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Cross-Shareholdings, Outside Directors, and Managerial Turnover: The Case of Japan

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Cross-Shareholdings, Outside Directors, and Managerial Turnover: The Case of Japan*

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Abstract

We have analyzed the monitoring role of outside directors in Japan. A detailed classification of each outside director into (1) former bankers; (2) former shareholders; (3) former cross-shareholders; and (4) pure outside directors reveals that only pure outside directors increase the turnover-performance sensitivity of inside directors. That is, we found that the background of each outside director is crucial for his or her role as a monitor.

1 Introduction

An increasing number of countries have published official guidelines that stipulate minimum standards for the participation of outside directors on the boards of listed companies. The movement toward increasing the number of outside directors is observed not only in European countries, but also in other countries such as Australia and Brazil. Particularly after the Asian currency crisis, many countries in the region, including Malaysia, Korea, Hong Kong, and Singapore, changed their corporate codes in order to increase the number of outsiders on the boards of publicly traded firms. Setting aside their actual effectiveness, we can observe that outside directors have been expected to play a major role in corporate governance in many countries.

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Japanese listed companies are not yet legally required to have outsider-dominated boards. The recently revised commercial law, however, promotes the adoption of more outside directors by providing options to managers.[1] Even though the formal new governance system is not yet generally accepted, an upward trend in the ratio of outsiders on the board can be observed.[2] [3] As Japanese companies have long been regarded as typical examples of the insider-driven system, the current movement toward outsider-dominated boards has received attention in both the academic and the business world.[4]

Quite naturally, there are an increasing number of studies concerning the effectiveness of outsiders on the board of directors. One of the most influential studies is Weisbach (1988), which finds that a board dominated by outsiders increases the sensitivity of the turnover of top executives to firm performance. Dahya and McConnell (2002) report similar results using data from the United Kingdom. In his recent survey, Murphy (1999) lists this finding as one of the stylized facts regarding CEO turnover.

Most analyses that investigate whether boards with many outside directors make different decisions than insider-dominated boards look at companies in the USA or the UK. Firms in such countries are known to have very different ownership structures than other countries; that is, in the Anglo-American economies, most shares are held by many small individual shareholders, whereas in continental Europe and Asia, shares tend to be concentrated in firms and families. As outside directors are supposed to mitigate the agency problems between managers

[1]The revision of the commercial law in 2003 enabled Japanese listed companies to choose either the traditional statutory audit system or the new, American-style, Company with Committee system. To be registered as the latter, the company must fulfill several requirements, including the adoption of many outsiders to the board. A Company with Committees does not have to obtain approval from a shareholder meeting for the determination of profits and the disposition of losses.

[2]By June 2003, only 40 listed companies, including Sony, Toshiba, and the Hitachi groups, had adopted the new-style governance system. This number is very small compared with the total number of listed companies (more than 3000).

[3]Abe (2004) reports a modest upward trend in the ratio of outsiders to the entire board members in the manufacturing industry. The ratio was 17% in 1990 and 22% in 2001.

[4]During the 1980s and the early 1990s, many researchers tried to investigate the unique mechanism of the so-called Japanese System. One of the excellent surveys along this line is Aoki and Patrick (1994). After the midle of the 1990s, however, the number of papers that noted negative implications for the Japanese System, such as the main bank and *keiretsu* (business group) increased. See, for example, Mork and Nakamura(1999) and Caballero et al. (2003).

and owners, or conflicts between major and minor shareholders, international differences in ownership structures might create distinct implications for the role of outside directors in each country.[5]

Compared with the USA and the UK, empirical studies regarding the participation of outside directors and the turnover of CEOs in other countries are very rare.[6] Although there are by now quite a few studies on Japanese outside directors, the empirical results have been far from conclusive. Kaplan and Minton (1994) find that the appointment of outside directors substantially raises the probability of turnover of incumbent top executives, as in the USA. This result can be interpreted as suggesting that, as in the USA, outside directors in Japan play a disciplinary role. In contrast, Kang and Shivdasani (1995) and Abe (1997) point out that the presence of outside directors on the board has no effect on the sensitivity of turnover to firm performance. That is, contrary to the stylized facts reported by Weisbach (1988), which describes the situation in other countries, no strong correlation between board composition and the sensitivity of turnover to firm performance has been observed in Japan. The objective of this paper is to explain why previous analyses have not been able to show a consistently positive role of outside directors.

A director in Japan is defined by the Corporate Code as an outside director if he or she has never been an employee of the company or of its subsidiary. That is, a director, even if he or she worked for a major stakeholder such as a supplier, can be regarded as an outsider.[7] Nevertheless, significant proportions of company shareholdings in Japan are mutually held by trading partners such as banks and suppliers.[8] Because shareholding companies can appoint

[5]Hermalin and Weisbach (2003) provide an excellent survey of both theoretical and empirical studies on the outside directors.

[6]Rather than turnover, some look at the relationship between outside directors and firm performance. See, for example, Peng (2004). As Hermanlin and Weisbach (2003) point out, there is no clear relationship between firm performance and the ratio of outside directors in the USA. They also argue that, since firm performance is affected by many unobservable factors, considering turnover is cleaner than testing the relationship between board composition and firm performance.

[7]According to Miyajima and Kuroki (2003), the market valuation of cross-shareholdings in Japan amounts to 17.6 trillion yen at the end of March 2002, which exceeds the market capitalization of all the listed banks (16.3 trillion yen).

[8]See Nakatani (1984) and Hoshi, Kashyap, and Sharfstein (1991) for the characteristics of Japanese business groups.

a director through a shareholders' meeting, there is a possibility that an outside director appointed by a shareholding company has an objective that is different from profit maximization. Let us examine the case of a car manufacturer. Suppose one of the directors was formerly employed by a major car dealer. Such a director might be more interested in the number that the former employer might be able to sell than in maximizing the present company's profits. In our sample, which covers all the listed companies in the Japanese electrical machinery industry, 61% of outside directors came from shareholding companies, which is far from negligible.

In this paper, we investigate whether the outside directors' background makes any difference to their monitoring role of inside directors, including top executives. More specifically, we classify outsiders by their background into two groups, which are "impure" outsiders and "pure" outsiders. The term "impure-outsiders" means directors who are former bankers or former shareholders. We further classify "impure" outsiders into three smaller subgroups, which are bankers, cross-shareholders, and shareholders who are neither bankers nor cross-shareholders, and investigate their effects on the turnover of inside directors. Figure 1 illustrates the classification of outsiders by their background.

Following Weisbach (1988) and other previous studies, we consider the role of outside directors in determining the turnover of executives. One large difference between this paper and others is that we investigate not only the top executives or CEOs, but also other inside directors. There are several advantages in covering all the insiders. The first is that, in Japanese companies, inside directors are usually more engaged in managing than are outside directors, and it is generally considered that most Japanese companies are insider-dominated. As is stipulated in Article 260.1 of the Commercial Law, all directors are engaged in managing as well as monitoring top executives.[9] However, we think that inside directors are required to manage a company, whereas outside directors are expected to do a better job in monitoring managers.

The second advantage comes from the number of turnover events of inside directors. Ac-

[9]The Article says: "The board of directors shall determine the administration of company affairs and supervise the execution of the duties of the directors".

cording to Kang and Shivdasani (1995), the annual likelihood of a nonroutine turnover of top executives is only 3.1%, which implies that the nonroutine turnover occurs less than once every 20 years.[10] In contrast, we can observe the replacement of some inside directors almost every year in many companies as a board usually consists of many inside directors in Japan. Therefore, it is possible to collect a large amount of turnover data, which gives us a significant advantage in the power of our statistics.

The third advantage of covering all the insiders is its consistency to related studies. An increasing number of papers have begun to investigate board compensation as a part of the governance mechanism. Most of those papers, such as Xu (1997), Murase (1998), and Abe et al.(2004), have used the average compensation of the board. In other words, they investigate the entire board rather than only the top executives in their analyses of incentive mechanisms such as pay-performance sensitivities. This paper can be regarded as a natural extension of these previous studies on compensation.

Our main findings can be summarized as follows: (1) the turnover of inside directors is negatively correlated with company performance; (2) without detailed classification, outside directors do not seem to play a major role in the turnover of inside directors; and (3) only "pure" outside directors increase the sensitivity of the turnover of insiders to company performance when the ownership is concentrated. These results fill the gap between the former studies on firms in the USA and in Japan. We need to classify each outside director by his or her origins to detect their effectiveness on the board. We also need to consider the entire board rather than only top executives to show clearly the governance mechanism. The second and third results cast serious doubts on the effectiveness of the recent moves in the corporate governance system in Japan; that is, a mere increase in outside directors might not improve monitoring. Thus, to improve the monitoring power of the board of directors, it is necessary that outside directors are genuinely independent, i.e., had no previous affiliation with the shareholding companies.

[10]Nonroutine turnover occurs when a president resigns and does not stay in the board as a chairperson. This definition is commonly used in turnover analyses in Japan. See Kaplan and Minton (1994) and Abe (1997) for details.

The rest of the paper is organized as follows. Section 2 states test hypotheses. Section 3 provides a description of the data. Section 4 explains the methodology employed. Section 5 presents the empirical results. Section 6 discusses endogeneity issues, while section 7 summarizes the findings and concludes the paper.

2 Some Hypotheses

Incentive mechanisms that are aimed to align outside directors' interest with that of shareholders, i.e., the mechanism behind their role in hiring and firing management, have been analyzed for a long time. A pioneering work in this respect is that by Fama (1980) and, many models have been built on Fama's argument. A recent model by Hermalin and Weisbach (1998) provides us many testable implications for the monitoring role of outside directors such as: (1) the presence of outside directors increases the probability of CEO turnover when firm performance is poor; and (2) the effectiveness of the disciplinary role by outside directors depends on their degree of independence. Although their model is quite general, before applying it to Japanese companies, we have to consider several characteristics of Japanese corporate governance and business practices. More specifically, we need to take into account: (1) the roles of directors; and (2) interfirm relationsips such as can be found in business groups in Japan.

Japanese corporate law does not consider CEOs or presidents. Instead, the law stipulates "representative directors" who are supposed to be the top managers. In each firm, there are usually three to five such representative directors at any one time. As is mentioned in the introduction, Japanese corporate law stipulates that one of the major roles of board members is to determine the administration of company affairs. Although most companies have one president, his or her role as manager is closely tied to the other directors who are mostly inside directors. Therefore, rather than regarding a president in Japanese companies as equivalent to a CEO in the USA who is solely responsible for the management, it is more appropriate to consider that all the inside directors, as a unit, are in charge of management. Based on the proposition by Hermalin and Weisbach (1998), which analyzes CEOs, we set our first hypothesis

to be tested as follows:

Hypothesis 1. The turnover of inside directors and firm performance are negatively correlated.

The second hypothesis to be considered concerns interfirm relationships among Japanese firms. One conspicuous characteristics of Japanese business practice is that a significant part of a company's shares is often held by business partners that are usually other listed companies.[11] Sometimes, we can observe even cross-shareholdings among many companies. As shareholding companies usually own other companies' shares for a long time, such practices have been criticized as a mechanism that entrenches managers in their positions and shields companies from a hostile takeover. If a company owns other companies' shares not for investment purposes but to seek other benefits, such as securing business deals, such shareholders may have an incentive to exercise his voting power to maximize their own benefits. Such an execution of the power by the outside director may not be consistent with profit maximization of the company whose shares are held. Outside directors formerly employed by such companies might not be a good monitor to ensure profit maximization. In much of the related literature, outside directors are expected to act as monitors who are in charge of removing incumbent managers when firm performance is poor. Considering business practices in Japan, the intensity of monitoring by outside directors might depend on whether they are from a business partner or not because their degree of independence is highly questionable(Hermalin and Weisbach 1998). Let us assume that outsiders who are former bankers, former shareholders, or former cross-shareholders are "impure" outsiders who may have objectives other than profit maximization. If this assumption is correct, the degree of a board's independence is an increasing function of the ratio of "pure" outsiders to the board size. If the degree of the independence is positively related to the existence of "pure" outsiders, the turnover-performance sensitivity of inside directors should be

[11] Cross-shareholdings have been analyzed in investigations of business groups in Japan that are called *keiretsu*. Except for obvious cases such as subsidiaries, it is not an easy task to classify each company into some particular *keiretsu*. Traditional ways such as the classification by Economic Research Association, which publishes famous "*Keiretsu no kenkyu*", have been criticized seriously by Miwa and Ramseyer (2002).

greater for the firm with a greater "pure" outsider ratio. In other words, the hypotheses to be tested are as follows:

Hypothesis 2. The presence of a "pure" outside director increases the turnover-performance sensitivity.

Hypothesis 3. The presence of an "impure" outside director does not affect turnover-performance sensitivity.

In the following sections, we will consider the monitoring role of outside directors by investigating the above hypotheses.

3 Data

3.1 Data sources

The data on board composition come from "Directors Data" by *Toyo Keizai*, which contains detailed information on individual directors such as age, tenure, schooling, position on the board, and so forth. Our information on company financial statements data is from the *NEEDS* database. We also use "Major Shareholders Data" provided by *Toyo Keiza*i as the source to determine the ownership structures. The sample used in this study consists of 192 listed companies and 6660 directors in the electrical machinery industry for the period from 1990 to 1999.[12] Firms are deleted from our sample if they were omitted from the list of *Toyo Keizai* for some reasons, such as bankruptcy, for this period. We selected our sample this way in order to exclude the effect of business failure.[13] Some data, such as each directors' shares, have been obtained from *Yuka Shoken Hokokusho,* which corresponds to the 10-K filings in the US data. To classify directors according to their former affiliations, we have used both Major Shareholders Data from *Toyo Keizai* and Firm Shareholding Data from the *NEEDS* database.

[12]We do not include data after year 2000 because of the change in information disclosure regulations. Before 2000, all the non-financial listed companies in Japan had to report the name and amount of each share they held as long as the ratio of the book value of the share to their capital was over 0.2%. The regulation was mitigated to 1% in year 2000, which makes it very difficult to create data on cross-shareholdings after year 2000.

[13]This type of problem may also arise on the data of 1999. However, this confusion disappears because we have the data set from 1990 to 2000 in initial stage. The information on the existence of firms in the data of 2000 enables us to exactly distinguish whether the board members of a firm are to be turned over or censored.

3.2 Descriptive Statistics

3.2.1 Outsiders and board composition

Panel A of Table 1 indicates the board composition of our sample. The average size of the boards is about 21 directors, which is larger than in many other countries.[14] As mentioned in Miwa and Ramseyer (2003), it is important to note that the number includes statutory auditors, i.e., *kansayaku*, on the grounds that the discussions of directors in Japanese firms typically include the *kansayaku*.[15] Even if we exclude the statutory auditors from our sample, the average size of boards is 18, which is still larger than that for US firms.[16]

In contrast to the size of the boards, the number of outsiders is very small, which is generally characterized as a distinct feature in the boards of directors in Japan. As shown in Table 1, only 32.3% of directors are what Weisbach (1988) terms "outsiders", which means that most Japanese firms are insider-dominated. About 14% of outsiders (4.6% of all the directors) are from banks. However, it should not be judged from this figure that relationship between banks and firms is weak. As presented in Panel C of Table 1, half of all the firms have at least one director from a bank. Although the effectiveness of the main bank system as the governance mechanism has been under serious criticism, our data show that, during the 1990's, many listed firms kept their ties with banks on the boards.

Directors from shareholders amount to about 20% of our sample, which corresponds to 61% of outside directors. This figure is far from negligible and implies that a closer examination of them is necessary in an analysis of outsiders and their roles. We classify the shareholder directors into three smaller subgroups, which are bankers (B), cross-shareholders (C), and shareholders who are neither bankers nor cross-shareholders (D). Note that directors from cross-shareholders comprise 11.8% of the outside directors.

Finally, we define "pure" outsiders (E) as directors who are neither former bankers, nor

[14] See Fukao and Morita (1997) for interational comparisons of corporate boards.

[15] On the other hand, we do not include executive directors, i.e., *sikkou yakuin*, in the sample because they had no legal obligations or responsibilities for managing and monitoring during the sample period.

[16] In their analysis of board compositions and the mainbank system, Morck and Nakamura (1999) includes auditors in the boards. They note that excluding auditors from board members does not affect their results.

former shareholders. There is a wide variety in the backgrounds of the "pure" outsiders. Some are from foreign consulting companies, and others are university professors or lawyers. It is considered that the pure outsiders are the most independent group among all the outside directors.

3.2.2 Turnover of the board of directors

Panel B of Table 1 documents the age and tenure of directors. The average age of Japanese directors in our sample is 58. We find that directors leave their position when their age is approximately 61 years old. Although not reported in Table 1, the first quartile of the age when directors leave the board is 58 and the third quartile is 64. This implies that the frequency distribution of the age when directors resign is symmetric to some extent. In other words, retirement from the position of director in their middle sixties is not common in Japan. The leaving age of directors is evenly spread between 58 and 61, although there is an extreme case in which one director kept his position until the age of 92. Our sample shows no explicit common retirement age for directors in Japan, which is consistent with former studies by Abe (1997).

The tenure of directors is defined as the number of years that the director has been a member of the board. On average, the tenure of our sample is 8.8 years, although there is also an extreme case where one director kept his position on the board for 62 years. Figure 1 shows the histogram of directors' tenure including censored observations. According to Figure 2, more than 75% of board members do not stay on the board for more than 10 years. In addition, we can observe that approximately 90% of directors resign within 17 years from their appointment. Panel B of Table 1 shows that the ratio of directors resigning their positions during the sample period is 13%, which implies that the turnover of directors occurs once in every 7.7 years. This figure is close to the median of the tenure reported in Panel B.

Panel B of Table 1 also shows the difference between the two groups, i.e., insiders and outsiders. The average age of outsiders is higher than that of insiders by about 2.3 years and the tenure of outsiders is shorter than that of insiders by 2.7 years.[17] We can also confirm that

[17]These differences are significant according to the t-test and Wilcoxon rank sum test at the 1 % level.

the difference between insiders and outsiders from Figure 3, which plots the hazard functions. Although the hazard rate of insiders increases for 15 years from the appointment, it begins to decrease gradually and again increases between years 35 and 55. In contrast, the hazard rate of outsiders increases for 10 years after inauguration and decreases gradually thereafter. The very different features of the hazard functions between inside directors and outside directors suggest their different roles on the boards.

3.2.3 Financial characteristics

Panel C of Table 1 presents the financial characteristics of the sample firms. Firm size is calculated as the natural logarithm of the total assets denominated by the consumer price index. Roughly, the mean value of the firm size is equivalent to 427 billion Japanese yen. As measures of firm performance, we adopt return on assets (ROA). ROA is the ratio of operating income to the total assets.[18] The ROA ranges from -14% to 24.8%, with an average of 3.3%, which is in the neighborhood of its median. Complementarily, we also employ the dummy variable for negative profit, which is a binary variable that takes unity if the operating income is negative and zero otherwise.

Panel C of Table 1 also reports the ownership structures. The average shares held by directors amount to 3.5%, which is larger than their median. At the maximum, 63% of shares are owned by directors. That is, the distribution of directors' ownership is highly skewed in the left direction like the typical distribution of consumer's income. In each director's ownership, the skewness is more enlarged, which can be inferred from the difference between the mean value and its median. Ownership by foreign institutions is modest and is 7.3% of all the shares, which is very small compared with the proportion owned by financial institutions. It is worth noting the proportion of shares held by the "speciall few", which is referred to as *shosu tokuteisha mochikabu* in Japanese.[19] As the shares held by the "special few" are unlikely to

[18] As the numerator, we could use net profit before tax. However, we use operating income as the numerator because net profit before tax exhibits were extremely volatile during the sample period.

[19] To be listed in the first tier, each firm has to keep the shares held by the "special few" to less than 70% of all the shares issued. The special few is defined as: (1) the top ten shareholders; (2) board members and their relatives in the second degree; and (3) the issuer itself if it owns shares.

be circulated in the market for trade, we regard this as a measure of ownership concentrations of Japanese listed companies.

4 Methodology

This section develops the econometric methodology employed in analyzing the duration of board members in our sample. We begin by introducing terminology common to survival analysis and then describe the estimation of the hazard function. Let T be a random variable measuring the duration of time that passes before the occurrence of a turnover of a board director with a probability distribution $F(t) = Pr(T < t)$. The corresponding density function is $f(t) = dF(t)/dt$. In studying duration data, it is useful to define survivor function, $S(t) = Pr(T \geq t)$, which yields the probability that the random variable T lasts at least to time t. Our duration data can also be described in terms of the hazard function. The hazard function determines the probability that a board turnover will occur, conditional on the spell surviving through time t, and is defined by

$$\lambda(t) = \lim_{\Delta t \to 0} \frac{Pr(t \leq T < t + \Delta t) | T \geq t)}{\Delta t} = \frac{f(t)}{S(t)}. \tag{4.1}$$

As our interest is to examine how variables such as the board compositions and firm performances explain the length of board tenure, we use the proportional hazard model, which has been widely used in many disciplines. In this model the hazard function is factored as

$$\lambda(t, x(t), \beta) = \lambda_0(t) \exp(x(t)'\beta) \tag{4.2}$$

where $x(t)$ is a vector of time-varying explanatory variables such as firm performances and age, β is a vector of unknown parameters, and $\lambda_0(t)$ is a baseline hazard function corresponding to $\exp(x(t)'\beta) = 1$. Noting that the logarithm of $\lambda(t, x(t), \beta)$ is linear in $x(t)$, we can immediately find that β reflects the partial impact of each variable in $x(t)$ on the logarithm of the estimated hazard rate.

The partial likelihood model by Cox (1972) can be used to estimate β in (4.2) without specifying the form of the baseline hazard $\lambda_0(t)$. Note that our data is individual panel

data and so we have many observations for each director. This panel structure gives us many advantages such as controlling for firm-level fixed effects.[20] Consider n directors of boards in a sample and assume k of the n directors have left the board by the end of the observation period. The remaining $n-k$ directors are right censored. Suppose the durations are ordered, $t_1 < t_2 < \cdots < t_k$, and i denotes the director's turnover at t_i.[21] The likelihood L_i that director i departs from his or her position at time t_i rather than the other existing directors can then be written as

$$L_i(\beta) = \frac{\lambda(t_i, x_i(t_i), \beta)}{\sum_{\ell=1}^{n} Y_\ell(t_i)\lambda(t_i, x_\ell(t_i), \beta)} = \frac{\exp(x_i(t_i)'\beta)}{\sum_{\ell=1}^{n} Y_\ell(t_i)\exp(x_\ell(t_i)'\beta)} = \frac{\exp(x_i(t_i)'\beta)}{\sum_{\ell \in R(t_i)} \exp(x_\ell(t_i)'\beta)} \quad (4.3)$$

where $x_\ell(t_i)$ denotes the time-varying covariate variables for director ℓ, $R(t_i)$ is the set of directors at risk of turnover at time t_i, and $Y_\ell(t_i)$ is an indicator function for risk, i.e., $Y_\ell(t_i) = 1$ if director ℓ is still at risk at time t_i and $Y_\ell(t_i) = 0$ otherwise. The product over i then gives the partial likelihood function for β,

$$L(\beta) = \prod_{i=1}^{k} \frac{\exp(x_i(t_i)'\beta)}{\sum_{\ell=1}^{n} Y_\ell(t_i)\exp(x_\ell(t_i)'\beta)} = \prod_{i=1}^{k} \frac{\exp(x_i(t_i)'\beta)}{\sum_{\ell \in R(t_i)} \exp(x_\ell(t_i)'\beta)}. \quad (4.4)$$

Finally, maximum likelihood estimates of β can be obtained by numerical maximization of (4.4).[22] [23]

[20] Controlling for fixed effects in nonlinear estimation is generally difficult due to the incidental parameter problem. In our model, however, the problem is less serious since we have more than 90 observations per firm on average.

[21] Here we ignore the case of ties. But the approximated formulations to calculate this likelihood functions are established by some previous studies. In this paper, we use the Breslow appoximation(Breslow, 1974) which is an approximation of the exact marginal. The idea of this method is that each of tied times is treated as though it occurred just before the others. To apply this approximation for ties, the above set-up needs to be slightly modified.

[22] It is important to note that competing risks occur when a spell can end in several different ways. For example, directors can leave his position for two reasons: an involuntary turnover that proxies for being fired or a voluntary departure that proxies for retirement or ill health. In this case, the above specification should be modified. Let $t_{j1} < t_{j2} < \cdots < t_{jk_j}$ denote the k_j times of type j turnovers, $j = 1, 2, \cdots, m$ and let $x_{ji}(t_{ji})$ denotes the time-varying covariate variables for director i at time t_{ji}. Then, the partial likelihood function can be constructed as a similar form of (4.4). Likewise, the Breslow approximation applies in case of tied turnover.

[23] In this paper, we define board tenure as the time from when they started as members of the board. Because the data about exact timing of their inauguration are available from *Toyo Keizai*, left censoring does not arise. However, alternative time dimensions can be considered, such as Tunali and Pritchett(1997), who applied the Cox model to the yellow fever epidemic in New Orleans, and compared three concepts of time dimensions: calendar time, age, and duration of residency in New Orleans. If we use calendar time as a measure of board tenure, left censoring necessarily occurs.

5 Empirical Results

This section reports the results of estimations of (4.2). The hazard rate is calculated from the turnover event of each inside director. As the explanatory variables, we use ROA, board composition, controlling for firm size, board size, each director's ownership, and his or her age. Model 1 of Table 2 reports the results of the simple regression without firm-fixed effects. Model 1 corresponds to Hypothesis 1 without controlling for board compositions. Table 2 shows that the coefficient of ROA is negative and statistically significant, which is consistent with Hypothesis 1 and many previous researches[24]. Even when the firm-fixed effects are added as in Model 3, this result does not change.[25]

In Model 2 of Table 2, we consider outsiders' ratio and its interaction with ROA. We find that, although the coefficient of the outsiders' ratio is significantly positive, the coefficient of its interaction with ROA is not. Therefore, we do not observe monitoring activities by outsiders in this model. This result is consistent with Kang and Shivdasani (1995) and Abe (1997), i.e., that outsiders have no effect on the sensitivity of the turnover to firm performance. Controlling for firm-fixed effects does not change the result, as is reported in Model 4.

By considering the background of each outside director in detail, we can oveserve the monitoring role of outside directors. Following Hypothesis 2, we classify outsiders into four smaller subgroups, which are bankers, shareholders, cross-shareholders, and pure outsiders. Table 3 presents the results of regressions according to the above classification. Model 1 shows that bankers have no effect on the sensitivity of the turnover to ROA. This result is inconsistent with much of previous researches on the main bank system such as Kaplan (1994), Kaplan and Minton (1994), and Kang and Shivdasani (1995), which argue that main banks have a key corporate governance role.[26]

[24]Note that most previous research on Japanese data such as Abe (1997), Kang and Shivdasani (1995), and Kaplan (1994) analyzes turnover of presidents but not inside directors.

[25]Every company has its own characteristics, such as history, culture, and other environments, that are likely to affect insiders' turnover and some explanatory variables such as board compositions. To avoid possible biases, we need to control for firm-fixed effects in the estimation. We simply include firm-specific dummy variables in our explanatory variables as in Hermalin and Weisbach (1988).

[26]As no previous research analyzed turnover of all the inside directors, the inconsistency might not be surpris-

Model 2 of Table 3 shows that, although the coefficient of shareholders (C) ratio is significantly positive, the coefficient of its interaction with ROA is never significant. That is, we do not observe monitoring roles by directors from former shareholders (C). Similarly, we find that cross-shareholders (D) have no effect on the sensitivity of the turnover to ROA from Model 3. As discussed previously, companies connected in business have their ties in shareholdings. This implies that these cross-shareholders are likely to behave as delegates of those firms rather than monitors, even though they are also shareholders. In other words, minority shareholders' rights might be exploited. In contrast, Model 4 of Table 3 shows that pure outsiders (E) increase the sensitivity of turnover of insiders to ROA. This implies that only pure outsiders play monitoring roles.

Next, we check whether the monitoring roles of pure outsiders shown in Table 3 are robust. Criticisms might come from possible endogeneity in the determination of board composition. Although we will discuss this in detail later, in this section, following the arguments of Weisbach (1988), we classify our sample by the degree of ownership concentration. According to Weisbach (1988), the degree of shareholdings by managers, or degree of entrenchment, is negatively correlated with the outsider ratio on the board because (1) strong CEOs avoid outsiders, or (2) there is no need for monitoring. The argument implies that the managerial ownership affects the board composition. Because most shares in Japanese listed companies are held by firms that can be regarded as "stable" shareholders, rather than using managerial ownership, we use the ratio of the shares owned by the "special few" as the proxy of managerial entrenchment.[27]

Table 4 reports the descriptive statistics of board composition, classified into high and low concentrations of shareholdings held by the "special few". The mean differences between

ing. Let us put one possible interpretation on this result, however. Suppose that the primary role of the main bank is to insure managers' position rather than monitoring management. If the existence of bankers implies the signal of supporting the appointing firm by banks, having a director from a bank is attractive for managers because they can keep the position regardless of firm performance. Therefore, the bankers would not affect the turnover of insiders.

[27] In much of corporate governance literature, the difference between voting and cash-flow rights is used as the proxy of concentration. To calculate the difference, we need to set a certain cut-off level of ownership that determines the control shareholders. A typical level is 20% as is adopted in La Porta et al. (1999). The application of the formula to Japanese listed companies is difficult as most companies' shares are held by many firms in small amount, such as 2%. We do not adopt the difference, rather we simply look at the direct ownership.

the high and low concentration groups are significant for all variables. Several features are noteworthy. The ratios for the outsiders in the high concentration group are about twice as large as those in the other group at the 1% significance level. In particular, we can observe that the ratios of shareholders (C) and cross-shareholders (D) in the high concentration group are much larger than those in the other group, whereas the ratio of pure outsiders (E), on whom this paper focuses, is only slightly greater in the low concentration group. That is, there is a negative correlation between ownership concentration and pure outsiders on the board. Weisbach (1988) shows that a company in which the CEO holds more shares tends to have fewer outside directors, which implies that only our pure outsiders group corresponds to his outsiders group.

Table 5 reports the regression results of the full sample and the two partitioned groups. Model 1 shows that the coefficient of ROA is negative and statistically significant as in the previous tables. Considering that the coefficient of ROA is still significantly negative in Model 3 and Model 5, we see that the sensitivity of insiders' turnover to ROA is robust. Model 5 reports that the only pure outsiders are engaged in monitoring activities, which is consistent with Table 3. Dividing the full sample into the two groups provides us with more information about the role of "pure" outsiders. Although, in the high concentration group, the pure outsiders' effect on the sensitivity of insiders' turnover to ROA is still statistically significant, the effects disappear in the other groups. This means that, although the pure outsiders makes up a smaller proportion of outsiders, they play more active disciplinary roles in the high concentration group. The result implies that the disciplinary role of outside directors is larger for a company whose shares are concentrated and managers are protected.

As a robustness check of the pure outsiders' effects, we consider another measure of firm performance. The continuous variables, such as ROA, generally includes some extremely poor or good values, which often have an unstable effect on the analysis concerned. To cope with these outliers, we use the dummy variable for negative profit, which is a binary variable that assigns one if operating income is negative. The introduction of this variable enables us to

check the stability of the previous results. It is necessary to note that the positive sign of the coefficient of the negative profit dummy variable means an increase in the insiders' turnover rate. The results are summarized in Table 6. We obtain a result that is similar to the case using ROA as a measure of firm performance, except for the coefficient of the pure outsiders' interaction with the negative profit dummy in the full sample.[28]

Finally, Table 7 reports the results with firm-fixed effects, which shows basically similar results to the cases without fixed effects shown in Table 5.

6 Endogeneity Issues

This section discusses whether possible endogenous determination of board composition seriously affects the results we have driven in previous sections. An increasing number of papers provide theoretical models that show that the board will have more outsiders after the realization of poor performances.[29] As full consideration of all the endogeneity issues by estimations of full-information maximum likelihood is prohibitively difficult, we consider whether the determination of board composition is greatly affected by past performance. If the outsider ratio of the board depends on firm performance, our interpretation of the empirical analyses might be incorrect. The reason is quite simple. Let us assume that there is a firm with poor performance. In addition, we assume that the poor performance of the firm is due to bad governance. In this case, it is possible that the firm selects pure outsiders as board members to appeal to the market by revamping the governance system. Therefore, one might argue that insiders change, not because the pure outsiders do a good job in monitoring management, but because there is an innately high likelihood of insiders' turnover in the firm.

To check whether the above actions actually happen and create serious biases in our esti-

[28] Generally, market-based measures of performance are affected by the market's expectation of the firm's future performance and, thereby, are less clear than accounting-based measures in the causality into the turnover of directors. Nevertheless, we also did the same work with ROI (rate of return on investment) and obtained a result that is similar to the case using ROA as a measure of firm performance.

[29] Kaplan and Minton (1994) show, by LOGIT regression, that the appointments of outsiders to boards increase with poor performance. This result also appears in many previous papers, including Hermalin and Weisbach (1988).

mates, we first plot pure outsiders' ratio and lagged ROA in Figure 3. If a firm selects pure outsiders as board members when its performance is poor, the scatter should slope downards. In other words, when the lagged ROA is negative, the pure outsiders' ratio should take a high value. Figure 3 shows no clear negative correlation between the pure outsiders' ratio and the lagged ROA. This means that some firms have already taken the governance system in which pure outsiders occupy a large proportion of their boards.

To support the idea that pure outsiders' ratio and lagged ROA are hardly correlated, we make use of Arellano-Bond GMM estimation, which is often employed in dynamic panel data analysis. Table 8 documents the results of two-step GMM estimation. According to the table, neither ROA nor lagged ROA exert significant influence on the pure outsiders' ratio, which suggests endogenous changes in board composition do not cause serious biases in the empirical results in the previous section.

7 Conclusion

In this paper, we have investigated the monitoring role of outside directors in Japan with detailed classifications of each outsider. More specifically, we classified each director into four smaller subgroups, which are former bankers (B), former shareholders (C), former cross-shareholders (D), and "pure" outsiders (E), and analyzed their effects on the turnover of inside directors. Our main findings can be summarized as: (1) the turnover of inside directors is negatively correlated with company performance; (2) without detailed classification, outside directors do not seem to play major roles in the turnover of inside directors; and (3) only "pure" outside directors increase the sensitivity of the turnover of insiders to company performance when the ownership is concentrated. These findings fill the gap between the previous studies in the USA and Japan. The outsider defined by Japanese corporate code does not correspond to the independent directors in the USA. The outside directors who worked for a shareholding company before his/her appointment cannot be expected to monitor the managers in order to maximize profits. The finding in this paper casts serious doubts on the current movements in

the reform of corporate governance in Japan. Without a strict definition of being outside, the notion is not useful for achieving an outsider driven system.

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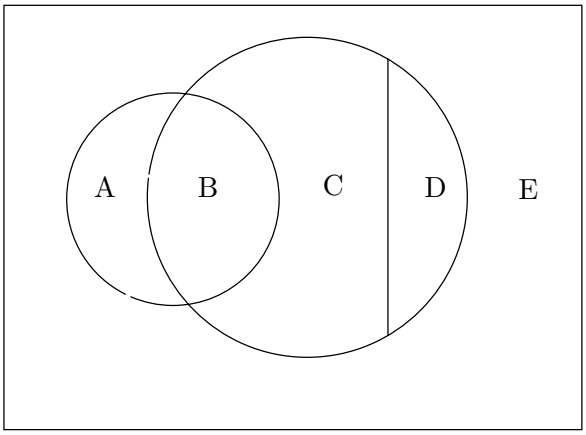
Figure 1: Venn diagram illustrating the classification of outsiders



Note: Former bankers(total) = A + B
Former shareholders(total) = B + C + D
(1) Former bankers = B
(2) Former shareholders = C
(3) Former cross-shareholders = D
"Pure" outsiders = E

Table 1. Descriptive statistics for board compostion and firm characteristcs

Variable	Mean	Median	SD	Minimum	Maximum
Panel A					
Number of directors	21.006	18	8.684	7	45
without statutory auditor	18.092	15	8.505	4	42
Outsider dummy	0.323	0	0.468	0	1
Banker dummy(A+B)	0.046	0	0.209	0	1
Shareholder dummy(B+C+D)	0.199	0	0.399	0	1
Banker dummy(B)	0.038	0	0.192	0	1
Shareholder dummy(C)	0.123	0	0.329	0	1
Cross shareholder dummy(D)	0.038	0	0.190	0	1
Pure outsider dummy(E)	0.118	0	0.323	0	1
Panel B					
Age of directors	58.405	58	6.450	20	92
Age of insider directors	57.660	58	5.991	20	92
Age of outside directors	59.963	60	7.069	28	91
Age of directors when leaving the position	61.358	61	6.131	36	92
Tenure of directors	8.790	7	7.561	1	62
Tenure of inside directors	9.798	8	8.383	1	62
Tenure of outside directors	7.047	6	5.453	1	39
Turnover rate of directors	0.130	0.111	0.111	0	0.667
Panel C					
Firm size(1000 yen)	11.599	11.306	1.563	8.073	15.311
ROA	3.334	3.146	3.696	-14.045	24.843
Negative profit dummy	0.109	0	0.311	0	1
Firm dummy with at least one banker	0.510	1	0.500	0	1
Shares held by each director(%)	0.255	0.006	1.814	0	45.003
Shares held by all directors(%)	3.529	0.531	7.150	0.008	63
Shares held by foreign institutions(%)	7.368	4.499	8.403	0.003	77.991
Shares held by small specified groups(%)	44.589	41.867	13.563	7.110	82.476
Shares held by financial instituions(%)	35.932	37.041	14.616	0.447	71.939

Notes: The sample consists of 192 listed companies and 6660 directors in the electronics industry for the period from 1990 to 1999. Number of directors includes Statutory directors. Firm size is logarithm of values of total assets which are adjusted by consumer price index. ROA is the ratio of opreration income to total assets. Negative profit dummy is a binary variable that equals one if operating income is negative.

Figure 2: Tenure of directors with censored data

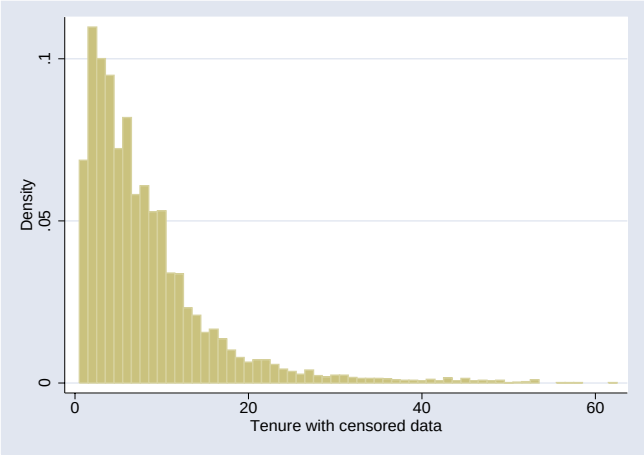


Figure 3: Nonparamateric hazard functions

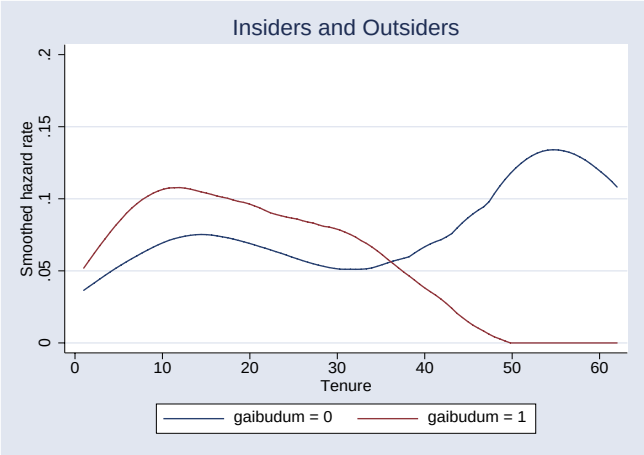


Table 2. Cox proportional estimates: regression based on insiders' tenure

	Without firm-fixed effects		With firm-fixed effects	
Variable	Model 1	Model 2	Model 3	Model 4
ROA	-0.046***	-0.039***	-0.031***	-0.047***
	(0.007)	(0.012)	(0.010)	(0.017)
Shares held by each director	-0.244***	-0.237***	-0.225***	-0.224***
	(0.037)	(0.036)	(0.039)	(0.039)
Age	0.561***	0.535***	0.544***	0.545***
	(0.055)	(0.055)	(0.058)	(0.058)
Age^2	-0.004***	-0.004***	-0.004***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Number of directors	0.016***	0.016***	0.049***	0.05***
	(0.005)	(0.005)	(0.010)	(0.011)
Firm size	-0.038	0.006	-0.004	-0.004
	(0.025)	(0.026)	(0.208)	(0.209)
Outsiders' ratio		0.886***		0.072
		(0.179)		(0.433)
Outsiders' ratio ×ROA		-0.018		0.054
		(0.034)		(0.046)
Number of observations	17501	17501	17501	17501
Number of subjects	3641	3641	3641	3641
Number of uncensored spells	2159	2159	2159	2159
Log likelihood	-1.45E+04	-1.45E+04	-1.43E+04	-1.43E+04
χ^2	1950.9	1982.444	2362.649	2364.199
Pseudo R^2	0.063	0.064	0.076	0.076

Notes: Number of directors includes Statutory directors. Firm size is logarithm of values of total assets which are adjusted by consumer price index. ROA is the ratio of oprerating income to total assets. Year dummies are included in all equations. Standard errors are in paretheses. *, **, *** indicate significance at the 10-, 5-, 1-percent levels, respectively.

Table 3. Cox proportional estimates: regression based on insiders' tenure

Variable	Model 1	Model 2	Model 3	Model 4
ROA	-0.051***	-0.05***	-0.048***	-0.028***
	(0.008)	(0.007)	(0.007)	(0.010)
Shares held by each director	-0.243***	-0.235***	-0.236***	-0.242***
	(0.037)	(0.036)	(0.036)	(0.037)
Age	0.565***	0.543***	0.538***	0.559***
	(0.055)	(0.055)	(0.055)	(0.055)
Age^2	-0.004***	-0.004***	-0.004***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Number of directors	0.017***	0.015***	0.015***	0.017***
	(0.005)	(0.005)	(0.005)	(0.005)
Firm size	-0.043*	-0.02	-0.025	-0.036
	(0.025)	(0.026)	(0.026)	(0.025)
Bankers(B)' ratio	-0.814			
	(0.549)			
Bankers(B)' ratio×ROA	0.093			
	(0.116)			
Shareholders(C)' ratio		0.418**		
		(0.171)		
Shareholders(C)' ratio×ROA		0.041		
		(0.035)		
Cross shareholders(D)' ratio			0.908***	
			(0.297)	
Cross shareholders(D)' ratio×ROA			0.067	
			(0.072)	
Pure outsiders(E)' ratio				0.414
				(0.268)
Pure outsiders(E)' ratio×ROA				-0.145***
				(0.055)
Number of observations	17501	17501	17501	17501
Number of subjects	3641	3641	3641	3641
Number of uncensored spells	2159	2159	2159	2159
Log likelihood	-1.45E+04	-1.45E+04	-1.45E+04	-1.45E+04
chi2	1953.151	1965.105	1970.225	1957.892
Pseudo R^2	0.063	0.063	0.064	0.063

Notes: Number of directors includes Statutory directors. Firm size is logarithm of values of total assets which are adjusted by consumer price index. ROA is the ratio of oprerating income to total assets. Year dummies are included in all equations. Standard errors are in paretheses. *, **, *** indicate significance at the 10-, 5-, 1-percent levels, respectively.

Table 4. Mean difference in two subgroups: high and low concentraions

Variable	high concentration	low concentration	t-test
Number of directors	18.337	23.721	***
without statutory auditors	15.378	20.757	***
Outsider dummy	0.423	0.221	***
Banker dummy(A+B)	0.037	0.055	***
Shareholder dummy(B+C+D)	0.313	0.082	***
Banker dummy(B)	0.032	0.045	***
Shareholder dummy(C)	0.221	0.023	***
Cross shareholder dummy(D)	0.061	0.014	***
Pure outsider dummy(E)	0.107	0.129	***

Notes: The two subgroups are classified according to the ratio of shares owened by *the special few*, which is considered as a proxy managerial entrenchment. If, from 1990 to 1999, the average of *shousu tokutei michi kabu hiritu* of a firm is larger than the median of it, the firm belongs to high concentration group. In the other case, the firm belongs to low concentration group. *** indicates significance at the 1-percent levels, respectively.

Table 5. Cox proportional estimates: regression based on insiders' tenure

	Full sample		High concentration		Low concentration	
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ROA	-0.044***	-0.032**	-0.051***	-0.025	-0.031***	-0.038*
	(0.007)	(0.014)	(0.010)	(0.020)	(0.010)	(0.020)
Shares held by each director	-0.228***	-0.226***	-0.235***	-0.228***	-0.217***	-0.216***
	(0.036)	(0.036)	(0.051)	(0.051)	(0.051)	(0.051)
Age	0.518***	0.514***	0.861***	0.859***	0.33***	0.33***
	(0.055)	(0.055)	(0.107)	(0.107)	(0.062)	(0.063)
Age^2	-0.004***	-0.004***	-0.006***	-0.006***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Number of directors	0.015***	0.015***	0.01	0.008	0.023***	0.023***
	(0.005)	(0.005)	(0.009)	(0.010)	(0.006)	(0.006)
Firm size	0.007	0.009	0.097*	0.115**	-0.032	-0.034
	(0.027)	(0.027)	(0.050)	(0.051)	(0.033)	(0.034)
Bankers(B)' ratio	0.035	-0.191	0.261	0.124	0.349	0.232
	(0.457)	(0.559)	(0.723)	(0.896)	(0.595)	(0.728)
Bankers(B)' ratio×ROA		0.09		0.077		0.043
		(0.119)		(0.192)		(0.154)
Shareholders(C)' ratio	0.822***	0.811***	0.748***	0.796***	-0.085	-0.156
	(0.159)	(0.193)	(0.201)	(0.247)	(0.649)	(0.806)
Shareholders(C)' ratio×ROA		0.013		0.002		0.026
		(0.037)		(0.046)		(0.148)
Cross shareholders(D)' ratio	1.428***	1.313***	1.161***	1.079**	1.874***	1.793***
	(0.250)	(0.313)	(0.326)	(0.424)	(0.542)	(0.573)
Cross shareholders(D)' ratio×ROA		0.051		0.021		0.05
		(0.075)		(0.102)		(0.118)
Pure outsiders(E)' ratio	0.55**	0.963***	0.352	1.228***	1.164***	1.106***
	(0.244)	(0.286)	(0.369)	(0.437)	(0.345)	(0.416)
Pure outsiders(E)' ratio×ROA		-0.153***		-0.256***		0.019
		(0.056)		(0.073)		(0.105)
Number of observations	17501	17501	7002	7002	10499	10499
Number of subjects	3641	3641	1511	1511	2130	2130
Number of uncensored spells	2159	2159	890	890	1269	1269
Log likelihood	-1.45E+04	-1.45E+04	-5161.244	-5153.7	-7852.82	-7852.69
chi2	1995.621	2005.502	917.777	932.874	1135.32	1135.587
Pseudo R^2	0.064	0.065	0.082	0.083	0.067	0.067

Notes: Number of directors includes Statutory directors. Firm size is logarithm of values of total assets which are adjusted by consumer price index. ROA is the ratio of oprerating income to total assets. Year dummies are included in all equations. Standard errors are in paretheses. *, **, *** indicate significance at the 10-, 5-, 1-percent levels, respectively.

Table 6. Cox proportional estimates: regression based on insiders' tenure

	Full smaple		High concentration		Low concentration	
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Negative profit dummy(NPD)	0.243***	0.161	0.394***	0.339	0.08	0.056
	(0.066)	(0.139)	(0.099)	(0.214)	(0.091)	(0.189)
Shares held by each director	-0.243***	-0.244***	-0.254***	-0.251***	-0.222***	-0.223***
	(0.036)	(0.037)	(0.053)	(0.053)	(0.051)	(0.051)
Age	0.538***	0.538***	0.902***	0.896***	0.337***	0.336***
	(0.055)	(0.055)	(0.107)	(0.106)	(0.062)	(0.062)
Age^2	-0.004***	-0.004***	-0.007***	-0.007***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
Number of directors	0.016***	0.016***	0.013	0.013	0.023***	0.023***
	(0.005)	(0.005)	(0.009)	(0.009)	(0.006)	(0.006)
Firm size	0.012	0.012	0.08	0.085*	-0.028	-0.028
	(0.027)	(0.027)	(0.050)	(0.051)	(0.033)	(0.033)
Bankers(B)' ratio	0.068	0.181	0.212	0.418	0.411	0.609
	(0.457)	(0.499)	(0.736)	(0.788)	(0.591)	(0.651)
Bankers(B)' ratio×NPD		-0.598		-0.765		-0.901
		(1.183)		(2.069)		(1.482)
Shareholders(C)' ratio	0.858***	0.831***	0.776***	0.825***	-0.141	-0.501
	(0.157)	(0.170)	(0.198)	(0.213)	(0.646)	(0.703)
Shareholders(C)' ratio×NPD		0.183		-0.274		2.043
		(0.388)		(0.491)		(1.519)
Cross shareholders(D)' ratio	1.524***	1.474***	1.256***	1.318***	2.033***	1.889***
	(0.249)	(0.267)	(0.326)	(0.346)	(0.535)	(0.632)
Cross shareholders(D)' ratio×NPD		0.335		-0.74		0.479
		(0.678)		(0.991)		(1.184)
Pure outsiders(E)' ratio	0.58**	0.48*	0.152	-0.136	1.329***	1.292***
	(0.243)	(0.263)	(0.364)	(0.398)	(0.340)	(0.366)
Pure outsiders(E)' ratio×NPD		0.656		1.955**		0.09
		(0.637)		(0.846)		(0.904)
Number of observations	17501	17501	7002	7002	10499	10499
Number of subjects	3641	3641	1511	1511	2130	2130
Number of uncensored spells	2159	2159	890	890	1269	1269
Log likelihood	-1.45E+04	-1.45E+04	-5168.211	-5164.95	-7857.36	-7856.33
chi2	1964.205	1965.744	903.842	910.367	1126.256	1128.306
Pseudo R^2	0.063	0.063	0.08	0.081	0.067	0.067

Notes: Number of directors includes Statutory directors. Firm size is logarithm of values of total assets which are adjusted by consumer price index. Negative profit dummy is a binary variable that equals one if operating income is negative. Year dummies are included in all equations. Standard errors are in paretheses. *, **, *** indicate significance at the 10-, 5-, 1-percent levels, respectively.

Table 7. Cox proportional estimates: regression based on insiders' tenure with firm-fixed effect

Variable	Full smaplce	High concentration	Low concentration
ROA	-0.041**	-0.042	-0.046*
	(0.018)	(0.029)	(0.026)
Shares held by each director	-0.223***	-0.244***	-0.218***
	(0.039)	(0.056)	(0.055)
Age	0.547***	0.985***	0.364***
	(0.058)	(0.118)	(0.065)
Age^2	-0.004***	-0.007***	-0.002***
	(0.000)	(0.001)	(0.001)
Number of directors	0.048***	0.06***	0.048***
	(0.010)	(0.021)	(0.013)
Firm size	-0.019	0.086	-0.103
	(0.213)	(0.338)	(0.299)
Bankers(B)' ratio	-0.638	2.719	-1.337
	(1.002)	(2.267)	(1.166)
Bankers(B)' ratio×ROA	0.288*	0.248	0.268
	(0.154)	(0.253)	(0.204)
Shareholders(C)' ratio	-0.823	-0.495	-0.797
	(0.783)	(0.855)	(2.287)
Shareholders(C)' ratio×ROA	0.053	0.057	0.076
	(0.052)	(0.065)	(0.235)
Cross shareholders(D)' ratio	0.318	0.837	0.691
	(0.971)	(1.158)	(2.293)
Cross shareholders(D)' ratio×ROA	0.028	0.029	0.013
	(0.086)	(0.128)	(0.127)
Pure outsiders(E)' ratio	0.726	0.642	0.837
	(0.530)	(0.832)	(0.736)
Pure outsiders(E)' ratio×ROA	-0.072	-0.235**	0.092
	(0.084)	(0.113)	(0.137)
Number of observations	17501	7002	10499
Number of subjects	3641	1511	2130
Number of uncensored spells	2159	890	1269
Log likelihood	-1.43E+04	-5073.195	-7759.567
chi2	2372.127	1093.875	1321.834
Pseudo R^2	0.077	0.097	0.078

Notes: Number of directors includes Statutory directors. Firm size is logarithm of values of total assets which are adjusted by consumer price index. ROA is the ratio of oprerating income to total assets. Year dummies are included in all equations. Standard errors are in paretheses. *, **, *** indicate significance at the 10-, 5-, 1-percent levels, respectively.

Figure 4: Pure outsiders' ratio and lagged ROA

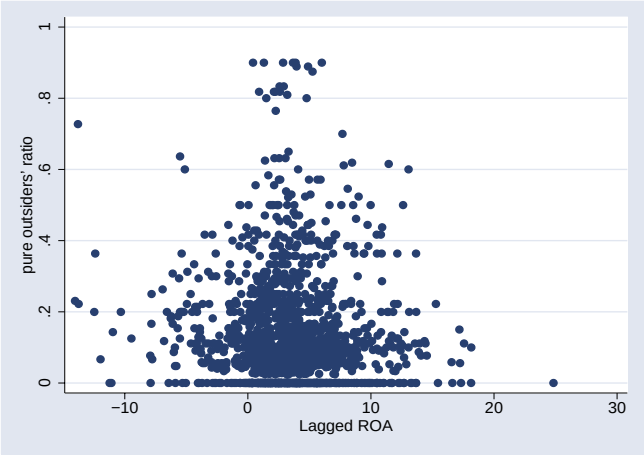


Table 8. GMM: Pure Outsider's ratio

Variable	Model1	Model2
Lagged Pure directors' ratio	0.803***	0.796***
	(0.055)	(0.058)
ROA	0.000	
	(0.000)	
Lagged ROA		0.000
		(0.000)
Number of directors	-0.001*	-0.001*
	(0.001)	(0.001)
Firm size	0.018	0.017
	(0.014)	(0.014)
Constant	0.002**	0.002*
	(0.001)	(0.001)
Sargan test	26.21	26.5
	[0.8582]	[0.8486]
Arellano-Bond LM test	-0.63	-0.62
	[0.5266]	[0.5338]
Number of observations	1419	1419

Notes: The Sargan test staticstics follow a χ^2 distribution. The Arellano-Bond LM test statistics, which correspond to m_2 test statistics in original paper, follow the standard normal distribution. Year dummies are included in all equations. Standard errors are in paretheses. *, **, *** indicate significance at the 10-, 5-, 1-percent levels, respectively. P-values are in [ ].