

# Operating Performance of Japanese Firms with Large Cash Holdings during the Bubble Economy

Chien-min Kevin Pan\*

## ABSTRACT

The existing literature posits that large corporate cash holdings might induce agency problems and thus hinder firms' operating performance. This paper investigates how Japanese firms maintain high/low cash holding position during the late 1980s and early 1990s. I find that firms pile cash because there is no profitable project. On the other hand, firms maintain a low cash holding position due to over-investing. I also find that excess cash holdings significantly affect firms' operating performance. Lastly, I find no direct evidences that ownership structure affect firms operating performance.

**Keywords:** cash, operating performance, bubble economy, Japan

## 1. Introduction

Cover story of the weekly Nikkei Business January 24 2005 issue features the "cash rich firms" in Japan. According to Nikkei Business, 34 Tokyo Stock Exchange (TSE) 1<sup>st</sup>-section listed firms recorded more than 100 billion Japanese Yen (roughly 1 billion US dollar) of net cash<sup>1</sup> in the March 2004 filings. Nikkei Business further points out that these cash rich firms were holding more cash in hand compared to their cash holdings during the bubble economy in the late 1980s. Another interesting figure points out by Nikkei Business was that 573 out of 1448 or 39.6% TSE 1<sup>st</sup>-section listed firms did not have any interest bearing debt.

The finance academic has long noticed that Japanese firms hold a lot more cash than their counterparts in other countries. According to Ranjan and Zingales (1995), the average cash to assets ratio of Japanese industrial firms was nearly twice as much among firms in any other G7 countries in 1991. Pinkowitz and Williamson (2001) also found that Japanese firms held more cash than U.S. or German firms in the years of 1974 to 1995. Dittmar, Mahrt-Smith, and Servaes (2003) document that average cash holding ratio of Japanese firms was the de facto highest among firms from other 45 countries in 1998.<sup>2</sup>

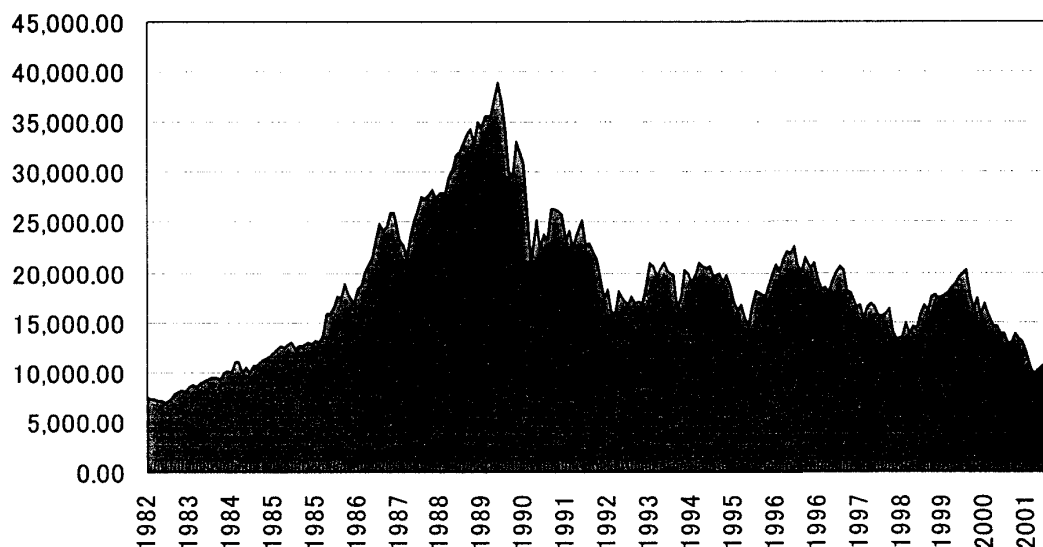
In the late 1980s, the Japanese bubble economy burst with plummeted stock prices. It has been generally recognized that the 1990s was the decade of recession to the

---

\* Graduate School of Commere, Waseda University, Tokyo, Japan.

<sup>1</sup> Nikkei Business defines "Net Cash" as "cash and deposits + short-term marketable securities - interests bearing debts." Nikkei Business acquired the data from the Nikkei Economics Electronic Databank System – FinancialQUEST (NEEDS-FQ). This paper uses the same data resource with Nikkei Business.

<sup>2</sup> In Dittmar, Mahrt-Smith, and Servaes (2003), only Egyptian and Israeli firms, on average, hold more cash than Japanese firms. However, their sample includes only 6 Egyptian and 37 Israeli firms. This is not comparable to other 1853 Japanese firms in the sample.

**Figure 1 - Nikkei Stock Index (Monthly Closing Prices)**

Data source: Public Statistics of Bank of Japan.

URL of file: <http://www2.boj.or.jp/en/dlong/etc/data/ehstock.csv>

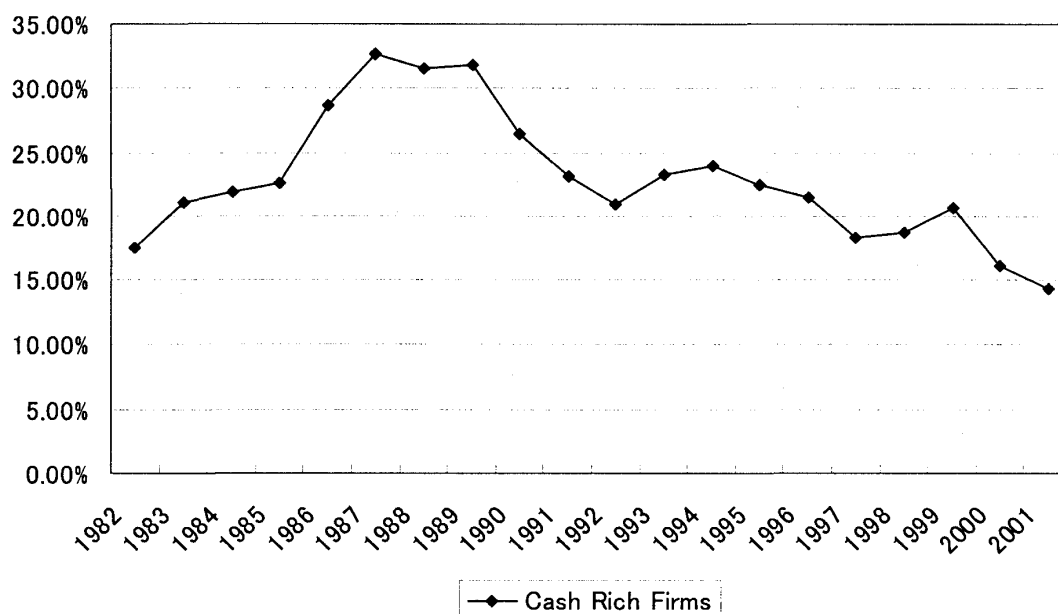
Japanese economy. Market value of the firms listed in the TSE reached its peak in December 1989 but soon plunged over 25% in value in only three months and further lost 45% of its total value in the following year. Figure 1 illustrates the Monthly Nikkei Index from 1982 to 2001. The over-heated prosperity, however, was believed to have lasted because the stock market index soon rebounded over 12.5% in prices in the following year.

The evidence Ranjan and Zingales (1995) document should not be a surprise. It is understandable that Japanese firms might hold more cash than they need with the rapid expanded economy in the late 1980s. The obvious question is, as indicated in Dittmar, Mahrt-Smith, and Servaes (2003), why cash balances of Japanese firms in 1998 were still higher than their counterparts in most countries. Dittmar, Mahrt-Smith, and Servaes (2003) apply the measures developed in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (hereafter LLSV, 1997 and 2000) and find that firms hold less cash in countries with good shareholder protections. Hence, it is interesting that Japanese firms, while under the well-established shareholder protection legal system, have so much cash in hand.

The existing literature (e.g., Jensen [1986], Blanchard, Lopez-de-Silanes, and Shleifer [1994], and Harford [1999]) posits that large cash holdings can to some extent relieve managers' disciplinary pressures and thus induce the managers to spend more cash on less profitable investments. On the contrary, managers of firms with large cash holdings feel that having cash handy is easier to fund large capital expenditures on profitable investments for that internal financing costs less than external financing, i.e., they can enjoy lower costs of capital.

Among these, Mikkelsen and Partch (2003) believe that large cash holdings do not necessarily thwart the firm values and show that persistent large cash reserves support

Figure 2 - Ratio of the Cash Rich Frims in the Market



investments without hindering corporate performance. In other words, they find no evidence to support that stockholders' rights are being sacrificed for firms that hold persistent large cash.

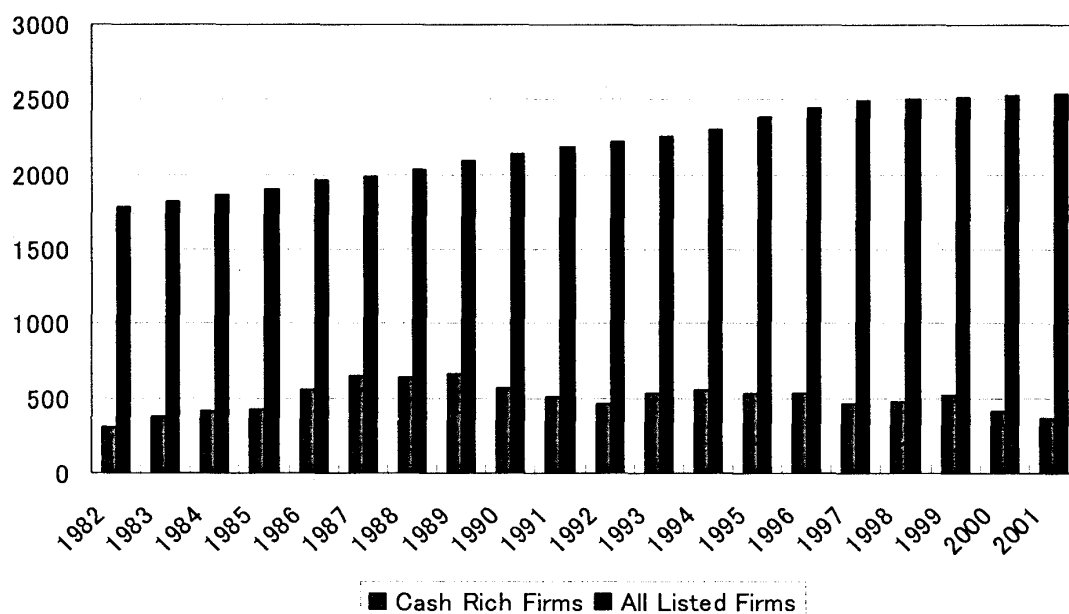
Following the cash rich criterion in Mikkelsen and Parth (2003), I document the cash rich TSE-listed firms into two figures. Cash rich firms in Mikkelsen and Parth (2003) are defined as the sums of cash and deposits + market securities that compose more than 25% of the firms' assets.

Figure 2 illustrates the percentage of cash rich TSE-listed firms to all firms listed in the TSE. In Figure 2, it is obvious that the number of cash rich firms sharply increases in 1986 and suddenly drops in 1990. This fact might suggest that during the bubble firms chose to hold large portions of cash in their assets. However, Figure 3 tells a slightly different story. The actual number of the rich firms went up to 663 firms during the bubble economy, and stayed on about 500 firms in the 90s.

These two figures reveal that there are considerable amounts of Japanese firms being cash rich. In addition, Figure 3 also reveals an interesting fact that the numbers of cash rich firms did not decrease in the post bubble period. Thus, some interesting questions come into attention; why Japanese firms keep so much cash, and if this cash deteriorates Japanese firms' performance?

First, I explore what financial factors might be the possible determinants for firms' high cash holdings. The restrictions are based on the concern that Japanese firms might have possessed more cash than they needed simply for the booming prosperity during the bubble economy. Thus this analysis benefits from setting cutoff point at the end of bubble economy. Next, I compare the corporate performance of the high cash firms and the low cash firms to see how the performance differs and changes across the late 1980s and early 1990s. At last, I explore the possible explanations to the variations in

Figure 3 - Cash Rich Firms in the Market



performance among firms with large cash holdings.

I find that firms that maintain high cash holding position accumulate cash within the firm because these firms do not have promising growth prospect during the bubble economy. On the other hand, firms that maintain low cash holding position are over-powered by the banks. These low cash firms are highly leveraged and pay out more cash dividends.

The evidences also show that excess cash significantly hinders the operating performance of firms with large cash in hand. On the other hand, excess cash holdings significantly improve the operating performance of firms with low cash to assets ratio. I also find evidences that ownership structure have little relation with operating performance.

This paper contributes to the literature in the following ways. First, this paper distinguishes the different cash holding determinants from high cash firms to low cash firms. This paper confirms the relations between cash holdings and the operating performance. This paper also contributes to the literature showing that excess cash holdings hinder the operating performance of Japanese firms with persistent large cash holdings while improve the operating performance of Japanese firms with persistent low cash holdings.

Layouts of this paper are as follows. Section 2 discusses more related literature in detail to explore what makes Japanese firms keep so much cash within the firms. Section 3 describes the process of sample selection and defines the variables to be used in this study. Section 4 presents the descriptive statistics of the firm characteristics and performances. Section 5 constructs the research designs and also provides an analysis on the determinants of cash holdings which estimates excess cash holdings and the effects on performance from holding excess cash. Section 6 interprets the empirical

results and also performs additional examinations. Section 7 summarizes the findings and concludes the paper.

## 2. Why Japanese Firms Keep Large Cash in Hand?

Existing literature documents considerable amount of theoretical frameworks to explain firms' motives to keep large cash in hand. Managers' desires to keep the money within the firm can be explained to be risk averse or simply to avoid market discipline as Easterbrook (1984) posits that frequent accesses to the capital market help control the agency conflict between shareholders and managers. Ignoring the fact that cash piling can be simply for the managers' personal interests, however, it is also argued that a substantial cash reserve can better serve shareholders' interests by replacing the costly external capital financing.

In the presence of the conflicts of interests between shareholders and managers, large cash holdings create managerial incentives that may lead managers to invest unproductively than to distribute to shareholders. What the existing literature has documented can be perceived in either two sides of the explanations. This section is to discuss some evidences on factors that might contribute to Japanese firms' high cash account balance and specify the questions being addressed in this paper.

### 2.1 Monopoly Power of the Banks

As being reported in Ranjan and Zingales (1995), Pinkowitz and Williamson (2001), and Dittmar, Mahrt-Smith, and Servaes (2003), the average cash holding ratio of Japanese firms are among the highest compared to other developed countries. However, what is interesting is that the Japanese firms operate their business in much different way from the existing literature posits.

Adopting measures developed by LLSV (1997, 2000), Dittmar, Mahrt-Smith, and Servaes (2003) find that firms hold twice as less cash in countries with better legal system for investor protections. However, even with good quality of law enforcement and comprehensive legal framework, firms in Japan still hold twice as more cash than firms in other countries that also with sound shareholder protections. What LLSV (1997, 2000) have concluded does not explain the situation in Japan.

One important fact that LLSV (1997, 2000) have addressed is why Japan, being the second largest economy in the world, has such extensive banking systems. The fact is that, being the second largest economy in the world, it was not until the 1980s that Japan became a capital surplus economy. Since, Japan's unique *main bank* system has dominated the market. Bank borrowings have been the main capital source for the Japanese firms before 1980. High level of intercorporate cross-holding and bank equity ownership have been important and distinct features of the Japanese business environment.

Ikeo and Hirota (1991) argue that the main bank system helps decrease firms' agency costs arise from the debts in Japan. They provide empirical evidences and argue that the main bank leads firms' debt ratio to rise. However, if the existence of main bank helps mitigate the agency problem in Japan, there is no reason for Japanese firms to maintain such high cash to assets ratio.

Germany also has a bank-centered financial system, but German firms do not have

comparable cash holding level to Japanese. Pinkowitz and Williamson (2001) argue that it is the banks that force Japanese firms to hold so much cash. It is the monopoly power of the Japanese main bank system that affects firms' cash accounts. They argue that the powerful Japanese banks persuaded firms to hold large cash in order to extract rents, as the evidences show, that cash holdings of Japanese firms declined as the bank power getting weak over time.

Intensive bank presence also influences the managements of Japanese firms in many aspects. Morck, Nakamura and Shivdasani (2000) show evidences that, in some specifications, firm value rises as bank equity ownership rises in Japan while Yermack (1996) provides evidences that companies with small board of directors receive better market valuation.

## 2.2 Low Degrees of Capital Market Disciplines

Managers in Japan suffer less pressure from the capital market. Instead, they are under greater pressure from the banks, particularly their main banks. Capital market disciplines are rare in Japan. Lack of capital market discipline is usually perceived as a result of the intensive bank systems in Japan. Shleifer and Vishny (1986) argue that large independent shareholders, if they exist, make takeovers and proxy contest easier; therefore, the firm is expected to hold excess cash where outside shareholders are highly dispersed. Other conditions where firms are expected to hold excess will be if the firms are large firms, firms with low debt, and firms are preparing for anti-takeover operations are expected to hold excess cash.

Shleifer and Vishny (1989) provide a model of managerial entrenchment that managers can strategically make some manager-specific investments to avoid being replaced by shareholders. In Japan, such entrenchment efforts are less important because such efforts can be offset by main banks directly sending their own people into the firms' board of directors. Also, Morck, Nakamura and Shivdasani (2000) argue that high level intercorporate cross-holdings and large bank equity ownership serve the hostile takeover deterrents in Japan. Stock repurchases were made to be legally available in 1997 for managerial stock option preparations. And stock repurchases were made generally available for Japanese firms as a financial tool in 2002. Nevertheless, we should not expect the capital market disciplinary managerial turnovers that Mikkelsen and Partch (1997) argue can be seen in Japan.

In other stream of the cash holding related researches, Harford (1999) find that firms with large cash reserves usually undertake underperformance acquisitions. He argues that these firms overpay the target firms when acquiring them. Kruse, Park, Park, and Suzuki (2003) find that merge and acquisition being undertaken within the *keiretsu* usually lead to improvements in performance. Therefore, they argue that Japanese firms merge to increase diversifications. Usui (2001) argues that hostile takeovers are rarely seen in Japan. He, however, also points that the increasing merge and acquisition activities in the late 1990s have given certain degrees of managerial pressures to firms to seek efficiencies.

## 3. Sample and Data Descriptive Statistics

The purpose of this paper is to investigate if large corporate cash holdings deteriorate

managerial performance. There have been considerable amounts of corporate cash holding related research already being documented in the existing literature. However, studies of the sustained significant cash holdings over a long period of time are rarely conducted. The paper aims to shed some lights on the relations of large cash holdings and operating performance and contribute to the literature. To test the argument that if persistent large cash holdings deteriorate firms' operating performance, this paper examines firms that hold sustained amount of cash during the bubble economy in 1986-1990.

### 3.1 Sample Selection and Data

I acquire the financial data from the Nikkei Economics Electronic Databank System - FinancialQUEST (NEEDS-FQ). All TSE 1<sup>st</sup>-section listed firms are included in the sample except for the financial institutes and regulated utilities firms. At this point, the average cash holding ratio of the TSE 1<sup>st</sup>-section firms is 20.24% (out of 13,004 observations) in 1986-1995. The average cash holding ratio drops to 19.22% (out of 27,147 observations) if the time span is extended to 1980-2000.

Following Mikkelsen and Partch's (2003) large cash holding definition (cash to total assets ratio in excess of 25%),<sup>3</sup> I select firms that have maintained being high cash position for 5 consecutive years from 1986-1990 at the end of each fiscal year. To highlight cash rich firms' high cash position policy, I use firms that maintain low cash to total assets ratio for comparison. I select firms that have maintained cash to total assets ratio of less than 15% for 5 consecutive years from 1986-1990 at the end of each fiscal year.<sup>4</sup> After excluding firms with missing values for stock prices, I obtain a sample consists of 140 high cash firms and 91 low cash firms.

As the result, the sample includes 11% of firms whose cash holding ratio falls in the highest end of the total TSE 1<sup>st</sup>-section listed firms and 9% of firms whose cash holding ratio falls in the lowest end of the total TSE 1<sup>st</sup>-section listed firms.<sup>5</sup> Therefore, the sample includes firms that have had established sustained high and low cash holding policy.

### 3.2 Definition of Key Variables

The selection of variables is adapted from Pinkowitz and Williason (2001). The same variable composition is used to estimate the Japanese firms' cash holding level in Pinkowitz and Williason (2001).<sup>6</sup>

Cash is the ratio of cash to operating assets. Cash is defined as "cash and deposits +

<sup>3</sup> Mikkelsen and Partch (2003) do not explain the reason why they use the 25% cash to assets ratio to define large cash holding firms. Also, they do not provide any evidence showing that their results will not change once the 25% definition does not stand hold.

<sup>4</sup> At this point, I obtain 169 high cash firms and 128 cash firms. When I set the cash holding restrictions to more than 30% and less than 10%, then the sample comprises 102 high cash firms and 34 low cash firms. If the consecutive cash holding restriction is set to 10 years, then it will be 46 (more than 30%) or 95 (more than 25%) high cash firm, and 99 (less than 15%) or 26 (less than 10%) low cash firms.

<sup>5</sup> 1,197 TSE 1<sup>st</sup>-section listed firm data are available for computing cash to total assets ratio in 1986.

<sup>6</sup> The variable composition in Pinkowitz and Williason (2001) is originally from Opler, Pinkowitz, Stulz, and Williason (1999). Opler, Pinkowitz, Stulz, and Williason (1999) develop the corporate cash holding determining model using the U.S. data. Pinkowitz and Williason (2001) argue that if Japanese banks' monopoly power determines the level of Japanese firms' cash holding by modifying Opler, Pinkowitz, Stulz, and Williason (1999). Dittmar, Mahrt-Smith, and Servaes (2003) also use Opler, Pinkowitz, Stulz, and Williason (1999) for an international comparison of corporate cash holdings.

marketable securities.”<sup>7</sup> I use operating assets as the scaling factor in an effort to eliminate the possible endogenous impacts of cash. This paper is to estimate the effects of cash. The intended dependent variable will be the ratio of cash. If every variable is scaled by total assets, the cash component of total assets will correlate the dependent variable to each independent variable and thus none of the variable will be identically and independently distributed. Hence, instead of using total assets as the scaling factor, I deflate most key variables in this study using operating assets. The operating asset is defined as “total assets - cash and deposits - marketable securities,” i.e., “total assets minus *cash*.”<sup>8</sup>

To measure the firm size, I take the natural logarithm of the book value of total assets. Total leverage is measured using the debt-to-assets ratio defined as “(short-term debt + long-term debt)/book value of assets.”

I use the market-to-book ratio to measure firms’ growth opportunities.<sup>9</sup> The market-to-book ratio is defined as “(market value of equity + book value of debt)/book value of assets.” A firm’s book value of assets reflects a firm’s book value of cumulated assets, but it does not include a firm’s growth option. Thus, a firm’s market value relative to the book value should proxy for its growth options.

In order to examine firms’ investment policy, I measure firms’ capital expenditures. Since there is no direct access to Japanese firms’ flow of funds statements in the late 1980s,<sup>10</sup> I use “annual change in fixed-assets + depreciation” to proxy for the capital expenditures. Cash flow is defined as “ordinary income - interest expense and discount charges - income taxes - cash dividends.”

Net working capital is used to control for alternative sources of liquidity. The commonly used definition of net working capital is referred to as the “difference between a firm’s current assets and current liabilities.” However, the dependent variable used to estimate firms’ level of cash holdings is the ratio of cash. Regressing cash on net working capital using the above net working capital with cash definition without any treatment might cause multicollinearity problem. Therefore, to insure eliminate possible econometrical problem, I measure the net working capital as “current assets - current liabilities - *cash*.”<sup>11</sup>

Net working capital is an indicator of a firm’s abilities to pay back its short-term liabilities. Another reason why I estimate net working capital without cash is because such it performs better in determine a firm’s cash holding level. Suppose a firm is not able to cover its account payables with its account receivables, then it has to finance the deficits. In such case, the firm will have to cover such deficits with its cash. In other

<sup>7</sup> The definition of “cash” or “cash holding” for Japanese firms varies from study to study. Cash is define as only “cash in hand” in Pinkowitz and Williason (2001); “cash and deposits + marketable securities” in Dittmar, Mahrt-Smith, and Servaes (2003); and “cash and deposits + short-term marketable securities - interests bearing debts” in the Weekly Nikkei Business.

<sup>8</sup> Pinkowitz and Williason (2001), Opler, Pinkowitz, Stulz, and Williason (1999) and Dittmar, Mahrt-Smith, and Servaes (2003) use the same measure to define the term “net assets” or “assets” in their study.

<sup>9</sup> See Smith and Watts (1992) and Barclay and Smith (1995) for details on market-to-book ratio as the growth opportunities proxy.

<sup>10</sup> Statement of cash flow was not required by the Japanese General Accepted Accounting Principles (GAAP) until March 2000.

<sup>11</sup> Opler, Pinkowitz, Stulz, and Williason (1999) and Pinkowitz and Williason (2001) exclude cash from net working capital so that net working capital without the impact of cash can be examined.



words, net working capital without cash is an indicator of a firm's needs of cash financing.<sup>12</sup>

I exclude research and development expenses (R&D) from the variable selection because the number of missing values may inevitably affect the results. Since the bubble economy in the late 1980s was characterized with the soaring Nikkei stock index, I add the value of investing securities as an independent variable to control for firms' speculation in the stock market. This is because that profitable a firm with no potential investing opportunity might possibly play the money game in the stock market during the bubble economy.

## 4. Descriptive Statistics of Variables

### 4.1 Descriptive Statistics of the Firm Characteristic Variables

Table 1 summarizes the statistics of key variables on firms' characteristics. Table 1 presents the descriptive variable of characteristics of the high cash firms and low cash firms from 1986 to 1990. Table 1 also presents the univariate comparisons using t-test and non-parametric Wilcoxon test to compare the differences between means and medians respectively of both high cash firms and low cash firms.

In Table 1, it is obvious to find out that the characteristics of high cash firms are significantly different from the low cash firms except for the growth opportunities. The differences in the market-to-book ratio are only statistically significant at the 10% significant level.

High cash firms' mean *cash* ratio is more than 6 times greater than the low cash firms' mean cash ratio. This is because the reported cash ratio in Table 1 is deflated using "assets without cash" while the deflator used to deflate cash at the sampling is "total assets." Not surprisingly, the high cash firms have less total assets and sales than the low cash firms.<sup>13</sup>

High cash firms also have more cash flow and capital expenditures than the low cash firms. This indicates that high cash firms undertake more investments and acquire more tangible assets. Note that the reported mean and median of cash flow in Table 1 are negative. This is because Japanese firms were not required to file flow-of-funds statements until the March 2000 fiscal year so that cash flow in this study is estimated from the balance sheet items.

Table 1 reports negative net working capital. This is because net working capital is defined without *cash* (i.e., current assets - current liabilities - *cash*). The mean and median net working capital of high cash firms and low cash firms are -0.0746, -0.0349, and -0.0427, -0.0504 respectively. The mean net working capital of high cash firms is significantly than of the mean net working capital of low cash firms. On the other hand, the median net working capital is slightly (while not significantly) higher than the median net working capital of low cash firms.

<sup>12</sup> The definition of net working capital without cash is very similar to the definition of operating working capital. See Palepu, Healy, and Bernard (1999) for detailed discussions on net working capital and operating working capital.

<sup>13</sup> This helps explain why the sampling results are similar whether the sampling definition is cash/assets or cash/sales.

**Table 1 - Summary Statistics: 1986-1990.**

Variable	High Cash Firms		Low Cash Firms	
	Mean (t-statistics)	Median (z-statistics)	Mean	Median
Cash	***0.74213 (31.32)	***0.61862 (27.364)	0.11737	0.11843
Real Size (JPY)	***11.38663 (-13.01)	***11.09425 (-8.631)	11.69055	11.4008
Real Sales (JPY)	**11.2608 (-2.36)	**11.1857 (-1.649)	11.4383	11.3531
Market to Book Ratio	*1.87291 (1.71)	1.60160 (0.999)	1.76681	1.55000
Cash Flow	***0.04022 (15.63)	***0.03435 (16.289)	-0.00493	-0.00352
Net Working Capital	** -0.07455 (-1.98)	-0.03494 (0.879)	-0.04277	-0.05043
Capital Expenditures	***0.08202 (3.63)	**0.06995 (2.203)	0.06125	0.05717
Investing Securities	***0.07631 (8.24)	***0.06483 (8.825)	0.04908	0.03573
Total Leverage	***0.10326 (-19.56)	***0.06078 (-15.373)	0.29379	0.25126
Dividend	***0.00381 (7.84)	***0 (4.688)	0.00107	0
Short-term Debt	***0.14920 (-4.40)	***0.07164 (-10.558)	0.20468	0.17965
Long-term Debt	***0.03778 (-13.29)	***0.00679 (-12.002)	0.12357	0.07878
Bank Debt to Total Debt	***0.18034 (-16.85)	***0.14019 (-14.169)	0.37887	0.36904
Insider's Ownership	***0.03474 (5.82)	***0.00237 (4.336)	0.01547	0
Financial Institute Ownership	***0.16011 (3.63)	***0.08700 (4.336)	0.12129	0

\*, \*\*, and \*\*\* indicate variable differences from the low cash firm significant at 10%, 5%, and 1% level respectively. The t-statistics in the parentheses are produced by t-test; and z-statistics by non-parametric test. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

**Definition of Variables:** *Cash*: (Cash and Deposits + Marketable Securities) / Operating Assets. *Market to Book Ratio of Assets*: (Market Capitalization + Book Value of Debt) / Total Assets. *Operating Assets*: Total Assets - Cash and Deposits - Marketable Securities. *Real Size*: Natural Logarithm of the Total Assets. *Real Sales*: Natural Logarithm of Sales. *Cash Flow*: (Ordinary Income - Interest Expense and Discount Charges - Taxes - Dividends) / Operating Assets. *Net Working Capital*: (Current Assets - Cash - Current Liabilities) / Operating Assets. *Capital Expenditures*: (Change in Fixed Assets + Depreciation) / Operating Assets. *Investing Securities*: Investing Securities / Operating Assets. *Total Leverage*: (Short-term Debt + Long-term Debt) / Total Assets. *Dividend*: Cash Dividends / Operating Assets. *Short-term Debt*: Short-term Debt / Operating Assets. *Long-term Debt*: Long-term Debt / Operating Assets.

Mean and median net working capital with *cash* (i.e., current assets - current liabilities) of high cash firms are 0.6675 and 0.5853. On the other hand, mean and median net working capitals with cash of low cash firms are 0.0746 and 0.0665.<sup>14</sup> It is obvious that the financing components (cash and deposits, and marketable securities) consist of large portions of net working capital. Since, the net working capital without cash excludes the financing components; the operating components (such as accounts receivable, inventory, and accounts payable) will be examined to determine a firm's needs of cash financing.

<sup>14</sup> Summary statistics of net working capital with cash are not reported in any Table.

**Table 2 - Panel A: Operating Performance of Firms with High/Low Cash Holdings, 1986-1990.**

	High Cash Firms		Low Cash Firms	
	Mean (t-statistics)	Median (z-statistics)	Mean	Median
1986	***0.144991 (7.41)	***0.119832 (8.14)	0.036785	0.025898
1987	***0.142587 (8.36)	***0.119534 (8.68)	0.036068	0.026792
1988	***0.134372 (8.65)	***0.110998 (7.87)	0.045865	0.039832
1989	***0.133879 (8.33)	***0.115547 (7.61)	0.050011	0.037318
1990	***0.125921 (8.98)	***0.107591 (8.41)	0.046642	0.037622
1986-1990	***0.13635 (9.05)	***0.120011 (8.14)	0.043074	0.038376

\*, \*\*, and \*\*\* indicate variable differences from the low cash firm significant at 10%, 5%, and 1% level respectively. Operating performance is defined as ordinary incomes over operating assets (total assets - cash - marketable securities). The t-statistics in the parentheses are produced by t-test for the differences in means; and z-statistics by non-parametric test for the differences in medians. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

**Table 2 - Panel B: Operating Performance of Firms with High/Low Cash Holdings, 1991-1995.**

	High Cash Firms		Low Cash Firms	
	Mean (t-statistics)	Median (z-statistics)	Mean	Median
1991	***0.115397 (7.62)	***0.098576 (8.14)	0.041043	0.034861
1992	***0.094649 (5.68)	***0.071117 (6.26)	0.035927	0.029212
1993	***0.084017 (5.72)	***0.065235 (7.61)	0.025404	0.022881
1994	***0.074941 (6.31)	***0.061100 (7.07)	0.019330	0.016330
1995	***0.072957 (5.39)	***0.054174 (6.53)	0.022929	0.015746
1991-1995	***0.088392 (6.65)	***0.067728 (6.53)	0.028927	0.025964

\*, \*\*, and \*\*\* indicate variable differences from the low cash firm significant at 10%, 5%, and 1% level respectively. Operating performance is defined as ordinary incomes over operating assets (total assets - cash - marketable securities). The t-statistics in the parentheses are produced by t-test for the differences in means; and z-statistics by non-parametric test for the differences in medians. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

High cash firms also have lower debts compared to low cash firms. The evidences indicate that high cash firms have significant lower leverage ratio, and the amount of short-term debt, long-term debt and bank debt. Low debt holdings indicate low bank influences. Pinkowitz and Williason (2001) argue that if the banks have dominating power over the firms, there should not be any expected relation between firms' cash holdings and leverage.

Pinkowitz and Williason (2001) also argue that the reason why Japanese firms tend to keep the cash at hand is because the banks tell them to do so. When a Japanese firms'

main bank possesses monopolistic power over the firm, the main bank will force the firm to borrow from the bank and deposit those borrowed funds in the bank. Thus, while the bank is able to make more loans with those loan deposits, the bank is also able to extract more rents from the firm. Pinkowitz and Williason (2001) is not a likely story to fit into the picture of this study. Even though the regulation to limit banks' equity holding of any single firm from 10% to 5% was taken in to effect in 1977;<sup>15</sup> Pinkowitz and Williason (2001) argue that the main bank should influence smaller bank to effectively control over the firms after 1987.

Mean and median financial institute ownership of the high cash firms are 16% and 8% in 1986-1990. However, the median of the banks' ownership in 1991-1995 is less than 2% (see Table 6 Panel A). This indicates that the banks are not powerful enough to influence high cash firms as the banks used to be.

#### *4.2 Descriptive Statistics of Operating Performance*

Table 2 presents the operating performance of the selected firms in the sample in 1986-1995. Panel A reports the summary statistics in 1986-1990 while Panel B reports the summary statistics in 1991-1995. The operating performance is defined as the ratio of ordinary incomes over operating assets.

Following the treatment used in Table 1, I also test if the mean differences and median differences between high cash firms and low high cash firms equal to zero using t-test and Wilcoxon test. Table 2 reveals that the operating performances of high cash firms are significantly greater than the operating performances of low cash firms throughout 1986-1995. The mean and median performances of high cash firm are 3 times greater than the performances of the low cash firms in 1986-1990, and are 2.5 times in 1991-1995.

## **5. Research Designs**

### *5.1 Simultaneous-Equation Model*

The purpose of this study is intended to shed light on the relation between Japanese firms' corporate cash holding levels and the corporate operating performance. I use two-stage least squares (2SLS) method to address the concern of this study. The reason why I use 2SLS method for the analyses is to avoid the simultaneous problems. Firms must have good performance to generate more cash; then firms with more cash can perform better. Or firms with large holding have good performance; then the good performance generates more cash. However, it is hard to demonstrate a clear cause-and-effect relationship between cash and operating performance.

In this study, I assume that firms' cash holding levels in 1986-1990 are (positively/negatively) correlated to their operating performance in 1991-1995. I first estimate the normal cash holdings with the cash holding determinants reported in Table 1; then I regress operating performance on the predicted error (unexplained excess cash) from the first stage regression to find out if the excess cash interacts with the operating

<sup>15</sup> According to Pinkowitz and Williason (2001), the regulation grants the banks a 10 years grace period to disgorge the cross-holding of equity. Therefore, the bank can only hold the equity shares of a single firm up to 5% since 1987.

performance or not.<sup>16</sup>

### 5.2 Determinants to Expected Cash Holding Levels

The following expected cash holding level determining regression is from Pinkowitz and Williason (2001). Pinkowitz and Williason (2001) modify the set of cash holding determinants developed in Opler, Pinkowitz, Stulz, and Williason (1999) for the estimation of the relation between the banks' powers over Japanese firms' cash holding levels. Dittmar, Mahrt-Smith, and Servaes (2003) use Opler, Pinkowitz, Stulz, and Williason (1999) cash holding determinants for a cross-country comparison on the corporate cash holding levels among 45 countries.

Following Pinkowitz and Williason (2001), I estimate firms' cash holding levels from the size, growth opportunities, flow-of-funds, leverage, and payouts. I also incorporate the effects of speculations in the capital market. The estimate regression of the expected cash holding level is:

$$\begin{aligned} CASH_i = & \beta_0 + \beta_1 * MtoB_i + \beta_2 * RSize_i \\ & + \beta_3 * CF_i + \beta_4 * NWC_i + \beta_5 * Capex_i \\ & + \beta_6 * InvSecu_i + \beta_7 * Lev_i + \beta_8 * DDiv_i + \beta_9 * BDtoTD_i + \varepsilon_i \end{aligned} \quad (1)$$

where

$MtoB_i$  = Market to Book Ratio (1986-1990)

$RSize_i$  = Real Size (1986-1990)

$CF_i$  = Cash Flow (1986-1990)

$NWC_i$  = Net Working Capital (1986-1990)

$Capex_i$  = Capital Expenditures (1986-1990)

$InvSecu_i$  = Investing Securities (1986-1990)

$Lev_i$  = Total Leverage (1986-1990)

$DDiv_i$  = Dividend Dummy (1986-1990)

$BDtoTD_i$  = Bank Debt to Total Debt (1986-1990)

Market-to-book ratio serves as the proxy for firms' growth opportunities. Real size is the natural logarithm of total assets, which is the variable controlling for the firm size. Cash flow and capital expenditures combined are the variables controlling for firms' flow-of-funds and investment policy. Net working capital is to determine firm's needs of funds. Total leverage (defined as the sum of short-term debt and long-term debt over total assets) is the sign for firm's capital structure where bank debt to total debt is the indicator of bank's influence. Dividend dummy is set equal to 1 when the firm pays out any cash dividends in that year.

Pinkowitz and Williason (2001) argue that banks' monopoly power is the direct

<sup>16</sup> Mikkelsen and Partch (2003) do not provide any explanation why they choose the 2SLS method. Even though my analyzing method is adapted from their work; I might run the 2SLS base on a totally different standing ground from them.

reason why the Japanese firms maintain at the high cash holding position. When banks are more powerful over firms, banks simply make excess loans to firms and extract rents from firms. Hence, other than the cash holding determinants developed in Opler, Pinkowitz, Stulz, and Williason (1999), Pinkowitz and Williason (2001) add bank debt to total debt to incorporate banks influences.

In addition to Pinkowitz and Williason (2001), I add investing securities to incorporate the effects of Japanese firms' speculation activities during the late 1980s bubble economy. If profitable firms do not have viable positive net present value (NPV) projects, they might easily find some profitable substitutes in the booming capital market.

### 5.3 Estimates of Performance on Excess Cash

The second stage regression estimates the relations between operating performance and the unexplained excess cash from the first stage regression. The second stage estimate regression is:

$$\begin{aligned} Perf_i = & \beta_0 + \beta_1 * UnexCASH_i + \beta_2 * PastPerf_i + \beta_3 * INSIDER_i \\ & + \beta_4 FinancialInst_i + \beta_5 * D * INSIDER_i + \beta_6 * D * FinlINST_i + \varepsilon_i \end{aligned} \quad (2)$$

where

$Perf_i$  = Operating Performance (1991-1995)

$UnexCASH_i$  = Unexplained Excess Cash

$PastPerf_i$  = Past Operating Performance (1986-1990)

$INSIDER_i$  = Insiders' Ownership (1986-1990)

$FinlINST_i$  = Financial Institutes' Equity Holdings (1986-1990)

$D$  = Dummy for Positive Unexplained Excess Cash

Unexplained excess cash is the prediction error of cash from regression (1). Current performance is assumed to be correlated to the cash holding level in the previous period. Hence, the dependent variable in regression (2) is the operating performance in 1991-1995. To control for the persistence in performance, the operating performance in 1986-1990 is included.

Other than unexplained excess cash, insiders' ownership (ratio of directors' share holdings over total outstanding shares) and financial institute ownership (ratio of the equity holdings of financial institute over total outstanding shares) are regressed on operating performance to control for managerial incentives and bank influences.<sup>17</sup>

Dummy for positive unexplained excess cash is set equal to 1 when the unexplained excess cash is positive or zero otherwise. Dummy for positive unexplained excess is intended to test if the firm's performance interacts with insider holding or financial institute holding conditioning on firms hold more cash than expected.

<sup>17</sup> Regression (2) is also modified from Mikkelsen and Partch (2003). However, I include bank influence to emphasize the differences in governing system between the U.S. firms and the Japanese firms as argued in many prior studies (e.g. Morck, Nakamura and Shivdasani [2000], Pinkowitz and Williason [2001]).

**Table 3** - Regressions of Financial Determinants on Cash Holdings.

Variable	High Cash Firms		Low Cash Firms	
	OLS	Fama-MacBeth	OLS	Fama-MacBeth
Constant	***0.462549 (3.150)	***0.515334 (3.791)	***0.133593 (9.500)	***0.125129 (9.407)
Market to Book Ratio	***-0.038568 (-3.653)	**-.0044144 (-3.3623)	0.001742 (0.814)	0.002457 (1.116)
Real Size	0.018075 (1.507)	0.013204 (1.435)	-0.000752 (-0.662)	-0.000064 (-0.063)
Cash Flow	***3.780317 (14.719)	***3.752606 (9.964)	0.025846 (0.339)	0.029315 (0.364)
Net Working Capital	***-0.759945 (-14.509)	***-0.738650 (-9.290)	-0.012886 (-0.153)	-0.016056 (-1.492)
Capital Expenditures	***-0.743890 (-6.471)	***-0.658164 (-4.540)	***-0.092144 (-3.967)	**-.0.100814 (-3.740)
Investing Securities	0.094904 (0.454)	0.089604 (0.462)	***-0.102667 (-3.081)	**-.0.070032 (-2.596)
Total Leverage	0.503057 (1.471)	0.433942 (1.024)	**-.0.090354 (-2.761)	**-.0.099315 (-3.900)
Dividend Dummy	0.009544 (0.360)	0.017876 (0.675)	**-.0.008553 (-2.181)	**-.0.009273 (-3.101)
Bank Debt to Total Debt	-0.346184 (-1.634)	-0.275798 (-1.049)	**0.075289 (2.604)	**0.078000 (3.222)
F-statistic (p-value)	66.43 (0.000)		4.414 (0.000)	
Adjusted R <sup>2</sup>	0.4573	0.44298	0.0634	0.02598

\*, \*\*, and \*\*\* indicate variable significant at 10%, 5%, and 1% level respectively. The dependent variable is cash over operating assets in 1986 to 1990. The fixed-effect t-statistics are reported in the parentheses. The adjusted R<sup>2</sup> of fixed-effects model is calculated without fixed-effects. Fama-MacBeth indicates that a cross-sectional regression is estimated each year and the average coefficients are calculated from the time series coefficients generated by the annual cross-sectional regressions. The Fama-MacBeth t-statistics are calculated using the Newey-West procedure for corrected for autocorrelation standard errors. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

**Definition of Variables:** *Cash*: (Cash and Deposits + Marketable Securities) / Operating Assets. *Market to Book Ratio of Assets*: (Market Capitalization + Book Value of Debt) / Total Assets. *Operating Assets*: Total Assets - Cash and Deposits - Marketable Securities. *Real Size*: Natural Logarithm of the Total Assets. *Cash Flow*: (Ordinary Income - Interest Expense and Discount Charges - Taxes - Dividends) / Operating Assets. *Net Working Capital*: (Current Assets - Cash - Current Liabilities) / Operating Assets. *Capital Expenditures*: (Change in Fixed Assets + Depreciation) / Operating Assets. *Investing Securities*: Investing Securities / Operating Assets. *Total Leverage*: (Short-term Debt + Long-term Debt) / Total Assets. *Dividend Dummy*: Set equal to 1 if the firm pays out a dividend in the specified year and zero otherwise.

## 6. Empirical Results

### 6.1 Expected Cash Holding Levels

Results of regressions (1) are documented in Table 3. Both the high cash firms and low cash firms are selected based on the level the persistent high cash/low cash holding position in 1986-1990. In addition to the panel regression, I also present the Fama-MacBeth cross-sectional regression to estimate the cash holding levels (Fama and MacBeth, 1973). Fama-MacBeth regression is estimated using the following steps. For each year, an annual cross-sectional regression is estimated. The time series coefficients are used to calculate the average coefficients. At last, I use the Newey-West procedure to produce the corrected for the autocorrelation standard errors for calculating the Fama-MacBeth t-statistics.

I find that the cash holding levels of the low cash firms are negatively correlated with the capital expenditures, investing securities, leverage and dividend, but are positively

corrected with the levels of bank debt to total debt. The coefficients of the above variables are both statistically and economically significant. The panel regression and Fama-MacBeth regression produce consistent and comparable results. This suggests that cash holding levels of the low cash firms are persistent through time.

With the influences of the powerful banks, firms' cash holdings are expected to increase with the bank debts. My results are consistent with Pinkowitz and Williason (2001) since cash holdings are positively correlated to bank debt ratio. Cash holdings of the low cash firms are also negatively correlated (-0.10 and -0.07) to the investing securities. This is also consistent with my hypothesis that firms without viable NPV projects simply purchase securities from the capital market.

In contrast to the low cash firms, I find cash holding levels of the high cash firms decrease with market-to-book ratio, capital expenditures and net working capital, but increase with cash flow. Again, the coefficients of these variables are both statistically and economically significant. The results generated by panel regression and Fama-MacBeth regression are comparable to each other. This suggests that cash holding levels of the high cash firms are also persistent through time.

The evidences indicate that while high cash firms spend more money in acquiring fixed-assets (coefficients of capital expenditures are -0.743 and -0.658), high cash firms need less funds for operating activities (coefficients of net working capital are -0.760 and -0.739) and are able to accumulate more cash (coefficients of cash flow are 3.78 and 3.725). Taking the fact that high cash firms do not have viable growth prospects (coefficients of market-to-book ratio are -0.039 and -0.044), the evidences suggest that high cash firms simply keep the cash within the firms.

The regression results suggest that the determinants of the cash holding levels of high cash firms and low cash firms are very different from each others. Of course, there is no reason that we should expect the cash determinants should be the same for firms with extremely high cash holding position and extremely low cash holding position. The only variable that correlates with cash holdings of both high cash firms and low cash firms is the capital expenditures; however, the magnitudes are also different (-0.744, -0.658 for high cash firms, and -0.092, -0.101 for low cash firms). It is obvious that high cash firms spend more cash in acquiring fix-assets than low cash firms do.

It is surprising that real size is not statistically significant for both high cash and low firms. This is inconsistent with the existing literature.<sup>18</sup> The straightforward interpretation is that firm size does not determine a firm's cash holding level once the firm's cash holding position is either extremely high or extremely low.

## 6.2 Cash Holding Effects on Performance

I estimate the effects of cash holdings on performance with regression (2). This is done by regressing operating performance on the unexplained excess cash, which is the prediction error on the cash from regression (1). The results of regression (2) are documented in Table 4.

The results confirm that the operating performance of both high cash firms and low cash firms are supported by their previous performance. This also confirms the

<sup>18</sup> Prior literature, for example, Rajan and Luigi Zingales (1995), Opler, Pinkowitz, Stulz and Williason (1999), and Pinkowitz and Williason (2001) all document significant correlation between a firm's size and its cash holding level. Mikkelson and Partch (2003) also find that high cash firms' cash holding level are significantly correlated to its size.



**Table 4** - Regressions of the Relations between Operating Performance and Unexplained Excess Cash.

Variable	High Cash Firms		Low Cash Firms	
	OLS	Fama-MacBeth	OLS	Fama-MacBeth
Constant	0.004617 (0.989)	0.001604 (0.287)	***0.012754 (5.556)	***0.010740 (4.445)
Unexplained Excess Cash	***-0.027559 (-2.893)	-0.025803 (-1.785)	***0.139270 (2.979)	*0.108491 (2.565)
Past Operating Performance	***0.576896 (23.840)	***0.605254 (15.215)	***0.392315 (10.721)	***0.458079 (9.724)
Insiders' Ownership 1986 - 1990	-0.052727 (-1.088)	-0.078207 (-2.202)	0.130684 (1.534)	0.133942 (2.019)
Financial Institute Ownership 1986 - 1990	0.018188 (0.931)	0.014054 (0.967)	-0.017438 (-1.393)	-0.024293 (-2.350)
Dummy for Positive Excess Cash x Insider's Ownership	0.027538 (0.311)	-0.005775 (-0.067)	-0.086041 (-0.846)	-0.176157 (-2.045)
Dummy for Positive Excess Cash x Financial Institute Ownership	*0.048990 (1.795)	*0.061180 (2.490)	0.003298 (-0.194)	0.020440 (1.714)
F-statistic (p-value)	101 (0.000)		24.26 (0.000)	
Adjusted R <sup>2</sup>	0.4620		0.2351	

\*, \*\*, and \*\*\* indicate variable significant at 10%, 5%, and 1% level respectively. The dependent variable is ordinary incomes over operating assets from 1991 to 1995. The fixed-effect t-statistics are reported in the parentheses. The adjusted R<sup>2</sup> of fixed-effects model is calculated without fixed-effects. Fama-MacBeth indicates that a cross-sectional regression is estimated each year and the average coefficients are calculated from the time series coefficients generated by the annual cross-sectional regressions. The Fama-MacBeth t-statistics are calculated using the Newey-West procedure for corrected for autocorrelation standard errors. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

**Definition of Variables:** *Operating Performance*: Ordinary Incomes / Operating Assets. *Unexplained Excess Cash*: Residuals of Estimate Regression Reported in Table 3. *Past Operating Performance*: Operating Performance in 1986-1990. *Insider's Ownership Stakes*: Directors' Holding / Outstanding Shares. *Financial Institute Ownership*: Financial Institutes' Holding / Outstanding Shares. *Dummy for Positive Excess Cash*: Set equal to 1 when excess is positive and zero otherwise.

persistence of operating performance.

Mikkelsen and Partch (2003) conclude that persistent large cash holdings do not hinder firms' operating performance base on the fact that unexplained excess cash does not interact with operating performance and any other ownership proxy.

I find that unexplained excess cash significantly decreases with the operating performance of high cash firms, but significantly increases with the operating performance of low cash firms. The Fama-MacBeth time series coefficients are not statistically significant; however, the value and sign of coefficients (-0.028 and -0.026 for high cash firms, and 0.139 and 0.108 for low cash firms) suggest that the magnitudes of variables are economically persistent. There are inconsistent with Mikkelsen and Partch's (2003) results.

I find little evidence that ownership structure might affect firms' performance. None of the managerial ownership structure variable is statistically significant. On the other hand, Dummy for Positive Excess Cash x Financial Institute Ownership for the high cash firms is statistically and economically significant. Again, Fama-MacBeth time series coefficients are not statistically significant, but the value and sign of coefficients, 0.049 and 0.061, suggest that the magnitudes of variables are economically persistent. This implies that operating performance of the high cash firms benefit from holding more cash than expected and the equity holdings of financial institute of the firms might be the reason that causes such an increase.

### 6.3 Cross-Sectional Analysis on Operating Performance

The last estimate regression in this study examines the cross-sectional variation in operating performance among high cash firms and low cash firms. I estimate this regression by combining high cash firms and low cash firm into one sample. The form of the regression is:

$$\begin{aligned} Perf_i = & \beta_0 + \beta_1 * MtoB_i + \beta_2 PastPerf_i \\ & + \beta_2 * RSize_i + \beta_3 * CF_i + \beta_4 * NWC_i \\ & + \beta_5 * Capex_i + \beta_6 * InvSecu_i + \beta_7 * Levg_i \\ & + \beta_8 * BDtoTD_i + \beta_9 * Insider_i + \beta_{10} * Financial_i + \beta_{11} * DDiv_i + \varepsilon_i \end{aligned} \quad (3)$$

where

$Perf_i$  = Operating Performance (1991-1995)

$MtoB_i$  = Market to Book Ratio (1991-1995)

$PastPerf_i$  = Past Operating Performance (1986-1990)

$RSize_i$  = Real Size (1991-1995)

$CF_i$  = Cash Flow (1991-1995)

$NWC_i$  = Net Working Capital (1991-1995)

$Capex_i$  = Capital Expenditures (1991-1995)

$InvSecu_i$  = Investing Securities (1991-1995)

$Levg_i$  = Total Leverage (1991-1995)

$DDiv_i$  = Dividend Dummy (1991-1995)

$BDtoTD_i$  = Bank Debt to Total Debt (1991-1995)

$INSIDER_i$  = Insiders' Ownership (1991-1995)

$FinlINST_i$  = Equity Holdings of Financial Institute (1991-1995)

The dependent variable of regression (3) is the operating performance in 1991-1995. All variables in regression (3) are the 1991-1995 values except for the value of past operating performance in 1986-1990. Two new variables, financial institute ownership and managerial ownership (insiders), are added to regression (3) to incorporate insiders' and banks' presence.

Considering that regression (3) is estimated with a combined sample, I estimate regression (3) with a fixed-effects model (Greene, 2002). I also estimate regression (3) with the Fama-MacBeth methodology with the same treatments used to estimate regression (1) and regression (2).

I find that operating performance increases with cash, past performance, market-to-book ratio, cash flow, leverage and financial institute ownership while decreases with net working capital.

**Table 5** - Cross-sectional Regressions of Operating Performance on Firm Characteristics, 1991-1995.

Variable	Fixed-Effects	Fama-MacBeth
Constant	-0.0015952 (-0.188)	0.0013249 (0.120)
Cash	***0.0322031 (11.768)	***0.0283662 (7.827)
Operating Performance (1986-1990)	***0.1323221 (11.855)	***0.1428858 (7.805)
Real Size	0.0007807 (1.257)	0.0006999 (0.978)
Market to Book Ratio	***0.0069700 (4.843)	**0.0081775 (2.757)
Cash Flow	***1.1917876 (55.724)	***1.1922221 (24.522)
Net Working Capital	***-0.0188106 (-4.045)	**0.0178832 (-2.551)
Capital Expenditures	**0.0225135 (2.088)	-0.0179379 (-1.445)
Investing Securities	0.0041259 (0.326)	0.0028394 (0.213)
Total Leverage	***0.0612088 (4.422)	*0.0534689 (2.575)
Bank Debt to Total Debt	**0.0223138 (-2.058)	-0.0179507 (-1.423)
Insiders' Ownership	-0.0255911 (-1.282)	-0.0236779 (-1.247)
Financial Institute Ownership	**0.0103487 (1.985)	**0.0140615 (3.172)
Dividend Dummy	*0.0076683 (1.699)	*0.0052430 (2.440)
F-statistic (p-value)	789.9 (0.000)	
Adjusted R <sup>2</sup>	0.8989	0.9108

\*, \*\*, and \*\*\* indicate variable significant at 10%, 5%, and 1% level respectively. The dependent variable is ordinary incomes over operating assets from 1991 to 1995. The fixed-effect t-statistics are reported in the parentheses. The adjusted R<sup>2</sup> of fixed-effects model is calculated without fixed-effects. Fama-MacBeth indicates that a cross-sectional regression is estimated each year and the average coefficients are calculated from the time series coefficients generated by the annual cross-sectional regressions. The Fama-MacBeth t-statistics are calculated using the Newey-West procedure for corrected for autocorrelation standard errors. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

**Definition of Variables:** *Operating Performance*: Ordinary Incomes / Operating Assets. *Cash*: (Cash and Deposits + Marketable Securities) / Operating Assets. *Past Operating Performance*: Operating Performance in 1986 - 1990. *Market to Book Ratio of Assets*: (Market Capitalization + Book Value of Debt) / Total Assets. *Operating Assets*: Total Assets - Cash and Deposits - Marketable Securities. *Real Size*: Natural Logarithm of the Total Assets. *Cash Flow*: (Ordinary Income - Interest Expense and Discount Charges - Taxes - Dividends) / Operating Assets. *Net Working Capital*: (Current Assets - Cash - Current Liabilities) / Operating Assets. *Capital Expenditures*: (Change in Fixed Assets + Depreciation) / Operating Assets. *Investing Securities*: Investing Securities / Operating Assets. *Total Leverage*: (Short-term Debt + Long-term Debt) / Total Assets. *Insider's Ownership*: Directors' Holding / Outstanding Shares. *Financial Institute Ownership*: Financial Institutes' Holding / Outstanding Shares. *Dividend Dummy*: Set equal to 1 if the firm pays out a dividend in the specified year and zero otherwise.

As expected, operating performance is supported by the operating performance in the previous period. The positive significantly correlation between cash and operating performance confirms that to some extent that performance is built on burning cash. The market-to-book ratio is also positively correlated to the operating performance. This shows that both high cash firms and low cash firms still have room for growth. Though, the magnitudes of the market-to-book ratio, 0.0067 with fixed-effects model and 0.0079 with Fama-MacBeth model, suggest that the room for firms to grow might be confined

**Table 6 - Panel A: Comparative Statistics of High Cash Firms and Low Cash Firms in 1991-1995.**

Variable	High Cash Firms		Low Cash Firms	
	Mean (t-statistics)	Median (z-statistics)	Mean	Median
Cash	***0.56004 (27.40)	***0.46567 (26.522)	0.09828	0.08743
Real Size (JPY)	***11.67469 (-6.91)	***11.44216 (-4.177)	12.21466	12.10264
Real Sales (JPY)	***11.39055 (-9.11)	***11.28476 (-6.103)	12.05921	12.06757
Market to Book Ratio of Assets	***1.42595 (2.76)	1.28676 (0.638)	1.33347	1.27631
Cash Flow	***0.02471 (11.99)	***0.02230 (15.807)	-0.01022	-0.00925
Net Working Capital	-0.00015 (0.54)	***0.02352 (3.407)	-0.00643	-0.01636
Capital Expenditures	***0.06553 (3.57)	***0.05405 (2.685)	0.05030	0.04371
Investing Securities	***0.08235 (8.24)	***0.06923 (7.862)	0.05246	0.03771
Total Leverage	***0.09785 (-19.93)	***0.05630 (-15.373)	0.27604	0.24788
Dividend	***0.00212 (5.36)	***0.00000 (2.185)	0.00083	0.00000
Short-term Debt	***0.10375 (-8.45)	***0.05183 (-12.725)	0.17372	0.16015
Long-term Debt	***0.04684 (-13.16)	***0.01417 (-12.123)	0.12696	0.09799
Bank Debt to Total Debt	***0.18398 (-16.30)	***0.13870 (-13.808)	0.36556	0.36424
Insiders' Ownership	***0.02559 (6.12)	***0.00210 (4.998)	0.01059	0.00000
Financial Institute Ownership	***0.17941 (4.79)	***0.16843 (4.998)	0.12555	0.00000

\*, \*\*, and \*\*\* indicate variable differences from the low cash firm significant at 10%, 5%, and 1% level respectively. The t-statistics in the parentheses are produced by t-test; and z-statistics by non-parametric test. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

**Definition of Variables:** *Cash:* Cash and Deposits + Marketable Securities / Operating Assets. *Market to Book Ratio of Assets:* (Market Capitalization + Book Value of Debt) / Total Assets. *Operating Assets:* Total Assets - Cash and Deposits - Marketable Securities. *Real Size:* Natural Logarithm of the Total Assets. *Real Sales:* Natural Logarithm of Sales. *Cash Flow:* (Ordinary Income - Interest Expense and Discount Charges - Taxes - Dividends) / Operating Assets. *Net Working Capital:* (Current Assets - Cash - Current Liabilities) / Operating Assets. *Capital Expenditures:* (Change in Fixed Assets + Depreciation) / Operating Assets. *Investing Securities:* Investing Securities / Operating Assets. *Total Leverage:* (Short-term Debt + Long-term Debt) / Total Assets. *Dividend:* Cash Dividends / Operating Assets. *Short-term Debt:* Short-term Debt / Operating Assets. *Long-term Debt:* Long-term Debt / Operating Assets.

due to the severe business environment in 1991-1995.

Cash flow and net working capital are also statistically and economically significantly correlated to operating performance. Taking into consideration the fact that market-to-book ratio is also positive significantly correlated to operating performance; this can be interpreted as these firms have some positive net present value projects being undertaken. Thus, the investments on these positive NPV projects lead to better performance of the firms.

I also find that leverage and financial institute ownership have positive correlation with operating performance. The results confirm the conclusion in the prior literature.

**Table 6** - Panel B: Comparative Statistics of High Cash Firms in 1986-1995.

Variable	1991-1995		1986-1990	
	Mean (t-statistics)	Median (z-statistics)	Mean	Median
Cash	***0.56004 (-8.70)	***0.46567 (-9.404)	0.74213	0.61862
Real Size (JPY)	***11.67469 (7.19)	***11.44216 (5.343)	11.27370	11.06061
Real Sales (JPY)	**11.39055 (2.04)	11.28476 (1.176)	11.26078	11.18573
Market to Book Ratio of Assets	***1.42595 (-8.76)	***1.28676 (-10.794)	1.87291	1.60160
Cash Flow	***0.02471 (-5.04)	***0.02230 (-5.771)	0.04022	0.03435
Net Working Capital	***-0.00015 (5.13)	***0.02352 (4.168)	-0.07455	-0.03494
Capital Expenditures	***0.06553 (-3.35)	***0.05405 (-3.954)	0.08202	0.06995
Investing Securities	*0.08235 (1.82)	0.06923 (1.176)	0.07631	0.06483
Total Leverage	0.09785 (-0.82)	0.05630 (-0.962)	0.10326	0.06078
Dividend	***0.00212 (-5.16)	***0.00000 (-4.937)	0.00381	0.00000
Short-term Debt	***0.10375 (-4.19)	**0.05183 (-2.565)	0.14920	0.07164
Long-term Debt	**0.04684 (2.10)	***0.01417 (4.275)	0.03778	0.00679
Bank Debt to Total Debt	0.18398 (0.38)	0.13870 (-0.214)	0.18034	0.14019
Insiders' Ownership	***0.02559 (-2.97)	0.00210 (-0.428)	0.03474	0.00237
Financial Institute Ownership	*0.17941 (1.95)	0.16843 (1.123)	0.16011	0.08700

\*, \*\*, and \*\*\* indicate variable differences from the low cash firm significant at 10%, 5%, and 1% level respectively. The t-statistics in the parentheses are produced by t-test; and z-statistics by non-parametric test. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

**Definition of Variables:** *Cash*: Cash and Deposits + Marketable Securities / Operating Assets. *Market to Book Ratio of Assets*: (Market Capitalization + Book Value of Debt) / Total Assets. *Operating Assets*: Total Assets - Cash and Deposits - Marketable Securities. *Real Size*: Natural Logarithm of the Total Assets. *Real Sales*: Natural Logarithm of Sales. *Cash Flow*: (Ordinary Income - Interest Expense and Discount Charges - Taxes - Dividends) / Operating Assets. *Net Working Capital*: (Current Assets - Cash - Current Liabilities) / Operating Assets. *Capital Expenditures*: (Change in Fixed Assets + Depreciation) / Operating Assets. *Investing Securities*: Investing Securities / Operating Assets. *Total Leverage*: (Short-term Debt + Long-term Debt) / Total Assets. *Dividend*: Cash Dividends / Operating Assets. *Short-term Debt*: Short-term Debt / Operating Assets. *Long-term Debt*: Long-term Debt / Operating Assets.

According to Pinkowitz and Williason (2001), Japanese firms' performance is hindered by the presence of powerful banks. My results indicate that when banks' influences became less powerful since the late 1980s, firms and banks developed decent cooperation relation to face the severe business environment.

#### 6.4 Differences between Early 1990s and Late 1980s

To further compare the differences between high cash firms and low cash firms, I document three comparison summary statistics in Table 6. Panel A compares the differences between high cash firms and low cash firms in 1991-1995. Panel B compares the differences of high cash firms between 1986-1990 and 1991-1995 while

**Table 6 - Panel C: Comparative Statistics of Low Cash Firms in 1986-1995.**

Variable	1991-1995		1986-1990	
	Mean (t-statistics)	Median (z-statistics)	Mean	Median
Cash	***0.09828 (-5.65)	***0.08743 (-9.343)	0.11737	0.11843
Real Size (JPY)	***12.21466 (3.31)	**12.10264 (2.187)	11.86429	11.72892
Real Sales (JPY)	***12.05921 (7.19)	***12.06757 (5.102)	11.43831	11.35310
Market to Book Ratio of Assets	***1.33347 (-11.23)	***1.27631 (-10.138)	1.76681	1.55000
Cash Flow	***-0.01022 (-2.84)	*-0.00925 (-1.922)	-0.00493	-0.00352
Net Working Capital	***-0.00643 (3.58)	***-0.01636 (3.407)	-0.04277	-0.05043
Capital Expenditures	**0.05030 (-2.38)	***0.04371 (-3.247)	0.06125	0.05717
Investing Securities	0.05246 (1.02)	0.03771 (0.596)	0.04908	0.03573
Total Leverage	0.27604 (-1.37)	0.24788 (-0.199)	0.29379	0.25126
Dividend	0.00083 (-1.62)	*0.00000 (-1.671)	0.00107	0.00000
Short-term Debt	***0.17372 (-3.68)	**0.16015 (-2.452)	0.20468	0.17965
Long-term Debt	0.12696 (0.38)	*0.09799 (1.921)	0.12357	0.07878
Bank Debt to Total Debt	0.36556 (-0.97)	0.36424 (-0.596)	0.37887	0.36904
Insiders' Ownership	***0.01059 (-2.59)	0.00000 (0.0000)	0.01547	0.00000
Financial Institute Ownership	0.12555 (0.36)	0.00000 (0.0000)	0.12129	0.00000

\*, \*\*, and \*\*\* indicate variable differences from the low cash firm significant at 10%, 5%, and 1% level respectively. The t-statistics in the parentheses are produced by t-test; and z-statistics by non-parametric test. High cash firms are firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990. Low cash firms are firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990. The sample consists of 140 high cash firms and 91 low cash firms for each single year.

**Definition of Variables:** *Cash*: Cash and Deposits + Marketable Securities / Operating Assets. *Market to Book Ratio of Assets*: (Market Capitalization + Book Value of Debt) / Total Assets. *Operating Assets*: Total Assets - Cash and Deposits - Marketable Securities. *Real Size*: Natural Logarithm of the Total Assets. *Real Sales*: Natural Logarithm of Sales. *Cash Flow*: (Ordinary Income - Interest Expense and Discount Charges - Taxes - Dividends) / Operating Assets. *Net Working Capital*: (Current Assets - Cash - Current Liabilities) / Operating Assets. *Capital Expenditures*: (Change in Fixed Assets + Depreciation) / Operating Assets. *Investing Securities*: Investing Securities / Operating Assets. *Total Leverage*: (Short-term Debt + Long-term Debt) / Total Assets. *Dividend*: Cash Dividends / Operating Assets. *Short-term Debt*: Short-term Debt / Operating Assets. *Long-term Debt*: Long-term Debt / Operating Assets.

Panel C compares the differences of low cash firms between 1986-1990 and 1991-1995. All numbers are scaled in operating assets, and each panel receives the same treatments as in Table 1.

Compare Table 6 Panel to Table 1, the difference between high cash firms and low cash firms are still the same. Low cash firms are still larger than high cash firms. Low cash firms also have more sales than high cash firms. High cash firms still spend more (larger cash flow, capital expenditures, and dividend payouts) but borrow less (lower leverage and debts) than low cash firms do. High cash firms also have more sufficient net working capital to finance short term liabilities. Though, the differences between high cash firms and low cash firms become closer.

Panel B compares the differences of high cash firms between 1986-1990 and 1991-1995. Panel B reveals that high cash firms in the early 1990s hold less cash compared to late 1980s. While firm size and sales continue to grow, the growth opportunities of high cash firms are less than what they used to have in the previous period. High cash firms also spend less (smaller cash flow and capital expenditures) and pay out less (cash dividends). Net working capital turns out to be positive numbers in 1991-1995. As to the leverage, there is no significant difference. This is because while the high cash firms increase their long-term debts, they also decrease the short-term debts in the same time. There are also decreases in directors' holdings and increases in financial institute ownership.

Panel C compares the differences of low cash firms between 1986-1990 and 1991-1995. Panel C reveals that low cash firms in the early 1990s also hold less cash compared to late 1980s. While firm size and sales continue to grow, the growth opportunities of low cash firms are also less than what they used to have in the previous period. High cash firms also spend less (smaller cash flow and capital expenditures) and pay out less (cash dividends). Low cash firms do have more net working capital in the early 1990s than in the late 1980s; however, net working capital is still negative. As to the leverage, the only indicator to be noted is that low cash firms have less short-term debts while there is no other significant difference. There are also decreases in directors' holdings.

## **7. Concluding Remarks**

This paper investigates how Japanese firms operate with high/low cash holding position. The purpose of this study is to find out if large cash holdings cause performance to deteriorate. I compare the operating performance associated with high cash firms (firms that persistently hold the ratio of cash to total assets in excess of .25 at the end of each of the years 1986-1990) and low cash firms (firms that persistently hold the ratio of cash to total assets less than .15 at the end of each of the years 1986-1990) across the late 1980s and early 1990s.

I find that operating performance of the high cash firms is significantly greater than firms that maintained low cash holdings in the late 1980s. High cash firms are associated with less debt, but more payouts and investments expenditures. In the mean while, I find little evidence that suggests ownership structure might be affecting the operating performance. Proxies for insider influences and outsider presences are all found unrelated to firms' performance and implies the fact that interests of the director's ownership were unrelated to Japanese firms' operating performance.

I find the cash holding determinants that comprise high/low cash holding firms are different. High cash firms are not surrounded with lenient investing opportunities; therefore, other than acquiring some fixed-assets the high cash firms simply keep the money within the firms. On the other hand, without lenient growth opportunities low cash firms borrow a lot from the banks, over-invest in acquiring fixed-assets and play money game in the capital market.

One major finding of this paper is that the excess cash of high cash firms are found negatively correlated to the operating performance while the excess cash of low cash firms are found positively correlated to the operating performance. This suggests that

large cash holdings might hinder performance of those firms that have had a lot of cash in hand already. On the other hand, operating performance of the low cash firms might be improved by holding more cash. The evidences presented in this study are however inconsistent with Milkkelson and Partch (2003) where they find no relation at all between firms' excess cash holdings and the operating performance. This inconsistency may due to the different governing system between two countries.

This paper provides a valuable exercise of examining persistent large cash holdings in Japan. Future research could explore cash holdings, financial leverage, equity payout, and firms' performance to find out in general that if the cash holdings boost performance or hinder performance.

## Acknowledges

I appreciate the helpful comments and suggestions of Masao Tsuji (my dissertation supervisor), Hiroshi Ishitsuka, Takao Kataoka, Masashi Okumura, Hiroo Sasaki, Koichi Takase, Eiko Tsujiyama, Akira Usui, Fumihiko Hiruma and Shinichi Hirota at the Waseda University, Masakatsu Oshima and Hajime Yasukuni at the Asia University, Mu-Ho Liu at the Nihon University, and Hiroaki Matsuura at the Harvard School of Public Health; an anonymous referee; workshop participants at the Waseda Accounting Institute and Institute for Research in Business Administration at the Waseda University, and conference participants at the 2003 Annual Meeting of the Japanese Management Accounting Association at the Kwansei Gakuin University. I gratefully acknowledge the financial support of Grant for Special Research Project (tokutei kadai), #2004A-375, from the Waseda University.

## Reference

- Barclay, M., and C. Smith Jr. 1995. "The Maturity Structure of Corporate Debt." *Journal of Finance* 50: 609-631.
- Blanchard, O. J., F. Lopez-de-Silanes, and A. Shleifer. 1994. "What Do Firms Do with Cash Windfalls?" *Journal of Financial Economics* 36: 337-360.
- Dittmar, A., J. Mahrt-Smith, and H. Servaes. 2003. "International Corporate Governance and Corporate Cash Holdings." *Journal of Financial and Quantitative Analysis* 38: 111-133.
- Easterbrook, F. 1984. "Two Agency-Cost Explanations of Dividends." *American Economics Review* 74: 650-659.
- Fama, E. F., and J. MacBeth. 1973. "Risk, Return, and Equilibrium: Empirical Tests." *Journal of Political Economy* 81: 607-636.
- Greene, W. 2002. *Econometric Analysis*. 5<sup>th</sup> Edition. Prentice Hall.
- Harford, J. 1999. "Corporate Cash Reserve and Acquisitions." *Journal of Finance* 54: 1969-1997.
- Ikeo, K., and S. Hirota. 1992. "Corporate Capital Structure and Main Bank. (Kigyo no shihon kousei to main bank.)" in Akiyoshi Horiuchi and Naoyuki Yoshino (ed.), *Financial Analysis of Modern Japan*. (Gendai nihon no kinyu bunseki.), University of Tokyo Press, 39-71.
- Jensen, M., 1986. "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers." *American Economics Review* 76: 323-329.
- Kruse, T, H. Park, K. Park, and K. Suzuki. 2003. "Long-term Performance following Mergers of Japanese Companies: The Effect of Diversification, Affiliation, and Employment." Working Paper, University of Illinois at Urbana-Champaign.



- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 1997. "Legal Determinants of External Finance." *Journal of Finance* 52: 1111-1155.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 2000. "Agency Problems and Dividend Policies around the World." *Journal of Finance* 55: 1-33.
- Mikkelson, W., and M. Partch. 1997. "The Decline of Takeover and Disciplinary Managerial Turnover." *Journal of Financial Economics* 44: 31-60.
- Mikkelson, W., and M. Partch. 2003. "Do Persistent Large Cash Reserves Hinder Performance?" *Journal of Financial and Quantitative Analysis* 38: 275-294.
- Morck, R., M. Nakamura, and A. Shivdasani. 2000. "Banks, Ownership Structure, and Firm Value in Japan." *Journal of Business* 73: 539-557.
- Opler, T., L. Pinkowitz, R. Stulz, and R. Willison. 1999. "The Determinants and Implication of Corporate Cash Holding." *Journal of Financial Economics* 52: 3-46.
- Palepu, K., P. Healy, and V. Bernard. 1999. *Business Analysis & Valuation: Using Financial Statements*. 2nd Edition. South-Western.
- Pinkowitz, L., and R. Willison. 2001. "Bank Power and Cash Holdings: Evidence from Japan." *Review of Financial Studies* 14: 1059-1082.
- R Development Core Team. 2005. *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL <http://www.R-project.org>.
- Rajan, R., and L. Zingales. 1995. "What Do We Know about the Capital Structure? Some Evidence from International Data." *Journal of Finance* 50: 1421-1460.
- Shleifer, A., and R. Vishny. 1986. "Large Shareholders and Corporate Control." *Journal of Political Economics* 94: 461-488.
- Shleifer, A., and R. Vishny. 1989. "Management Entrenchment - The Case of Manager-Specific Investments." *Journal of Financial Economics* 25: 123-139.
- Smith Jr., C., and R. Watts. 1992. "The Investment Opportunity Set and Corporate Financing, Dividend and Compensation Policies." *Journal of Financial Economics* 32: 263-292.
- Usui, A. 2001. "Shareholder Value and M&A. (Kabunushi Kachi to M&A)." in Akira Usui (ed.), *M&A Investment of Value Management* (Value Keiei no M&A Tousei), Chuo Keizai, 71-111.
- Yermack, D. 1996. "Higher Market Valuation of Companies with a Small Board of Directors." *Journal of Financial Economics* 40: 185-211.
- Zeileis, A. 2004. "Econometric Computing with HC and HAC Covariance Matrix Estimators," *Journal of Statistical Software* 11: 1-17.