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The Basel III net stable funding ratio adjustment speed and systemic risk

Kim Cuong Ly*, Zhizhen Chen, Senyu Wang, Yuxiang Jiang[1]

Adam Smith Business School, University of Glasgow, United Kingdom

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ABSTRACT

The theory on the timing of liquidity trades highlights two contrasting rational expectations equilibria for the liquidity adjustment speed effect, namely an immediate-trading equilibrium (trade at the onset of the liquidity shock) and a delayed-trading equilibrium (trade at the last resort). Using a partial adjustment model and an annual data sample of US bank holding companies from 1991 to 2012, we investigate the effect of Net Stable Funding Ratio (NSFR) adjustment speeds on systemic risk. We find that banks with the immediate-trading equilibrium tend to adjust the NSFR quickly in response to the Basel III liquidity requirement, thereby, reducing systemic risk. With the same level of the NSFR, our findings suggest that only the adjustment speed exerts a negative impact on systemic risk. Our evidence shows that small banks strengthen the effects of the negative impact of the NSFR adjustment speed on systemic risk. Our study sheds light on a real-time indicator of the NSFR for Basel III revisions before its implementation in 2018.

1. Introduction

Liquidity pressure is the first overt sign of a banking crisis and has become a serious concern since the 2007–2009 financial crisis. In the post-crisis revisions, known as Basel III, the Basel Committee on Banking Supervision (BCBS 2013) introduced a quantity-based liquidity standard, Net Stable Funding Ratio (NSFR), to strengthen bank liquidity risk management practices. This represents a starting point to quantify individual banks' market-implied vulnerability to system-wide funding constraints during the period of stress. Faced with the new prudential standard, an open question that has recently been asked concerns whether the adjustment frictions of the NSFR affect systemic risk? Since the liquidity problem has escalated all systemic crises (Jobst 2014), such a liquidity change should be reflected in each bank's adjustment speeds relative to the increase in stable funding in response to systemic liquidity risk. However, to the best of our knowledge, this specific issue has not been formally investigated to date. Our paper therefore draws attention to the market-based evaluation of the riskiness of the whole banking system by using a measure of dynamic exposure via a risk-adjusted value − the NSFR.

It is important to study the effect of the adjustment speed of the NSFR on systemic risk. First, the 2007–2009 financial crisis is a concrete evidence since banks across countries suffered liquidity shortages due to the dislocation of wholesale bank funding markets, and thus a total meltdown of the financial system (Acharya and Merrouche 2012; Billio et al., 2012; Afonso

* Corresponding author at: Adam Smith Business School, University of Glasgow, University Avenue, Glasgow, G12 8QQ, United Kingdom. Tel.: +44 (0) 141 330 7797.
E-mail addresses: k.ly.1@research.gla.ac.uk (K.C. Ly), z.chen.2@research.gla.ac.uk (Z. Chen), s.wang.1@research.gla.ac.uk (S. Wang), y.jiang.1@research.gla.ac.uk (Y. Jiang).

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et al., 2011; Huang and Ratnovski 2011; Brunnermeier and Pedersen 2009). Hence, acknowledging how the new liquidity standard influences systemic risk is important in the Basel III reform process. Second, Basel III evaluates banks' long-term liquidity using the NSFR (Distinguin et al., 2013; Yan et al., 2012). The traditional liquidity requirement for individual bank does not work as systemic stability; however, the reaction of banks is a real response to policy makers.

Our paper departs from the intersection of two literatures on liquidity risk management. The first departure is the definition of the NSFR. King (2013) defines the NSFR as the ratio of the available amount of stable funding (ASF) divided by the required amount of stable funding (RSF). If the RSF is higher than the ASF, it implies that banks are exposed to the risk of selling assets at fire sale prices to repay the liabilities claim on demand. The NSFR is assessed according to market prices to generate a time-varying measure of funding risk and only excessive maturity mismatches indicates regulatory implications for the social costs of system-wide constraints in stress periods (Jobst 2014). The more the potential funding constraints are projected by a declining NSFR, the larger the expected losses from liquidity risk will be (Jobst 2014).

The second departure is the likelihood of falling below the boundary of the NSFR conditions on the individual funding choice and bank's experiencing of a liquidity shortage due to a common funding shock (Jobst and Gray 2013). Countervailing arguments challenge the view that when all banks face the same deterioration of stable funding, the way in which an individual bank treats the risk of selling assets at fire sales prices to repay the liabilities claim on demand has an impact on the degree of systemic risk.

Our hypotheses are put forward by the novel theory on the timing of liquidity trades introduced by Bolton et al. (2011) in terms of two rational scenarios, namely the immediate-trading equilibrium (trade at the onset of the liquidity shock) versus the delayed-trading equilibrium (trade at the last resort). In times of stress, banks face the choice between liquidating early before adverse selection problems and riding out the crisis at more depressed prices. In the immediate-trading equilibrium, higher future lemon problems cause an acceleration of trade (Akerlof 1970). Dornbusch (1991) argues that the higher the cost of failure is, the greater the incentives for rapid adjustment should be. If banks could adjust the funding risk quickly to reduce their individual expected losses, the joint probability of all banks experiencing a liquidity shortfall simultaneously will decline, hence reducing the systemic risk (Jobst 2014). Altogether, we propose the first hypothesis that banks with an immediate-trading equilibrium tend to adjust the NSFR quickly; therefore, the systemic risk can be reduced.

An opposite view, modelled by Bolton et al. (2011), shows that worssening asymmetric information leads to an increase in the cost of outside liquidity. Brunnermeier and Pedersen (2009) argue that a liquidity shock raises the expectation about the future volatility, therefore lowering the market liquidity. When the funding condition is tight, banks become more reluctant to take on positions. In other words, Bolton et al. (2011) emphasize that when the adverse selection problem becomes severe, the delayed-trading equilibrium occurs. When the market liquidity and lemon problems are highly sensitive to the change in the funding condition, liquidity spirals will ruin the stability of the system (Brunnermeier and Pedersen 2009). Therefore, we posit the second hypothesis that banks with the delayed-trading equilibrium tend to be reluctant to respond to an increased cost of funding, resulting in increased systemic risk.

A partial adjustment model has hence attracted considerable attention from the studies on the nature of the adjustment process (Flannery and Rangan 2006; Leary and Roberts 2005; Hovakimian et al., 2001). However, this model has been significantly employed in the capital structure rather than the liquidity structure, leaving it largely unexplored in the bank liquidity literature. In this paper, we attempt to adapt this decent dynamic model to fill the gap and provide some novel empirical results about the impact of banks' liquidity adjustments on systemic risk.

Our data are obtained from two sources. The bank holding company (BHC) data are collected annually from the FRY-9 reports over the period from 1991 to 2012. The stock prices data come from the Center for Research in Security Prices (CRSP). We find that when banks adjust their liquidity promptly to comply with the new Basel III regulation, the systemic risk underlying the whole financial system is significantly undermined. Our finding shows that banks tend to adopt an immediate-trading equilibrium in response to the Basel III reform on the NSFR, therefore, reducing systemic risk, consistent with our first hypothesis. In the immediate-trading equilibrium, greater future lemon problems cause an acceleration of trade (Akerlof 1970). This is in line with our hypothesis suggesting that if banks adjust their funding risk quickly to reduce their individual expected losses, the joint probability of all banks experiencing a liquidity shortfall simultaneously will decline, hence reducing the systemic risk. Therefore, the long term benefit of combined actions leads to a more stabilized financial system and lower systemic risk. With the same level of the NSFR, our findings suggest that only the adjustment speed exerts a negative impact on systemic risk. Our evidence shows that small banks strengthen the effects of the negative impact of NSFR adjustment speed on systemic risk.

This paper is written at a time of significant Basel III reform of liquidity; therefore, it makes several contributions. First, we are the first to employ a partial-adjustment model of the NSFR in Basel III and we add more evidence to the literature on the adjustment speeds model (Flannery and Rangan 2006; Leary and Roberts 2005; Hovakimian et al., 2001). Second, this paper contributes to our knowledge of how banks react to the NSFR requirement and its impact on systemic risk. From the theoretical point of view, our paper complements the work of Brunnermeier and Pedersen (2009) in that the delay regime reinforces the liquidity spirals, leading to higher systemic risk. As documented in Ratnovski (2013) study, which states that liquidity buffers and information asymmetry are strategic substitutes in liquidity management, our paper puts forward more evidence that banks tend to be in favour of building liquidity as quickly as possible to negate the cost of information asymmetry in the midst of squeezed funding markets.

Third, Jobst (2014) suggests that the current proposed liquidity standard of the NSFR in Basel III will be not able to determine the potential liquidity shortfall in time of stress. Using our results for BHCs in the US, we raised the interesting