of CEOs in pre-SOX period and 28% in post-SOX period move to greater firms as an outside director than their original firms after retirement. And, 29% in pre-SOX period and 18% in post-SOX period move to smaller firms as an outside director after retirement. Thus, retired CEOs tend to move to smaller firms than their retired firms as outside directors during pre-SOX period whilst to bigger firms during post-SOX.

Fourth, retired CEOs with greater human capital (measured by pre-retirement compensation) hold more outside directorships in the post-retirement period. Our result is consistent with Lee (2011) that the pre-retirement accounting performance is not correlated with the number of outside directorships held by retired CEOs after SOX and that stock price performance (abnormal stock return) is negatively associated with the number of outside directorships held by retired CEOs after SOX. It implies that pre-retirement compensation for retired CEO is a good proxy for human capitals in the market for directors. Additionally, the negative relationship between market performance (measured by abnormal stock return) and the number of outside directorships can be explained by market expectation; if a CEO heir is expected not as good as the current CEO, stock market will drop when the current CEO is about to retire.

The remainder of the paper is organized as follows. Section 2 describes our data. Section 3 documents the effect of SOX on outside directorships held by retired CEOs. Section 4 examine the relationship between pre-retirement performance and outside directorships held by retired CEOs. Section 5 serves as the conclusion.

2 Data and Initial Analysis

2.1 Sample Selection

To investigate the effect of SOX on the market for directorships held by retired CEOs,

we collect the data of retired CEOs who have worked as directors for two years after their retirement. It is possible that a retired CEO from a public firm works as an executive or as a director in a private firm. However, we only concentrate on those retired from public firms as CEOs and hired by public firms as directors. Since SOX was enacted in 2002, we examine the directorships during the five-year periods before SOX (1997–2001) and after SOX (2003–2007). We identify the retired CEOs from the Compustat ExecuCompu database from 1995 to 2005. In the data, each executive has his own executive ID (EXECID in Compustat). By using this executive ID, if a retired CEO works as an executive for a firm that is different from the retired firm, we eliminate the retired CEO in the sample. For the directorship, we use the retired CEOs name and age to the director data to find director ID (DIRECTOR_DETAIL_ID in Risk Metrics) in the Risk Metrics database. Among 1,695 retired CEOs who were in the director market before and after retirement, only 897 retired CEOs held directorship two years after retirement. However, 86 retired CEOs are on an interim basis or remain less than 2 years in the CEO position. Since we need to calculate pre-retirement characteristics of retired CEOs, zero or one year tenure is not enough. The final sample contains 338 CEOs who retired in the pre-SOX period (1995–1999) and 352 CEOs who retired in the post-SOX period (2001–2005). The directorships from the sample are 642 positions in the pre-SOX period (1997–2001) and 547 positions in the post-SOX period (2003–2007).

[Insert Table 1]

Table 1 shows the distribution by year and by industry for CEO retirement. In 2000, when the stock market bubble burst, the number of retired CEOs was greater than the other years. Significantly decreases the average number of outside directorships held by CEOs who retired after 2000. Additionally, the number of the outside directorships held by retired CEOs was less than the average number of whole samples in the post-SOX period. Outside directors are neither a current employee nor a former employee of the firm. All other directors are considered as an inside director.

2.2 Director Quality and Pre-Retirement Information

[Insert Table 2]

Table 2 introduces the core concepts in our paper including the definition and measurement of director quality. To estimate the quality of a retired CEO as a director, we collect pre-retirement information from Compustat and Center for Research in Security Prices (CRSP). Following Brickley, Linck and Coles (1999) and Lee (2011), We use the average of each variable during the four years before retirement in order to define qualities. When the tenure is two or three years, we calculate the average

variable during their tenure before retirement year. For the firm performance data, we collect return on asset (ROA), industry-adjusted ROA, annual stock return (ASR), and abnormal ASR. Industry-adjusted ROA is calculated by subtracting industry median ROA from the firm's ROA. Industry is defined by the 2-digit Standard Industrial Classification (SIC) code. Abnormal ASR is calculated by subtracting the CRSP value-weighted stock return from the monthly compounded annual stock return of the firm.

3 SOX Effects on the Social Capitals of Directors

3.1 Matching Director Firm and Retired Firm

We categorize both the firms where CEOs retired ('retired firms') and the firms where retired CEO become outside directors ('director firm') by size. We use the S&P major index to categorize the size of the retired firms and director firms. Then we examine how retired CEOs in each category of retired firms move to each category of director firms.

[Insert Table 3]

Table 3 shows that 50% of retired CEOs in the pre-SOX period and 55% in the post-SOX period worked in the same class of firm size as outside directors after retirement. 22% retired CEOs in the pre-SOX period and 28% in the post-SOX period moved to bigger firms as an outside director after CEO retirement. 29% of retired CEOs in the pre-SOX period and 18% in the post-SOX period transited to smaller firms as an outside director after CEO retirement. In panel B, a two-sided t-test shows that the difference in percentages between periods is significant (at 5%). About one half of the retired CEOs move to firms with the same size class of firms as outside directors. However, when a retired CEO works for a firm with a different size class of firms as an outside director in the post-retirement period, he tends to serve for a smaller firm in the pre-SOX period and for a bigger firm in the post-SOX period than his retired firm.

Since we conceptualize director quality with the size of a firm that a CEO retired from, we examine whether firms hire retired CEOs from relatively smaller or larger size class of firms during the post-SOX period. The proportion of retired CEOs moving to the same size class of firm as outside directors comprises a majority. Thus, we regard the size category of retired firm as the benchmark of director quality for retired CEOs. Then analyzing the category matching between retired firm and director firm, we can identify the change of director quality at firms around institutional events. Firms

clearly hire lower quality CEOs as outside directors after SOX than before SOX.

3.2 Directorship Data

To analyze the impact of SOX on the retired CEOs' directorship activities, we examine the change in the number of directorships held by retired CEOs between the pre-SOX and post-SOX periods.

[Insert Table 4]

Table 4 shows the number of retired CEOs who hold the indicated number of directorships. For all ages, the proportion of directors that hold at least four outside directorships is greater during pre-SOX than post-SOX, while fewer than four outside directorships is a smaller proportion during pre-SOX than post-SOX. Following Brickley, Linck and Coles (1999), we analyze two sub-samples with normal retirement age. The two sub-samples show that one or two outside directorships have greater proportions in the post-SOX period, while the other cases are a smaller proportion in the post-SOX period.

[Insert Table 5]

Table 5 shows the average characteristics of directorship and performance data. The total number of retired CEO directorships decreases significantly from the pre-SOX period to post-SOX period, mainly driven by the decrease in outside directorships. We categorize the retired firms by using the S&P major index when CEOs retired into two sub-samples: the S&P 500 and S&P midcap 400 firms denote big firms. Firms in S&P smallcap 600 or without S&P major index membership define small firms. Retired CEOs from big firms hold 2.09 outside directorships during pre-SOX period, while they hold 1.53 outside directorships in the post-SOX period on average. In addition, retired CEOs from small firms hold 0.95 outside directorship during pre-SOX period while they hold 1.22 outside directorships in the post-SOX period on average. Outside directorships decrease significantly for retired CEOs from big firms and increase significantly for retired CEOs from small firms after SOX.

Other interesting patterns also arise. The number of both outside and inside directors decreases significantly after SOX due to the decrease in outside directors in big firm. The return on asset (ROA) of retired firm decreases after SOX. However, once we control industry effect to compute industry adjusted ROA, we can observe significant increase of the performance. This means that firms tend to hire the retired CEO with better relative ROA performance after SOX. This effect is stark in big firms, but invisible in

small firms. We can find comparable patterns in stock market performance. The annual stock return (ASR) of retired firm apparently decreases after SOX. However, once we adjust market risk to compute abnormal ASR, we can observe significant increase of stock performance. This means that firms tend to hire the retired CEO with better relative stock performance after SOX. This effect arise both in big and small firms. Thus, we can conclude that the retired CEOs with better accounting and stock market performance are more likely to become outside directors after SOX than before SOX, especially at big firms. As we conceptualize human capital of retired CEOs with their accounting and stock market performance, such results suggest large implication about how human capital changes after SOX. We will discuss this human capital implication in detail later.

3.3 Regression Analysis on the Social Capital of directors

[Insert Table 6]

Table 6 shows that the number of outside directorships is positively correlated to the firm size in both periods, meaning that the retired CEO who comes from a bigger firm will hold more outside directorships. In addition, during post-SOX, the number of outside directorship tends to be negatively correlated with stock market performance such as annual stock return (ASR) and abnormal ASR. Thus, retired CEOs with good stock market performance are also those with fewer outside directorship after SOX.

[Insert Table 7]

Next, we run the regression based on Brickley, Linck and Coles (1999) and Lee (2011). We use accounting performance, market performance, and regulation dummies as control variables. Table 7 shows that the number of outside directorships is positively related to the firm size and negatively related to the market performance and regulated industry in both periods. The regression shows the same qualitative results for firm size in both periods, however, the size of the effect is significantly different; The Wald test shows that the ordered logit coefficients between the two periods are significantly different at the 1% level. In detail, the log-odd ratio for pre-retirement firm size is higher in the pre-SOX period, which means that the increased likelihood of having more outside directorships by pre-retirement firm size is higher before SOX. The binary choice model, whether holding outside directorship or not, shows that the chance of having outside directorships held by retired CEOs from big firms is lower after SOX. And the chance of having outside directorships held by retired CEOs from a small firm is higher after SOX. In Panel B, a 1-unit increase in log of assets during CEO tenure yields about a 12.8 increase in average probability

that the CEO will hold outside directorships two years after retirement in the pre-SOX period, while indicating a 9.5 increase in average probability in the post-SOX period.

4 SOX Effect on the Human Capital of Outside Directors

4.1 Pecuniary Reward for Outside Directorships

In this section, we analyze possible explanations of the negative relationship between market performance (possible measurement for human capitals of retired CEOs) and number of outside directorships in Table 7. Considering the pay gap between CEOs and directors, it is hard to imagine that higher director pay motivates retired CEOs to hold multiple outside directorships.¹⁾ However, financial incentive can stimulate retired CEOs to hold more directorships when a lower level of compensation is realized. The greater ratio of the stock-related payment among the total compensation and the lower stock performance can cause retired CEOs to hold more directorships. To test this financial-incentive hypothesis with our data, we study the relationship between the number of outside directorships and an interaction term between the higher ratio of stock-related pay and lower stock return. If the interaction term shows a positive relationship to the number of outside directorships, we can say that lower-realized CEO compensation incurs more outside directorships after retirement.

[Insert Table 8]

Stock-related pay is calculated by subtracting current compensation from total compensation.²⁾ The ratio of stock-related pay is the stock-related pay over the total pay. The pre-retirement ratio of stock-related pay is the average of the variable during the 4 years before retirement. If the tenure is 2 or 3 years, we calculate the average variable during their tenure before retirement year. Table 8 shows that the interaction term between the higher ratio of stock-related pay and lower annual stock return is insignificant in both periods relative to the number of outside directorships. In addition, the interaction term between the higher ratio of stock-related pay and lower abnormal annual stock return is significantly negative in the pre-SOX period and not significant in the post-SOX period relative to the number of outside directorships. The retired CEO with lower realized compensation does not hold

1) Linck, Netter and Yang (2009) show that median compensation in 2004 is 0.1 millions of dollars for directors and 3.6 millions of dollars for CEOs.

2) Total compensation (TDC1 in Compustat) includes salary, bonus, other annual compensation, long-term incentive payouts, restricted stock granted, Black-Scholes value of stock-options granted, and all other compensation. Total current compensation (Total_Curr in Compustat) includes salary and bonus. Long-term incentive payouts and all other compensation can include no stock-related payment; however, the proportion is so small that this will be disregarded.

more outside directorship in the post-retirement period. The result is not consistent with financial incentive hypothesis. Stock-pay ratio is positively related to the number of the outside directorships only in the pre-SOX period. The effects of annual stock return, abnormal annual stock return, firm size, and regulation dummy on the number of post-retirement outside directorships are similar to the regression result in Table 7.

4.2 Proxy for Human Capitals of Directors

In this section, we test the hypothesis that post-retirement directorships for retired CEOs are positively related to their human capitals using alternative performance measurements. Considering the monitoring and advising role of a director, a good performer is more likely to possess better talent to be a director. In this sense, our previous analysis might be insufficient to measure the director quality (human capitals) related to the pre-retirement performance. For alternative performance measurement, we test the relationship between performance and directorship by using growth of earning per share (EPS) and compensation. Kim and Yang (2009) find that the EPS (growth) is the most popular measurement for the performance target to determine CEO compensation. One can ask whether the firm level performance like EPS reflects the CEO' s own performance. In the sense that CEO is a chief manager of the firm and his leadership can change whole firm business, firm level performance is a good proxy for CEOs. However, if we can extract a CEO' s own performance, it will better explain his own ability. Despite ongoing debates about executive compensation, compensation schemes in various respective firm reflect each executive' s performance. Thus, it is reasonable to test CEO compensation as one of the CEO' s performance proxies. We use size and regulated status of retired firm as control variables. Further, we also include industry-adjusted return on asset and abnormal annual stock return as performance measurements of retired CEO. Since, those two performance measurements are different from EPS growth and compensation, it is suitable to analyze if there is any change of the effects of those variables on the number of outside directorship held by retired CEO. Table 8 shows the multivariate analysis of alternative performance proxies.

[Insert Table 9]

Table 9 shows that the estimated coefficient on EPS growth is statistically insignificant. However, CEO compensation is significantly and positively related to the number of his outside directorship after retirement in both periods. For other performance variables, industry-adjusted return on asset is not related to the number of outside directorships for retired CEOs; abnormal annual stock return is negatively

related.

The negative relationship between pre-retirement market performance as measured by abnormal stock return and the number of outside directorships held by retired CEOs can be explained by stock market expectations. Suppose a CEO is expected to be incompetent in the stock market, and then he turns out to be merely bad. Then the stock price of the company will rise because he is not as bad as expected. Since market performance represents not the raw quality of a CEO but the gap between his performance and market expectation, pre-retirement market performance may not indicate the quality level of a retired CEO as a director. If a talented CEO approaches retirement, the stock price of the firm may fall because the successor's expected ability will not be as good as the current CEO's. Then, the talented CEO will have more directorships with bad market performance in the post-retirement period.

5 Conclusion

We analyze the effect of the Sarbanes-Oxley (SOX) Act of 2002 on the quality of boards. We show asymmetric effects of SOX on directorships held by retired CEOs according to their director quality which is measured by their pre-retirement firm size. The average number of outside directorships held by highly (lowly) qualified retired CEOs significantly decreases (increases) after SOX. Secondly, the firms tend to hire retired CEOs with less social capitals as outside directors after SOX. 22% of CEOs in pre-SOX period and 28% in post-SOX period work at greater firms as an outside director than their original firms after retirement. However, 29% in pre-SOX period and 18% in post-SOX period move to smaller firms as an outside director. Additionally, an increase in the size of CEOs original firm yields about a 12.8 increase in average probability of CEOs holding outside directorships during pre-SOX period, while about indicating a 9.5 increase during post-SOX period. Finally, pre-retirement compensation neither better pre-retirement accounting performance nor better pre-retirement stock price performance is a good proxy for human capitals in the market for directors.

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Table1: Sample distribution by year

This Table describes the distribution of the retired CEOs from 1995 to 2005 and their career as outside directors after two years retirement. For example, CEOs who are retired in 2001 have about 1.38 outside director positions on average in 2003.

Retired Year	Number	Percent	Average number of outside directors two years after retirement
Pre-SOX Period			
1995	48	6.16	1.667
1996	66	8.47	1.712
1997	68	8.73	1.471
1998	74	9.5	1.811
1999	82	10.53	1.768
SOX Enactment			
2000	89	11.42	1.831
Post-SOX Period			
2001	74	9.5	1.378
2002	71	9.11	1.296
2003	67	8.6	1.507
2004	65	8.34	1.354
2005	75	9.63	1.587
Total	779	100	1.588

Table 2: Concepts

Concepts	Definition and measurement
Director Quality	<ul style="list-style-type: none"> ● Definition: The accumulation of both social and human capital which are beneficial to the well-being of a firm. ● Measurement: The quality of social and human capital that a director owns
Director social capital	<ul style="list-style-type: none"> ● Measurement of its quality: Size of a firm right before a director retires as CEO for the firm. This measurement is in line with Bourdieu (p8, 1986): “The volume of the social capital possessed by a given agent thus depends on the size of the network of connections he can effectively mobilize and on the volume of the capital (economic, cultural or symbolic) possessed in his own right by each of those to whom he is connected.”
Director human capital	<ul style="list-style-type: none"> ● Measurement about its quality: Performance of a firm right before a director retires as CEO for the firm. This is in line with Becker (2008): “The limited data available indicate that on-the-job training is an important source of the very large increase in earnings that workers get as they gain greater experience at work.” More specifically, Ulrich, Huselid and Becker (2001) relate high performing firms with the quality of human capital, similar to our operationalization.
Retired (Original) firm	<ul style="list-style-type: none"> ● The firms where CEOs were working at retiring
Director firm	<ul style="list-style-type: none"> ● The firms where former CEOs are working as directors
Director firm size	<ul style="list-style-type: none"> ● The size of firms where the retired CEOs work as board members measured with the total asset of the firm
Pre-retirement firm size	<ul style="list-style-type: none"> ● The size of firms where the directors retired as CEOs measured with the total asset of the retired firm
Pre-retirement accounting performance	<ul style="list-style-type: none"> ● Original firm’s net income during CEO tenure measured with Average Return on Asset (ROA) of the retired firm
Retire firm market performance	<ul style="list-style-type: none"> ● Original firm’s market return during CEO tenure; Average Annual Stock Return (ASR) of the retired firm
Industry adjusted return on asset	<ul style="list-style-type: none"> ● The industry adjusted ROA shows about how well the retired CEOs performed the accounting return compared to the firms in the same industry; $(ROA) - (Industry\ Median\ ROA)$
Abnormal annual stock return (ASR)	<ul style="list-style-type: none"> ● The ASR shows about how well the retired CEOs performed the market return compared to the overall stock market; $(stock\ return) - (CRSP\ value\ weighted\ stock\ return)$.
Stock pay ratio	<ul style="list-style-type: none"> ● The ratio of the stock-related pay over total pay; $((TDC1) - (TCC)) / (TDC1)$ in Compustat
Earnings per share (EPS) Growth	<ul style="list-style-type: none"> ● Change of earnings per share in each year; $((EPSFI_t) - (EPSFI_{t-1})) / (EPSFI_{t-1})$ in Compustat

Table 3: Matching the Firms as an Outside Director VS Retired CEO by Firm Size

This table shows the transition from CEO to outside director two years after retirement as a CEO. In order to classify firms, we use the classification of the S&P index. 1 indicates an S&P 500 index firm, 2 indicates an S&P Midcap 400 index firm, 3 indicates an S&P Smallcap 600 index firm, and 4 indicates no major S&P index firm. Panel B shows the percentage of the directors whose original firm has a different S&P index to the director firm. In panel A, Firms at retiring in S&P index is the original firm's S&P index in the retirement year. Firms at directorship in S&P index indicates the director firm's S&P index in the two years after retirement as a CEO. The retired CEOs are the same as described in Table 1. In this table each retired CEO can be shown in more than one director position if he holds more than one outside directorship. The parenthesis shows the percentage of the each director position in each period. The percentage is calculated by adding off-diagonal percentage in each period in Panel A. For example, during pre-SOX period, 21.77% (8.19+4.74+3.02+3.23+1.08+1.51) of directors came from greater firms where they worked as a CEO rather than a director firm.

Panel A											
Firms at retiring in S&P index during Pre-SOX						Firms at retiring in S&P index during Post-SOX					
		1	2	3	4	Total	1	2	3	4	Total
Firms at directorship in S&P index	1	203 (43.75)	38 (8.19)	22 (4.74)	14 (3.02)	277 (59.7)	157 (43.01)	30 (8.22)	14 (3.84)	15 (4.11)	216 (59.18)
	2	35 (7.54)	13 (2.8)	15 (3.23)	5 (1.08)	68 (14.66)	31 (8.49)	19 (5.21)	29 (7.95)	9 (2.47)	88 (24.11)
	3	32 (6.9)	26 (5.6)	11 (2.37)	7 (1.51)	76 (16.38)	15 (4.11)	18 (4.93)	23 (6.3)	5 (1.37)	61 (16.71)
	4	21 (4.53)	8 (1.72)	11 (2.37)	3 (.65)	43 (9.27)	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
	Total	291 (62.72)	85 (18.32)	59 (12.72)	29 (6.25)	464 (100.)	203 (55.62)	67 (18.36)	66 (18.08)	29 (7.95)	365 (100.)
Panel B											
							Pre-SOX	Post-SOX			
The size of firms at directorship is greater than that at retiring							21.77%	27.96%			
The size of firms at directorship is smaller than that at retiring							28.66%	17.53%			
The size of firms at directorship is similar to that at retiring							49.57%	54.51%			

Table 4: Post-Retirement Directorships

This table shows the number of outside and inside directorships of retired CEOs before and after SOX by age. Age is the retired CEO's age in the retirement year. Inside +2years>0 means the number of retired CEOs who work as directors in retired firms two years after retirement. Outside +2 years>0 means the number of retired CEOs who work as outside directors two years after retirement. Total +2years>0 means the number of retired CEOs who work as directors two years after retirement. The numbers in parenthesis are the percentage in each period and each sub-sample.

Period	All age		Age≥60		64≤Age≤66	
	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX
Inside +2years>0	178 (52.66)	182 (51.7)	132 (58.41)	135 (55.1)	45 (50.56)	45 (51.14)
Outside+2years						
0	95 (28.11)	100 (28.41)	66 (29.2)	71 (28.98)	20 (22.47)	18 (20.45)
1	85 (25.15)	99 (28.13)	44 (19.47)	62 (25.31)	15 (16.85)	23 (26.14)
2	70 (20.71)	91 (25.85)	45 (19.91)	65 (26.53)	19 (21.35)	25 (28.41)
3	38 (11.24)	40 (11.36)	29 (12.83)	28 (11.84)	16 (17.98)	15 (17.05)
4 or more	50 (14.79)	22 (6.25)	42 (18.58)	18 (7.35)	19 (21.35)	7 (7.95)
Outside +2 years>0	243 (71.89)	252 (71.59)	160 (70.79)	174 (71.03)	69 (77.53)	70 (79.55)
Total+2years						
1	149 (44.08)	157 (44.6)	85 (37.61)	101 (41.22)	28 (31.46)	29 (32.95)
2	71 (21.01)	104 (29.55)	48 (21.24)	75 (30.61)	16 (17.98)	26 (29.55)
3	53 (15.68)	61 (17.33)	38 (16.81)	44 (17.96)	20 (22.47)	23 (26.14)
4 or more	65 (19.23)	30 (8.52)	55 (24.34)	24 (10.20)	25 (28.09)	10 (11.36)
Total +2years>0	338 (100.)	352 (100.)	226 (100.)	245 (100.)	89 (100.)	88 (100.)

Table 5: Mean Difference between Pre- VS Post-SOX

This table shows the average number of directorships and average value of pre-retirement data in the pre- and post-SOX periods by original size. We use the classification of the S&P indexes to group firms by size. If a firm is included in the S&P 500 or S&P Midcap 600, the firm is considered big. If a firm is included in the S&P Small 400 and no S&P major index, the firm is considered small. Mean Diff is calculated by the average value of each variable in pre-SOX minus the average value of each variable in post-SOX. Outside +2 years is the average number of outside directors who retired as a CEO two years ago. Inside +2 years is the average number of inside directors who retired as a CEO two years ago. Total +2 years is the average number of directors retired as a CEO two years ago. Pre-retirement data is based on the average of each variable during the 4 years before retirement, and if the tenure is 2 or 3 years, the average variable has been calculated for their tenure before the retirement year. Return on Asset (ROA) is the net income over the total asset. Industry-adjusted ROA (Ind-adj ROA) is calculated by subtracting industry median ROA from the firm's ROA. Annual stock return (ASR) is the compounded annual stock return which is calculated from the CRSP monthly stock return with a reinvesting dividend. Abnormal ASR is the ASR minus the CRSP value-weighted index. *, **, and *** means that the average values between two periods are different at 10%, 5%, and 1% significance level. The significance level is estimated by a 1-sided difference in the means test.

Period	All Firm			Big Firm			Small Firm		
	Pre-SOX	Post-SOX	Mean Diff	Pre-SOX	Post-SOX	Mean Diff	Pre-SOX	Post-SOX	Mean Diff
N	338	352	690	220	234	454	118	118	236
Outside + 2 years	1.69	1.42	0.266***	2.09	1.53	0.561***	0.95	1.22	-0.271*
Inside + 2 years	0.53	0.52	0.00958	0.45	0.49	-0.0417	0.68	0.58	0.102*
Total + 2 years	2.22	1.94	0.276***	2.54	2.02	0.519***	1.63	1.8	-0.169
Return on Asset	5.18%	4.23%	0.945**	5.19%	4.83%	0.359	5.15%	3.04%	2.108***
Ind-adj ROA	1.97%	2.83%	-0.866**	2.20%	3.48%	-1.281***	1.54%	1.55%	-0.0141
Annual stock return	19.94%	15.74%	4.193***	21.16%	16.02%	5.132***	17.66%	15.19%	2.476
Abnormal ASR	0.15%	12.15%	-12.00***	1.45%	12.27%	-10.81***	-2.28%	11.91%	-14.19***
Tenure	10.45	10.74	-0.295	10.44	10.77	-0.333	10.47	10.69	-0.220

Table 6: The Relationship between Outside Directorship and Pre-Retirement Characteristics

This table shows the pairwise correlation coefficients between the number of outside directorships and retired CEOs in each period. If the number of outside directorships exceeds three, then the number of outside directorships is set to four. Ind-adj ROA is the industry adjusted return on asset. Abnormal ASR is the abnormal annual stock return. Regulation dummy is equal to one if the original firm's SIC 2-digit code in the retirement year is 49 (utility), 60 (depository institution), or 63 (insurance) and 0 otherwise. For the definition of other variables, see Table 5. *, **, and *** indicate significance levels of each correlation coefficient at the 10%, 5%, and 1% levels.

	Pre-SOX						
	Outside + 2 years	Return on Asset	Ind-adj ROA	Annual Stock Return	Abnormal ASR	Firm size	Regulation Dummy
Outside + 2 years	1						
Return on Asset	-0.064	1					
Ind-adj ROA	-0.036	0.9516***	1				
Annual Stock Return	-0.069	0.2027***	0.2076***	1			
Abnormal ASR	-0.073	0.1966***	0.2050***	0.9590***	1		
Firm size	0.4580***	-0.2220***	-0.1738***	0.02	0.015	1	
Regulation Dummy	-0.049	-0.1718***	-0.1312**	0.03	0.042	0.3026***	1

	Post-SOX						
	Outside + 2 years	Return on Asset	Ind-adj ROA	Annual Stock Return	Abnormal ASR	Firm size	Regulation Dummy
Outside + 2 years	1	-0.051	-0.023	-0.1676***	-0.1581***	0.2721***	0.005
Return on Asset		1	0.9129***	0.2413***	0.1972***	-0.03	-0.1162**
Ind-adj ROA			1	0.1789***	0.1491***	-0.042	-0.1427***
Annual Stock Return				1	0.9434***	-0.082	-0.065
Abnormal ASR					1	-0.095*	-0.092*
Firm size						1	0.3714***
Regulation Dummy							1

Table 7: Ordered Logit Regression Results of the Number of Outside Directorships by Original Firm Size

In panel A, the dependent variable is the number of the outside directorships. If the number of outside directorships exceeds three, then the number of outside directorships is set to four. If the firm is included in the S&P 500 or S&P Midcap 600, the firm is considered a Big Firm. If the firm is included in the S&P Small 400 and no S&P major index, the firm is considered a Small Firm. Regulation dummy is equal to one if the original firm's SIC 2-digit code in the retirement year is 49 (utility), 60 (depository institution), or 63 (insurance) and 0 otherwise. For the definition of other variables, see Table 5. The coefficients of the regression results represent the ordered log-odd scale change in a response to the one unit change in explanatory variables. *, **, and *** indicate significance at the 10%, 5%, and 1% levels. P-values are reported in parentheses. Panel B shows the change of the probability that the CEO will hold one or more directorship two years after retirement by one unit change of each variable with holding the other variable at their mean value. For example, a 1 unit increase in log of assets during CEO tenure yields about 12.7 percent increase in average probability that the CEO holds one or more outside directorships 2 years after retirement during the pre-SOX period, while about 9.4 percent increase in average probability during the post-SOX period for all sample.

Panel A: Ordered logit regression result						
Periods	Pre-SOX			Post-SOX		
	(1)	(2)	(3)	(4)	(5)	(6)
Sample	All	Big Firm	Small Firm	All	Big Firm	Small Firm
Ind-adj ROA	1.035 (0.579)	2.458 (0.394)	-2.722 (0.309)	-0.192 (0.884)	0.389 (0.830)	-0.648 (0.728)
Abnormal ASR	-1.192* (0.050)	-0.771 (0.362)	-2.051** (0.032)	-1.039*** (0.009)	-1.152** (0.028)	-0.863 (0.182)
Ln(Asset)	0.635*** (0.000)	0.532*** (0.000)	0.550*** (0.000)	0.366*** (0.000)	0.352*** (0.001)	0.570*** (0.005)
Regulation dummy	-1.135*** (0.000)	-1.184*** (0.001)	-0.593 (0.219)	-0.766** (0.012)	-0.515 (0.142)	-1.840** (0.020)
N	338	220	118	352	234	118

Panel B: Marginal effect of each variable to the probability that outside directorship change from 0 to 1 or more						
Ind-adj ROA	-0.399	0.376	-1.703*	0.038	0.261	-0.243
Abnormal ASR	-0.301**	-0.118	-0.728**	-0.187*	-0.094	-0.318*
Ln(Asset)	0.127***	0.088***	0.141***	0.094***	0.094***	0.098*
Regulation dummy	-0.190**	-0.172**	-0.102	-0.160	-0.067	-0.364*

Table8: Ordered Logit Regression with Stock-Related Pay Ratio

This table shows the relationship between the number of outside directorships and the stock-related pay ratio for retired CEO. The dependent variable is the number of the outside directorships. If the number of outside directorships exceeds three, then the number of outside directorships is set to four. Regulation dummy is equal to one if the original firm's SIC 2-digit code in the retirement year is 49 (utility), 60 (depository institution), or 63 (insurance) and 0 otherwise. The regression result represents the ordered log-odd scale change in response to the one unit change in explanatory variables. Stock-pay ratio is the stock-related pay over the total compensation. The stock-related pay is calculated by subtracting the total current compensation from the total compensation. Low stock return equals 1 if stock return is lower than median stock return during each period and 0 otherwise. Low abnormal stock return equals 1 if abnormal stock return is lower than median abnormal stock return during each period and 0 otherwise. High stock-pay ratio equals 1 if the stock-pay ratio is higher than the median stock-pay ratio and 0 otherwise. Pre-retirement data are based on the average of each variable during 4 years before CEO retirement in the original firm and, if the tenure is 2 or 3 years, I calculate the average variable during their tenure before the retirement year. (Low stock return)*(High stock-pay ratio) and (Low abnormal stock return)*(High stock-pay ratio) are interaction terms between those variables. For the definition of other variables, see Table 5. *, **, and *** indicate significance at the 10%, 5%, and 1% levels. P-values are reported in parentheses.

Period	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX
Annual Stock Return	-1.415** (0.029)	-1.272*** (0.001)			-1.995** (0.014)	-1.335** (0.004)		
Abnormal ASR			-1.232** (0.046)	-1.217*** (0.002)			-1.820** (0.016)	-1.274*** (0.006)
LnAsset	0.561*** (0.000)	0.318*** (0.000)	0.561*** (0.000)	0.316*** (0.000)	0.568*** (0.000)	0.318*** (0.000)	0.568*** (0.000)	0.316*** (0.000)
Regulation Dummy	-0.899*** (0.002)	-0.631** (0.044)	-0.906*** (0.002)	-0.631** (0.045)	-0.919*** (0.001)	-0.636** (0.043)	-0.946*** (0.001)	-0.632** (0.044)
Stock-pay ratio	1.867*** (0.000)	0.777 (0.146)	1.779*** (0.000)	0.832 (0.124)	2.383*** (0.000)	0.850 (0.174)	2.343*** (0.000)	0.900 (0.151)
Low stock return * High stock-pay ratio					-0.514 (0.105)	-0.076 (0.795)		
Low abnormal stock return * High stock-pay ratio							-0.581* (0.068)	-0.069 (0.807)
N	337	349	337	349	337	349	337	349

Table 9: Ordered Logit Regression with Alternative Performance Measurements

The dependent variable is the number of the outside directorships. If the number of outside directorships exceeds three, then the number of outside directorships is coded to four. Regulation dummy is equal to one if the original firm's SIC 2-digit code in the retirement year is 49 (utility), 60 (depository institution), or 63 (insurance) and 0 otherwise. For the definition of other variables, see Table 5. The coefficients of the regression result represent the ordered log-odd scale change in a response to the one unit change in explanatory variables. Earnings per share (EPS) is EPSFI in Compustat and EPS Growth is the EPS change from the previous year. CEO compensation is based on TDC1 which includes salary, bonus, other annual compensation, long term incentive payouts, restricted stock granted, Black-Scholes value of stock-options granted, and all other compensation. Pre-retirement data are based on the average of each variable during the 4 years before CEO retirement in the original firm and, if the tenure is 2 or 3 years, I calculate the average variable during their tenure before the retirement year. For the definition of other variables, see Table 5. *, **, and *** indicate significance at the 10%, 5%, and 1% levels. P-values are reported in parentheses.

Period	(1)	(2)	(3)	(4)	(5)	(6)
	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX	Pre-SOX	Post-SOX
Ind-adj ROA	1.035 (0.579)	-0.192 (0.884)	0.941 (0.617)	-0.147 (0.912)	0.556 (0.763)	-0.805 (0.580)
Abnormal ASR	-1.192* (0.050)	-1.039*** (0.009)	-1.171* (0.059)	-0.984** (0.015)	-1.369** (0.029)	-1.263*** (0.002)
LnAsset	0.635*** (0.000)	0.366*** (0.000)	0.635*** (0.000)	0.365*** (0.000)	0.476*** (0.000)	0.240** (0.012)
Regulation Dummy	-1.135*** (0.000)	-0.766** (0.012)	-1.141*** (0.000)	-0.759** (0.012)	-0.788** (0.010)	-0.569* (0.086)
EPS Growth			0.029 (0.834)	0.046 (0.268)		
CEO Compensation					0.403*** (0.008)	0.260* (0.072)
N	338	352	338	352	337	349