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1. Introduction

In recent years, the necessity for the rejuvenation of Japanese managers has often been advocated. For example, the July 1, 2002 issue of *Nikkei Business* featured an article titled “The Forties is the Age Limit for the President of the Company.” In addition, the article posted survey results indicating that younger presidents had achieved a better business performance.

On the other hand, due to increased interest in corporate governance in recent years, the necessity for board of directors restructuring has been raised. For example, according to the questionnaire survey reported in Omura /Masuko(2003), a high percentage of institutional investors have raised issues such as the improvement of board meeting functions, the introduction of outside directors, and the reinforcement of the independence of company auditors, indicating that they be resolved in order to improve corporate management. In addition, in the shareholders’ meeting in June 2004, the Pension Fund Association executed voting rights to oppose 50.6% (536 cases, of which 77 were partial opposition) of decisions related to the selection of board members. It is believed that this example is not completely unrelated to empirical results that the reduction in size of the board of directors (reduction in the number of board members) will enhance corporate value. These discussions have been reported by researchers such as Yermack (1996) and Suzuki and Xu (2000).

In the midst of an increase in awareness of board of directors reforms in Japanese companies, verifying whether the rejuvenation of managers will lead to business performance is considered to be an important issue. Based on the awareness of these issues, this paper will conduct an empirical analysis on the impact of the management age on firm value.

This paper conducted a regression analysis using data of April 2003 from 1104 companies that were listed on the first section of the Tokyo Stock Exchange and that ended their fiscal year in March (excluding the financial and insurance

industry). In this analysis, this paper adopted the age of the president, average age of directors, and service years of directors (tenure of directors) as the explanatory variables. In addition, this paper adopted Tobin's Q as the explained variables. In order to conduct a regression analysis, this paper controlled corporate attributes such as the size of company, ratio of stocks owned by directors, ROA, ratio of liabilities, and research and development. The influence of these factors on Tobin's Q had been demonstrated in the preceding research.

The empirical results have indicated negative relationships between the average age of directors and the simple Q. In addition, it has been suggested that the average age of directors had more significant impact on the simple Q than the age of the president. These results provide an empirical basis to the argument that the rejuvenation of directors is necessary.

The remainder of this paper is organized as follows: Section 2 explain the association between management age and firm value. Section 3 presents research design. Section 4 reports the empirical result. Section 5 offers concluding comment.

2. The influences of the management age upon firm value

From the standpoint of corporate governance, managers are required to make appropriate decisions to enhance firm value. In order to respond to this request, a certain level of experience is believed to be necessary. The age of the manager can be regarded as a proxy variable of accumulated experience and might exert positive effects on firm value improvement. On the other hand, the manager must gather and analyze various types of information to make a quick judgment. However, aging might lead to a decline in morale and physical ability as well as in willingness and the ability to accept and respond to changes. This might eventually make it difficult for the manager to make correct decisions. If these negative aspects exert a strong influence, a higher age of the manager will bring about negative effects on firm value.

Thus, the aging of the manager can exert both positive and negative effects on firm value. Okamuro (2006) has reported that there was a positive relationship between the age of the manager and ROA for companies listed in the second section of the Tokyo Stock Exchange during the high-speed economic growth era of the 1960s. He has interpreted that the vast experience of the manager

enhanced business performance.

In contrast, at present, it seems that most studies insist that this negative effect is overwhelming. The main reason for this argument is that acceleration in technological advancement and economic globalization has reduced the importance of past experience and knowledge. According to a survey published in 1999 by the National Institute of Science and Technology Policy of the Science and Technology Agency, in the 1960s, once a new technology was invented, it was possible to obtain profits using this technology for 22 years. However, the period for which profits could be generated was reduced over time to approximately 3 years in the 1990s. In other words, even if the manager attempts to judge technology based on their past experience (10 or 20 years after leaving the actual work site), making an appropriate judgment is not possible because the technology currently in use would have advanced by many generations. In addition, it is believed that such survey results backed up the interpretation of Okamuro (2006) that older and experienced managers achieved better business performance in the 1960s when there existed a longer technology life cycle.

Despite the negative effect exerted by aging, it is possible that there are some positive effects of aging such as an increase in experience. Therefore, this paper will also verify the hypothesis that aging exerts positive effects due to factors such as accumulation till the manager reaches a certain age, while aging exerts negative effects once the manager exceeds a certain age. Specifically, this paper will conduct a regression analysis using age, the square of age as explanatory variables.

Furthermore, this paper will discuss the scope of the manager. In most cases, the members of the board of directors in Japanese companies have been appointed to that position through the internal promotion system. Each member of this board tends to be regarded as a responsible manager of their division. Therefore, the board of directors is considered a management group as a whole rather than as supervisors of the manager. This paper proposes that the board of directors acts as one member of the corporate management rather than as supervisors of managers¹.

¹ Companies that have adopted the committee system are introduced as the result of the revision of the commercial act in recent years. Now, it is possible to select the company that has adopted “company with committee”. Under this system, executive officers take responsibility for the execution of business, while directors concentrate on the supervision of executive officers. Thus, the company that has adopted “company

In addition, this paper considers that the average age of the directors as one member of management is more important to corporate evaluation than the age of only the president, who is a member of a management group. This paper will use the age of the president and the average age of the directors as the management age. In addition, there are positive effects, such as increase in experience, as a result of more years of service as well as aging. On the other hand, there can also be negative effects, such as the inability to implement necessary reforms, due to persistence in the past successful experiences and a conservative attitude. In order to analyze this impact, this paper will also consider the average years of service of the directors.

Based on the discussion mentioned above, this paper will attempt to verify the following hypotheses: There is a significant relationship between the management age and firm value (Hypothesis 1). If there is a significant relationship, this paper will verify whether this relationship is linear. This paper will also alternatively verify the hypothesis that this relationship is negative and linear (Hypothesis 2-1), and there is a non-linear relationship in which firm value is enhanced for relatively younger managers due to the accumulation of experience, while negative effects due to aging will be predominant once the manager exceeds a certain age (Hypothesis 2-2). The age of the president (youth of the president) is less important than the average age of directors (youth of the board of directors) if there is a relationship between the management age and firm value (Hypothesis 3). This paper will conduct an analysis focusing on these 3 hypotheses.

3. Research Design

In this section, I present how to verify the hypothesis mentioned above.

3.1. Data

I construct my sample using data of April 2003 from 1104 companies that were listed on the first section of Tokyo Stock Exchange (TSE) and ended their fiscal year in March, and excluding financial corporations. I use only the firm that ended their fiscal year in March to eliminate possible distortions from the

with committee” attempts to clarify the “segregation of execution and supervision.” However, only an extremely limited number of companies have moved to this system so far (approximately 60 companies among the ones listed on the first section of the Tokyo Stock Exchange).

difference of accounting period influences stock price.

The information on manager and board of directors are assembled from Toyo keizai's Yakuin Shikihou 2004 (The directory of board members). Financial data set are collected from Toyo keizai's Zaimu Karte CD-ROM 2005 (financial data base). I use consolidated accounting data principally, and if the firm has only unconsolidated account data, I use it. Table 1 show that descriptive statistics of the data used in this paper.

Table 1

Descriptive statistics for attributes of board of directors and financial data

	Mean	Std.dev.	Minimum	Maximum	Median
simple q	0.860	0.470	0.199	4.358	0.754
ROA	0.052	0.044	-0.331	0.274	0.044
age of president	60.5	6.9	32	87	62
Average age of directors	59.8	3.1	43	85.9	60
Average tenure of directors	6.4	3.1	0.3	20.6	5.8
board size	11.18	5.41	4	49	10
directors stock ownership	0.034	0.076	0	0.606	0.004
firm size(million yen)	370732	1192202	2989	21568275	75517
debt ratio	0.242	0.194	0	1.387	0.22
R&D/sales	0.021	0.031	0	0.307	0.01

3.2. Performance Variable

To investigate whether management age has a significant association with firm value, I use Tobin's Q as a proxy for firm value. The age of the president and average age of directors are one of the characteristics of the board of directors. In many empirical researches on the relation between characteristics of board of directors and firm value, they use Tobin's Q as a proxy for the firm value. Tobin's Q is defined as the ratio of the market value of a firm to the replacement cost of its asset. Although Tobin's Q is an attractive theoretical firm value measure, its empirical construction is usually difficult. In this paper, I use simple Q proposed by Perfect/Wiles (1994), Chung/Pruitt (1994) as proxy for Tobin's Q to avoid this difficulty. This simple Q is defined as the ratio of market value of stock plus book value of the firm's debt to the book value of the total assets of the firm.

As stated above, all of those required input are readily obtainable from firm's basic financial and accounting information. Perfect/Wiles (1994) stated that simple Q may provide acceptable initial estimates in the other estimators are not available. Chung/Pruitt (1994) stated simple Q offers a simple, tractable formula to obtain relatively accurate and timely Q values with minimal computational effort.

3.3. Explanatory Variables: attributes of board of directors

Management age

I use two explanatory variables as a proxy for the management age. The first is the age of president, and the second is the average age of directors. In addition to management age, I include controls for attributes of board of directors.

Board size

Jensen(1993) contend that the firm reducing board size can improve their performance. This named board size effect. This effect is supported by the empirical research, such as Yermach(1996) . He reports the evidence that there are negative significant association between board size and firm value. To control for board size effect, I include log of the number of directors in the regression model.

Directors stock ownership

With respect to directors stock ownership, Morck *et al.* (1988), McConnell/Servaes (1990) find significant, though non-linear association between different levels of directors stock ownership and firm value, suggesting that some levels of directors stock ownership have systematic advantages. Teshima(2000) also reports similar results about Japanese firm. To control for directors stock ownership, I include the ratio of common stock owned by directors in the regression model.

3.4. Other Controls

In addition to attributes of board of directors, I include other control variables below.

Firm size

I control for firm size with the log of total capital. It equals the market value of equity at the end of the fiscal year, plus the book value of debt. Below I consider alternative measures of firm size in section 4.2.1.

Profitability

A firm's profitability has a significant impact upon its market value, so I include return on asset (ROA) in regression model as a proxy for measure of profitability. It was calculated as EBIT divided by total assets (measured at March 2004).

Debt ratio

I also control debt using debt ratio. It is defined by total debt over asset.

R&D

Firm value may depend on future growth opportunities. I use the ratio of R&D over sales as a proxy for growth opportunities.

Age of the firm

Young firm (which means the firm has established recently) may have young management. So I include age of the firm in my regression model.

Industry dummy

I include in the regression dummy variables for industry classification specified by SIIC (see Table 7).

4. Regression Analysis

To investigate the association between management age and firm value, I estimate least square regressions using simple Q as a dependent variable, and management age and its square as explanatory variable.

4.1. Main Result

Table 2

Regression coefficient estimates: management age and firm value

	(1)		(2)		(3)	
	coefficient	p-value	coefficient	p-value	coefficient	p-value
Constant	5.736	0.000	1.839	0.000	3.011	0.000
President age	-0.035	0.032	0.000	0.916	-0.041	0.011
square of president age	0.031	0.029			0.035	0.011
average age of directors	-0.127	0.014	-0.031	0.000	-0.030	0.000
square of average age of directors	0.080	0.060				
average tenure of directors	0.004	0.342	0.005	0.218	0.004	0.403
log of board size	-0.247	0.000	-0.241	0.000	-0.248	0.000
Directors stock ownership	0.999	0.000	1.112	0.000	1.036	0.000
log of firm size	0.137	0.000	0.136	0.000	0.137	0.000
debt ratio	-0.097	0.148	-0.094	0.166	-0.101	0.133
R&D/sales	2.546	0.000	2.484	0.000	2.540	0.000
age of the firm	-0.002	0.001	-0.002	0.000	-0.002	0.000
adjusted R-square		0.402		0.398		0.401

Column (1) of Table 2 present coefficient of age of president and its square are significant. And coefficient of average age of directors is also significant (p-value above 5%).

Column (2) of Table 2 shows that if we do not use square of management age, the coefficient of the age of president is not significant.

Coefficient of age of firm which may associate with management age (age of president, or average age of directors) is significantly negative. It is suggested that younger firm have high firm value. Considering age of firm, management age relate firm value significantly.

So the regression results in Table 2 suggest a non-linear relation between the age of president and firm value, and negative linear relation between the average age of directors and firm value.

Coefficient of board size is significantly negative, and coefficient of director stock ownership is significantly positive. This result is consistent with prior research. So it seems reasonable to suppose that management age associate with

firm value.

4.2. Robustness

In this section, I conduct additional test of the robustness of my finding.

4.2.1. Firm size

The firm size and firm value can be correlated in complicated ways. So I check the robustness of my results to different definition of firm size variable. I estimate the model of the column (3) of Table 2 based on four different measure of size: total capital (already used), total asset (book value), employees, sales.

The regression results are presented in Table 3. Column (1) of Table 3 is the same as column (3) of Table 2. Coefficient of the age of president and its square, average age of directors are significant in all columns in Table 3. Coefficient estimates for other control variables also significant. Thus the regression results of Table 2 seem to be robust.

Table 3

	total capital	p-value	total asset	p-value	employees	p-value	sales	p-value
Constant	3.011	0.000	3.225	0.000	3.342	0.000	3.193	0.000
president age	-0.041	0.011	-0.037	0.033	-0.037	0.035	-0.038	0.029
square of president age	0.035	0.011	0.031	0.039	0.030	0.044	0.032	0.035
average age of directors	-0.030	0.000	-0.024	0.000	-0.022	0.000	-0.023	0.000
average tenure of directors	0.004	0.403	0.005	0.308	0.005	0.313	0.006	0.241
log of board size	-0.248	0.000	-0.143	0.000	-0.123	0.000	-0.133	0.000
director stock ownership	1.036	0.000	1.090	0.000	1.109	0.000	1.109	0.000
log of firm size	0.137	0.000	0.055	0.000	0.040	0.000	0.048	0.000
debt ratio	-0.101	0.133	0.049	0.496	0.085	0.236	0.065	0.372
R&D/sales	2.540	0.000	3.544	0.000	3.712	0.000	3.713	0.000
age of the firm	-0.002	0.000	-0.003	0.000	-0.003	0.000	-0.003	0.000
adjusted R-square	0.401		0.296		0.289		0.293	

4.2.2. The effect of management age

Figure 4
Effect of aging

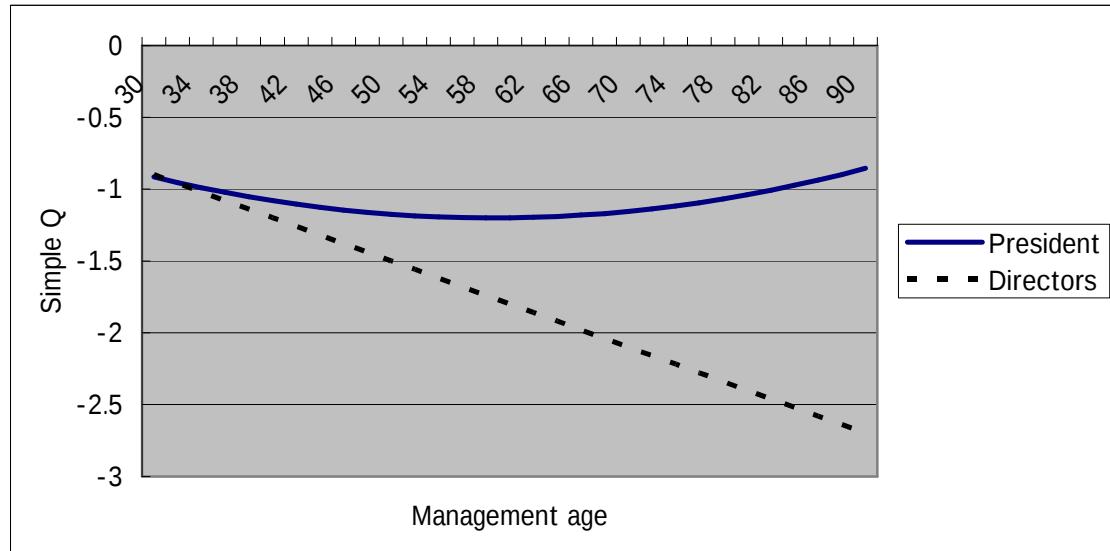


Figure 4 shows that the relationship between the change in management age and the change in simple Q. This figure is drawn based on column (3) of Table 2. Because the age of president range from 32 years old to 87 years old, and the average age of directors range from 43 years old to 86 years old (see Table 1), I draw figure 4 within 90 years old to 30.

For young manager, aging might usually lead to accumulate experience and might exert positive effect on firm value. But above a certain age, aging have negative effect that might lead to decline in morale and physical ability and might exert negative effect on firm value.

Table 5
Distribution of the age of president

Age	Under 39	40-49	50-54	55-59	60-64	65-69	70-79	Over 80
Number	12	70	67	222	466	211	52	4
cumulative		82	149	371	837	1048	1100	1004

Table 5 present distribution of the age of president. President below 69 years old are more than 95%. Considering a little president is 80 years old or more (see Table 1), it is thought that the influence of the average age of directors on

simple Q is larger than the age of president.

4.2.3. Industry specification

Table 7 presents that the industry specific influence of management age on simple Q. I classify industry by the sector classification specified by the SIIC (Securities Identification Code Committee). This classification classifies industry into 33 sectors. The sectors that only a small number of the firms belong are grouped as follow (see Table 6).

Table 6.

Industry Classification

Financial and insurance section (4 sub-classifications) omitted.

Sector specified by SIIC		Classification used in Table 7
Main classification	Sub classification	
Fishery, Agriculture & Forestry	Fishery, Agriculture & Forestry	not classified
Mining	Mining	not classified
Construction	Construction	(1)
Manufacturing	Foods	(2)
	Textiles & Apparels, Pulp & Paper	(3)
	Chemicals, Pharmaceutical	(4)
	Oil & Coal Products, Rubber Products, Glass & Ceramics Products, Iron & Steel, Nonferrous Metals, Metal Products, Other Products	(5)
	Machinery, Electric Appliances, Transportation Equipment, Precision Instruments	(6)
Electric Power & Gas	Electric Power & Gas	(7)
Transportation, Information & Communication	Land Transportation, Marine Transportation, Air Transportation Warehousing & Harbor Transportation Services, Information & Communication	
Trade	Wholesale Trade, Retail Trade	(8)
Real Estate	Real Estate	
Services	Services	

Table 7

The left side of each column presents estimated coefficient and the right side presents its p-value.

	(1)		(2)		(3)		(4)	
Constant	0.165	0.908	1.983	0.462	3.903	0.173	5.311	0.004
president age	0.036	0.331	0.015	0.865	-0.041	0.593	-0.097	0.079
square of president age	-0.030	0.328	-0.004	0.953	0.036	0.588	0.087	0.063
average age of directors	-0.024	0.144	-0.052	0.058	-0.045	0.027	-0.056	0.000
average tenure of directors	0.024	0.071	-0.001	0.949	-0.001	0.952	0.015	0.236
log of board size	-0.078	0.197	0.013	0.919	-0.228	0.036	-0.252	0.003
director stock ownership	-1.064	0.333	2.658	0.067	2.029	0.219	0.490	0.434
log of firm size	0.088	0.001	0.085	0.094	0.077	0.032	0.181	0.000
debt ratio	0.409	0.013	0.151	0.631	0.563	0.009	0.028	0.847
R&D/sales	10.101	0.293	10.005	0.101	12.334	0.000	1.685	0.004
age of the firm	-0.004	0.075	0.000	0.946	-0.001	0.549	0.000	0.800
Adjusted R-square	0.293		0.166		0.54		0.420	
Sample	94		48		47		135	

Table 7. (Continued)

	(5)		(6)		(7)		(8)	
Constant	0.361	0.737	3.240	0.009	2.911	0.009	4.546	0.000
president age	0.012	0.708	-0.036	0.344	-0.024	0.469	-0.112	0.006
square of president age	-0.013	0.636	0.027	0.392	0.024	0.408	0.104	0.004
average age of directors	-0.011	0.217	-0.032	0.008	-0.032	0.042	-0.026	0.005
average tenure of directors	0.005	0.464	0.008	0.387	-0.031	0.098	-0.015	0.170
log of board size	-0.096	0.116	-0.327	0.000	-0.167	0.088	-0.384	0.000
director stock ownership	0.887	0.003	1.405	0.006	3.797	0.000	0.855	0.018
log of firm size	0.080	0.000	0.153	0.000	0.067	0.009	0.194	0.000
debt ratio	0.305	0.019	-0.140	0.378	0.425	0.006	-0.851	0.000
R&D/sales	3.134	0.000	1.431	0.176	-0.005	0.999	7.730	0.051
age of the firm	-0.001	0.211	-0.006	0.002	0.000	0.857	-0.006	0.001
adjusted R-square	0.292		0.328		0.56		0.413	
Sample	156		306		80		229	

In column (1) (2) and (5) of Table 7, most coefficients are not significant. In column (3) (4) and (6), the coefficient of the average age of directors is significantly negative, and coefficients of the age of president and its square are not significant. In column (8), not only coefficient of the age of directors but also coefficients of the age of president and its square are significant.

5. Summary and conclusion

In this paper, I analyze the effect of management age on firm value. The empirical results indicate negative relationship between management age and simple Q. These results provide an empirical basis to the argument that rejuvenation of director is necessary. In recent years, institutional investors are active in exercising voting rights in shareholder's meetings, and especially request the improvement of board meeting function. Japanese companies respond to such requests by reducing board size, or introducing outside directors. The results suggest that institutional investors should give consideration to rejuvenation of Japanese managers in exercising voting rights.

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