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Capital Expenditure Behavior of Overconfident Managers of Japanese Firms: Empirical Evidence During the Financial Crisis in Japan*

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Abstract

Malmendier and Tate (2005) and Aktas et al. (2019) suggested that overconfident managers will invest if they have sufficient internal funds. Still, they will save internal funds instead of reducing investment if they have insufficient internal funds because they perceive more substantial financial constraints than other managers. This study examines whether overconfident managers will not invest when the financial crisis makes it difficult to raise external funds. In particular, during the financial crisis in Japan, banks simultaneously provided active monitoring and financing to firms with strong relationships with banks. Therefore, this study can also examine the relationship between overconfident managers and bank behavior by focusing on Japanese firms. This study examines whether overconfident managers increase their investment in firms with strong relationships with banks during the financial crisis. The results of this study showed that overconfident managers, especially their firms with strong relationships with banks, reduce investments more than other managers during the financial crisis. This study suggests that Japanese banks reduced financial constraints and exerted strong corporate governance on Japanese firms during the financial crisis.

Keywords: Overconfidence, Investment, Financial Crisis, Bank-Centered Corporate Governance, Japanese Firms.

JEL Classification Code: G32, G38, M41

1. Introduction

Previous studies have suggested that managerial characteristics influence firm behavior. For example, Hambrick and Mason's (1984) influential upper echelons theory demonstrates that managerial characteristics affect firms' business strategies and problem-solving methods through cognitive biases toward private information. According to Malmendier and Tate (2005), overconfident

managers overestimate returns from firm investment projects and are more willing to make risky investments. Malmendier and Tate (2005) and Aktas et al. (2019) showed that when external financing constraints increase, overconfident managers estimate the cost of capital to be higher than other managers, which leads them to invest less and save more internal funds. In terms of financing, the 2008 Lehman crisis and the ensuing global recession made it difficult to raise funds from financial markets. Based on the above discussion of previous studies, overconfident managers may be more reluctant than other managers to invest during financial crises. This study uses data from Japanese firms to examine the changes in the managerial behavior of overconfident managers during a financial crisis.

Japanese firms are considered more influenced by banks than those in other countries (Aoki, 1990). Japanese banks provided more funds to firms with whom they had strong relationships during the US subprime mortgage crisis in 2008 (Iwaki, 2019). Therefore, by focusing on Japanese firms during the financial crisis, we can compare firms that experienced difficulties raising bank funds with those that did not. It must also be noted that Japanese firms that

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have a strong relationship with banks may not only have more debt but may also be monitored more closely by the bank. For example, bank-centered corporate governance makes firms more risk-averse (Sakawa & Watanabel, 2021), which may have a significant impact on the risky investment behavior of overconfident managers. This study examines the impact of Japan-specific banks' policies on overconfident managers' managerial behavior during a financial crisis.

This study tests our hypothesis using data from companies listed in the First Section of the Tokyo Stock Exchange (TSE) from 2008 to 2011. This study uses least-squares estimation, with the interaction term between the indicator variable of overconfident managers and a dummy variable indicating the year of the global recession (2008 and 2009) as the independent variable and capital expenditure as the dependent variable. This study analyzes the association between firms having a strong relationship with banks by splitting the sample from the base model. For firms having strong relationships with banks, this study refers to French et al. (2019) and analyzed the regression model by splitting the sample of firms using the same lending bank from 2006 to 2008.

The results of this analysis show that during the financial crisis, overconfident managers reduced their capital expenditure more than other managers, and in Japan, this occurred only in firms having a strong relationship with their banks. The study contributes to current research by revealing the changes in investment behavior of overconfident managers during financial crises. The results not only are consistent with the prediction of Malmendier and Tate (2005) but also expand the scope of the analysis of previous studies by examining corporate behavior during financial crises in *non-financial* firms. This finding is useful for predicting overconfident managerial behavior. In addition, this study adds to a growing body of research on the impact of overconfident managers on firms' managerial behavior and performance, which is of interest in Asia (Nguyen et al., 2020; Hoang et al., 2020; Zaludin et al., 2021).

Another research gap that this study address is the impact of bank monitoring (based on the characteristics of the Japanese financial crisis) and the effectiveness of corporate governance by banks. Banerjee et al. (2015) argued that in the United States, overconfident managers are affected by shareholder-oriented corporate governance. This study suggests that the behavior of overconfident managers is effectively monitored not only by shareholder-oriented corporate governance but also by bank-centred corporate governance. This insight may be of interest to investors and analysts who need to understand biases in corporate behavior, and also to policymakers who are interested in the state of corporate governance.

2. Literature Review and Hypotheses

2.1. Investment Behavior of Overconfident Managers

Hambrick and Mason (1984) propose the upper echelons theory and explain that the cognitive biases of managers affect their decision-making and, therefore, the characteristics of managers affect the overall managerial behavior of firms. Bertrand and Schor (2003) showed that there is a statistically significant effect of manager fixed effects on the firm behavior even when the effects of firm characteristics, such as firm size and the debt ratio, are controlled. Overconfident managers, among various managerial characteristics, make optimistic future forecasts and, therefore, aggressively invest in capital expenditures, mergers, and acquisitions, and R&D investment when they have sufficient internal funds (Hirshleifer et al., 2012; Malmendier & Tate, 2005, 2008).

However, a firm's internal funds are not always sufficient. Therefore, firms need to receive external financing to make investments. In this regard, according to Malmendier and Tate (2005), overconfident managers overestimate the returns from firm investment projects and perceive underpriced stock prices from the market; thus, overconfident managers perceive the cost of capital to be costly for external financing from the stock market. Therefore, this study showed that overconfident managers invest aggressively when their internal funds are sufficient for the investment but reduce investment when their firm's internal funds are insufficient. Aktas et al. (2019) also showed that overconfident managers also reduce investment when external financing constraints are strong.

2.2. The Bank's Role During the Financial Crisis in Japan on Firm Management

The U.S. subprime mortgage crisis in 2008 stalled funding through the debt market. Kahle and Stulz (2013) suggested that the financial crisis hampered firms' access to the bond market because of: 1) supply shocks in bank lending, 2) supply shocks in the debt market, 3) demand shocks, and 4) worse balance sheet multiples, suggesting that the difficulty in raising funds from the debt market reduced firms' investment. The resulting global recession significantly lowered stock prices in many countries and made it temporarily difficult to raise funds through the stock market (Duchin et al., 2010).

In Japan, however, the situation was different from other countries; banks actively lent debt even during the financial crisis (Iwaki, 2019). In particular, firms having strong relationships with banks were less constrained by debt financing than other firms (Uchino, 2013). However, these firms may have been subject to close monitoring by banks.

Japanese banks, often referred to as main-bank, hold a large stake in firms they finance and reduce agency costs by mitigating information asymmetries (Prowse, 1992). Corporate governance by Japanese banks particularly reflects the risk-averse utility of creditors, which encourages risk-averse management behavior in firms with strong relationships with banks (Sakawa & Watanabel, 2021). In addition, corporate governance by Japanese banks is more effective when firm performance is poor, not when firm performance is good (Aoki, 1990).

2.3. Hypothesis Development

U.S. and Japanese firms reduced their investments during the financial crisis when financial markets became dysfunctional due to plummeting stock prices and worsening bank funding, making it difficult to raise funds from financial markets (Duchin et al., 2010; Kahle & Stulz, 2013; Uchino, 2013; Iwaki, 2019). In particular, overconfident managers predict external financing to be costlier than other managers, so they reduce investment to enhance internal financing when external financing constraints become stronger (Malmendier & Tate, 2005; Aktas et al., 2019). Based on the above, we present Hypothesis 1:

H1: *In a financial crisis, overconfident managers will reduce capital expenditure more than other managers.*

During the financial crisis, Japanese banks lent aggressively to firms (Iwaki, 2019). As a result, Japanese firms with strong relationships with banks received large funds and did not reduce investment during the financial crisis (Uchino, 2013; Iwaki, 2019). The same tendency is expected to be observed in firms managed by overconfident managers. In particular, if overconfident managers manage firms having strong relationships with banks, they may invest more aggressively than other managers because of the larger inflow of funds during financial crises (Malmendier & Tate, 2005). Therefore, we propose the following hypothesis:

H2a: *During a financial crisis, overconfident managers who manage firms having strong relationships with banks will increase their capital expenditure more than other managers.*

However, firms with strong relationships with banks are subject to strong monitoring by banks (Sakawa & Watanabel, 2021). In particular, investments based on the optimistic outlook of overconfident managers may be discouraged as they entail excessive risk, especially for banks as creditors. Banerjee et al. (2015) find that the Sarbanes-Oxley Act (SOX Act) has led to increased

monitoring by the stock market. Banerjee et al. (2015) pointed out that the implementation of the Sarbanes-Oxley Act (SOX Act) has changed the management behavior of firms managed by overconfident managers. In Japan's bank-centered corporate governance, banks not only lend money but, in many cases, also own shares in the firms. As a result, Japanese banks, both as creditors and shareholders, strongly monitor a firm's behavior and are expected to do so more strongly when firm performance deteriorates due to the financial crisis. Therefore, an overconfident manager who manages a firm having a strong relationship with a bank expects that close monitoring by the bank restricts investment based on an optimistic outlook during a financial crisis, even if the firm receives a large inflow of funds from the bank. Therefore, we propose the following hypothesis in place of Hypothesis 2a:

H2b: *During the financial crisis, overconfident managers who manage firms having strong relationships with banks will reduce their capital expenditure as compared to other managers.*

3. Research Design

This study examines the investment behavior of overconfident managers. The analysis in this study is a least-squares analysis with the variable of overconfidence manager (OC) as the independent variable and the variable of capital investment cost divided by total assets at the beginning of the period (CAPEX) as the dependent variable.

$$\begin{aligned} \text{CAPEX}_{i,t+1} = & \beta_1 \text{CRISIS}_{i,t} + \beta_2 \text{NONCRISIS}_{i,t} + \text{OC}_{i,t} \\ & * (\beta_3 \text{CRISIS}_{i,t} + \beta_4 \text{NONCRISIS}_{i,t}) \\ & + \sum_l \beta_{5,l} \text{Controls}_{li,t} + \sum_n \beta_{6,n} \text{YEAR}_{ni,t} \\ & + \sum_m \beta_{7,m} \text{INDD}_{mi,t} + \varepsilon \end{aligned} \quad (1)$$

To observe the average impact of the financial crisis on capital investment, this study estimates CRISIS and NONCRISIS, which represent the financial crisis and non-crisis periods, respectively. Here, CRISIS is a dummy variable that is set to 1 for 2008 (when the global recession occurred), 1 for 2009 (when the impact of the global recession increased in Japan), and 0 for all the other years. In contrast, NONCRISIS is a dummy variable that is set to 1 for all the other years (2010 and 2011) and 0 for the financial crisis years. In addition, OC is a variable indicating managerial overconfidence, which is the main interest of this study and is created based on management earnings forecasts in the periods preceding the study (2006 and 2007). Hribar and Yan (2016) pointed out that overconfident managers tend to announce optimistic managerial forecasts. This study also

created a variable with overconfident managers (OC=1), where the difference between management net income forecasts and actual net income is positive for two years in a row, whereas OC=0 in other cases. Note that the sample selection bias can be mitigated compared with previous studies, especially since most Japanese firms disclose their managerial forecasts.

Based on H1, we expect β_3 to be negative because overconfident managers are likely to reduce capital expenditures more than other firms due to a shortage of funds during a financial crisis.

The control variable (Controls) relies on Malmendier and Tate (2005). CFO is the operating cash flow divided by the total assets at the beginning of the period. This study controls the state of a firm's cash flow because overconfident managers determine their investment behavior based on whether cash flow is sufficient for the level of investment. MTB, which represents the investment opportunity, is the market value of shares at the end of the fiscal year divided by the book value of net assets. CEOIR represents the management's stock ownership and controls the incentive for management to invest aggressively. SIZE is the natural logarithm of the book value of total assets. OUTSIDE, which controls the status of corporate governance, is the ratio of outside directors. YEARD is a year dummy. INDD is an industry dummy based on the TSE industry classification.

In H2, we estimate equation (1) by creating a subsample of firms with strong and weak relationships with banks to observe their relationship with banks. To determine the strength of the relationship with banks, this study refers to French et al. (2019) and considers a firm to have a strong relationship with banks if the bank with the most loans is the same for the three years from 2006 to 2008 (BANKRLATION = 1) and considers a firm to have a weak relationship with banks otherwise (BANKRLATION = 0).

4. Empirical Results

4.1. Sample and Descriptive Statistics

In the analysis, data on consolidated financial statements were obtained from Nikkei NEEDs Financial Quest by Nikkei Media Marketing, and data on corporate governance were obtained from Nikkei NEEDs Cges by Nikkei Media Marketing. The selection criteria for the sample were as follows:

1. Year is from 2008–2011.
2. Twelve-month financial period.
3. The firm is listed on the first section of the Tokyo Stock Exchange.
4. The firm is non-financial in the TSE industry classification (excluding finance, securities, insurance, and other financial industries).
5. All variables used in the analysis are calculable.

The number of samples that met the above conditions was 5503 firm-year. This was obtained after excluding outliers that were not within three standard deviations from the mean of each variable. Table 1 shows the descriptive statistics. Table 2 shows Pearson's correlation coefficients for the variables used in this study. The correlation coefficients for CAPEX and OC are negative, but the values were small.

4.2. Main Results

Table 3 presents the results of the analysis of H1. The coefficient of the interaction term between OC and CRISIS, which shows the results of testing H1 in this study, is 5% significant and negative. This result indicates that overconfident managers reduce investments more than other managers because the financial crisis makes

Table 1: Descriptive Statistics

| Variables | Obs. | Mean | Min | Median | Max | SD |
|------------|------|--------|--------|--------|--------|-------|
| CAPEX | 5503 | 0.037 | 0.000 | 0.030 | 0.155 | 0.030 |
| OC | 5503 | 0.230 | 0.000 | 0.000 | 1.000 | 0.421 |
| CRISIS2008 | 5503 | 0.491 | 0.000 | 0.000 | 1.000 | 0.500 |
| CFO | 5503 | 0.064 | -0.121 | 0.063 | 0.262 | 0.054 |
| MTB | 5503 | 0.963 | 0.108 | 0.812 | 4.865 | 0.595 |
| CEO | 5503 | 0.034 | 0.000 | 0.002 | 0.338 | 0.065 |
| SIZE | 5503 | 11.375 | 7.003 | 11.189 | 15.873 | 1.441 |
| OUTSIDE | 5503 | 0.085 | 0.000 | 0.000 | 0.467 | 0.116 |

Table 2: Pearson's Correlation

| Correlation | CAPEX | OC | CRISIS | CFO | MTB | CEO | SIZE | OUTSIDE |
|-------------|--------|--------|--------|-------|-------|--------|-------|---------|
| CAPEX | 1.000 | | | | | | | |
| OC | -0.048 | 1.000 | | | | | | |
| CRISIS | 0.020 | 0.015 | 1.000 | | | | | |
| CFO | 0.323 | -0.056 | -0.125 | 1.000 | | | | |
| MTB | 0.191 | -0.081 | -0.020 | 0.270 | 1.000 | | | |
| CEO | 0.018 | 0.034 | 0.019 | 0.081 | 0.050 | 1.000 | | |
| SIZE | 0.169 | -0.109 | 0.001 | 0.022 | 0.124 | -0.366 | 1.000 | |
| OUTSIDE | 0.022 | -0.016 | -0.052 | 0.052 | 0.147 | -0.071 | 0.136 | 1.000 |

Table 3: The Results of Testing Hypothesis 1

| OLS 1 | | | | | |
|-------|---------------|--------|--------|---------|-----|
| | CAPEX | | coef | t-value | |
| (1) | CRISIS | | 0.036 | 1.879 | * |
| (2) | NOCRISIS | | 0.033 | 1.702 | * |
| (3) | OC * CRISIS | H1:(-) | -0.003 | -2.351 | ** |
| (4) | OC * NOCRISIS | | -0.001 | -0.516 | |
| (5) | CFO | | 0.132 | 13.152 | *** |
| (6) | MTB | | 0.004 | 3.675 | *** |
| (7) | CEO | | 0.012 | 1.220 | |
| (8) | SIZE | | 0.002 | 5.242 | *** |
| (9) | OUTSIDE | | -0.008 | -1.746 | * |
| | YEAR | | yes | | |
| | INDD | | yes | | |
| | adj.R2 | | 0.708 | | |
| | obs. | | 5503 | | |

Note: Table 3 summarizes the estimation results of a least-squares analysis. *, **, ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. The *t*-value test uses firm cluster robustness.

it difficult to raise funds from financial institutions. The results of this analysis are consistent with H1 and with the theories and test results of Malmendier and Tate (2005, 2008) and Aktas et al. (2019). They suggested that overconfident managers reduce investment when the inflow of funds decreases.

Some researchers have shown the impact of financial crises on the managerial behavior of overconfident managers, such as Ho et al. (2016), who targeted the financial industry and analyzed the aggressive lending behavior of firms. However, no analysis has been conducted for non-financial firms. Previous studies have focused only on the direct

impact of the financial crisis on the financial industry. In this study, however, the scope has been broadened to include the indirect impact of the crisis on the non-financial industry. In addition, the analysis in this study is more accurate than that of previous studies by mitigating the sample selection bias and using the management forecast disclosed by most Japanese companies as an indicator of overconfident managers.

The results of the analysis of the interaction term between OC and NOCRISIS in Table 3 are not significant. The results of this analysis do not contradict previous studies because overconfident managers change their investment behavior depending on whether their firm's internal funds are sufficient. The coefficients of both NOCRISIS and CRISIS were 10% significant and positive. The results of the analysis of NOCRISIS and CRISIS indicate that compared with the results of the analysis of the interaction term between OC and NOCRISIS or CRISIS, non-overconfident managers did not change their investment behavior due to the financial crisis, whereas overconfident managers did change during this time.

Table 4 shows the results of H2 and the results of the analysis, where BANKRLATION is a criterion for strong relationships between firms and banks. The coefficients of the interaction terms of OC and CRISIS are not significant in the sample of BANKRLATION = 0 but are 1% significant and negative in the sample of BANKRLATION = 1.

The results of this analysis are consistent with H2b presented in this study, which indicates that the corporate governance of banks has a strong influence on overconfident managers in Japan. Banerjee et al. (2015) show that overconfident managers are influenced by strong corporate governance. However, this discussion is based on shareholder-oriented corporate governance, which is characteristic of the US and the UK. This study suggests that overconfident managers, who have not been analyzed in previous studies, are also affected by managerial behavior

Table 4: The results of testing Hypothesis 2

| | | | OLS 2 | | | | OLS 3 | | |
|-----|---------------|--------|------------------|---------|-----|----------|------------------|---------|-----|
| | | | BANKRELATION = 0 | | | | BANKRELATION = 1 | | |
| | CAPEX | | coef | t-value | | | coef | t-value | |
| (1) | CRISIS | | 0.060 | 8.499 | *** | | 0.012 | 1.484 | |
| (2) | NOCRISIS | | 0.057 | 7.888 | *** | | 0.009 | 1.105 | |
| (3) | OC * CRISIS | H2:(?) | -0.001 | -0.554 | | H2:(+/-) | -0.005 | -2.996 | *** |
| (4) | OC * NOCRISIS | | 0.000 | 0.173 | | | -0.002 | -0.890 | |
| (5) | CFO | | 0.133 | 10.024 | *** | | 0.130 | 8.477 | *** |
| (6) | MTB | | 0.004 | 3.039 | *** | | 0.003 | 2.297 | ** |
| (7) | CEO | | 0.023 | 1.908 | * | | -0.009 | -0.482 | |
| (8) | SIZE | | 0.002 | 4.399 | *** | | 0.002 | 2.901 | *** |
| (9) | OUTSIDE | | -0.009 | -1.622 | | | -0.007 | -0.899 | |
| | YEAR | | yes | | | | yes | | |
| | INDD | | yes | | | | yes | | |
| | adj.R2 | | 0.709 | | | | 0.713 | | |
| | obs. | | 3338 | | | | 2165 | | |

Note: Table 4 summarizes the estimation results of a least-squares analysis. *, **, ***, indicate statistical significance at the 10%, 5%, and 1% level, respectively. The t-value test uses firm cluster robustness.

in bank monitoring, which is a unique corporate governance system in Japan.

4.3. Additional Analysis

In this study, to show the robustness of the analysis results in Table 4, this study uses the main-bank ownership ratio, which is also used by French et al. (2019), as a criterion to indicate the strength of the relationship with the bank. The criterion is to divide the sample into whether the main-bank ownership ratio is higher than the median of the whole sample or not. The results of this study show that the interaction term between OC and CRISIS is not significant in the sample of firms with a main-bank ownership ratio under the median but is 10% significant and negative in the sample of firms with a main-bank ownership ratio above the median. The results show the same trend as the analysis where the sample is divided based on BANKRELATION.

5. Conclusion

This study examines whether overconfident managers change managerial behavior during a financial crisis. Prior research has shown that overconfident managers engage in aggressive investment behaviors. In contrast, as overconfident managers feel that the subjective cost of raising external funds is relatively high, they reduce investment to save

internal funds when it is impossible to raise sufficient funds for their investment level. In particular, it is more difficult to raise funds from external financial markets during a financial crisis; therefore, overconfident managers will reduce investments during such a time to save their internal funds.

The analysis in this study shows that overconfident managers reduce capital expenditure compared to other managers during a financial crisis, based on data from Japanese firms listed on the First Section of the Tokyo Stock Exchange. While previous studies have only focused on the financial industry, this study expands upon previous studies by examining the management behavior of overconfident managers during financial crises from non-financial firms. Furthermore, by using Japanese data and considering the specific role of banks in Japan, this analysis has shown that overconfident managers follow not only the shareholder-oriented corporate governance that was discussed in previous western studies but also the corporate governance of banks.

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