

# **President Turnover and Product Market Competition: Empirical Evidence from Japanese Manufacturing Firms**

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**Preliminary version**

## **Abstract**

This study uses Japanese data to examine the competition effect on managerial incentive contract, which is measured by president turnover and turnover patterns. The findings obtained in empirical analyses are consistent with the assertion that there are distinct differences between the rate of president turnover, and turnover patterns in competitive markets and concentrated markets. More detailed, the rate of president turnover is greater in competitive market than in less competitive market. Moreover, firms in competitive markets are more likely to take disciplinary action to remove their presidents than firms in concentrated markets. The presence of a dominant firm in the industry also enhances the probability of disciplinary president turnover. Consequently, these findings are consistent with Schmidt's argument that the competition causes a threat of firm's liquidation and therefore reduces managerial shirk, suggesting that presidents face different contracts between competitive markets and concentrated markets.

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## 1. Introduction

The corporate governance literature has highlighted various mechanisms, both internal and external, to reduce agency problems between shareholders and managers. Such mechanisms include, for example, providing managers with shares in the company, monitoring by large shareholders, having outside directors on the board, and the threat of external takeovers. However, a number of studies, such as Hoshi, Kashyap and Scharfstein (1990) and Morck and Nakamura (1999) suggest that in Japan, these “conventional” mechanisms described in the literature do not appear to play an important role, raising the question whether there exists other mechanisms in Japan for the effective monitoring of management. In Japanese firms, the president is often the most powerful figure among the board members.<sup>2</sup> He normally identifies his successor and in practice has the final authority over personnel matters such as appointing and removing directors/officers.<sup>3</sup> Given this, without effective control, the president may not run the firm in the interest of shareholders and perhaps select a successor or promote an officer to the president position for selfish interest rather than with the interest of shareholders in mind.

In order to avoid the conflict of interests between manager and shareholder, some studies suggest managerial equity ownership can serve to align the interests of managers with those of shareholders and thus increase firm value (Jensen and

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<sup>2</sup> The directors in Japanese firms are ranked as chairperson (kaicho in Japanese), president (shacho in Japanese), vice-president, senior executives (senmu in Japanese), executives (joumu in Japanese) and non-titled directors. Nevertheless, in most firms the chairman is as an informal position for the retiring president, who has no power to control the succession process. Hence, the president is conventionally viewed as the equivalent of CEO in the U.S.

<sup>3</sup> Bonazzi and Islam point out that Japan’s corporate law empowers shareholders to choose the board of directors. However, in practice, shareholders almost always vote for the slate proposed by management. Moreover, this slate is approved by, if not chosen by, the very CEO these directors are supposed to monitor.

Meckling, 1976; Morck et al., 1988, Morck et al., 2000)<sup>4</sup> Yet, in Japan, the president typically owns only a small stake in the firm.<sup>5</sup> Meanwhile, the threat of takeover rarely happens in Japan, in this case, institutional shareholders are therefore considered as the effective outside governance mechanisms to reduce agency cost, discipline managers (Aoki, 1988; Prowse, 1990; Kaplan and Minton, 1994). About two-thirds of all shares of listed firms in Japan are held by corporate blockholders (Hodder and Tschoegl, 1992). Such corporate blockholders seldom sell their shares and consistently support management. What is more, in the event that a company encounters financial difficulty, desirable from an efficiency point of view (Hoshi et al., 1990; Morck and Nakamura, 1999). Therefore, rather than serving as a mechanism of monitoring managers, such stable relationships entrench managers and serve as a form of insurance against liquidation of the firm. Consequently, in this type of set-up, it is difficult to oust the incumbent management (Coffee, 1991).

One strand of the theoretical literature claims that product-market competition has an important effect on managerial incentive. Machlup (1967) points out that there is no scope for slack if a firm operates in a perfectly competitive output market. This assertion is confirmed by Hart (1983), who developed a model that suggests that average managerial slack is lower under competition than if there is a single nonprofit-maximizing monopolistic firm. Scharfstein (1988), on the other hand, argues that the effect of competition on managerial incentives depends on the specification of managerial preferences, and hence competition may exacerbate the

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<sup>4</sup> Berle and Means (1932) point out that when managers hold little equity in the firm and shareholders are too dispersed to enforce value maximization, corporate assets may be deployed to benefit managers rather than shareholders. Jensen and Meckling (1976) argue that the costs of deviation from value maximization declines as management ownership rises. More recently, Morck, Nakamura and Shivdasani (2000) have shown that the relationship between the managerial ownership and firm value is monotonic for Japanese firms.

<sup>5</sup> In the 1990s, the median (mean) shares of directors' equity stake in the company they work for was 1.9 percent (5.6 percent).

managerial agency problem when firm's market profit target is low but its managerial productivity is high. In this case, the manager has a greater incentive to underreport his productivity. Scharfstein concludes that the effect of competition on managerial incentives remains ambiguous. Seeking to reconcile the differences between Hart's and Scharfstein's arguments, Schmidt (1997) argues that competition reduces managerial slack, but this relation is not monotonic. He demonstrates that competition increases the probability of liquidation, which has a positive effect on managerial effort, but also reduces that firm's profits, which may make the managerial position less attractive to induce high effort. In a monopoly market, managerial effort may increase as additional competitors enter the market, but will eventually decrease when competition becomes too intense.<sup>6</sup>

Numerous theoretical studies have investigated the relationship between product market and managerial incentives, but the little empirical studies have explored the relationship between competition and managerial incentive contract.<sup>7</sup> To fill the gaps on the empirical research, this analysis uses Japanese data to examine the competition effect on managerial incentive contract, which is measured by president turnover and turnover patterns.

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<sup>6</sup> The example Schmidt provides is that in the 1990s, productivity improvements in the automobile and computer industries dramatically exceeded average productivity growth.

<sup>7</sup> However, although there is no direct evidence shown to support Schmidt's argument, several empirical studies indirectly demonstrate that regulatory and political constraints can have a significant effect on top management incentive and governance, since regulations weaken the incentives of shareholders and outsiders to discipline effectively top managers of large publicly held corporations. The results of these studies show that managerial pay levels and pay-performance sensitivities are lower for regulated industries than for unregulated industries. Together, management turnover rate and turnover-performance sensitivities are lower for regulated industries than for unregulated industries (Joskow et al, 1993; Cragg and Dyck, 1999). Also, Porter (1990) argues that domestic competition generates world-beating industries. For example, the Japanese success stories (e.g., cars, motorcycles, cameras) are precisely those industries in which domestic competition is intense. On the other hand, those Japanese industries in which domestic competition is feeble have shown little or no international success (e.g., construction, commodity chemicals, and paper).

The empirical analysis here uses variations in product market competition across industries and a comprehensive data set, consisting of 1,916 observations on announcements of changes of president from 1991 to 2001. Japanese data setting provides two advantages on exploring this issue. (1) The presence of various types of corporate governance in Japan provides the advantage on comparison of these governance structures between the long-term relationship system and market-oriented system. (2) Most Japanese listed firms release the news of president turnovers, and this can avoid self-selection bias.

The findings obtained here are consistent with the assertion that there are distinct differences between the rate of president turnover, and turnover patterns in competitive markets and concentrated markets. More detailed, the rate of president turnover is greater in competitive market than in less competitive market. Moreover, firms in competitive markets are more likely to take disciplinary action to remove their presidents than firms in concentrated markets. The presence of a dominant firm in the industry also enhances the probability of disciplinary president turnover. Consequently, these findings are consistent with Schmidt's argument that the competition causes a threat of firm's liquidation and therefore reduces managerial shirk, suggesting that presidents face different contracts between competitive markets and concentrated markets.

The remainder of this study is structured as follows: Section 2 outlines the relationship between market competition and management incentives as well as related competition hypotheses. Section 3 describes the sample and data used in this analysis. Section 4 then presents descriptive statistics of the main variables as well as the empirical results. Finally, section 5 concludes.

## **2. President Turnover and Competition Hypotheses**

This section discusses the theoretical background to the analysis, presents the

results of previous empirical hypotheses and present the hypotheses tested in the analysis. Beginning with the theoretical considerations managerial incentive contracts can be said to be designed to tie either manager's compensation to firm performance or manager's employment to firm performance. A representative example of the former type of contract is market-oriented contract typically found in the United States. In contrast, an example of the latter type of contract is the managerial contract typically found in Japan, where managers' salary is determined by the limits to the total salary amount set out in the statutes of the corporation. Overall, the literature suggests that Japanese corporate governance is more financial institution-oriented rather than market-oriented. However, using firm-level data, the analysis here will show that the situation is not as clear-cut as is often made out and that Japanese firms, too, use contracts that are market-oriented.

The theoretical model applied in this analysis is based on Schmidt's (1997) argument outlined above, namely that the degree of competition shapes managerial incentives. Specifically, the argument is that managerial effort increases with increasing competition, but will eventually decrease when competition becomes too intense. The link between competition and managerial incentive is the optimal incentive scheme employed by the owner of company, which is affected by the degree of competition of company's operating environment.

One of the earliest studies on this issue is the influential paper by Jensen and Meckling (1976), which demonstrated that the intensity of competition does not affect managerial incentive contracts because managerial slack is enjoyed by the manager of the firm, not by its owner. Therefore, the owner of a monopoly has the same interest to reduce agency costs as the owner of a competitive firm, and they both should offer exactly the same incentive scheme. In contrast to Jensen and Meckling's argument, several theoretical studies have developed models for proving that market competition of a firm is influential on its principal-agent contract. Most of the studies develop competition and managerial incentive contract based on difference in information

spillover between competitive market and concentrated market. Lazear and Rosen (1981), and Nalebuff and Stiglitz (1983) analyzed moral hazard in general form in terms of tournaments, and demonstrated that the presence of competitors allows a firm to use relative performance to evaluate the ability or effort of its managers. This is consistent with the arguments modeled by Machlup (1967) and Hart (1983),<sup>8</sup> who also suggested that there is less scope for managerial slack in companies that operate in competitive markets than in companies that operated in more concentrated markets. In other words, information-based assertions imply that managers in higher competitive markets are more likely to experience more stringent incentive schemes provided by owners of firms than managers in less competitive markets. If the rate of managerial turnover reflects the outcome of firms' implicit contracts, we would expect that managerial turnover is higher in competitive markets and lower in concentrated markets.

An alternative hypothesis suggests that competition affects the structure of contracts. Harris and Raviv (1979) and Lewis (1980), for example, provide models in which managers do not differ in their ability, but many nevertheless receive distinct contracts in different markets. Harris and Raviv's work shows that under some monitoring mechanisms available, the results of monitoring can be incorporated into contracts. The example they give is that most employer-employee agreements stipulate some remuneration to the employee provided that he is judged to have performed adequately. As a result, managers whose companies operate in a competitive market are more likely to be fired for poor performance than managers in a less competitive

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<sup>8</sup> Machlup (1967) argued that there is no scope for managerial slack if a firm operates in a perfectly competitive output market, and therefore suggests that imperfect competition in markets is a necessary condition for the existence of managerial slack. Hart (1983) provides a model showing that competition reduces managerial slack; he suggests, however, that this is only satisfied when firms' costs and product prices fall jointly, and hence this gives the manager less opportunity for slack, but competition may increase managerial slack if the product costs of his/her company had fallen alone whereas product prices in the market had not changed.

market. If this reasoning is correct, we would expect to observe a higher rate of disciplinary managerial turnover in competitive markets than in concentrated markets.

On the other hand, Scharfstein (1988) developed a hidden information model, and argued that the competition effect on managerial incentives also depends on the specification of managerial preferences. He argued that competition may exacerbate the managerial agency problem when the market profit target is low but managerial productivity is high. In this case, the manager has a greater incentive to underreport his productivity. Scharfstein therefore concluded that the effect of competition on managerial incentives remains ambiguous. Similar ambiguity arises in a model developed by Hermalin (1992).<sup>9</sup> However, no such ambiguity arises in the model proposed by Schmidt (1997). Focusing on the threat-of-liquidation effect on managerial incentives, Schmidt found that there was a non-monotonic relationship between competition and managerial incentive. He demonstrated that competition increases the probability of liquidation, which has a positive effect on managerial effort, but that it also reduces that firm's profits (manager's expected income), which may make it less attractive to exert a high level of effort. That is, starting from a monopoly, managerial effort may increase as additional competitors enter the market, but will eventually decrease when competition becomes too intense. If we view either a high rate of managerial turnover or disciplinary turnover as a less attractive contract for managers in a highly competitive environment, Schmidt's model predicts that the rate of managerial turnover and the number of disciplinary replacements initially increase with the degree of market competition but then eventually decrease when market competition becomes very intensive.

Although there is a considerable number of theoretical studies on the relationship between market competition and managerial incentives, empirical studies somewhat

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<sup>9</sup> Hermalin (1992) focused on the change in relative bargaining power between managers and shareholders with the level of competition, and showed that the competition effect on this relative bargaining power is ambiguous.



scarce. An important exception is the attempt by Nickell (1996) to link competition theory and corporate performance is a significant study in this field. Nickell used data on 670 UK companies to examine the effect of market competition, measured by the number of firm entries and monopoly rent, on performance, measured by total factor productivity (TFP). The result of his analysis show that greater competition is associated with, which provides empirical support for the assertion that market competition affects managerial incentives. Another empirical study on competition and managerial employment contracts is that of Fee and Hadlock (2000), who use data on the U.S. newspaper industry for the period 1950 to 1993 to examine the relationship between management turnover and product market competition. The empirical results show that turnover rates are greater in competitive markets.<sup>10</sup> Their explain for their results observing that managers may have an incentive to work hard in a competitive environment to avoid liquidation, but the threat of liquidation also generates an incentive to pursue alternative job opportunities. However, they find no evidence that the sensitivity of turnover to performance varies with the product market environment, and hence suggest that competition does not change the importance of managerial ability and/or effort in the determination of profits. However, the focus on a single industry ignores important issues regarding the nature of managerial incentives across industries.

To sum up, three potential relationships between competition on the one hand and the rate of managerial turnover and patterns of managerial change are suggested by theoretical studies discussed. The first relationship suggested is that the *rate* of managerial turnover is constant irrespective of the degree of market competition, but the *pattern* of managerial turnover changes with competition intensity. As illustrated in Jensen and Mecklings' (1976) model, regardless of the level of market competition,

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<sup>10</sup> Fee and Hadlock (2000) viewed a firm as in a competitive market if there is rival in city where it was located, and the basic statistics show that 48.4 percent of firms were operating in a competitive market.

all owners of corporations have the same incentive to reduce managerial slack, which suggests companies in highly competitive markets and companies in concentrated markets should have the same rate of managerial turnover. Nevertheless, since companies in concentrated markets are less likely to face financial distress than companies in highly competitive markets, therefore their owners are less likely to take disciplinary action to remove managers who are slack but reluctant to leave their position. Instead, retirement age rules and tenure-limit rule are the more likely mechanisms for removing incumbent manager.

The second argument is that managers are given stringent managerial incentive schemes provided by owners of companies in competitive markets. That is, increases in the level of competition lead to a high rate of managerial turnover, and furthermore managers in those highly competitive markets are likely to be fired for disciplinary reasons, such as bad performance.

Finally, the third possible relationship, as suggested by Schmidt (1997), is that competition reduces managerial shirking, but greater competition also reduces firms' profit, which may make the managerial position less attractive for managers. Hence, owners of firms in intensively competitive markets might be less likely to either change their managers frequently or adopt strict approaches on removing managers.

To examine the above three possible relationships, the first hypothesis to be tested in the empirical analysis is whether president turnover increases with competition intensity. Further, the second hypothesis is that the pattern of president turnover varies with the level of competition.

### **3 Sample and Data**

A comprehensive dataset is constructed to examine the above hypotheses. The dataset consists of four sub-datasets including firm-level information on board

structure, firms' financial variables, industry-level indicators of the degree of competition, and announcements changes of president reported in the press. The analysis here focuses on manufacturing firms only for reasons of data comparability, where manufacturing firms are defined as those firms with JIP 2006 codes 08 to 59 (see Table 1 for a list of industries).<sup>11</sup> Three manufacturing industries that have less than four firms at the JIP 2006 two-digit industry level (tobacco, leather, and leather products) are dropped from sample. The final sample includes 48 industries comprising 1,424 Japanese manufacturing companies, and the period covered is 1991 to 2001.

The main dataset on the board structure of listed firms is constructed from the Toyo Keizai database. This comprehensive dataset includes the detailed personal information on each director, such as the director's full name, birthday, year of becoming president, and former employment. Based on this dataset, we can identify the year of president change took place, the tenure of removal president and whether he moved on to less prestigious directorial position or departure from the company. The other helpful piece of information concerns the former employment of each president. Taking advantage of this information, a president is identified as an outsider if he has experience working for other companies. As is well known, most "outside" presidents in Japan come from other listed companies with which the company in question has business relationships. With regard to the pattern of president turnover, detailed data for the reason of the change in president are compiled from announcements in four major newspapers in Japan. In total, there are 1,916 instances in the dataset on boards of directors indicating that a change of president took place.

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<sup>11</sup> The Japan Industrial Productivity Database (JIP2006) is based on survey data of the *Population Census*, which is conducted every five years by the Research Institute of Economy, Trade and Industry (RIETI). The JIP2006 classification contains 52 manufacturing industries at the two-digit level. Thus, it has a wider coverage in term of number of industries than the Japanese Standard Industry Classification (JSIC), which covers 24 manufacturing industries at the two-digit level.

In addition to data on president turnover, measures of competition in a particular industry are constructed. The sources for the relevant data are the JIP2006 database, and the Development Bank of Japan database, which provides financial data on individual companies. The following sub-section present a detailed discussion of the definition of variables used in the analysis which will be important for the interpretation of the results.

### 3.1 Competition Variables

This study uses several different measures of competition intensity: Hirschman-Herfindahl Index (HHI), three import and export indices, price-cost margin (PCM), and finally dominant-firm dummy. The first measure, HHI, is calculated at the JIP2006 two-digit industrial level. This index measures industry concentration and is a widely used measure of industry competition.<sup>12</sup> It is calculated as the sum of the squares of firms' market shares and a low value implies a low level of industry concentration.<sup>13</sup> Based on the HHI for 1996 (HHI96), the 48 manufacturing industries in the JIP database are divided into quintiles, with the group of industries in which competition is most intense labeled as Competition 1 and the group of industries which are the most concentrated labeled as Competition 5. Each group contains around 10 industries. The reason that the 48 industries are divided into five groups is that using constant value as a proxy variable for dynamic alternation maybe

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<sup>12</sup> According to Sleuwaegen and Wim's (1986) theoretical work, choosing between the HHI and the concentration ratio (e.g., four-firm ratio) may provide empirically very different information to assess industry performance. Therefore, in addition to the HHI, the four-firm ratio is used as well to measure market competition. Yet, the competition intensity of individual industry does not have substantial difference between HHI and four-firm ratio, and hence the industry coverage in each category does not change much, either. The four-firm ratio was first introduced by Saving (1970). The data for the calculation of the four-firm ratio used in this chapter are also obtained form the JIP2006 database.

<sup>13</sup> The value of HHI equals 10000 when there is only a single firm in the industry and tends towards zero when there are more firms and greater degree of equality in market shares. A lower index value signifies greater competition.

impropriety. HHI used in the analysis has been reported by RIETI every five years, using the value of HHI96 of each industry for the competition in each year might misrepresent the real competition among industries. For instance, perhaps the most competitive industry among the manufacturing industries in 1996 was not the most competition industry in 1998, but still fall into the highly competitive industry category. Therefore, dividing the 48 industries into 5 groups rather than using the absolute value of HHI96 is considered a better approach to define the market competition in the analysis.

The 48 industries, and their HHI, are listed in Table 1. As can be seen, the HHI ranges from 1.23 to 1531.77. The HHI of 1.23 for the steel industry, indicating that competition is the most intense in the former, while the latter is the most concentrated.

(Insert Table 1)

However, the degree of competition in an industry varies over time. Thus, in addition to the degree of competition over time are likely to also have an effect on president turnover. Three alternative measures of competition, which are compiled annually, are also used in the analysis. The three measures are *Import penetration*, the *Export-import ratio*, and an *Import-advantage dummy*. These are expected to capture the pressure of international competition and are calculated at the two-digit industry level using data from JIP2006 database. Import penetration is calculated as the value of imports divided by the value of all domestics plus imports minus exports. The Export-Import ratio is calculated as the value of exports divided by the value of imports. The *Import-advantage dummy* is equal to one if the value of import in that industry is greater than the value of export, and zero otherwise.

In addition, an industry is considered to be competitive industry if it has low

monopoly rents. Monopoly rents are measured as the difference between price and marginal cost in efficiency theory. The fundamental condition for the competitive market is that marginal cost equals price. By contrast, under monopoly or oligopoly, the allocation of output will be inefficient because price will exceed marginal cost. Therefore the measure of price-cost margin is used here to capture the monopoly rents of markets. The calculation follows Lerner's measure of monopoly power measured as  $(P-MC)/P$ .<sup>14</sup> In practice, it is difficult to observe marginal cost. Therefore, instead of marginal cost, average cost (AC) is used here to draw inferences about monopoly rents. Therefore, monopoly rent (*PCM*) is calculated as follows:<sup>15</sup>

$$PCM = (P \cdot Q - AC(\text{Middle input, Labor cost, Capital cost}) \cdot Q) / P \cdot Q$$

Finally, because above measures of competition are calculated at the two-digit industry level, which maybe too aggregated to represent the "market", to address this problem, firms' market share at the four-digit SIC level is employed as an additional measure to capture more precise market information. The variable calculated at four-digit SIC level is labeled as *Dominant-firm dummy*. This dummy variable takes a value of one if a company operates in a market which exists a dominant firm who had accounted for the largest market share throughout observed 11 years and zero if a company operates in a market without a dominant firm. Even if a market is competitive, if one firm managers to reduce costs while the others do not, it will become a monopolist. On the other hand, if there is a strong dominant firm in a concentrated market, then all other firms are less likely to enjoy monopoly rents. A

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<sup>14</sup> The concept of PCM comes from Lerner's index (1934),  $P=MC$

<sup>15</sup> The measure of PCM here is not calculated as exactly same way in the theory. See Hall (1988) for details of the calculation of PCM, and Cowling and Waterson (1976) for the relationship between market share (e.g. HHI) and PCM.

further variable included is a dummy for internationalized firm that takes a value of one if it exports, and zero otherwise. The inclusion of this variable is based on the empirical observation that many oligopolistic industries are under enormous pressure to reduce costs. For example, in the automobile and computer industries productivity improvements dramatically exceeded average productivity growth in recent years. These industries liquidation became a serious threat even for industrial giants like GM or IBM partly due to increased competition from abroad.

### 3.2 President Attributes and Firm Characteristics

In order to investigate the relationship between president turnover and competition, it is necessary to control for presidents' personal attributes as well as companies' attributes. First, the tenure and age of removal president have demonstrated fairly consistent positive relationship with president turnover. As a president's length of tenure increases and/or he/she reaches retirement age, the probability increases that he/she will leave voluntarily. Hence, length of tenure, age, and the squares of these two are included as variables. Second, several variables to control for company characteristics, such as firm size, board size, and board characteristics, are included. It is expected that greater firm size is associated with higher president turnover. Moreover, according to previous research (Yermack, 1996), larger boards experience more difficulties in accomplishing firm objectives. If this is the case, smaller boards may tend to have lower rate of president departure due to the fact that they have fewer decision-making and communication problems. In addition, agency theory suggests that directors who sit on large boards may be less inclined to resign from the board than directors that sit on small boards. Slack presidents with little equity shares can be easily removed by disgruntled institutional investors or ousted by hostile raiders attracted by a depressed share price. However, presidents with large blocks of equity cannot be casted out in these ways. Hence, *Directors'*

*shares\_ratio* is added as a variable to capture the effect of equity ownership on president turnover. A further control variable is the ratio of outside directors to total directors (*Outsider ratio*), since firms with a high ratio of outside directors are likely to have higher president turnover. Besides, previous empirical research has identified the prior industry relative performance and industry performance as potentially important determinants of president turnover. Industry-relative ROA, *Adj-firmperformance*, is a proxy variable for firm performance, computed as the sample firm's return on assets, minus the industry (4-digit SIC) median return on assets. Industry median returns on assets are based on the population listed firms in industry. It is expected to observe that presidents who performed badly would be asked to leave before tenure is accrued. *Industry performance* is also controlled.

### 3.3 Turnover Patterns

Since the removal of the president is one of the most drastic and visible actions taken by a company when it is confronted with increasing competition, the analysis here also examines whether output market competition leads to an increase in the disciplinary replacements of presidents. In order to examine patterns in president turnover, the reasons underlying the change in president in the 1916 president turnover events in the database are identified and divided into three groups: disciplinary replacements, non-disciplinary replacements, and residual replacements.

The reasons for a change in president are determined on the basis of new releases. Turnover reasons of each firm are searched in the Nikkei News database. This database covers the daily issues of the Nihon Keizai Shimbun, Nikkei Kinyu Shimbun, Nikkei Sangyo Shimbun, and Nikkei Ryutu Shimbun (business papers similar to the *Wall Street Journal*). The classification of reasons for the replacement of a president follows the example of Kang and Shivdasani (1995). Disciplinary replacements include those for corporate losses, a worsening of business performance, and



corporate restructuring. In contrast, a president replacement is considered to be a non-disciplinary succession when it follows the tenure rules of the organization. Therefore non-disciplinary replacements include presidents resigning for reasons other than age, retirement, long tenure (more than 6 years) or illness. The final group consists of all residual replacements, such as when the only reason cited was the need for younger management, no reasons were given at all, or no news could be found regarding a specific replacement. Included in this final group are also instances where a new president was named as a result of a scandal or the death of the incumbent president.

Before dividing the residual turnovers into disciplinary and non-disciplinary turnovers, it is worthy knowing the custom of president turnover in Japan. In general, there are two types of tenure rules that are followed by many Japanese firms: The two-year unit term rule or tenure-limit rule is an inflexible rule that stipulates that a president be replaced after a fixed period of time. Japanese presidents are typically awarded a two-year contract and likely to be offered a renewal based on two-year basis. The term of tenure may vary across firms, yet it is common for a president to resign at the end of the two-year term, not in the middle of the term. Therefore, in the announcement, the tenure of president change is often described as two-term-four-year or three-term-six-year, meaning the president has served for two or three 2-year, making four or six years in total. Thus, taking these Japanese customs into account, it seems reasonable to assume that a replacement of president is likely to fall into the disciplinary category when his tenure is less than six years and into the non-disciplinary category otherwise.

In addition to the tenure-limit rule, the most common tenure rule among large firms in Japan is the retirement age rule. The age of sixty-five is a socially accepted retirement age that is widely adopted by Japanese firms. Individuals described as retiring are symmetrically distributed around the age commonly used in retirement policies (65) and the mean retirement age of total sample is 65.33.

Table 3 lists the reasons reported in the four Nikke-related newspapers for changes in president among listed manufacturing listed firms in Japan. Of the total 1916 cases, 595 fall into the disciplinary category, with poor company performance being mentioned in 225 cases, the need for a young manager mentioned in 102 cases, the need for new management with certain required skills mentioned in 100 cases, strong ties with major shareholder or other companies mentioned in 61 cases, increasing industry competition mentioned in 47 cases, corporate restructuring mentioned in 31 cases, and the president taking a job in another firms mentioned in 18 cases. 759 cases fall into the non-disciplinary categories, with long tenure (298 cases) and company stabilized or performing well (252 cases) given as the most frequent reasons. Other common reasons include old age or the reaching of the retirement age (108 cases) and poor health or illness (74 cases). Listing in the First Section of the stock exchange and anniversary of the company were cited in 18 cases and 9 cases, respectively.

503 cases fall into the residual category, with no reason provided in 443 cases. Finally, in 59 cases, the reason for replacement was the death of the presidents. These cases are excluded from the analysis below.

(Insert Table 3)

#### **4. Empirical methodology and results**

The first hypothesis, whether president turnover increases with competition intensity, is tested by panel logit models where the dependent variable is a dummy variable taking a value of one if a change in president took place and zero otherwise. The following logit model is employed.

$$P(y = 1|X) = G(X\beta) \equiv p(X) \tag{1}$$

In the analysis here, (1) can be rewritten as

$$P(\text{turnover} = 1 | \text{president attributes, firm characteristics, industry performance, competition})$$

The probability of a change in president change is

$$G(X\beta) \equiv \exp(X\beta) / [1 + \exp(X\beta)] \quad \text{where } X = x_1, x_2, \dots, x_i \quad (2)$$

In the case of continuous explanatory variables, such as president tenure, age, firm performance and the PCM, the partial effect (marginal effect) of  $x_i$  on  $p(X)$  is

$$\frac{\partial p(X)}{\partial x_i} = g(X\beta)\beta_i \quad \text{where } g(X\beta) \equiv \frac{dG}{d(X\beta)}(X\beta) \quad (3)$$

On the other hand, in the case of discrete explanatory variables, such as competition intensity, the dominant-firm dummy and the international firm dummy, the marginal effect of  $x_i$  on  $p(X)$  is simply

$$G(x_1\beta_1 \dots x_i\beta_i) - G(x_1\beta_1 \dots x_{i-1}\beta_{i-1}) \quad (4)$$

For ease of interpretation, instead of coefficients  $\beta_i$ , the marginal effects, (3) and (4), are reported as the derivative of the probability of president turnover with respect to the corresponding right-hand-side variable computed at the mean of the dependent variable. This represents the marginal impact of a change in the explanatory variable.

To examine the effect of competition on president turnover, the HHI and the dominant-firm dummy are included as proxy variables for competition in the logit regressions shown in Table 5. The dominant-firm dummy takes a value of one if the company operating in a market where there existed one company who had accounted for the largest market share throughout the observed period 1991 to 2001, and zero otherwise. Three specifications are used that differ in the inclusion of interaction terms between competition indicators and firm characteristics.

The results presented in Table 5 show that, as expected, the likelihood of a change in president significantly increases with length of tenure. Moreover, the effects of firm size and the ratio of outside directors are positively and statistically significant. Not surprisingly, firm performance and industry performance are always jointly negative and significant, indicating the underperformance in the market encourages firms to change presidents. However, the marginal effect on the equity shares owned by directors is not statistically significant.

The results of the competition effect on president turnover indicate that the rate of president turnover increases with the level of market competition. In specification (1), we observe that the marginal effect of *Competition 2* is -0.0192, that of *Competition 3* -0.0195, and that of *Competition 5* -0.0216, indicating that in a highly competitive market (*Competition 1*) the rate of president turnover is significantly higher than in the other markets, while it is lowest in the most concentrated markets (*Competition 5*). This indicates that there is a positive correlation between competition intensity and the rate of president turnover. However, this relationship is not monotonic. In specification (2), interaction terms between the dominant firm dummy and the competition intensity variables are included to examine whether the existence of a dominant firm in a competitive market decreases the probability of a change in president. A negative sign of interaction terms would support this hypothesis. However, the results are not significant, that is, they do not support this assertion.

Next, in specification (3), interaction terms between the industry-adjusted firm performance variable and the competition variables are added. If the marginal effects of these interaction terms turn out to be negative and decreasing with the degree of competition, this would indicate that president turnover is more sensitive to bad performance in a competitive market than in a concentrated one. In other words, a negative and highest marginal effect of *Competition 1\*Adj-firmperformance* among five categories supports threat-of-liquidation argument that the probability of liquidation increases the rate of president turnover. The results for specification (3) indicate that turnover rates indeed vary with the degree of competition but do not support the hypothesis that president turnover in a competitive market is more sensitive to bad performance than in a less competitive market. Interestingly, the marginal effect of interaction between *Competition 5* and industry-adjusted firm performance on the turnover rate is positive and significant, suggesting that a firm with superior performance in a concentrated market is more likely to change its president frequently than a firm with a superior performance in a competitive market. This result implies that the determinants of president change vary with competition intensity. Therefore, we further investigate the effect of competition on turnover pattern in various markets in the next section.

(Insert Table 5)

Before examining the pattern of president turnover across competition degrees, several alternative measures of competition are used for a robustness check. The marginal effect of competition variables on president turnover is estimated and the results are shown in Table 6. In specification (1), the competition variables based on the HHI are replaced with the PCM takes replace with HHI. In specification (2) and specification (3), the *international firm* dummy is included. As Porter (1990) has

convinced, Japan's success stories are those industries in which domestic competition is intense, while those industries in which domestic competition is feeble have little or no international success. Thus, if international firms face greater pressure from overseas competitors than domestic firms, we should observe that international firms display a high rate of president turnover. However, the results presented in Table 6 do not provide evidence to support this argument, suggesting that alternative measures of competition do not affect president turnover.

(Insert Table 6)

#### 4.1 Competition and the Pattern of President Turnover

The results above (Table 6) provided no support for the hypothesis that the degree of competition, as measured price-cost margins, import penetration, or the presence of a dominant firm in the industry, increases the probability of president turnover. There are at least two possible explanations. The first is that, at the two-digit industry level, these indicators are too aggregate to accurately reflect the degree of competition in output markets. The second is that, rather than increases the probability of president turnover, competition changes the pattern of president turnover. To examine the latter argument, we further explore the relationship between competition and three different types of turnovers, namely disciplinary turnover, non-disciplinary turnover and residual turnover. Multinomial logistist regressions are employed to the analysis here. The methodology is applied to cases where an unordered response has more than two outcomes. An individual chooses one alternative from the group of choices, and the labeling of the choices is arbitrary (Wooldridge, 2001). Here,  $Y$  denotes a random variable referring to the outcome "disciplinary turnover," "non-disciplinary turnover," or "residual turnover," while  $X$  denotes a set of conditioning variables which include president attributes, firm characteristics, industry performance, and competition. As

usual,  $(x_i, y_i)$  is a random variable draw from the population. Like the logit model in Table 6, the multinomial logit model in Table 7 explains how the changes in the elements of  $X$  affect the probabilities of disciplinary, non-disciplinary, and residual president turnovers.

Taking non-disciplinary turnover as a benchmark, the probabilities of disciplinary, non-disciplinary and residual president turnover are as follows:

$$P(Y = \text{disciplinary} | X) \equiv \exp(X\beta_{\text{disciplinary}}) / [1 + \exp(X\beta_{\text{disciplinary}}) + \exp(X\beta_{\text{residual}})] \quad (5)$$

$$P(Y = \text{non-disciplinary} | X) \equiv 1 / [1 + \exp(X\beta_{\text{disciplinary}}) + \exp(X\beta_{\text{residual}})] \quad (6)$$

$$P(Y = \text{residual} | X) \equiv \exp(X\beta_{\text{residual}}) / [1 + \exp(X\beta_{\text{disciplinary}}) + \exp(X\beta_{\text{residual}})] \quad (7)$$

Where the dependent variables take a value of one if the type of turnover was coded as “disciplinary,” “non-disciplinary,” or “residual”. Each group performs three specifications which differ in the interaction terms. The marginal effects as the derivatives of the probability of type of president turnover with respect to the corresponding  $x_i$  computed at the mean of the dependent variable are reported in Table 7.<sup>16</sup>

The results in Table 7 indicate that a greater degree of competition increases the probability of a disciplinary change in president. On the other hand, there is no significant impact of the degree of competition on non-disciplinary president changes. Overall, the probability of disciplinary turnover increases with poor firm performance and poor industry performance. Both non-disciplinary and residual turnovers increase with the superior firm performance. However, non-disciplinary turnover is positively

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<sup>16</sup> The expression of marginal effect for multinomial logit model is omitted here. See Woodlridge (2002) for details.

related to industry performance, while residual turnover is not associated with industry performance. In addition, firms with more outside directors are more likely not to release news when their president changes than other firms.

(Insert Table 7)

With regard to the probability of a disciplinary change in CEO, the dominant-firm dummy is positive and significant in two of the specifications. This result is consistent with the argument of Schmidt (1997) that if a dominant firm is successful in reducing costs while all other firms are not, competition will drive profits down to zero. Consequently, in order to compete with the dominant firm on market share, firms are likely to dismiss slack managers. This suggests that the peer in the industry is a substitute mechanism for corporate governance. Interestingly, we observe a positive coefficient on the interaction term between the degree of competition and the dominant-firm dummy in specification 2. This implies that the presence of a dominant firm in less competitive markets raises the probability of a disciplinary change in president, whereas in intensively competitive markets, the presence of a dominant firm increases the likelihood of disciplinary replacement. This result also indirectly supports Schmidt's argument that when competition becomes too intense, firms' profits are driven to zero, which may make the managerial position less attractive to managers. Consequently, firms operating in highly competitive markets are less likely to force a president to leave, since otherwise they may face difficulties in hiring a new president.

Next, alternative measures of competition to the HHI are used to rerun the regressions shown in Table 6. The results are shown in Table 8a to 8c. The results show that monopoly rents (PCM) has adverse effect on disciplinary president change, but positive effect on with non-disciplinary turnover. However, both relationships are



not significant. In specification (2) in Table 8a, the international-firm dummy, the import penetration variable and the interaction term between these are included. The positive coefficient on the import penetration variable indicates that competitive pressure from international rivals spurs firms to take the most drastic and visible actions to change slack managers. Further evidence of the effect of international competition on disciplinary president turnover is provided by the significantly negative coefficient on Export-Import ratio in specification (3) and the fact that the coefficient on the import-advantage dummy remains significantly positive in specification (4). However, the estimate of international firm dummy is statistically significant.

Taken as a whole, the evidence reported in Table 8a appears to weakly support the hypothesis that competition as measured by import penetration, the export-import ratio, and the import-advantage dummy at two-digit level increases the probability of disciplinary turnover. However, the presence of a dominant firm in an industry does not appear to have an effect on disciplinary president turnover.

(Insert Tables 8a, 8b, 8c)

## **5. Conclusion**

Using several measures of competition, this analysis provides examined whether increased competition in product market increases the probability of president turnover. Controlling for CEOs' age and tenure, several firm attributes, the performance from of the industry in which a firm operates, and the deviation of the firm's performance from industry performance, the results show that the probability of president turnover is greater in highly competitive industries than in lowly competitive industries. This result is consistent with the argument of the competition

effect on managerial incentive contracts. This conclusion is further supported by the fact that the degree of competition in an industry has a significant effect on the probability of a disciplinary change in president. These results hold not only when the HHI is used as the measure of competition, but also when alternative measures are used, such as import penetration or the ratio of export sales to import sales. The presence of a dominant-firm also has a significant positive effect on the likelihood of disciplinary turnover, indicating that the presence of a dominant firm in the industry increases effort incentives because the all firms face intensive competition on gaining market share. Conclusively, the findings in this analysis support that competition non-monotonically reduces managerial shrink and further suggest that managerial incentive contracts in Japan are designed on the basis of the market competition.

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**Table 1. List of the 48 industries in JIP 2006 used in this research ranked in terms of the HHI for 1996**

SIC	competition	HHI96	Industry name	Number of Firms
15	Competition 1		1.23 Textiles	71
17	Competition 1		3.5 Furniture	12
16	Competition 1		3.62 Lumber	10
41	Competition 1		4.43 Other metal products	42
58	Competition 1		6.03 Plastic products	33
19	Competition 1		6.93 Paper products	13
33	Competition 1		8.23 Clay products	22
20	Competition 1		9.23 Publish and printing	15
59	Competition 1		9.48 Other manufacturing	36
40	Competition 2		12.95 Metal products	38
43	Competition 2		13.76 Special machinery equipment	96
11	Competition 2		14.48 Other foods	70
44	Competition 2		16.51 Other general machinery products	24
13	Competition 2		29.05 Beverages	23
57	Competition 2		32.18 Precision machinery & equipment	43
37	Competition 2		32.3 Other steel	41
12	Competition 2		36.23 Fertilizers	6
51	Competition 2		39.53 Semiconductor devices, integrated circuits	9
52	Competition 2		39.53 Electronic parts	68
8	Competition 3		47.73 Livestock products	17
45	Competition 3		52.35 Office and services	25
42	Competition 3		55.89 General machinery equipment	62
46	Competition 3		72.27 Electrical machinery	30
53	Competition 3		73.45 Other electrical machinery	6
29	Competition 3		75.73 Other chemical products	46
28	Competition 3		81.62 Chemical final products	55
24	Competition 3		85.48 Organic chemical basic products	32
30	Competition 3		90.17 Petroleum products	8
50	Competition 3		96.48 Electric measuring instruments	27
54	Competition 4		99.6 Motor vehicles	12
55	Competition 4		99.6 Motor vehicles, components	86
34	Competition 4		99.7 Stone products	11
35	Competition 4		99.7 Other stone, clay & glass products	23
22	Competition 4		101.03 Rubber products	21
39	Competition 4		106.43 Non-ferrous metals processed products	30
49	Competition 4		110.6 Wired communication equipment, radio communication e	31
25	Competition 4		139.93 Non-organic chemical basic products	5
26	Competition 4		139.93 Organic chemical products	46
10	Competition 4		151.65 Rice polishing flour milling	7
18	Competition 5		158.39 Pulp, paper	22
56	Competition 5		163.03 Other transportation equipment (ships)	29
48	Competition 5		163.73 Electric computing equipment (main parts, accessort equi	14
32	Competition 5		187.44 Glass products	11
38	Competition 5		244.73 Non-ferrous metals	15
47	Competition 5		244.74 Equipment and supplies for household use	32
23	Competition 5		270.21 Chemical fertilizers	4
27	Competition 5		819.73 Chemical fibers	5
36	Competition 5		1531.73 Steel manufacturing	16

Source: Research Institute of Economy, Trade and Industry, "JIP Database 2006," online:

<http://www.rieti.go.jp/en/database/d05.html>.

Note: Industry competition categories are ranked based upon the square root of the HHI for 1996. Processed marine products, tobacco, leather and leather products, and coal products are dropped from the sample since the number of firm is less than four, which may cause sample bias in the analysis.

**Table 2. Descriptive statistics on all observations used in analysis from 1991 to 2001**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1																			
2	0.038	1																		
3	0.007	0.937	1																	
4	0.236	0.227	0.237	1																
5	0.244	0.250	0.261	0.995	1															
6	0.019	-0.086	-0.060	0.105	0.099	1														
7	0.030	-0.126	-0.105	0.115	0.110	0.800	1													
8	-0.001	0.011	0.010	-0.035	-0.033	-0.023	-0.023	1												
9	0.073	-0.181	-0.140	0.063	0.049	-0.268	-0.197	-0.012	1											
10	-0.012	-0.015	-0.004	0.069	0.071	0.546	0.393	-0.020	-0.276	1										
11	-0.059	0.085	0.074	0.005	0.009	0.072	0.037	-0.004	-0.031	0.058	1									
12	-0.048	0.063	0.041	-0.031	-0.027	0.021	0.040	-0.021	-0.045	0.032	-0.137	1								
13	0.003	0.005	0.002	0.020	0.017	0.108	0.113	0.011	-0.057	0.030	-0.014	0.065	1							
14	0.018	-0.093	-0.097	0.066	0.063	0.153	0.141	-0.012	0.085	0.031	-0.005	-0.062	0.053	1						
15	-0.018	0.007	-0.011	-0.014	-0.010	0.059	0.024	-0.008	-0.037	0.058	0.038	0.252	-0.062	0.007	1					
16	0.007	-0.030	-0.023	0.071	0.070	0.186	0.171	0.001	-0.073	0.161	-0.042	0.109	-0.047	0.124	-0.013	1				
17	0.024	-0.046	-0.035	0.035	0.032	0.372	0.431	-0.006	-0.087	0.116	0.020	-0.009	0.074	0.117	-0.048	0.189	1			
18	0.005	-0.028	-0.027	-0.025	-0.030	0.095	0.099	-0.013	0.101	0.045	-0.034	-0.007	0.025	0.231	-0.235	0.201	0.135	1		
19	0.019	-0.009	0.013	0.020	0.021	-0.006	-0.044	0.013	-0.038	0.011	0.022	-0.208	-0.054	0.055	-0.175	-0.015	-0.002	-0.378	1	
20	-0.0008	0.014	0.015	-0.008	-0.004	-0.049	-0.045	0.009	-0.089	-0.041	-0.007	0.123	0.063	-0.223	0.148	-0.268	-0.100	-0.554	0.250	1

Name of Variables

#	Variables	#	Variables	#	Variables	#	Variables
1	Turnover	6	Log assets	11	Adj-firmperformance	16	International firm dummy
2	Tenure	7	Board size	12	Industry performance	17	Firm export
3	Tenure^2	8	Directors' shares_ratio	13	Dominant firm dummy	18	Export-import ratio
4	Age	9	Outsider ratio	14	HHI	19	Import penetration
5	Age^2	10	Listed market	15	PCM	20	Import-advantage dummy

**Table 3. Reasons cited for replacement of president among manufacturing firms whose president changed during 1991-2001**

Stated Reasons	Insider->Insider	Insider->Outsider	Outsider->Insider	Outsider->Outsider	Total number of president changes
<b><i>Disciplinary</i></b>					
Poor company performance	103	38	23	61	<b>225</b>
Need for younger management	49	4	11	38	<b>102</b>
Need for new management with required skills	66	6	8	20	<b>100</b>
Strong ties with major shareholder or other companies	10	11	8	32	<b>61</b>
Increasing industry competition	33	3	3	8	<b>47</b>
Corporate restructuring	9	9	6	8	<b>32</b>
Take job in another firms	9	2	3	4	<b>18</b>
Merge	4	3	0	3	<b>10</b>
Subtotal	<b>283</b>	<b>76</b>	<b>62</b>	<b>174</b>	<b>595</b>
<b><i>Non-disciplinary</i></b>					
Long tenure	171	31	17	79	<b>298</b>
Company stabilized or performing well	131	24	34	63	<b>252</b>
Old age or retirement age	61	9	15	23	<b>108</b>
Poor health or illness	47	4	8	15	<b>74</b>
Listing in upper section of stock exchange	9	1	1	7	<b>18</b>
Anniversary of company	7	1	1	0	<b>9</b>
Subtotal	<b>426</b>	<b>70</b>	<b>76</b>	<b>187</b>	<b>759</b>
<b><i>Residual</i></b>					
No reasons given	108	44	39	185	<b>443</b>
No news released	18	1	10	11	<b>40</b>
Scandal	17	1	0	2	<b>20</b>
Subtotal	<b>143</b>	<b>46</b>	<b>49</b>	<b>198</b>	<b>503</b>
Death	29	9	13	8	<b>59</b>
<b>Total</b>	<b>881</b>	<b>201</b>	<b>200</b>	<b>567</b>	<b>1916</b>



**Table 4. Descriptive statistics on financial and governance characteristics.**

Characteristic	Obs	Mean	Median	Max	Min
Turnover=0					
Turnover	11809	0	0	0	0
Tenure	11777	7.52	4	52	1
Tenure^2	11777	129	16	2704	1
Agee	11807	61.7	63	90	34
Age^2	11807	3855	3969	8100	1156
Log assets	11786	17.8	17.6	22.8	13.5
Board size	11539	17.2	16	61	4
Directors' shares_ratio	11809	3.2	0	7354	0
Outsider ratio	11539	0.176	0.133	0.864	0
Listed market	11809	0.599	1	1	0
Adj-firmperformance	11785	0.00177	0.00134	1.59	-3.73
Industry performance	11800	0.0252	0.0266	0.105	-0.121
Dominant firm dummy	11809	0.709	1	1	0
Competition Intensity	11809	2.75	3	5	1
PCM	11795	6.98	5.15	46.7	-26
International firm dummy	11809	0.453	0	1	0
Firm export (million)	11809	21.9	0	3840	-75.4
Export-import ratio	11795	3.29	1.93	26.4	0.00631
Import penetration	11795	0.0808	0.0616	0.533	0.00169
Import-advantage dummy	11809	0.304	0	1	0
Turnover=1					
Turnover	1916	1	1	1	1
Tenure	1912	8.45	6	53	1
Tenure^2	1912	135	36	2809	1
Agee	1909	66.3	67	91	36
Age^2	1909	4427	4489	8281	1296
Log assets	1911	17.8	17.6	22.7	14.1
Board size	1910	17.8	16	61	4
Directors' shares_ratio	1916	2.99	0	3736	0
Outsider ratio	1910	0.21	0.175	0.852	0
Listed market	1916	0.582	1	1	0
Adj-firmperformance	1911	-0.0108	-0.00179	0.627	-1.76
Industry performance	1916	0.0215	0.0228	0.105	-0.119
Dominant firm dummy	1916	0.713	1	1	0
Competition intensity	1916	2.81	3	5	1
PCM	1916	6.57	4.72	46.7	-26
International firm dummy	1916	0.463	0	1	0
Firm export (million)	1916	31.2	0	4100	0
Export-import ratio	1916	3.34	1.95	26.4	0.00631
Import penetration	1916	0.0851	0.0632	0.533	0.00169
Import-advantage dummy	1916	0.303	0	1	0

Note: The sample consists of 1,424 Japanese manufacturing firms. The time period covered fiscal 1991 to 2001. Turnover takes a value of one if a change of president occurred and 0 otherwise.

**Table 5. Panel logit analysis of president turnover: Base-line regression**

Estimated Model:			
Proability(President turnover)= f.(President attributes, firm performance, industry performace,manufacturing performance,Competition)			
Explanatory Variable	(1)	(2)	(3)
Competition2	-0.0192 [2.64]***	-0.0151 [1.13]	-0.0198 [2.72]***
Competition3	-0.0195 [2.58]***	-0.0118 [0.85]	-0.0195 [2.59]***
Competition4	-0.0181 [2.40]**	-0.0294 [2.14]**	-0.0184 [2.45]**
Competition5	-0.0216 [2.59]***	-0.0291 [2.08]**	-0.0204 [2.43]**
Dominant firm dummy	-0.0002 [0.03]	0.0000 [0.00]	-0.0001 [0.01]
Competition2*Dominant firm dummy		-0.006 [0.38]	
Competition3*Dominant firm dummy		-0.012 [0.73]	
Competition4*Dominant firm dummy		0.018 [0.83]	
Competition5*Dominant firm dummy		0.014 [0.59]	
Competition2*Adj-firmperformance			-0.104 [1.05]
Competition3*Adj-firmperformance			-0.101 [0.93]
Competition4*Adj-firmperformance			-0.140 [1.12]
Competition5*Adj-firmperformance			0.168 [2.04]**
Tenure	0.013 [10.83]***	0.013 [10.77]***	0.013 [11.17]***
Tenure^2	-0.0004 [11.61]***	-0.0004 [11.60]***	-0.0004 [11.87]***
Age	0.008 [1.1]	0.008 [1.1]	0.007 [1.03]
Age^2	0.0001 [0.82]	0.0001 [0.83]	0.0001 [0.92]
Log assets	0.010 [2.67]***	0.010 [2.67]***	0.009 [2.63]***
Listed market	-0.018 [2.76]***	-0.019 [2.80]***	-0.017 [2.59]***
Board size	0.001 [1.17]	0.001 [1.15]	0.001 [1.19]
Directors' shares_ratio	0.00003 [1.17]	0.00003 [1.18]	0.00003 [1.1]
Outsider ratio	0.148 [9.03]***	0.147 [8.99]***	0.147 [8.96]***
Adj-firmperformance	-0.247 [6.94]***	-0.245 [6.90]***	-0.246 [3.36]***
Industry performance	-0.532 [4.51]***	-0.521 [4.37]***	-0.564 [4.79]***
<b>Year dummy</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
BIC	9712	9747	9734
N	13367	13367	13367

Note: The sample consists of 1,424 Japanese manufacturing firms. Time period covers fiscal years of 1991 to 2001. The dependent variable in the panel logit model is coded 1 if a change of president occurred and 0 otherwise. Instead of coefficients, the marginal effects of the regressors on the probabilities are shown in the table.

**Table 6. Panel logit estimate of president change: Alternative regression**

Explanatory Variable	(1)	(2)	(3)	(4)
Estimated Model: Proability(President turnover)= f.(President attributes, firm performance, industry performace,manufacturing performance,Competition)				
Dominant-firm dummy	-0.003 [0.35]	0.000 [0.07]	0.000 [0.04]	0.000 [0.02]
International firm dummy		-0.006 [0.73]	0.001 [0.13]	
Firm export-value				0 [0.88]
PCM	0.000 [0.75]			
Import penetration		0.033 [0.83]		
Export-import ratio			0.001 [0.82]	
Import-advantage dummy				0.007 [1.25]
Dominant-firm dummy * PCM	0.000 [0.46]			
International firm dummy * Import penetration		0.035 [0.54]		
International firm dummy * Export-import ratio			-0.001 [0.78]	
Import-advantage dummy * Firm export				0.000 [0.77]
Tenure	0.013 [10.82]***	0.012 [9.58]***	0.012 [9.56]***	0.012 [9.56]***
Tenure^2	-0.0004 [11.57]***	-0.0004 [10.43]***	-0.0004 [10.41]***	-0.0004 [10.40]***
Age	0.008 [1.08]	0.010 [1.38]	0.010 [1.32]	0.010 [1.35]
Age^2	0.000 [0.83]	0.000 [0.51]	0.000 [0.57]	0.000 [0.53]
Log assets	0.009 [2.40]**	0.007 [1.91]*	0.007 [1.88]*	0.007 [1.94]*
Listed market	-0.018 [2.72]***	-0.016 [2.46]**	-0.016 [2.46]**	-0.016 [2.41]**
Board size	0.001 [1.21]	0.001 [1.47]	0.001 [1.46]	0.001 [1.18]
Directors' shares_ratio	0.00003 [1.24]	0.00003 [1.15]	0.00003 [1.17]	0.00003 [1.14]
Outsider ratio	0.144 [8.81]***	0.144 [8.67]***	0.143 [8.49]***	0.147 [8.79]***
Adj-firmperformance	-0.245 [6.89]***	-0.261 [7.05]***	-0.261 [7.05]***	-0.260 [7.04]***
Industry performance	-0.535 [4.43]***	-0.589 [4.87]***	-0.607 [5.05]***	-0.607 [5.04]***
Year dummy	Yes	Yes	Yes	Yes
BIC	9702	9950	9951	9940
Obs.	13367	13426	13426	13426

**Table 7. Estimated multinomial logit models of president turnover regressed on competition variables**

Estimated Model:		Probability(type of President turnover)= f.(President attributes, firm performance, industry performance,manufacturing performance,Competition)								
Explanatory Variable	Disciplinary			Non-disciplinary			Residual			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	
Competition2	-0.044 [1.39]	-0.030 [0.92]	-0.024 [0.40]	-0.016 [0.40]	-0.025 [0.65]	-0.099 [1.44]	0.059 [1.79]*	0.056 [1.68]*	0.123 [1.98]**	
Competition3	-0.056 [1.72]*	-0.048 [1.39]	-0.050 [0.84]	0.014 [0.34]	0.007 [0.18]	-0.033 [0.46]	0.042 [1.21]	0.040 [1.15]	0.084 [1.32]	
Competition4	-0.128 [4.37]***	-0.122 [3.99]***	-0.164 [2.64]***	0.070 [1.71]*	0.066 [1.61]	0.055 [0.68]	0.059 [1.63]	0.056 [1.56]	0.109 [1.5]	
Competition5	-0.061 [1.68]*	-0.049 [1.30]	-0.081 [1.21]	0.068 [1.47]	0.060 [1.29]	0.042 [0.49]	-0.007 [0.18]	-0.011 [0.29]	0.039 [0.52]	
Dominant firm	0.059 [2.44]**	0.057 [2.37]**	0.062 [1.18]	-0.039 [1.41]	-0.037 [1.33]	-0.098 [1.56]	-0.020 [0.90]	-0.020 [0.92]	0.036 [0.75]	
Competition2*Dominant firm		1.033 [1.78]*			-1.120 [1.67]*			0.087 [0.17]		
Competition3*Dominant firm		0.607 [0.91]			-0.080 [0.10]			-0.527 [0.90]		
Competition4*Dominant firm		0.539 [0.83]			-0.216 [0.28]			-0.323 [0.55]		
Competition5*Dominant firm		1.218 [1.81]*			-0.794 [0.92]			-0.425 [0.60]		
Competition2*Adj-firmperformance			-0.037 [0.54]			0.114 [1.44]			-0.077 [1.49]	
Competition3*Adj-firmperformance			-0.013 [0.17]			0.064 [0.75]			-0.051 [0.89]	
Competition4*Adj-firmperformance			0.055 [0.54]			0.007 [0.07]			-0.061 [1.02]	
Competition5*Adj-firmperformance			0.029 [0.3]			0.030 [0.3]			-0.060 [0.92]	
Tenure	0.001 [0.14]	0.001 [0.16]	0.001 [0.17]	0.015 [3.03]***	0.015 [2.98]***	0.015 [2.94]***	-0.016 [3.87]***	-0.016 [3.82]***	-0.016 [3.79]***	
Tenure^2	-0.0001 [0.82]	-0.0001 [0.83]	-0.0001 [0.86]	-0.0002 [1.48]	-0.0002 [1.43]	-0.0002 [1.36]	0.0003 [2.80]***	0.0003 [2.74]***	0.0003 [2.70]***	
Age	-0.072 [2.67]***	-0.075 [2.77]***	-0.071 [2.65]***	0.049 [1.36]	0.050 [1.4]	0.047 [1.31]	0.024 [0.84]	0.024 [0.85]	0.025 [0.87]	
Age^2	0.0005 [2.20]**	0.0005 [2.29]**	0.0005 [2.19]**	-0.0003 [1.06]	-0.0003 [1.11]	-0.0003 [1.02]	-0.0002 [0.80]	-0.0002 [0.81]	-0.0002 [0.83]	
Log assets	0.023 [1.48]	0.022 [1.38]	0.023 [1.49]	0.031 [1.72]*	0.033 [1.82]*	0.031 [1.75]*	-0.054 [3.84]***	-0.054 [3.86]***	-0.055 [3.88]***	
Board size	0.002 [0.61]	0.002 [0.69]	0.002 [0.58]	-0.004 [1.16]	-0.004 [1.28]	-0.004 [1.12]	0.002 [0.75]	0.002 [0.8]	0.002 [0.73]	
Directors' shares_ratio	0.001 [0.35]	0.001 [0.37]	0.001 [0.32]	-0.001 [0.36]	-0.001 [0.37]	-0.001 [0.33]	0.001 [0.36]	0.001 [0.37]	0.000 [0.33]	
Outsider ratio	-0.017 [0.23]	-0.015 [0.21]	-0.016 [0.22]	-0.250 [3.06]***	-0.250 [3.06]***	-0.252 [3.09]***	0.267 [4.45]***	0.265 [4.40]***	0.268 [4.45]***	
Listed market	0.013 [0.47]	0.013 [0.48]	0.012 [0.42]	0.011 [0.34]	0.010 [0.32]	0.012 [0.39]	-0.024 [0.98]	-0.023 [0.96]	-0.024 [0.98]	
Adj-firmperformance	-1.672 [7.88]***	-2.384 [5.00]***	-1.661 [7.86]***	1.266 [5.19]***	1.834 [3.27]***	1.253 [5.15]***	0.406 [2.27]**	0.550 [1.28]	0.408 [2.28]**	
Industry Performance	-2.105 [3.73]***	-2.232 [3.98]***	-2.132 [3.78]***	2.260 [3.51]***	2.444 [3.76]***	2.319 [3.57]***	-0.155 [0.32]	-0.212 [0.44]	-0.187 [0.38]	
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
BIC	3698	3751	3755	3698	3751	3755	3698	3751	3755	
N	1824	1824	1824	1824	1824	1824	1824	1824	1824	

Note: Instead of coefficients, the marginal effects of the repressors on the probabilities are shown in the table. The values in brackets are the absolute value of z-statistics. \*, \*\*, \*\*\* indicate significance at the 10%; 5%; and 1% level, respectively.

**Table 8a. Estimated multinomial logit models of disciplinary president turnover regressed on alternative measures of competition**

Estimated Model:	(1)	(2)	(3)	(4)
Dominant firm dummy	0.036 [1.16]	0.053 [2.21]**	0.053 [2.22]**	0.049 [1.99]**
International firm dummy		0.067 [1.86]*	-0.061 [1.82]*	
Firm export				0.000 [1.16]
PCM	-0.002 [0.72]			
Import penetration		0.406 [2.47]**		
Export-import ratio			-0.014 [2.80]***	
Import-advantage dummy				0.090 [3.37]***
Dominant firm dummy*PCM	0.002 [0.8]			
International firm dummy*Import penetration		-0.526 [1.83]*		
International firm dummy*Export-import ratio			0.025 [3.79]***	
Import-advantage dummy*Firm export				0.000 [1.00]
Tenure	0.001 [0.15]	0.001 [0.21]	0.001 [0.13]	0.002 [0.35]
Tenure^2	-0.0001 [0.77]	-0.0001 [0.82]	-0.0001 [0.77]	-0.0001 [0.97]
Age	-0.075 [2.76]***	-0.078 [2.85]***	-0.073 [2.71]***	-0.073 [2.67]***
Age^2	0.0005 [2.29]**	0.0005 [2.37]**	0.0005 [2.23]**	0.0005 [2.19]**
Log assets	0.022 [1.41]	0.020 [1.29]	0.024 [1.53]	0.021 [1.36]
Listed market	0.010 [0.36]	0.007 [0.25]	0.006 [0.21]	0.018 [0.63]
Board size	0.001 [0.29]	0.001 [0.27]	0.000 [0.06]	-0.001 [0.24]
Directors' shares_ratio	0.001 [0.47]	0.001 [0.46]	0.001 [0.4]	0.001 [0.35]
Outsider ratio	-0.052 [0.71]	-0.043 [0.59]	-0.045 [0.61]	-0.015 [0.20]
Adj-firmperformance	-1.704 [7.95]***	-1.665 [7.84]***	-1.692 [7.95]***	-1.690 [7.91]***
Industry performance	-2.229 [3.85]***	-1.831 [3.27]***	-1.989 [3.62]***	-2.302 [4.18]***
Year dummy	Yes	Yes	Yes	Yes
BIC	3683	3693	3685	3676
Obs.	1824	1824	1824	1824

Note: The dependent variable in the multinomial logit model is coded 1 if the president turnover happened and 0 otherwise. In stead of coefficient, the marginal effects of the repressor on the probabilities are shown in the table.

**Table 8b. Estimated multinomial logit models of non-disciplinary president turnover regressed on alternative measures of competition**

Estimated Model:	(1)	(2)	(3)	(4)
Dominant firm dummy	-0.002 [0.05]	-0.033 [1.19]	-0.034 [1.25]	-0.033 [1.21]
International firm dummy		-0.029 [0.73]	0.088 [2.37]**	
Firm export				0.000 [4.93]***
PCM	0.001 [0.34]			
Import penetration		-0.311 [1.56]		
Export-import ratio			0.011 [2.20]**	
Import-advantage dummy				-0.064 [2.24]**
Dominant firm dummy*PCM	-0.005 [1.60]			
International_firm*Import_penetration		0.596 [1.84]*		
International_firm*Export-import ratio			-0.020 [2.74]***	
Import-advantage dummy*Firm export				0.000 [0.44]
Tenure	0.015 [2.94]***	0.015 [2.91]***	0.015 [2.92]***	0.014 [2.71]***
Tenure^2	-0.0002 [1.42]	-0.0002 [1.38]	-0.0002 [1.38]	-0.0002 [1.22]
Age	0.052 [1.45]	0.057 [1.59]	0.053 [1.48]	0.053 [1.47]
Age^2	-0.0003 [1.14]	-0.0004 [1.28]	-0.0003 [1.18]	-0.0003 [1.16]
Log assets	0.032 [1.84]*	0.032 [1.84]*	0.030 [1.69]*	0.029 -1.620
Listed market	0.012 [0.4]	0.010 [0.32]	0.010 [0.32]	0.008 [0.25]
Board size	-0.003 [1.05]	-0.003 [1.00]	-0.003 [0.82]	-0.003 [0.90]
Directors' shares_ratio	-0.002 [0.48]	-0.001 [0.46]	-0.001 [0.41]	-0.001 [0.36]
Outsider ratio	-0.216 [2.68]***	-0.227 [2.81]***	-0.229 [2.80]***	-0.240 [2.95]***
Adj-firmperformance	1.334 [5.36]***	1.266 [5.13]***	1.292 [5.24]***	1.293 [5.26]***
Industry performance	2.498 [3.73]***	1.896 [2.96]***	2.018 [3.19]***	2.228 [3.53]***
Year dummy	Yes	Yes	Yes	Yes
BIC	3683	3693	3685	3676
Obs.	1824	1824	1824	1824

Note: The dependent variable in the panel multinomial logit model is coded 1 if the president turnover is disciplinary change and 0 otherwise. In stead of coefficient, the marginal effects of the repressors on the probabilities are shown in the table.

**Table 8c. Estimated multinomial logit models of residual president turnover regressed on alternative measures of competition**

Estimated Model:	(1)	(2)	(3)	(4)
Dominant_firm dummy	-0.034 [1.20]	-0.021 [0.94]	-0.019 [0.87]	-0.015 [0.72]
International_firm dummy		-0.038 [1.25]	-0.027 [0.91]	
Firm export				0.000 [9.96]***
PCM	0.001 -0.460			
Import penetration		-0.095 [0.60]		
Export-import ratio			0.003 -0.800	
Import-advantage dummy				-0.026 [1.27]
Dominat firm dummy*PCM	0.003 [1.12]			
International firm*Import penetration		-0.071 [0.27]		
International firm*Export-import ratio			-0.005 [0.88]	
Import-advantage dummy*firm export				0.000 [0.87]
Tenure	-0.016 [3.78]***	-0.016 [3.82]***	-0.015 [3.73]***	-0.015 [3.80]***
Tenure^2	0.0003 [2.68]***	0.0003 [2.70]***	0.0003 [2.63]***	0.0003 [2.74]***
Age	0.023 [0.82]	0.020 [0.72]	0.020 [0.71]	0.020 [0.73]
Age^2	-0.0002 [0.79]	-0.0002 [0.68]	-0.0002 [0.67]	-0.0002 [0.70]
Log assets	-0.054 [3.90]***	-0.052 [3.78]***	-0.053 [3.85]***	-0.050 [3.59]***
Listed market	-0.022 [0.93]	-0.017 [0.71]	-0.016 [0.66]	-0.025 [1.07]
Board size	0.003 [0.94]	0.002 [0.91]	0.003 [1.03]	0.004 [1.36]
Directors' shares_ratio	0.001 [0.47]	0.001 [0.46]	0.001 [0.41]	0.000 [0.36]
Outsider ratio	0.268 [4.48]***	0.270 [4.54]***	0.273 [4.56]***	0.254 [4.32]***
Adj-firmperformance	0.370 [2.03]**	0.398 [2.17]**	0.400 [2.19]**	0.398 [2.24]**
Industry performance	-0.269 [0.54]	-0.065 [0.13]	-0.029 [0.06]	0.073 -0.160
Year dummy	Yes	Yes	Yes	Yes
BIC	3683	3693	3685	3676
Obs.	1824	1824	1824	1824

Note: The dependent variable in the multinomial logit model is coded 1 if the news of president turnover is not revealed or not given and 0 otherwise. In stead of coefficient, the marginal effects of the repressors on the probabilities are shown in the table.