

THE RELATION BETWEEN CASH HOLDINGS AND EARNINGS PERSISTENCE

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Abstract:

Our research question is whether corporate cash holdings can benefit firms through improving earnings persistence which is one of the measures of earnings quality. In order to answer this question, we test whether and how cash holdings are related to earnings persistence. Our results show a strong positive relation between cash holdings and earnings persistence. Next, we examine whether this relation holds after controlling for earnings volatility, since Dichev and Tang (2009) find a strong negative relation between earnings volatility and earnings persistence. We find that the positive relation between cash holdings and earnings persistence can be seen if earnings volatility is higher, but it cannot be seen if earnings volatility is lower. These results suggest that cash holdings can benefit firms with volatile earnings.

Keywords: Cash Holdings; Earnings Persistence

INTRODUCTION

In the international studies on accounting and finance, Japanese industrial firms are known as one of the most “cash-rich” firms in the world (cf. Pinkowitz et al.(2006), Guney et al. (2007), and Chen(2012)). In addition, corporate cash holdings in Japan have been increasing recently. Though stockholders can criticize “cash-rich” firms for failing to use investors’ funds efficiently, why are many Japanese firms are eager to hold so much cash? What are the benefits of this? For the first question existing literatures highlight four motives for cash holdings by firms. The second question is the main focus of this paper. We focus on the effects of cash holdings on earnings persistence in this study, different from many existing literatures that discuss the effects on corporate behaviours. Accounting researchers regard earnings persistence as one of the measures of earnings quality (Dechow et al. (2010)) and practitioners like Chief Financial Officers (CFOs) think that it is one of the favourable features of earnings (Dichev et al.(2013), Kagaya (2013)). So our research is the attempt to evaluate whether corporate cash holdings can benefit firms through improving earnings persistence.

Based on the research design of Dichev and Tang (2009), we investigate the relation between cash holdings and earnings persistence. The result of our basic test shows that cash holdings has a positive relation with earnings persistence. Next, we move on to the further analysis. We test whether this relation holds after controlling for earnings volatility because Dichev and Tang (2009) find a negative relation between earnings volatility and earnings persistence. We observe the positive relation between cash holdings and earnings persistence only for firms with high volatility of earnings. In contrast, the positive relation cannot be seen among firms with stable earnings. These results suggest that cash holdings benefit firms with volatile earnings.

This study proceeds as follows. In the next section, we outline the trends in the cash holdings of listed firms in Japan. After that, we review the existing literatures on cash holdings. Next, was how our research design and the empirical results. In the final section, we conclude this study.

Trends in the cash holdings of Japanese firms

Previous research indicates that Japanese industrial firms have more cash than comparable firms in other countries. Pinkowitz et al.(2006) point out that Japanese firms are the most “cash-rich” out of firms in 35 countries. They find that the cash-to-assets ratio of Japanese firms (16%) is almost four times higher than that of the U.S. firms

(4.4%). Descriptive statistics given by Guney et al. (2007) also confirm the position of Japanese firms as the “cash-rich” firms comparing the average cash-to-assets ratio of the firms in five developed countries (Japan, the U.S., the U.K., France, and Germany). In their sample, Japanese firms are the richest in cash on average. Chen (2012) proposes the average cash holdings of firms in 23 countries respectively and shows the same facts as Pinkowitz et al. (2006) and Guney et al. (2007).

These studies support that Japanese firms hold so much cash. In addition, there is still an upward trend in the cash holdings of Japanese industrial firms. As we check the trend in our sample period (from 1995 to 2013), the average cash-to-assets ratio is gradually increasing since 2001, even though Japanese firms have faced severe economic shocks over this period. For example, financial crisis following the collapse of Lehman Brothers strongly hurt many Japanese firms in 2009. In 2011, the Great East Japan Earthquake occurred and many Japanese firms were damaged by the disaster in direct or indirect ways. Despite these shocks, the average cash-to-assets ratio for Japanese industrial firms has continued to increase. In 2013, the end of our sample period, the ratio reached its highest point.

These upward trends in the cash holdings can also be seen in the U.S. firms. Bates et al. (2009) investigate the average cash-to-assets ratio for the U.S. industrial firms and find that the ratio approximately doubled from 10.5% in 1980 to 23.2% in 2006. Gao et al. (2013) find a similar trend using more recent financial data on the U.S. firms. They report that the cash-to-assets ratio increased from 13.53% in 1995 to 20.45% in 2011.

LITERATURE REVIEW

Motives for cash holdings

Why do some firms want to hold more cash in reserve instead of investing in projects or paying dividends? Bates et al. (2009) propose four motives to hold cash, as identified in the existing literatures. The first motive is *the transaction motive*. Firms with this motive want to hold cash so that they are able to pay day-to-day expenses in cash. In short, firms want to use cash as the main source of capital for ordinary operation such as buying raw materials.

The second motive is *the precautionary motive*. Firms save cash so as not to run short of funds to invest in the future. Opler et al. (1999) find that firms with greater difficulty in obtaining external capital tend to hold more cash as a buffer against a lack of funds. Shinada and Ando (2013) note that this precautionary motive is supported by pecking order

theory. According to this theory, in the presence of severe asymmetry of information between borrowers and lenders of funds, firms prefer internal capital to external capital because the agency costs of internal capital are lower than those of external capital.

The third motive is *the tax motive*, as explained by Foley et al. (2007). Foreign earnings of multinational firms located in Japan are taxable in the U.S. or in Japan. However, the tax burdens against those earnings can be deferred until earnings are repatriated. Thus, multinationals can lower their effective tax rate by holding cash abroad. Foley et al. (2007) indicate that higher tax costs promote larger cash holdings in multinational firms.

The fourth motive is *the agency motive*. When firms lack investment opportunities with a positive net present value, their managers have an incentive not to return funds to stockholders and instead to hold cash. Dittmar et al. (2003) observe differences between various countries in cash holdings. They find that corporations in countries where shareholders rights are less protected hold more cash than in countries with greater shareholder protections. This occurs because in the latter countries, shareholders force managers to pay out more cash.

Bates et al. (2009) conclude that the precautionary motive plays an important role in the increase in cash in the U.S. firms. Shinada and Ando (2013) find a positive effect of the standard deviation of cash flow on cash holdings and argue that Japanese firms hold much cash due to the precautionary motive. Their findings are consistent with Bates et al. (2009). Therefore, the precautionary motive is likely to be the main motive in the U.S. and Japan.

The benefits and problems of cash holdings

Now we will move on to the benefits and problems of cash holdings. First, having ample cash reserves may encourage firms to spend and invest. These activities will contribute to improving the firm value if they are appropriate. Thus, prior literatures focus on whether firms use cash to increase their firm values. Denis and Sibilkov (2010) suggest that cash holdings are valuable for financially constrained firms because they can use cash to encourage prospective investments. Brown and Petersen (2011) show that firms likely to face financing frictions can use cash to smooth R&D expenditures. In addition, Wang and Gu (2012) indicate that R&D has a negative effect on earnings uncertainty. These studies support that cash holdings will benefit financially constrained firms.

On the other hand, there are researchers and stockholders that criticize “cash-rich” firms for failing to use investors’ funds efficiently. This criticism is largely due to agency problems. It can be supposed that holding too much cash causes excessive investments or overspending. Harford (1999) and Harford et al. (2008) suggest that cash-rich firms can engage in excessive investments such as acquisitions and capital investments, and thereby they can reduce their firm values. In Japan, stockholders of cash-rich firms grow to push for greater payouts. In 2014, the year-over-year growth of the sum of payouts is expected to be 22%, while that of the net income is anticipated to be 3% in Japan according to “*the Nikkei*¹”.

As seen above, empirical results on whether cash holdings improve or reduce the firm values are still mixed. In order to contribute to the discussion of the merits and drawbacks of cash holdings, we investigate whether and how cash holdings are related with earning persistence. Earnings persistence is thought to be one of the measures of earnings quality in accounting studies (Dechow et al. (2010)). In addition, not only the accounting researchers but also CFOs regard earnings persistence as the favourable features of earnings. Dichev et al. (2013) present results from a survey of CFOs of public companies in the U.S. which asks about important features of high-quality earnings. According to their results, 80.5% of CFOs think that sustainability is an important feature of high-quality earnings. Kagaya (2013) also sends the same questionnaire survey to CFOs in Japanese firms. His questionnaire results are consistent with those of Dichev et al. (2013). These studies show that earnings persistence is thought to be an important earnings quality by both researchers and business people.

RESEARCH METHOD

Sample selection

Our sample is obtained from Nikkei NEEDS Financial QUEST 2.0, a database of financial data of Japanese firms. Our sample period covers from 1995 to 2013. We limit the sample to Japanese firms that are listed on stock exchanges in Japan and adopt the Japanese Accounting Standard. We further limit the sample to firms with a fiscal year end of March, which is the most common fiscal year end for Japanese public firms. Financial firms (e.g. banks, insurance companies, brokerages, and

¹The sum of the payouts last year is the highest, 13 trillion yen. Listed firms are utilizing the funds: improving performances, expanding investments, and raising wages and salaries (in Japanese). (2015, April 5). *the Nikkei (Morning Paper)*, p.1

asset management companies) are excluded because they have financial data that is qualitatively different from that of industrial firms. The sample is further restricted to firm/year observations that have non-missing data to construct the variables we use. To diminish the influence of outliers, we then exclude observations with values in the top and bottom 1% of each variable described in the descriptive statistics in Table 1. Our final sample comprises the 29,005 firm/year observations meeting all of these requirements.

The definitions of variables in this study are as follows. $Earnings_t$ is net profit gained during the period t . $Cash_t$ is cash and cash equivalents plus short-term investment securities at the end of fiscal year t . These two variables are scaled by total assets at the previous fiscal year end (at the period $t-1$). $Vol(Earnings_t)$ is the standard deviation of net profit deflated by total assets at the end of the previous year over the recent five years. Descriptive statistics for the full sample are presented in Table 1. Empirical distributions and pairwise correlations of the variables are shown in Panel A and B respectively.

FINDINGS AND ANALYSIS

In line with many existing literatures, we define the coefficient β in the auto-regressive regressions of current on lagged earnings ($Earnings_{t+1} = \alpha + \beta Earnings_t + \varepsilon$) as earnings persistence. If this estimate has a high value, we can regard the earnings of the observation ($Earnings_t$) as highly persistent. Our basic analysis focuses on the link between cash holdings and earnings persistence. At first, we partition the full sample into quintiles according to $Cash_t$. In classifying firm/year observations, we subdivide the quintiles by industry because what industry a firm belongs to can have a large influence on its financial data and its characteristics. To check the difference between industries, we calculate the average of cash-to-assets ratio by industry in 2013. The average cash-to-assets ratio between firms in the electricity supply industry is the lowest (2.3%) and that in the service sector is the highest (25.7%). Since the difference between the top and the bottom is substantial (23.4%), we divide the sample in the following way.

Table 1. Descriptive statistics

$Earnings_t$ is net profit scaled by total assets. $Cash_t$ is cash-to-assets ratio. And $Vol(Earnings_t)$ is the standard deviation of earnings scaled by total assets over the recent five years.

Panel A: Empirical distributions								
	Mean	SD	Min	25%	Med	75%	Max	N
$Earnings_t$	0.017	0.044	0.241	0.004	0.018	0.038	0.171	29,005
$Cash_t$	0.159	0.120	0.009	0.074	0.127	0.209	0.746	29,005
$Vol(Earnings_t)$	0.024	0.026	0.002	0.009	0.016	0.030	0.244	29,005
Panel B: Pairwise Pearson (Spearman) correlations below (above) the diagonal								
	$Earnings_t$	$Cash_t$	$Vol(Earnings_t)$					
$Earnings_t$					0.271		-0.098	
$Cash_t$			0.243				0.123	
$Vol(Earnings_t)$			-0.200		0.154			

Table 2. Results of the basic analysis.

β_1 (Earnings persistence) is estimated for the group G_{CR} and all are significant at the 1% level. The group G_{CR} is classified by the value of CR ("Cash holdings Ranking"). Smaller values of CR indicate higher cash-to-assets ratio for firm/year observations in G_{CR} . $Earnings_t$ is net profit scaled by total assets. $Cash_t$ is cash-to-assets ratio. $Vol(Earnings_t)$ is the standard deviation of earnings scaled by total assets over the recent five years.

G_{CR}	β_1 (Persistence)	$Adj R^2$	N
$CR = 1$	0.625	0.378	5,890
$CR = 2$	0.550	0.280	5,871
$CR = 3$	0.484	0.215	5,876
$CR = 4$	0.480	0.207	5,871
$CR = 5$	0.407	0.157	5,886

Table 3. Results of the further analysis

The value in each of the 25 cells indicates β_1 (earnings persistence) estimated for the group $G_{CR,VR}$ and all are significant at the 1% level. Adjusted R squared values are indicated in parentheses. The group $G_{CR,VR}$ is classified by the value of CR (“Cash holdings Ranking”) and VR (“Volatility of earnings Ranking”). Smaller values of CR indicate higher cash-to-assets ratio for firm/year observations in $G_{CR,VR}$. Smaller values of VR indicate lower earnings volatility for firm/year observations in $G_{CR,VR}$. $Earnings_t$ is net profit scaled by total assets. $Cash_t$ is cash-to-assets ratio. and $Vol(Earnings_t)$ is the standard deviation of earnings scaled by total assets over the recent five years.

$G_{CR,VR}$	$Vol(Earnings_t)$				
	$VR = 1$	$VR = 2$	$VR = 3$	$VR = 4$	$VR = 5$
$CR = 1$	0.879	0.816	0.794	0.670	0.524
	(0.534)	(0.488)	(0.500)	(0.441)	(0.299)
$CR = 2$	0.878	0.782	0.681	0.641	0.431
	(0.375)	(0.302)	(0.342)	(0.333)	(0.225)
$Cash_t$ $CR = 3$	0.892	0.816	0.706	0.561	0.350
	(0.328)	(0.294)	(0.283)	(0.255)	(0.161)
$CR = 4$	0.925	0.840	0.663	0.537	0.354
	(0.223)	(0.333)	(0.256)	(0.229)	(0.154)
$CR = 5$	0.929	0.765	0.580	0.471	0.309
	(0.234)	(0.199)	(0.201)	(0.180)	(0.128)

We order firm/year observations, $F_{i,p}$, in each industry according to the value of $Cash_t$. In our model, i is the industry code and p is calculated for each firm/year observation from the formula below.

$$p = \frac{\text{the rank of } Cash_t \text{ in the industry } i}{\text{the number of observations in the industry } i}$$

We define $G_{i,CR}$ as the group composed of firm/year observations $F_{i,p}$ that satisfy the following requirement.

$$\frac{1}{5}(CR - 1) \leq p \leq \frac{1}{5}CR$$

Here, $CR(= 1,2,3,4,5)$ is the “Cash holdings Ranking” of the group, where a smaller value means that the members of the group have relatively more cash. We can then describe $G_{i,CR}$ as follows.

$$G_{i,CR} \ni \left\{ F_{i,p} \mid \frac{1}{5}(CR - 1) \leq p \leq \frac{1}{5}CR \right\}$$

Aggregating the above groups according to CR , we form the subgroups, G_{CR} , that contain all $G_{i,CR}$ with the same value of CR . In the next stage, we estimate and compare earnings persistence in every G_{CR} .

$$G_{CR} := \bigcup_i G_{i,CR}$$

In the basic analysis, we estimate earnings persistence in each of the quintiles formed on the basis of $Cash_t$ in order to identify the relation between corporate cash holdings and the two characteristics of earnings.

Table 2 shows the results from estimating the auto-regressive β for each quintile formed on $Cash_t$. Out of all the groups, β for group G_1 is the largest and those for group G_5 is the smallest. In addition, β is decreasing from top quintile to bottom quintile. This gradation of β indicates that there is a positive relation between cash holdings and earnings persistence. Namely, the more cash firms hold, the more persistent their earnings are. In other words, the earnings of cash-rich firms are highly persistent.

Dichev and Tang (2009) find a strong negative relation between earnings volatility and earnings persistence. So, our next question is whether this relation can remain after controlling for earnings volatility. This section covers the further analysis, which looks at the effects of earnings volatility on the positive relation between cash holdings and earnings persistence. In this test, we divide the sample into 25 groups according to cash-to-assets ratio and earnings volatility. We order firm/year observations, $F_{i,p,r}$, in each industry according to the value of $Cash_t$ and $Vol(Earnings_t)$ independently. In the model, i is an industry code p and r are calculated for each firm/year observation using the formulas below.

$$p = \frac{\text{the rank of } Cash_t \text{ in the industry } i}{\text{the number of observations in the industry } i}$$

$$r = \frac{\text{the rank of } Vol(Earnings_t) \text{ in the industry } i}{\text{the number of observations in the industry } i}$$

We define $G_{i,CR,VR}$ as the group composed of firm/year observations $F_{i,p,r}$ that satisfy the following condition:

$$\frac{1}{5}(CR - 1) \leq p \leq \frac{1}{5}CR, \frac{1}{5}(VR - 1) \leq r \leq \frac{1}{5}VR$$

Here, $CR (= 1, 2, 3, 4, 5)$ indicates “Cash holdings Ranking (lower values of CR indicate higher cash holdings)”. $VR (= 1, 2, 3, 4, 5)$ indicates “Volatility of earnings Ranking (lower values of VR indicate lower volatility)”. We can then describe $G_{i,CR,VR}$ in the following way. We classify all observations according to cash-to-assets ratio and earnings volatility by industry.

$$G_{i,CR,VR} \ni \left\{ F_{i,p,r} \mid \frac{1}{5}(CR - 1) \leq p \leq \frac{1}{5}CR, \frac{1}{5}(VR - 1) \leq r \leq \frac{1}{5}VR \right\}$$

We then aggregate these groups according to the pairings of CR and VR .

$$G_{CR,VR} := \bigcup_i G_{i,CR,VR}$$

Through these operations, we make 25 groups. We estimate and compare earnings persistence in every $G_{CR,VR}$.

The results are shown in Table 3. First, let us take a look at each row in Table 3. The two columns on the right ($VR = 4, 5$) indicate the earnings persistence of the groups composed of observations with high earnings volatility. In these columns, the top cells ($CR=1$) have the largest estimated coefficient (earnings persistence) and the bottom cells ($CR=5$) have the smallest values for the coefficient. In addition, β is generally decreasing from the top row to the bottom row. Thus, we can see that the gradation in β can be seen in high earnings volatility groups. In contrast, in the left two columns ($VR = 1, 2$), such gradation cannot be seen. These results indicate that when earnings are highly volatile, holding more cash is related with higher earnings persistence. But, when firms have stable earnings, we cannot observe a positive relation between cash holdings and earnings persistence.

Now, the coefficients are basically decreasing from left to right in Table 3. These results confirm the negative relation between earnings persistence and earnings volatility. Therefore, our results are consistent with those of Dichev and Tang (2009).

CONCLUSION

This paper investigates the relation of cash holdings with earnings persistence. Our basic analysis explored this relation and the results show that there is a positive relation between them. Next, we examine whether this positive relation remains after considering the negative relation between earnings volatility and earnings persistence. Our results show

that the positive relation between cash holdings and earnings persistence remains only when earnings are highly volatile. Recently, stockholders criticize Japanese firms for holding too much cash and they require increasing the amount of payouts. However, our results suggest that cash holdings should not be quickly regarded as the evidence that the firms do not use their capital efficiently. Cash holdings should be assessed together with earnings volatility. For example, stockholders probably should not require more payouts against the firms whose earnings are highly volatile. If they do not demand payouts, they will expect more persistent earnings of those firms.

Our study has some limitations. First, there is not a clear explanation as to why there is a positive relation between cash holdings and earnings volatility if firms gain volatile earnings. Second, we do not gain enough evidence to prove the causation. It is possible that cash holdings have a positive effect on earnings persistence of the firms whose earnings are volatile. Cash holdings can give them the opportunities of valuable investments. But, persistent earnings can make firms rich in cash. These questions will be addressed in future research.

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