

Research on the Time-Varying Characteristics of Liquidity Risk in Asset Pricing

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Abstract: This paper systematically investigates the role of liquidity risk in asset pricing, its performance in different markets, time-varying characteristics, and interactive relationship with other risk factors. Significant differences between the developed and emerging markets are noted in this empirical research on liquidity risk premia. That is to say, within the financial turmoil period, liquidity risk from the emerging markets is more volatile and highly correlated with market risk and credit risk. These findings underline the necessity of including the liquidity risk factors within the asset pricing model and provide a theoretical support for investors to manage risks effectively in complex market environments.

Keywords: Liquidity Risk; Asset Pricing; Time-Varying Characteristics; Market Efficiency; Risk Management

1. Introduction

1.1 Research Background and Importance

During the modern day financial markets, liquidity risk cannot be left out as it has broad consequences to the pricing of assets. The development of the globalization of the capital market has been growing and so is its importance to market liquidity. Notably, with turbulent market conditions, the problem of liquidity might lead to systemic risks, which poses a challenge to market stability [1]. Liquidity risk is an important factor of asset prices [2], not only a derivative result of market volatility. Especially during financial crises, this impact is huge. It not only aggravates the fluctuation in asset prices but may also cause a change in the behavior of market participants, further influencing the mechanism of price formation of assets [3]. One of the recent hot topics in financial research is the time-varying characteristics of

the liquidity risk. Performance differences of liquidity in different periods may be highly linked to a lot of factors such as macroeconomic conditions, market structure, and investor behavior. This time-varying characteristic makes liquidity risk difficult to foretell and control, thereby more uncertainty to asset pricing [4]. Given the complexity and importance of liquidity risk, deep research into its time-varying characteristics in asset pricing will not only help understand price formation mechanisms in markets but also provide a useful reference for investors and policymakers to better cope with market fluctuations and crises.

1.2 Research Objectives

That is, it is systematic research focusing on the time-variant characteristics of liquidity risk in asset pricing by analyzing its long-term and short-term impact on asset prices. That is, it sorts out the existing literature, reviews the performance difference of liquidity risk in different market environments, and explores how the liquidity risk in fact does affect the pricing of assets. The study attempts to disclose the role of liquidity risk in affecting the fluctuation of asset prices along with time, analyze the possible reasons for its time-varying characteristic, and its meaning to investment decisions. Therefore, the final goal of this research is to provide theoretical support to understand the role of liquidity risk in financial markets and give practical guidance to investors in managing liquidity risks in actual operations.

2. Concept and Theoretical Basis of Liquidity Risk

2.1 Definition and Classification of Liquidity Risk

Liquidity risk is the possible inability to buy or sell an asset quickly enough without significantly moving the price of the respective

asset. It falls under two major types: market liquidity and financing liquidity risk. Market liquidity risk refers to the inability to trade assets at expected prices due to changes in market conditions, and financing liquidity risk refers to the inability to obtain adequate financial support in time due to rising financing costs or shrinking financing channels. Moreover, it can be further divided with regard to frequency and degree of occurrence into onsite and offsite liquidity risks. For instance, some researchers divide the liquidity risk into systemic liquidity risk and non-systemic liquidity risk. The former is caused by the general shortage in market liquidity, while the latter is usually caused by certain specific liquidity problems of individual assets [6]. The multi-dimensional nature of this risk makes its impact on the financial market extremely complex and exhibits significant time-varying characteristics under different market environments.

2.2 Factors Affecting Liquidity Risk

Factors affecting liquidity risk are complex and run across several dimensions, from the macroeconomic environment and market microstructure to investor behavior. One of the key factors affecting liquidity risk is the macroeconomic environment. It can be noted that when the economy falls into recession, its liquidity appears to drop significantly, and hence investors tend to prefer cash holding rather than assets, which finally increases the market liquidity risk. Another key factor affecting liquidity risk is market microstructure [7]. Market microstructure also has an important impact on liquidity risk. For example, factors such as market depth, transaction costs, and transaction frequency directly affect the liquidity level of assets. In addition, investors' risk preferences and behaviors are also key factors. Especially when market volatility intensifies, investors tend to withdraw funds quickly, which further exacerbates liquidity risk [8]. Studies have shown that market liquidity is highly correlated with investors' trading behavior. Investors' emotional fluctuations, especially in panic selling, can lead to liquidity depletion [9]. Therefore, the management of liquidity risk needs to comprehensively consider the interactive effects of the above multiple

factors.

2.3 Overview of Liquidity Risk and Asset Pricing Theory

The pricing of assets in reference to liquidity risk is considered among the most discussed issues in recent years, essentially in a complex financial market environment. According to recent studies, the presence of liquidity risk in the pricing relationship can be justified by the factor of liquidity premiums, which refer to the requirement for additional returns to compensate for the risk of holding an asset which is not easily tradable [10]. For example, the CAPM has traditionally been extended to tackle liquidity risk factors into the LCAPM, rendering it an enhanced approach to asset pricing since it incorporates the liquidity risk premium. Some studies have shown that this has been important, more so during periods of market turmoil, than many other factors, thereby showing the sensitivity to liquidity risk by market participants [11]. It is therefore of utmost importance to clarify time-varying characteristics in liquidity risk along with the effect on asset pricing in order to effectively formulate investment strategies and measures for risk management [12].

3. The role of Liquidity Risk in Asset Pricing

3.1 Liquidity Risk and Market Efficiency

In particular, liquidity risk is the major determinant of market efficiency, more so during market stress. If a market is illiquid, trading its assets will always be challenging without moving their prices significantly in either direction, thereby lowering efficiency. This happens mostly in times of high market volatility or financial crisis, where the lack of liquidity restricts the price discovery mechanism and, therefore, the market price does not accurately reflect the value of assets [13]. Studies have determined that with an increase in liquidity risk, usually there will be an upward movement in transaction costs and a downward move in trading volume. These, coupled with the turbulent periods where this market inefficiency is even more palpable, affect the decisions of the investors and the stability of the market in general.

3.2 The Impact of Liquidity Risk on Asset

Returns

Liquidity risk is one of the important factors affecting asset returns. High liquidity risk usually leads to an increase in asset returns because investors demand higher returns to compensate for the liquidity risk they bear. Assets with insufficient liquidity, especially during periods of market instability, tend to exhibit higher volatility and risk premiums[14]. Therefore, the liquidity level of an asset directly affects its expected return, especially when facing market shocks, the impact of liquidity risk on returns is more significant. This shows that it is crucial to consider liquidity risk factors in asset pricing models to ensure the accuracy of return forecasts.

3.3 Manifestations of Liquidity Risk Premium

Liquidity risk premium is the extra return that an investor is willing to give for bearing liquidity risk. Some of the ways it shows are as widening of spreads or increasing costs of market shocks, which tend to be considerably on the upside during relatively high market volatility or crisis times when the premia rise[15]. The liquidity premium can be different conditional on trading frequency and liquidity conditions in the market across various classes of assets. That said, the knowledge of how liquidity risk premium manifests is an important element in making asset allocation and risk management decisions.

4. Time-Varying Characteristics of Liquidity Risk

4.1 Time Variability of Liquidity Risk

Time variability of liquidity risk would represent fluctuations and the development of liquidity risk over the given time periods. This variability is generally affected by market conditions, investor preferences and macroeconomic factors. For example, market liquidity is usually high during an economic upturn, while such liquidity risk becomes high during economic downturn or financial crisis [15]. This path variability puts higher demands on the risk management of investors, who are already facing an enormous market change, and this needs an immediate change toward the way of coping with the fluctuation of liquidity risk through changes in investment

strategy. It is important for asset allocation and risk hedging to have knowledge about the time-variability in the liquidity risk.

4.2 The Impact of Macroeconomic Environment on the Time Variability of Liquidity Risk

This is undoubtedly the case with respect to time variability of liquidity risk, which is importantly influenced by the macroeconomic environment. For example, shifts in the general level of interest rates, inflation rates, and economic growth rates will directly impact market liquidity. In an environment of rising interest rates, financing costs are higher, market liquidity may dry up, and liquidity risk therefore rises. At that time, macroeconomic uncertainty could add to liquidity risk volatility by reducing confidence among market participants, thereby impacting the overall level of market liquidity. Therefore, during asset allocation decisions, investors must focus on the potential impact resulting from changes in the macroeconomic environment on liquidity risk [16].

4.3 The Dynamic Relationship Between Market Events and Liquidity Risk

Market events — financial crises, changes in policies, or geopolitical conflicts — may most of the time hugely influence the dynamic relationship between liquidity risk. If major market events do occur, investors may alter their portfolios at a very fast pace; such alteration then results in changes in liquidity from the market, resulting in drastic changes. For example, the global financial crisis in 2008 witnessed the huge drop in market liquidity and correspondingly huge surge in liquidity risk. These events changed the liquidity conditions within the market, affecting its price formation mechanism of assets and increasing market uncertainty. One can understand how these market events relate dynamically to liquidity risk in a bid to come up with more effective investment strategies when uncertainty rises. Figure 1: The diagram shows how the occurrence of market events may lead to higher market uncertainty, which, in turn, affects investor behavior and further induces liquidity risk. The heightened liquidity risk is manifested in terms of the widening bid-ask spreads and the decrease in trading

volume. All these factors ultimately contribute to increased volatility in asset prices [17].

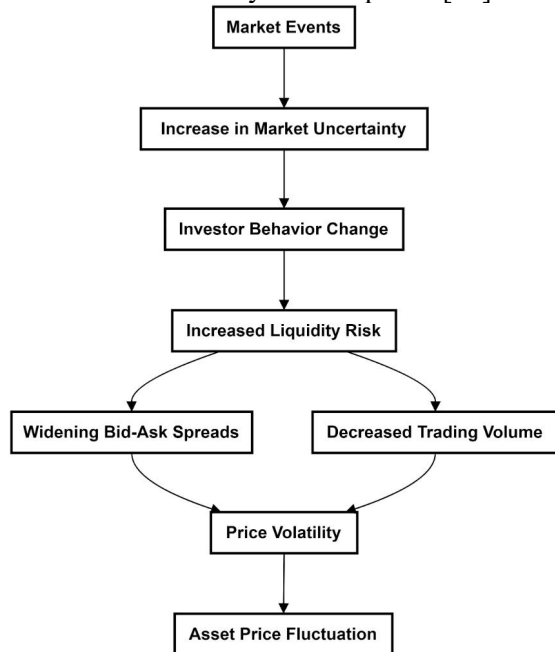


Figure 1. The Dynamic Relationship Between Market Events and Liquidity Risk

5. Empirical Research on Liquidity Risk in Asset Pricing

5.1 Overview of Existing Research Results

Over the last ten years, many empirical research results on the liquidity risk impact on asset pricing were compiled. Empirical research has indeed long recognized that liquidity risk may be an important determinant for asset prices, especially in periods where market volatility is high or during a financial crisis. Guided by the general idea of an extended capital asset pricing model, researchers introduced liquidity factors to better explain changes in asset prices. These findings also show that, in turbulent markets, there is an explicit case of premiums for liquidity: the investor requires higher returns to compensate him against probable risks when there is high liquidity risk.

5.2 Research on Liquidity Risk in Different Markets

Liquidity risk behaves differently in different markets. In developed markets (such as North America), liquidity risk is generally low and relatively stable, while in emerging markets (such as Asia Pacific), liquidity risk is more significant and volatile. This difference is

mainly due to differences in market depth, investor structure, and trading mechanisms. Figure 1 shows a comparison of liquidity risk in the North American and Asia Pacific markets.

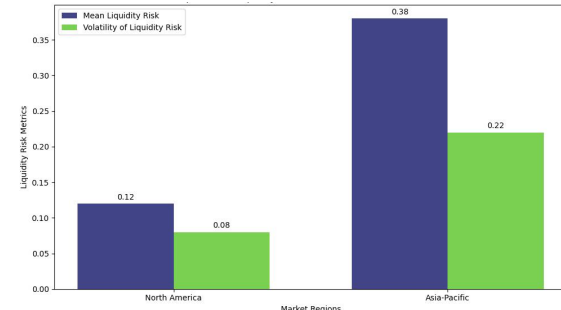


Figure 2. Mean Liquidity Risk in the North American and Asia Pacific Markets

Figure 2 shows the mean and volatility of liquidity risk in the North American and Asia-Pacific markets. The data is based on daily trading volume and spread volatility statistics from 800 listed companies in the two regions between 2010 and 2020. It can be seen that the liquidity risk in the Asia-Pacific region is significantly higher than that in North America, and the volatility is greater, reflecting the vulnerability of emerging markets in dealing with economic uncertainty.

5.3 Interaction Between Liquidity Risk and other Risk Factors

The interaction between liquidity risk and other risk factors such as market risk and credit risk is complex and has important pricing significance. In developed markets, the correlation between liquidity risk and market risk is usually high, while in emerging markets, liquidity risk is not only highly correlated with market risk, but also shows a stronger interaction with credit risk. The correlation between liquidity risk and other risk factors in these two markets is shown in Figure 3.

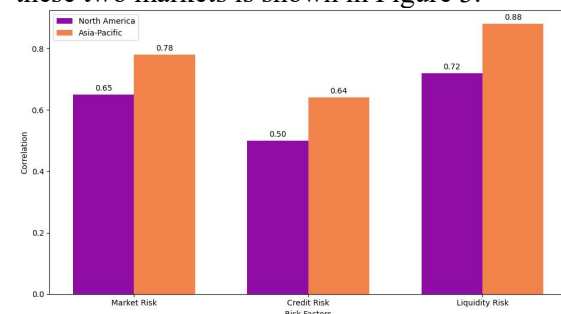


Figure 3. Correlation Between Liquidity Risk and Other Risk Factors in the Two Markets

6. Conclusion

This paper systematically explores the role of liquidity risk in asset pricing and analyzes its time-varying characteristics and its interactive relationship with other risk factors. Through empirical research on different markets, this paper reveals significant differences in liquidity risk between developed and emerging markets, especially in the context of increased market volatility and economic uncertainty, where liquidity risk in emerging markets is more prominent. In addition, this paper further explores the interactive relationship between liquidity risk and market risk and credit risk, and finds that liquidity risk usually amplifies the impact of other risk factors during market turmoil, thereby producing a greater volatility effect on asset prices. These findings emphasize the necessity of incorporating liquidity risk factors into asset pricing models, which helps to improve the prediction accuracy of asset returns and the scientific nature of investment decisions.

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