

Empirical Study on the Influencing Factors of Liquidity Risk in International Money Market Funds

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ABSTRACT

In the past two years, new funds issuance has been extremely hot, and the total scale of public offering funds has also increased significantly. Behind the extremely hot issuance of new funds, it also gave birth to a number of “hotstyle” funds. But at the same time, a number of “hotstyle” funds have also encountered a large number of redemption phenomenon, making a large number of young investors get the title of “leek zero”. This paper returns the quarterly data of 28 money market funds, analyzes the factors affecting money market fund liquidity risk, and obtains the relationship between each influencing factor and the liquidity risk of money market fund. Then it put forward the establishment of a liquidity monitoring and early warning mechanism for money market funds, strengthen the risk tips for investors and improve the subscription and redemption fees.

KEYWORDS

Money Market Funds; Liquidity Risk; Redemption

1. INTRODUCTION

Employing empirical research methods to explore the influencing factors of liquidity risk in China's money market funds holds significance both theoretically and practically. Firstly, from a theoretical perspective, against the backdrop of the current dual-cycle development strategy, the rapid development of money market funds promotes the flow of funds to the real economy, thereby facilitating industrial upgrading and playing a crucial role in promoting the development of inclusive finance. Furthermore, as one of the most important financial instruments in the money market, money market funds provide liquidity to the market and are key participants in its secondary market, activating trading activities. Therefore, the development of money market funds can promote the healthy growth of China's money market. Secondly, from a practical standpoint, studying the liquidity risk of money market funds enables investors to make rational judgments about monetary funds. This aids investors in reasonably analyzing the investment value of specific money market funds, leading to rational investment decisions. For fund managers, examining the liquidity risk of money market funds allows them to predict and assess fund redemption, enabling them to take preventive measures and thus promoting the healthy development of the market. For regulatory agencies, studying the liquidity risk of money market funds can provide guidance on how to respond to large-scale redemptions of these funds. It also promotes the formulation of relevant regulatory policies.

2. THE PRINCIPLE OF THE LIQUIDITY RISK OF MONEY MARKET FUNDS

2.1. Mismatch of Asset and Liability Terms

We all know that most of the mismatch between the asset and liability terms of investment portfolios can cause liquidity shortages, and in severe cases, may even lead to financial crises. For example, during the subprime crisis, the "run" on asset-backed commercial paper (ABCP) was triggered by the mismatch between the term of the securities side and the term of the asset side, leading to liquidity insufficiency due to the renewal risk, and further accelerating the spread of the financial crisis. The existence of such a time lag can trigger massive redemption of fund shares by money market funds, thereby triggering liquidity risk. This is why we include the residual maturity of the investment portfolio in the range of factors that affect the liquidity of money market funds.

2.2. The Channels for Assets to Obtain External Liquidity Are Limited

With the continuous development of the scale of money market funds, the types of assets invested by the funds are also constantly increasing, and some of these assets may not perform optimistically within the investment horizon. For example, some credit instruments have relatively limited access to external liquidity, primarily funded by their parent companies or shareholders. If market interest rates remain high for a prolonged period, money market funds may face systematic risks. Both the United States and China have experienced such difficulties, such as the Reserve Primary Fund in the United States in 2008 and the "Fuxi Bond" incident in China in 2006, which involved nine long-term bond funds. Due to their lack of strong liquidity, they suffered significant economic losses. Starting from this point, we consider including the institutional holding ratio in the scope of analysis.

3. RESEARCH DESIGN

3.1. Theoretical Hypothesis and Analysis

From the perspective of individual funds, the factors that affect the liquidity risk of money market funds include: the proportion held by institutional investors, establishment time, scale, background, fund yield, underestimation of redemption, etc.

Hypothesis 1: The higher the return of money market funds and the shorter the holding period of the asset portfolio, the lower the possibility of redemption is, and the lower the liquidity risk is; vice versa.

Hypothesis 2: The greater the asset value of money market funds, the lower the liquidity risk is; vice versa.

Hypothesis 3: The longer the cumulative establishment time of money market funds, the lower the liquidity risk is; vice versa.

Hypothesis 4: The structure of money market fund holders also affects their liquidity risk. The lower the overall holding rate of institutions, the lower the liquidity risk is; vice versa.

Hypothesis 5: The better the macroeconomic environment, the higher the growth of gross domestic product, the increase in money supply, the increase in inter-bank lending rates, and the lower the liquidity risk of money market funds; vice versa.

Hypothesis 6: The performance of the financial market, especially the stock market, also has an impact on the liquidity of money market funds. Generally speaking, the better the stock market performs, the greater the liquidity risk of money market funds due to substitution effects; conversely, the lower it is.

3.2. Variable Selection.

3.2.1. Selection of Liquidity Indicators for Money Market Funds

The proxy variable for the liquidity of money market funds selected in this article is the net redemption rate of fund shares (FLOW), which is calculated using the formula: $FLOW = (\text{purchases this period} - \text{redemptions this period}) / (\text{beginning fund shares} + \text{ending fund shares}) / 2$. A $FLOW > 0$ indicates net purchases, while a $FLOW < 0$ indicates net redemptions.

3.2.2. Selection of Influencing Factors.

Factors affecting the liquidity of individual money market funds: (1) Fund unit net worth yield (p): The net worth yield of money market funds. (2) Cumulative establishment time of the fund (lnT): The time span from the establishment of the money market fund to the statistical year, followed by taking the logarithm. (3) Remaining maturity of the fund investment portfolio (lnF): This article directly adopts the average maturity of the investment portfolio and takes the logarithm, rather than the method adopted by some scholars: multiplying the asset proportion by the average remaining maturity and then taking the logarithm. (4) Institutional holding ratio (I): The ratio of fund shares held by institutional investors to the total fund shares. (5) Fund size (lnASSET): The asset size of the fund, followed by taking the logarithm.

Factors affecting the entire money market fund: (1) Interbank offered rate (Shibor): Shanghai Interbank Offered Rate. (2) Economic growth rate (lnGDP): The growth rate of GDP. (3) Money supply (M2): The growth rate of M2. (4) Shanghai Stock Exchange Index (SZ): The year-on-year growth rate of the Shanghai Stock Exchange Index, reflecting the performance of China's stock market.

3.2.3. Model Establishment

$$FLOW = \alpha + \beta_1 P_{it} + \beta_2 \ln T_{it} + \beta_3 \ln F_{it} + \beta_4 I_{it} + \beta_5 \text{Shibor}_{it} + \beta_6 \ln \text{ASSET}_{it} + \beta_7 \text{GDP}_{it} + \beta_8 \text{SZ}_{it} + \beta_9 \text{M2}_{it} + \varepsilon_{it} \quad (1)$$

Within this model, i denotes a money market fund, t represents time (measured in quarters), β_n denotes coefficients ($n=1, 2, 3 \dots 9$), and ε represents the random error term.

4. EMPIRICAL TESTING

4.1. Descriptive Statistics.

As shown in Table 1, this is a descriptive statistics of the liquidity risk indicators and influencing factors of money market funds. Among them, the minimum value of the net redemption rate (FLOW) of money market funds is -1.2724029, indicating that a certain money market fund was redeemed by the majority within a quarter.

The maximum value of the fund's net return rate is 1.306%, and the minimum value is -0.3391%, indicating that different money market funds may have varying returns at different times or the same money market fund may have varying returns during different periods. The maximum value of institutional shareholding ratio (I) is 90.03%, and the minimum value is 0, indicating that there are money market funds specifically targeted at retail investors during a certain period, as well as money market funds with a higher institutional shareholding ratio. The standard deviations of both the Shanghai Stock Exchange Index growth rate (SZ) and the money supply growth rate (M2) are less than 0.15, indicating that these two indicators have relatively small fluctuations. During the statistical period, China's economic growth and stock market performance were relatively stable. The standard

deviation of GDP growth is 0.0051098, which also suggests that China's economy was relatively stable during the statistical period.

Table 1. Descriptive Statistics

	Mean	Standard Deviation	Maximum	Minimum	Observed Values
FLOW	0.11815	0.3156004	0.4965462	-1.2724029	392
Net Return Rate (P)	0.8051164	0.2180638	1.306	-0.3391	392
Cumulative Establishment Time (lnT)	7.044324	0.7196988	7.919356	5.220356	392
Remaining Maturity Period (lnF)	4.135748	0.5049666	4.89784	1.609438	392
Institutional Ownership Ratio (I)	0.1783729	0.2549914	0.9003	0	392
Interbank Offered Rate (Shibor)	0.0333996	0.0114715	0.06163	0.02355	392
Fund Company Size (lnASSET)	22.04185	1.925293	25.83889	17.7359	392
GDP	0.0699286	0.0051098	0.078	0.06	392
SSE Composite Index	0.0229921	0.2242829	0.57918	-0.3511064	392
Money Supply.	0.1097143	0.0235193	0.147	0.08	392

4.2. Stationarity Test

To prevent the occurrence of spurious regression, this paper also conducted a Levin-Lin-Chu test on the data of each variable. The test results are shown in Table 2. As can be seen from Table 2, each variable is significant at the 1% level, so we reject the null hypothesis of non-stationarity of the sequence, i.e., the data of each variable is stationary.

Table 2. Results of Stationarity Test

	Statistics	prob
FLOW	-8.5244	0.0000
p	-6.2584	0.0000
M2	-8.4284	0.0000
Shibor	-5.2458	0.0000
GDP	-3.4850	0.0002
SZ	-13.1023	0.0000
I	-4.9266	0.0000
lnASSET	-7.4438	0.0000
lnT	-10.3619	0.0000
lnF	-3.6898	0.0001

Regarding the influencing factors of individual funds, these five indicators mostly have a significant impact on money market funds. Specifically, the net return rate (P) has a significant impact on the liquidity risk of money market funds at the 1% level, with a regression coefficient of 0.260517. This means that for every 1% increase in the net asset return rate, the net subscription increases by 0.265017%. Therefore, there is an inverse relationship between the net asset return rate and liquidity risk of money market funds, which is consistent with Hypothesis 1 of this paper. lnF, lnT, and lnASSET represent the elasticity by taking the logarithm of the remaining maturity of the asset portfolio, the cumulative establishment days of the fund, and the asset size of the fund, respectively.

Their coefficients are 0.436058, -0.1503323, and 0.0181556, respectively. Among them, $\ln F$ is significant at the 1% level, indicating that the longer the holding period of the asset portfolio, the lower the net redemption rate of money market funds. In other words, there is a positive correlation between the remaining maturity of the asset portfolio and the liquidity risk of money market funds, which is consistent with Hypothesis 1 of this paper. $\ln A$ is significant at the 10% level, indicating that the larger the asset size of a money market fund, the lower its net redemption rate. In other words, there is a positive correlation between asset size and the liquidity risk of money market funds, which is consistent with Hypothesis 2 of this paper. However, $\ln T$ is not significant at the 10% level. The institutional shareholding ratio (I) is significant at the 5% level with a coefficient of 0.1381097. This means that under other constant conditions, for every 1% increase in institutional shareholding, there will be a 0.1381097% increase in net subscriptions to money market funds. In other words, there is a positive correlation between institutional shareholding ratio and the liquidity risk of money market funds, which is consistent with Hypothesis 4 of this paper.

Regarding the influencing factors of the money market fund overall, only the money supply ($M2$) does not show significance in terms of the liquidity risk of money market funds at the 1%, 5%, and 10% levels. Specifically, the Shanghai Stock Exchange Index (SZ) is significant at the 5% level with a coefficient of -0.357172. This indicates that when other conditions remain constant, for every 1% change in the SZ , the net redemption rate of the fund will change by 0.357172%, which is consistent with Hypothesis 6 of this paper. The Shanghai Interbank Offered Rate ($Shibor$) is also significant at the 5% level with a coefficient of -0.186974. This means that for every 1-point increase in $Shibor$, 18.6974% of money market funds will be redeemed. In other words, there is a positive correlation between the liquidity risk of money market funds and the interbank offered rate, which is inconsistent with Hypothesis 5 of this paper. One possible explanation is that when interest rates are higher, other financial products offer higher yields, leading investors to transfer funds away from money market funds. The coefficient for Gross Domestic Product (GDP) is 4.561849, indicating a positive correlation between GDP and the net redemption rate of money market funds. When GDP increases by 1%, the net redemption rate of money market funds increases by 4.561849%, which is consistent with Hypothesis 5 of this paper.

5. CONCLUSION AND SUGGESTIONS

5.1. Conclusion.

With the development of money market funds, more and more investors have entered the market, especially in recent years when many post-90s have become popular investors in money market funds. However, most post-90s lack relevant theoretical knowledge and are prone to losing their investment. Therefore, investors need to be rational and cannot only focus on the high returns of the funds but also pay attention to the risks involved.

5.2. Suggestions

5.2.1. Establish a liquidity monitoring and early warning mechanism for money market funds.

From the conclusion above, we know that the Shanghai Interbank Offered Rate ($Shibor$) and the Gross Domestic Product (GDP) have certain impacts on the liquidity of money market funds. Therefore, market regulators can set up indices based on these influencing factors, analyze the risk of money market funds, and prepare for a large amount of redemption accordingly.

5.2.2. Strengthen risk warnings to investors.

In recent years, money market funds have become a hot topic among the post-90s generation, and a large number of young investors have poured into money market funds. However, most investors

only blindly follow the trend and lack understanding of relevant risks. Therefore, fund companies and relevant third-party platforms selling money market funds should strengthen risk warnings to investors during the sale of funds, thereby reducing the "herd effect".

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