# AN EXAMINATION OF BOARD SIZE EFFECT IN A RELATIONSHIP-ORIENTED SYSTEM: EVIDENCE FROM JAPAN

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**Abstract**

This paper examines whether or not board size effect hypothesis exist in Japan. We make two points about it. First, board size effect exists in Japanese firm which adopt the relationship-oriented system. Second, banks take a part of effective monitoring as stockholder, but do not take it as outside directors.

**Keywords:** Board of Directors; Board size effect; Relationship-Oriented System

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## Introduction

The purpose of this paper is to examine whether or not board size effect hypothesis exist in Japan. There are mainly two different sources of the board size effect: 'agency-based sources' and 'outside director effects'. The former is occurred by a coordination problem of governing larger size of board[1]. The latter is led by ineffective monitoring of outside directors in larger size of board[2]. Bhagat et al. (1999) find that outside directors who have a substantial equity ownership create a personal incentive to monitor. In other words, there is a possibility of outside directors' ineffective monitoring when stockownership of outside directors is limited in a similar case of Japan[3].

There are empirical studies to check the board size effect in the external market-oriented systems such as US public firms adopt. Yermack (1996) empirically shows the existence of board size effect in US Public firms. Eisenberg et al. (1998) also show the board size effect in smaller firms in Finland.

In Japan under the relationship-oriented systems, there is a few empirical study of analyzing the relationship between board size and firm performance. Basu et al. (2007) analyze the relationship between board size and top executive compensation, and they show that board size is not significantly correlated to top executive compensation. However, Basu et al. (2007) do not analyze the direct relationship between board size and firm performance.

This paper seeks to contribute two points. First, we find that board size effect exist also in Japanese firm which adopt the relationship-oriented system. Second, we also show that banks take a part of effective monitoring as stockholder, but do not take it as outside directors.

## Japanese Monitoring Mechanism and Data

In this section, we introduce Japanese firms monitoring mechanisms under the relationship-oriented systems which many Japanese firms rely on. It is different of the external market-oriented systems US public firms adopt.

In the relationship-oriented systems, managers in the firm monitor each other. In Japan, each of directors faces a hierarchical structure on the board such as the promotion and job security. Yasui (1999) suggests that there is a difficulty of board of directors' effective monitoring. However, in many cases,

[1] Jensen (1993) points out that board in US faces the coordination problem and board size in US tend to be too large.
[2] Yermack (1996) suggests that board size effect is related to board composition.
[3] The descriptive statistics of our sample in Table 1 suggest that outside ownership is limited because board ownership including executive ownership is only 2.1%.

Japanese boards include outside directors. Aoki et al. (1994) and Kaplan and Minton (1994) point out that outside directors take a role of strengthening the monitoring of host firms.

There are some empirical studies to analyze the monitoring role of Japanese outside directors and shareholders. Kaplan and Minton (1994), Kang and Shivdasani (1995), and Morck and Nakamura (1999) show that outside directors appointed by main banks of financially troubled client firms take an important monitoring role. Litchenberg and Pushner (1994) prove that bank ownerships take a role of improving firm performance (TFP). On the other hand, Morck et al. (2000) find that bank holders take a role of decreasing firm value. There are mixed evidence about bank holders monitoring role.

We draw our sample for 522 manufacture firms listed in TSE 1st section during 1991 and 1995. We use data from the Nikkei Needs, which tells us each firm's financial statements and stock holding, and also use data from Yakuin Shikiho (1991-1995), which tells us the composition of each firm's board. Table 1 describes the descriptive statistics of each variable.

**Insert Table 1**

There is a possibility of two sources of board size effect in Japanese relationship-oriented systems. First, table 1 show that Japanese average board size is 19 and larger than US firms in Yermack (1996). This suggests that Japanese boards have a difficulty of coordinating decision making. In other words, there is an 'agency-based sources' of board size effect in Japanese relationship-oriented systems.

Second, there is also an 'outside director effects' in Japanese relationship-oriented systems. Japanese outside directors include bank officers appointed by main banks, and are unwilling to take risks that could lead to bankruptcy. Table 1 points out that the average ratio of bank directors is about 21.1%, and that of outside directors is about 21.4%. This fact suggests that there is also an 'outside director effects' of Japanese bank directors.

## Empirical evidence

In this section, we examine whether board size effect is also existed in Japanese manufacturing firms or not. First, we analyze the relation between board size and firm performance, and show the negative correlation between board size and firms performance. We do not adopt as Tobin's Q because the land price dramatically decreased and the denominator of Tobin's Q also decreased owing to heavily falls of land asset value during 1991 and 1995. Figure 1 suggests the relation that firms with lower ROA have larger board size.

**Insert Figure 1**

Second, we estimate four regression equations to analyze the board size effect and monitoring role of outside directors and stockholders. Table 2 presents regressions of firm performance on board size, board composition, ownership structure, control for firm size, time dummy, and industrial dummy[2]. Table 2 presents coefficient estimates for OLS models with White (1980) robust standard errors.

**Insert Table 2**

Model 1(2) in table 2 relates ROA (ROS) to board size, board ownership, and the ratio of outside directors whose explanatory variables are same as Yermack (1996). In Model 1, board size is significantly negative effect to ROA. This implies that board size effect exists and produces an estimate of -0.017 for the logarithm of board size (significant at 1%).

The result of Model 2 shows that the existence of board size effect shown in model 1 is robust. However, we need to analyze the monitoring role of bank directors which previous studies stress on because both models show that an estimate of outside directors is not significant.

Model 3 and 4 analyzes Japanese unique monitoring mechanism such as the monitoring role of bank directors, bank ownership, and corporate ownership. So, Model 3 (4) adds the bank directors, bank ownership, and corporate ownership into Model 1 (2).

The regression of Model 3 also shows that board size is significantly negative effect to ROA, and produces an estimate of -0.017 for the logarithm of board size (significant at 1%). This suggests that board size effect exists. The bank ownership is significantly positive effect to ROA, but bank directors is

[2] Our sample is divided into 15 industry groups following Japan's Standard Industrial Classification.

not significant. This implies that the monitoring role of bank is only as shareholder, and not as outside directors. The regression of Model 4 shows the robustness of Model 3.

The estimation results of four models are interpreted as follows. First, there would be an 'agency-based sources' of board size effect because of negative estimates for the logarithm of board size. Second, there would be few 'outside director effects' because bank outside directors do not take a monitoring role.

## Conclusions

In this paper, we make two main points about Japanese board. First, we find that the board size effect also exists in Japanese relationship-oriented system. Second, we find that monitoring role of bank is only as shareholder, and not as outside directors. These results imply that board size effect in Japan is mainly due to 'agency-based sources'. However, there is a possibility of 'outside director effects', and we can not fully identify which sources are main cause of board size effect in Japan. This remains an important task for future work.

## Acknowledgements

The authors are grateful to Yoshiro Tsutsui and Akira Kohsaka for their valuable comments on an earlier draft. All remaining errors are solely ours.

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## Appendices

**Appendix: Definitions of Variables**
ROA = Return on Asset
ROS = Return on Sale
Board Size = Number of directors in board
Total Capital = Total capital
Outside directors = Number of outside directors / Board size
Bank Director = Outside directors from commercial bank / Number of outside directors
Board Ownership = Board's shareholding ratio
Bank Ownership = Financial companies' shareholding ratio
Corporate Ownership =Non-financial companies' shareholding ratio

**Table 1.** Descriptive statistics

| Variables | Average | Median | Std |
|---|---|---|---|
| ROA | 0.013 | 0.014 | 0.030 |
| ROS | 0.017 | 0.015 | 0.048 |
| The Board Size | 19.825 | 18.000 | 6.541 |
| Total Capital (Billion Yen) | 78.564 | 34.845 | 141.283 |
| Outside Directors(□) | 0.214 | 0.176 | 0.175 |
| Bank Director(□) | 0.211 | 0.000 | 0.320 |
| Board Ownership(□) | 0.021 | 0.004 | 0.041 |
| Bank Ownership(□) | 0.411 | 0.413 | 0.131 |
| Corporate Ownership(□) | 0.262 | 0.225 | 0.149 |

**Table 2.** Regression Coefficient Estimates

| Dependent variable | ROA | ROS | ROA | ROS |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Log (Board Size) | -0.017*** | -0.031*** | -0.017*** | -0.032*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Log (Total Capital) | 0.007*** | 0.012*** | 0.006*** | 0.011*** |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| Board Ownership | 0.033** | 0.061** | 0.060*** | 0.098*** |
| | (0.043) | (0.035) | (0.001) | (0.002 ) |
| Outside Directors | -0.005 | -0.004 | -0.001 | 0.002 |
| | (0.232) | (0.498) | (0.870) | (0.748) |
| Bank Directors | | | -0.003 | -0.004 |
| | | | (0.121) | (0.201) |
| Bank Ownership | | | 0.034*** | 0.047*** |
| | | | (0.000) | (0.000) |
| Corporate Ownership | | | 0.012* | 0.015 |
| | | | (0.100) | (0.185) |
| F-statistics | 12.5 | 10.0 | 12.3 | 10.4 |
| | (0.000) | (0.000) | (0.000) | (0.000) |
| R-squared | 0.101 | 0.095 | 0.109 | 0.102 |

Note: P-values are in parentheses. Significant at 1%(***), 5%(**), and 10%(*).

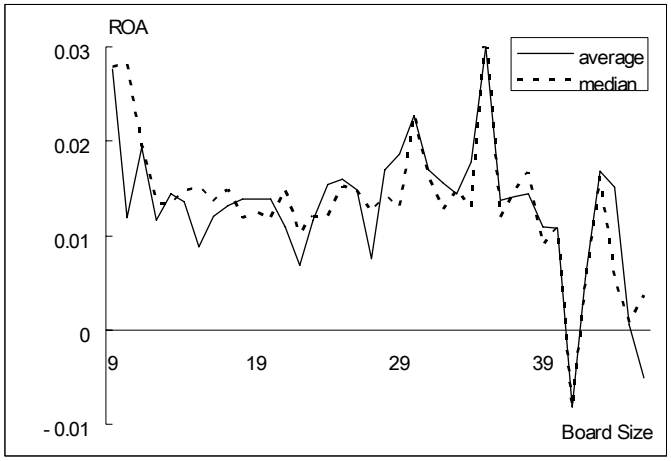


**Fig.1.** Board Size-firm performance relationship