A Study on Cash Holding Motivation of Listed Companies

Wang Qiuming

Jiangsu University, Zhenjiang, Jiangsu, 212013

Abstract— *Cash, every company or individual will hold more or less, but why hold cash? Individuals are to buy what they like or sell what they produce. What about the company? What about Listed Companies in particular?*

In 2008, the United States caused and radiated the global financial crisis. I believe you and I are still very impressed. How did it come into being? The subprime mortgage crisis on Wall Street is the most direct cause of the financial crisis. And the existence of a large number of economic bubbles is a fatal danger. The economic bubble makes the industrial capital chain lengthen, causing the company's liquidity shortage, which leads to the breakup of the capital chain, and finally leads to the company's financial crisis and lead to bankruptcy. When the global economy was still under the shadow of the financial crisis, the European debt crisis broke out in 2010, which intensified the fluctuation of the world economy and made the company's capital chain more fragile. Therefore, the liquidity problem has become the focus of the company in recent years. In the financial management of the company, the flexibility of property will also be put in the first place to strengthen the liquidity management. Cash, as the most liquid asset of a company, is held by a large number of Listed Companies in developed countries. At the same time, due to the imperfect development of capital market and the unreasonable ownership structure of listed companies, it is of great significance to study the cash holding motivation of Listed Companies in China.

This paper studies the motivation theory of cash holding by combining theory with empirical research. Taking the apartments listed in Shanghai Stock Exchange from 2014 to 2018 as samples, this paper establishes a data model to analyze the motivation of cash holding, and finally puts forward reasonable suggestions for China's listed companies.

Keywords— *Cash holding; listed company; case analysis.*

I. RELATED THEORIES OF CASH HOLDING

1.1 Research Background

At the end of the 20th century, the cash holdings of S & P 500 companies reached more than $700 billion. Some of the large multinational companies hold more than $100 in cash. Global vantage database also reported that the cash holdings of large companies worldwide reached US $1.5 trillion, equivalent to nearly 10% of book assets and more than 10% of market value of net assets. Why is it more and more common for companies to hold large amounts of cash? What are the motives of cash holding of Listed Companies in China?

1.2 Motivation Analysis of Cash Holding

Keynes's money demand theory is the earliest literature on cash holding behavior. He proposed that the reason why enterprises hold cash is based on transaction motivation, preventive motivation and speculative motivation. These three motivational theories have been applied to the financial analysis of companies.

The transactional motivation of cash holding refers to the cash held by enterprises to ensure the normal operation of enterprises. This is because when enterprises need cash to complete transactions, it is impossible to obtain them at any time. It is necessary to convert fixed assets into cash. If there is a shortage of cash, enterprises must borrow from banks in order to operate, and the cost of loans is very high. Therefore, it is necessary for enterprises to hold cash to avoid the cost of obtaining cash due to cash shortage. [1]

The preventive motivation of cash holding refers to that enterprises hold cash in order to make timely payment in case of future emergencies, so as to avoid various potential risks and meet the investment needs of profitable projects in the future. Cash held out of preventive motivation can make enterprises meet the needs of future enterprise development process, and make enterprises seize favorable investment opportunities to enhance the value of enterprises when external financing difficulties or high costs. In 1966, Whalen put forward the cube root law to analyze the preventive cash balance[2],

$$M = \sqrt[3]{\frac{2s^2c}{r}} \, ,$$

Where m is the preventive cash balance, s is the standard deviation of the probability distribution of net expenditure, C is the shortage cost of cash, and R is the opportunity cost rate, i.e. interest rate.

The cube root law shows that the optimal preventive cash balance has a positive correlation with the cash shortage cost and the standard deviation of the probability distribution of net expenditure, and has a negative correlation with the opportunity cost rate or interest rate.

The speculative motivation of cash holding refers to the cash held in order to seize the future opportunistic opportunities because of the confidence that it can accurately predict the future market situation. For example, holding enough cash in order to purchase profitable futures or securities or raw materials with low prices in a timely manner.

At present, there are few researches on the speculative motivation of cash holding, while the theoretical research on motivation mainly focuses on the transactional motivation and preventive motivation of cash holding. Therefore, this paper mainly focuses on the transaction motivation of cash holding and the preventive motivation of cash holding.

1.3 Trade off Theory and Cash Holdings

The core idea of the early cash holding theory is the marginal idea, that is, the company has the best cash holdings, and this optimal holding is at the level of its marginal cost and marginal income.

The emergence of the trade-off theory of cash holdings can be traced back to the 1930s. Keynes put forward the transaction cost model in the 1930s. He thought that the marginal cost curve of cash shortage is a curve inclined to the right and down, while the marginal cost curve of cash holding is a straight line. The intersection point of these two curves is the optimal cash holdings of enterprises[3]

In the 1950s, Baumol and Tobin revised the transaction cost model[4], This paper proposes a cash inventory model. Under the assumption that there is no cash inflow in the company's planning period and the cash expenditure rate remains unchanged, the optimal cash holding formula is derived,

$$Z = \sqrt{\frac{2TF}{K}}$$

Among them, Z is the optimal cash holdings, T is the total amount of cash required by the exchange in the planning period, F is the transaction cost of selling securities, and K is the opportunity cost of holding cash.

Therefore, the optimal cash holdings of tradability are positively correlated with the total amount of cash required by the exchange and the transaction cost of selling securities in the planning period, and negatively correlated with the opportunity cost of holding cash.

Since the cash in and out of the company is random and irregular, Miller and orr improved the cash storage model and proposed a stochastic cash model. The formula of target cash holdings is derived,

$$Z = \sqrt{\frac{3Fs^2}{4K}} + L$$

Where K is the daily opportunity cost, F is the transaction cost, s^2 is the cash flow volatility, L is the control limit, and Z is the target cash holdings[5]

The later cash holding theory has been supplemented and developed, and the main factors influencing cash holdings are: investment opportunities, external financing costs, cash cycle, asset disposal, restructuring, the consequences of reducing cash dividends, the uncertainty of cash flow and the cost of hedging instruments.

1.4 Information Asymmetry, Financing Priority Theory and Cash Holdings

In the process of solving the problem of cash holding, trade-off theory is an important theory. But it also has shortcomings: only focus on the tangible cost of cash holdings, and not consider the intangible costs[6].

In the capital market, information cannot be completely symmetrical, and because of asymmetric information will lead to a lot of intangible costs. In the principle of maximizing the interests of the owners of the enterprise, due to the asymmetric information between the managers and the suppliers of funds, when the managers who know all the relevant information of the company conduct external financing, the suppliers demand a higher rate of return on investment because the information they know is not complete and overestimates the investment risk. At the same time, in order not to buy securities at an overvalued price, the supplier needs to pay more attention to the investment Ask for a discount, which leads to the securities being undervalued. This increases the cost of financing and increases the difficulty of financing. Such repetition leads to the deepening of information asymmetry, which makes enterprises give up investment and even financial difficulties. According to the theory of asymmetric information, there is a positive correlation between investment opportunities and cash holdings [7].

In 1984, Myers and makilov put forward the theory of financing priority[8]. The theory is based on information asymmetry, assuming that the market is completely competitive, and under the principle of maximizing the interests of shareholders, it considers that in order to minimize the financing cost, the enterprise financing has the optimal order, that is, the internal financing is first followed by the external financing, and the external financing is the debt financing before the interest financing. According to the theory of financing priority, cash flow is positively correlated with cash holdings, while debt ratio and repayment rate are negatively correlated with cash holdings [9].

1.5 Agency Theory, Free Cash Flow Theory and Cash Holding

Based on the assumption of maximizing shareholder value, trade-off theory and financing priority theory mainly consider transactional motivated cash holdings and preventive cash holdings [10]. However, the ownership and management of the company are highly separated. In 1976, British economist Mitchell Johnson put forward the principal-agent theory. The theory holds that under the premise of separation of management right and ownership, the owner of an enterprise does not participate in the operation and management of the company, but gives the management right to the manager. But in the process of company management, the separation of the two rights of shareholders and managers leads to the conflict between them: shareholders want to obtain all profits, while managers pursue the maximization of personal interests [11]; Therefore, in the case of asymmetric information, managers may make decisions that seek their own maximum interests and are not conducive to shareholders. The agency cost is produced from this, including the cost of supervising managers and the cost of moral hazard of managers [12]. Agent theory mainly solves the problem that managers with management rights can obtain the maximum benefits for the shareholders with ownership.

In 1986, economist Jensen put forward the theory of free cash flow, which believes that the separation of ownership and management leads to agency problems. In the process of the company's operation, managers pursue high-quality life, reduce the risks of enterprises and individuals, and avoid the supervision of the capital market and hold more cash. The excess cash forms the free cash flow of the company.

In view of the large amount of free cash caused by the conflict of interests between managers and shareholders, it can

be alleviated by interest binding between shareholders and managers, such as increasing the number of shares held by managers. Or shareholders have representatives to supervise managers. Thus, the relationship between interest binding and corporate cash holdings is negative, and that of supervisory representatives is negatively correlated with corporate cash holdings.

1.6 Summary

This chapter first describes the historical background of the research on cash holding motivation, and then analyzes the transactional motivation holding, preventive motivation holding and self-interest motivation holding according to the time sequence and development logic proposed by the cash holding motivation theory. The theory includes: trade-off theory, financing priority theory, free cash flow theory.

II. A Case Study on Cash Holding Motivation of Listed Companies

2.1 Analysis and Hypothesis

The transactional motivation of cash holding refers to the cash held by enterprises to ensure the normal operation of enterprises. This is because the enterprise cannot obtain it at any time when it needs cash to complete the transaction. It needs cost to convert fixed assets into cash. If the enterprise is short of cash, it must borrow from the bank in order to operate, and the cost of loan is very high; or foreign aid financing, but the cost is higher. Therefore, it is necessary for enterprises to hold cash to avoid the cost of obtaining cash due to cash shortage.

Hypothesis 1: the company's tradable cash holdings are positively correlated with transaction costs and daily operating needs.

The motivation of holding tradable cash can be expressed by cash flow, asset liability ratio, trading volume, cash substitutes, dividend payment and other financial indicators.

Therefore, this hypothesis can be refined as follows:

Hypothesis A: there is a positive correlation between trading cash holdings and cash flow.

Hypothesis B: there is a negative correlation between the company's trading cash holdings and the asset liability ratio.

Hypothesis C: there is a positive correlation between trading cash holdings and trading volume.

Hypothesis D: there is a negative correlation between the company's trading cash holdings and cash substitutes.

Hypothesis E: there is a positive correlation between trading cash holdings and dividend payment.

2.2 Design

According to the above analysis and hypothesis, the following variables are selected to establish the model.

Selection and definition of variables

(1) Explained variable

The cash holding level of an enterprise is regarded as the explanatory variable, in which the cash holding level is the ratio of cash to net assets, which is recorded as cash.

(2) Explanatory variables

a. Trading volume, recorded as Jyl;

b. Cash flow, recorded as xjll;

c. Cash substitutes, recorded as TDW;

d. Debt ratio, recorded as fzl;

e. The level of dividend payment, recorded as glzf, takes the value of 1 or 0.

Sample selection and data sources

Since the new accounting standards began to be implemented on January 1, 2007, for the sake of continuous and comparable data. Accurate, this chapter selects the listed companies that issued a shares in Shanghai Stock Exchange before December 31, 2006 as the research sample, and selects 2014-2018 as the research interval.

Screening principle:

(1) Due to the special operation mode of financial companies, such as insurance companies, which will hold a large amount of cash, which affects the research results, financial listed companies are excluded.

(2) Excluding the listed companies with continuous liabilities and companies with debt ratio greater than 1.

(3) Exclude companies with incomplete information.

After screening, 552 listed companies in Shanghai stock market were selected as samples. Data source: wind database.

Modeling

The panel data model established in this chapter is the test of the transaction motivation of cash holding of listed companies.

The measurement model is as follows:

$$cash_{i,t} = \alpha + \beta_1 jyl_{i,t} + \beta_2 xjll_{i,t} + \beta_3 tdw_{i,t} + \beta_4 fzl_{i,t} + \beta_5 glzf_{i,t} + \mu_{i,t}$$

Among them, I is a sample, I is a listed company, the value is 1-552; t is the year, the value is 2014-2018; α is the intercept term, β_i is the regression coefficient, $\mu_{i,t}$ is the random error term.

2.3 Result Analysis

Statistical analysis

This paper makes a descriptive statistical analysis on the sample variables of transactional motivation cash holdings of listed companies from 2014 to 2018, and the results are shown in Tables 1, 2 and 3. According to the data in the table, the average cash holding level of Listed Companies in Shanghai Stock Exchange from 2014 to 2018 is 29.13%, which is far higher than that of developed countries such as Europe and the United States, which shows that the companies listed before 2006 prefer to hold high amount of cash, and the standard deviation is 18.75, which indicates that the cash holding levels of these companies are quite different. The average value of trading volume is 75.01%, and the standard deviation is 50.55%, which indicates that there is a large gap between these companies. The minimum value of cash flow is -2.1570, the maximum value is 2.2011, and the average value is 11.02%, and the standard deviation is 21.07%, indicating that there is a large gap in cash flow among these companies. The minimum value of cash substitutes is -23.7245, the maximum value is 5.4425, the average value is -20.24%, and the standard deviation is 73.56%. It shows that these companies do not prefer to hold cash substitutes, and the cash substitutes

vary greatly among companies. The average value of debt ratio is 53.17%, and the standard deviation is 18.19%, which indicates that the difference of debt ratio among these companies is large.

To sum up, there are significant differences in cash holdings and trading volume, cash flow, cash substitutes, debt ratio and other variables of Listed Companies in Shanghai stock market before 2006. These variables are representative to a certain extent. We can study the transactional motivation of cash holdings of listed companies through transaction volume, cash flow, cash substitutes, debt ratio and other variables.

Table 1. (2014-2018)

Variable	Sample size	Minimum	Maximum	Average	Standard deviation
cash	2760	0.0011	0.9983	0.2913	0.1875
jyl	2760	0.0007	5.4378	0.7501	0.5055
xjll	2760	-2.1570	2.2011	0.1102	0.2107
tdw	2760	-23.7245	5.4425	-0.2024	0.7356
fzl	2760	0.0108	0.9905	0.5317	0.1819

Table 2. (2014)

Variable	Sample size	Minimum	Maximum	Average	Standard deviation
cash	552	0.0011	0.9866	0.2804	0.1775
jyl	552	0.0600	3.4069	0.7285	0.4958
xjll	552	-1.8309	0.9764	0.1043	0.1796
tdw	552	4.9748	2.0307	-0.2252	0.6518
fzl	552	0.0467	0.9544	0.5113	0.1874

Table 3. (2018)

Variable	Sample size	Minimum	Maximum	Average	Standard deviation
cash	552	0.0012	0.9903	0.2837	0.17325
jyl	552	0.0893	4.8533	0.7039	0.4531
xjll	552	-1.9307	1.0251	0.1103	0.1852
tdw	552	-5.7321	1.9323	-0.2274	0.6607
fzl	552	0.0503	0.9672	0.5307	0.1916

Result analysis

This paper uses statistical analysis software stata15.0 to study the trading motivation of cash holding of Listed Companies in Shanghai Stock Exchange. Through the results of Hausmann test (prob > chi2 = 1.000 > 5%), the best model random effect model was selected, and then the regression results (Wald chi2 (5) = 245.13 and pro > chi2 = 0.000) were analyzed. After the establishment of the model, the results of quantitative analysis on sample data were true and reliable. The correlation was judged by Z-test value and P-test value.

Table 4. Hausmann test results

Original hypothesis: the model has random effect
Chi2(5)=0.00
Prob>chi2=1.000

The empirical results show that the cash held by Listed Companies in order to ensure the normal operation of enterprises, that is, there is a transactional motivation for cash holdings. It is mainly reflected in the negative correlation between cash holdings and cash substitutes, and a significant positive correlation between cash holdings and trading volume, cash flow and dividend payment level.

Table 5. Regression results of cash holding transaction motivation

Cash	Coef	Z	P>|z|
Jyl	0.0349645	4.43	0.000
xjll	0.0975346	8.18	0.000
tdw	-0.034213	-8.82	0.000
fzl	0.123578	5.53	0.000
glzf	0.017632	2.09	0.002
Constant	0.173213	12.07	0.000
Wald chi2(5)	245.13		
Prob>chi2=1.000			

2.4 Summary

Taking 552 listed companies in Shanghai Stock Exchange from 2014 to 2018 as samples, this chapter empirically analyzes the trading motivation of cash holding of Listed Companies in China by using random effect model. The results show that there is a significant negative correlation between cash holdings and cash substitutes, and a significant positive correlation between cash holdings and trading volume, cash flow and dividend payment level.

III. A CASE STUDY ON THE PREVENTIVE MOTIVATION OF CASH HOLDING OF LISTED COMPANIES

3.1 Analysis and Hypothesis

The preventive motivation of cash holding refers to that enterprises hold cash in order to make timely payment in case of future emergencies, so as to avoid various potential risks and meet the investment needs of profitable projects in the future. Cash held out of preventive motivation can make enterprises meet the needs of future enterprise development process, and make enterprises seize favorable investment opportunities to enhance the value of enterprises when external financing difficulties or high costs.

Hypothesis 1: the preventive cash holdings are positively correlated with financial risk and future investment demand.

The precautionary Cash Holding Motivation of a company can be expressed by the company size, cash flow volatility, investment opportunities, financial leverage, bank debt, cash dividend and other financial indicators.

Therefore, this hypothesis can be refined as follows:

Hypothesis A: there is a negative correlation between preventive cash holdings and company size.

Hypothesis B: there is a positive correlation between precautionary cash holdings and cash flow volatility.

Hypothesis C: there is a positive correlation between preventive cash holdings and investment opportunities.

Hypothesis D: there is a positive correlation between preventive cash holdings and financial leverage.

Hypothesis E: there is a negative correlation between preventive cash holdings and bank debt.

Hypothesis F: there is a positive correlation between preventive cash holdings and cash dividends.

3.2 Design

According to the above analysis and hypothesis, the following variables are selected to establish the model.

Selection and definition of variables

(1) Explained variable

The cash holding level of an enterprise is regarded as the explanatory variable, in which the cash holding level is the ratio of cash to net assets, which is recorded as cash.

(2) Explanatory variables

    a. Company size, recorded as gsgm;

    b. Cash flow volatility, recorded as xjll;

    c. Investment opportunities, recorded as tzjh;

    d. Financial leverage, recorded as cwgg;

    e. Bank debt, recorded as yhzw;

    f. Cash dividends, recorded as xjgl;

Sample selection and data sources

Since the new accounting standards began to be implemented on January 1, 2007, for the sake of continuous and comparable data. Accurate, this chapter selects the listed companies that issued a shares in Shanghai Stock Exchange before December 31, 2006 as the research sample, and selects 2014-2018 as the research interval.

Screening principle:

(1) Due to the special operation mode of financial companies, such as insurance companies, which will hold a large amount of cash, which affects the research results, financial listed companies are excluded.

(2) Excluding the listed companies with continuous liabilities and companies with debt ratio greater than 1.

(3) Exclude companies with incomplete information.

After screening, 552 listed companies in Shanghai stock market were selected as samples. Data source: wind database.

Modeling

The panel data model established in this chapter is the research test of the preventive motivation of cash holdings of listed companies.

The measurement model is as follows:

$$cash_{i,t} = \alpha + \beta_1 gsgm_{i,t} + \beta_2 xjll_{i,t} + \beta_3 tzjh_{i,t} + \beta_4 cwgg_{i,t} +$$

$$\beta_5 yhzw_{i,t} + \beta_6 xjgl_{i,t} + \mu_{i,t}$$

Among them, I is a sample, I is a listed company, the value is 1-552; t is the year, the value is 2014-2018; α is the intercept term, β_i is the regression coefficient, $\mu_{i,t}$ is the random error term.

3.3 Result Analysis

According to the comparison between the average value and the standard value, there are obvious differences between the cash holdings and the company size, cash flow volatility, investment opportunities, financial leverage, bank debt and other variables before 2006. These variables have certain representativeness. We can study the preventive motivation of cash holding of listed companies through the variables of company size, cash flow volatility, investment opportunities, financial leverage, bank debt and so on.

Table 6. (2014-2018)

Variable	Sample size	Minimum	Maximum	Average	Standard deviation
cash	2760	0.0098	0.9887	0.2756	0.1746
gsgm	2760	19.5056	27.3267	22.4365	1.1532
xjll	2760	0.0018	2.6076	0.1185	0.1546
tzjh	2760	0.7756	12.1232	1.5765	0.8976
cwgg	2760	0.0997	0.9786	0.5498	0.1697
yhzw	2760	0.0016	0.9065	0.4073	0.2087

IV. CONCLUSION AND SUGGESTION

4.1 Conclusion

The transactional motivation of cash holding refers to the cash held by enterprises to ensure the normal operation of enterprises. This is because when enterprises need cash to complete transactions, it is impossible to obtain them at any time. It is necessary to convert fixed assets into cash. If there is a shortage of cash, enterprises must borrow from banks in order to operate, and the cost of loans is very high. Therefore, it is necessary for enterprises to hold cash to avoid the cost of obtaining cash due to cash shortage.

The preventive motivation of cash holding refers to that enterprises hold cash in order to make timely payment in case of future emergencies, so as to avoid various potential risks and meet the investment needs of profitable projects in the future. Cash held out of preventive motivation can make enterprises meet the needs of future enterprise development process, and make enterprises seize favorable investment opportunities to enhance the value of enterprises when external financing difficulties or high costs.

Taking 552 listed companies in Shanghai Stock Exchange from 2014 to 2018 as samples, this paper empirically analyzes the trading motivation of cash holding of Listed Companies in China by using random effect model. The results show that there is a significant negative correlation between cash holdings and cash substitutes, and a significant positive correlation between cash holdings and trading volume, cash flow and dividend payment level.

Taking 552 listed companies in Shanghai Stock Exchange from 2014 to 2018 as samples, this paper empirically analyzes the preventive motivation of cash holding of Listed Companies in China by using fixed effect model. The results show that there is a significant negative correlation between cash holdings and bank debt, and a significant positive correlation between cash holdings and cash flow volatility, investment opportunities and financial leverage.

4.2 Suggestions

(1) Strengthen cash management and improve cash efficiency;

(2) Strengthen the incentive, supervision and restraint mechanism for managers;

(3) Strengthen the supervision of large shareholders;

(4) Improve the capital market and reduce the financing constraints of enterprises.

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Wang Qiuming, born on August 5, 1992, male, Han nationality, from Gao'an, Jiangxi Province, is now studying in Jiangsu University, majoring in statistics in the College of Finance and economics. Address: No.301, Xuefu Road, Zhenjiang City, Jiangsu Province, postcode: 212013, Tel: 18852898967, e-mail: 1179101448 @ qq.com