Dear anonymous referee,

Thank you very much for giving us the chance of revision. As you suggest, we believe that this paper has a potential and contributes to the existing literature. Temporarily, we answer for the comments. After the editor makes a revision decision, we will fully reflect all of your comments in our revised version.

## Comments 1

*The paper sheds light on the role of funding liquidity of financial institutions in a distressed market and provides a valuable alternative in explaining the investment behavior of financial institutions in a distressed market. The idea in the present paper is similar to the one in DeLong et al. (1990). Namely, an informed investor might be forced to liquidate at disadvantageous prices - that is before prices recover from some shock - and uninformed investors (noise traders) potentially further depress the price.*

## Answer 1

DeLong et al. (1990) analyzed the effects of uninformed noise traders on informed traders' behavior and financial markets. However, in addition to the uninformed trader, this paper studies the price destabilizing of the financial market by analyzing the effects of market liquidity risk and funding liquidity risk.

## Comments 2

*In Finance, an arbitrage opportunity does not require any net investment. This stands in sharp contrast to the financial institution's investment policy in the present paper. I suggest to talk about an informational rent instead of arbitrage profits as the financial institution knows that the depressed price will recover to the fundamental value for sure. Note that the greater the negative shock to the price is the higher is the informational rent to be earned.*

## Answer 2

Shleifer and Vishny (1997) refer to arbitrage as follows.

"Textbook arbitrage in financial markets requires no capital and entails no risk. In reality, almost all arbitrage requires capital, and is typically risky… professional arbitrage has a number of interesting implications for security pricing, including the possibility that arbitrage becomes ineffective in extreme circumstances, when prices diverge far from fundamental values."

This paper introduces the concept of arbitrage in the above context, and other studies (Liu and Longstaff (2004), Liu and Mello (2011), Lewellen (2011)) also use the same concept of arbitrage.

As Referee mentions, I agree that the driver of arbitrage profit in this paper is the informational advantage and therefore arbitrage profit can be regarded as informational rent. However, we believe that it is appropriate to use arbitrage because we developed the analysis with focus on

arbitrage opportunities and price destabilization.

**Comments 3**

*In my view, the relevant driver of the results is not liquidity risk per se but the restriction that the financial institution is unable to borrow funds upon realizing the cash outflow \theta.*

**Answer 3**

As Referee pointed out, some may have access to resources and may be able to invest more when prices diverge further from fundamentals. In general, however, institutional investors are difficult to borrow by credit rationing in situations of market decline or large fund outflows. Brunnermeier and Pedersen (2009) state that, in extreme situations, liquidity spirals could arise when marginal calls forced to sell assets held by financial institutions. As we have witnessed in 2008, the government has eventually bail out financial institutions by credit crunch.

This paper attempted to analyze the situation of market decline such as the financial crisis, so borrowing was as not considered. However, as Diamond and Dybvig (1983) describe the cause of credit rationing as liquidity risk, liquidity risk can be thought of in a broad sense including credit rationing. Accordingly, if we look at funding liquidity as net fund flows (= fund inflows - fund outflows), we can also include the concept of borrowing (fund inflows). However, as our research focuses on liquidity risk due to fund outflows, extension of the existing model will be required for credit rationing analysis.

**Comments 4**

*The authors assume some deterministic price process.*

**Answer 4**

The price process is not deterministic because theta is assumed a uniform distribution. So, the asset price at time2 is stochastically determined by theta. Even if institution chooses mu at time1 to maximize the expected value of profit, the realized profit is stochastically determined.

**Comments 5**

*The authors discuss market stability in section 3.2. I disagree strongly. Nothing is said about whether the price recovers more quickly due to the financial institution's investment. The resiliency of the price is exogenous to the model. After the negative shock at date t=1 the financial institution knows that the price will recover at date t=3. This is independent of the financial institution's investment.*

**Answer 5**

If there are multiple institutional investors in the market and only a few institutions experience liquidity risk, other institutions will increase the size of investments and market prices will not diverge from the fundamental. However, if many institutional investors invest in a direction

opposite to the fundamental price and many suffer from lack of liquidity, the price at time2 will fall sharply. We hypothesize that only one institutional investor exists and we consider market destabilization as the situation in which prices deviate from fundamental value. Referee sees market stability as a concept of time, but this paper defines market stability as the degree of destabilization in fundamentals. The concept is also used in other papers (Brunnermeier and Pedersen (2009), Shleifer and Vishny (1994), and De Long et al. (1990)). Among them, Brunnermeier and Pedersen (2009) describe the relationship between speculator and market destabilization as follows.

"The system is also destabilized if speculators lose money on their previous position as prices move away from fundamentals."

## Comments 6

*The authors argue along (7) that the funding liquidity f and the shock s are symmetric. Mathematically, this is true. However, as can be seen from figure 4, there are values of s which do not yield an equilibrium for the corresponding f value. Thus, economically both variables definitely are not symmetric.*

## Answer 6

As referee mentions, there are areas that are not defined in a particular s, and s and f are not 'perfectly' symmetric. But the reason we have referred to it as symmetric is because s and f have a similar effect on institutional investors' decisions.

## Reference

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Liu, J., & Longstaff, F. A. (2004). Losing money on arbitrage: Optimal dynamic portfolio choice in markets with arbitrage opportunities. *Review of Financial Studies*, 17(3), 611-641.

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