

Regulating liquidity risk in mutual funds



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I analyze the effects of liquidity risk regulation in a model of investors, mutual funds, and the underlying asset market. Investor redemptions lead mutual funds to sell assets, which may result in fire sales if market liquidity, driven by the anticipation of fire sales, is scarce. Mutual funds optimally choose to pass fire sales of their assets on to investors. Pecuniary externalities make liquidity supply to the underlying asset market inefficiently low. Regulatory policies, liquidity requirements for mutual funds, and redemption gates have adverse effects on liquidity provision to the asset market and may increase the incidence of fire sales.

Globally more than USD30 trillion in assets are held in open-ended mutual funds that offer short-term redemptions while investing in longer-dated and potentially illiquid assets such as corporate bonds. After the Covid-19 pandemic put severe pressure on the industry, the Federal Reserve Board called for structural reforms based on the assessment that "fixed-income mutual funds continue to be vulnerable to large, sudden redemptions, and sizable outflows can still lead to a deterioration in market liquidity of underlying assets" (Federal Reserve Board 2020). This quote reflects an ongoing debate between academics and policy makers about the financial stability implications of illiquid mutual funds and the effects of regulatory interventions.

While there is mounting empirical evidence showing that mutual funds holding illiquid assets can induce fragility in underlying asset markets (Jiang et al. 2020), in a recent paper (Cucic 2021), I propose a theoretical model of the connection between investor redemptions in mutual funds, fire sales, and asset market liquidity. The theoretical framework allows analyzing the equilibrium effects of two regulatory reform proposals, namely liquidity requirements for mutual funds and redemption gates. Specifically, I show that regulatory policies reducing the need for asset (fire) sales by mutual funds have negative effects on liquidity supply to the underlying asset market. This adverse general equilibrium response to regulation may be sufficiently strong to result in a decline in asset market liquidity and an increased likelihood of fire sales.

Investor redemptions, fire sales, and market liquidity

To analyze the links between investor redemptions, asset (fire) sales by mutual funds, and market liquidity, I model mutual funds investing in risky assets, for example, a corporate bond portfolio, on behalf of their investors. When investors gain access to alternative investment opportunities, they choose to redeem some of their mutual fund shares. Mutual funds accommodate redemptions by selling some of their risky asset holdings to specialized liquidity providers such as hedge funds. I assume that liquidity providers can finance their risky asset purchases only with liquid assets ("cash") in their portfolio, which they determine at an earlier date. Liquidity providers' ex-ante choice of how much cash to hold is driven by their anticipation of using it to purchase undervalued assets from mutual funds in fire sales.

In the competitive equilibrium, the risky asset may trade at fundamental prices or fire sales. Fire sales occur when liquidity providers lack the liquid funds to purchase the risky asset at its fundamental value, leading to a tight link between market liquidity and asset prices as in Allen and Gale (1994). Mutual funds' share price reflects the market value of their asset holdings, that is, the funds mark their shares to market. I show that market liquidity is inefficiently low in the competitive equilibrium, which leads to an increased likelihood of fire sales.

The inefficient supply of liquidity is due to a pecuniary externality that is driven by the assumption of market incompleteness: since liquidity providers can finance risky asset purchases only with their cash holdings, mutual funds' revenues from asset sales to pay redeeming investors are constrained by the available market liquidity. Liquidity providers fail to internalize the impact of their cash holdings on asset prices and ultimately on the payout to redeeming investors.

Regulating liquidity risk in mutual funds

I analyze the potential of two popular policy proposals to mitigate liquidity risk in mutual funds: first, a liquidity requirement that leads mutual funds to hold liquid assets in their portfolio, and second, a redemption gate that restricts investor redemptions during times of market turmoil. For a given level of asset market liquidity, the direct effect of both policies is to reduce the need for asset sales by mutual funds. This reduces the likelihood of

fire sales, which in turn lowers liquidity providers' expected returns to holding cash ex-ante. The indirect effect of both policies is thus a decrease in liquidity supply to the asset market.

The net effect of both policies is determined by the relative strength of their direct and indirect effects. Since redemption gates insulate mutual funds from the most severe fire sales, when returns to liquidity providers' cash holdings are highest, they result in an equilibrium with lower market liquidity and a higher incidence of fire sales. By contrast, liquidity requirements help to avoid only small fire sale periods, which leaves sufficient incentives for liquidity providers to hold cash. As a result, market liquidity increases and the likelihood of fire sales declines.

Figure 1: Equilibrium effects of a liquidity requirement

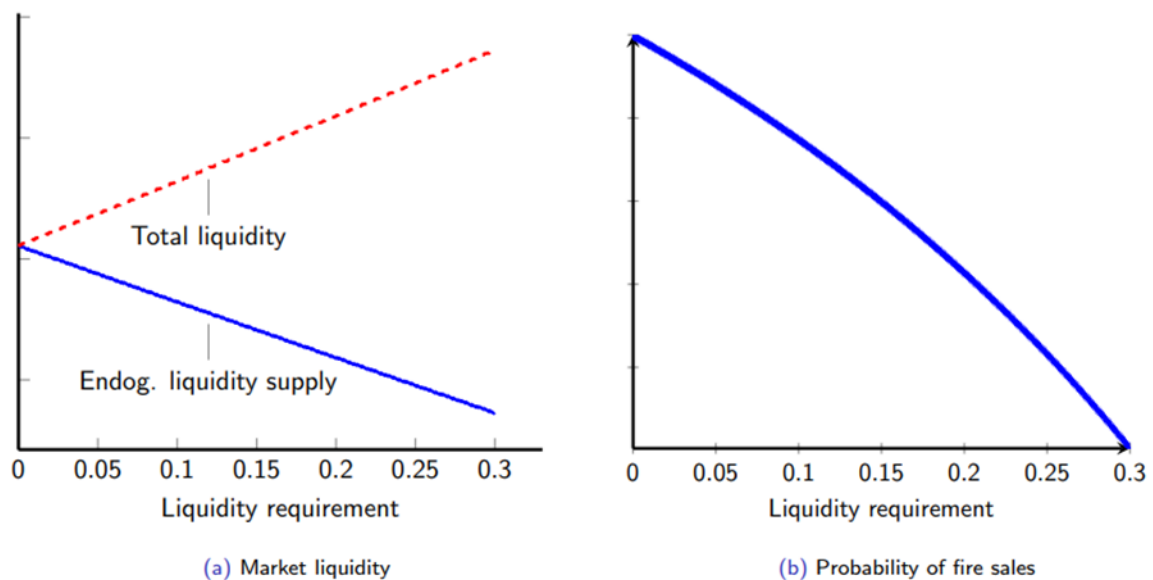


Figure 1 illustrates the direct and indirect effects of a liquidity requirement for mutual funds. Panel (a) shows how increasing the liquidity requirement affects endogenous liquidity supply to the asset market (blue, solid line) and total market liquidity (red, dashed line), which accounts for both the endogenous liquidity supply and liquid assets held by mutual funds. An increase in the liquidity requirement reduces liquidity supply to the asset market (the indirect effect of regulation). Importantly, however, total market liquidity increases as mutual funds' liquidity buffer more than offsets the reduction in liquidity supply. Panel (b) shows that, as a consequence of the increase in market liquidity, the ex-ante probability of fire sales decreases as liquidity regulation tightens.

The positive net effect of liquidity requirements raises the question whether mutual funds would build up adequate liquidity buffers absent a regulatory policy mandate. To address this question, I study an extension of the model in which mutual funds invest their collected funds in a portfolio of the risky asset and cash. Mutual funds' cash holdings reduce the need for asset (fire) sales in the face of redemptions but come at the cost of foregone returns from investing more in the risky asset. Interestingly, I show that in the presence of incomplete markets, mutual funds' endogenous liquidity buffers are inefficiently small. This result further strengthens the case for liquidity requirements for mutual funds.

Conclusion

This paper contributes to the ongoing debate about structural reforms to address liquidity risk in the mutual fund industry. The theoretical framework it develops can help policy makers assess the impact of various regulatory reform proposals. The results highlight that regulators must account for the reforms' impact on liquidity in the underlying asset markets. Failing to do so may result in ill-designed policies that worsen the impact of liquidity risk in the mutual fund industry. ■

References

- Allen, Franklin, and Douglas Gale. 1994. "Limited Market Participation and Volatility of Asset Prices." *American Economic Review* 84 (4): 933–955.
- Cucic, Dominic. 2021. "[Regulating Liquidity Risk in Mutual Funds](#)." Danmarks Nationalbank Working Paper No. 171.
- Jiang, H., Li, Y., Sun, Z. and Wang, A., 2020. Does Mutual Fund Illiquidity Introduce Fragility into Asset Prices? Evidence from the Corporate Bond Market. August 25, 2020.
- Federal Reserve Board. 2020. "Financial Stability Report." November.

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