Systemic liquidity and macroprudential supervision

Synopsis of the 2nd Macroprudential Supervision Workshop in Vienna

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This article presents a synopsis of a workshop on systemic liquidity and macroprudential supervision held at the Oesterreichische Nationalbank on October 28, 2015. We introduce the concept of systemic liquidity and argue that it can be a driving force of systemic risk. Systemic liquidity is shown to be endogenous and cyclical, and to reflect the interaction between banks, other financial intermediaries and financial markets. We then summarize the main conclusions from the individual contributions to the workshop. Finally, we present key questions to be addressed when developing a macroprudential policy to contain systemic liquidity risk.

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1 The concept of systemic liquidity

Systemic liquidity may be characterized by four defining features (for more details, see Van Lelyveld et al., forthcoming).

First, systemic liquidity is an endogenous concept, as the liquidity of assets is determined by the state of the financial system. In technical terms, it is not a time- and state-invariant function of a particular asset, but a function of the leverage of the issuer, the risk tolerance of market participants, and the overall macroeconomic and financial environment.

Second, in the upswing of the financial cycle, the financial sector is subject to an illusion of systemic liquidity. In this phase, investors regard most assets as highly liquid because contractual maturities are relatively short and bid-ask spreads are narrow. At the same time, the issuers of these very same assets view their access to funding via these instruments as stable, as reflected in (temporarily) high roll-over rates. In essence, the liquidity illusion affects both sides of financial institutions' balance sheets, as behavioral maturities are much longer than contractual maturities – at least for as long as the upturn lasts.

Third, systemic liquidity is driven by interconnectivity – within the banking sector, between banks and nonbank financial intermediaries (such as money market and hedge funds), and between financial institutions and financial markets (Shin, 2010; ECB, 2015). This interdependence within the financial system amplifies booms and busts, transforming liquidity into a systemic phenomenon (Gorton and Metrick, 2012). It leads to increasing "liquidity leverage," as a shrinking share of truly stable liabilities finances an increasing share of truly illiquid assets. As liquidity leverage rises across the financial system, systemic liquidity risk does so, too. When the financial cycle turns, systemic liquidity evaporates. In these cases, contractual maturities become binding, financial entities are forced to reduce liquidity leverage, network effects materialize (one institution's assets being another institution's liabilities) and feedback loops aggravate the liquidity shock (Schmitz, 2013).

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The fourth feature of systemic liquidity is that liquidity leverage is highly correlated with capital leverage, but is also a distinct source of systemic risk. The interaction between these two types of leverage increases the vulnerability to shocks, because liquidity shocks have an impact on solvency and vice versa (Puhr and Schmitz, 2014, and Basel Committee on Banking Supervision, 2015). Beyond a tipping point, liquidity and capital leverage force institutions to increase their stable and loss-absorbing funding from external sources (Brunnermeier and Pedersen, 2009). However, in times of stress, these sources will seek to reduce their exposure to liquidity risk and credit risk, thus aggravating funding shortages and liquidity shortages. Hence, reducing liquidity leverage may actually prompt asset fire sales that precipitate losses in the financial intermediation chain, fueling systemic risk.

Current regulatory requirements do not capture these features of systemic risk. While the novel liquidity requirements of the Basel III framework, especially the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR), will serve to mitigate liquidity risks at the level of individual banks (see European Banking Authority, 2013 and European Banking Authority, 2015), they do not take account of the endogenous and cyclical characteristics of systemic liquidity risk across the banking sector or beyond banking. In other words, a macroprudential perspective on liquidity risk needs to be developed.

2 Systemic liquidity and the interaction between banks, other financial intermediaries and financial markets

The research presented at the workshop provided concrete proposals on how to grapple with systemic liquidity risk. *Giovanni di Iasio* provided a model of the interaction between banks (and other financial companies with nominally fixed liabilities) and shadow banking (activity-based definition). He argued that the emergence of shadow banking is a response to the increasing demand for safe and liquid assets. This increasing demand stems from institutional cash pools accumulated by corporates, households and reserves managers. To meet this demand for safe and liquid assets, shadow banking manufactures shadow collateral from private investment projects (e.g. asset-backed securities). Shadow banking thereby exposes itself to capital and liquidity leverage, but offers higher yields than traditional safe and liquid assets such as government bonds and bank deposits. The model endogenizes the liquidity risk of shadow banks and shows that complex shadow banking with high liquidity risk can be a competitive equilibrium. The general equilibrium model shows that financial sector interconnectivity is not a temporary phenomenon that can easily be eliminated by more stringent investment rules for banks and other regulated financial intermediaries. Consideration should thus be given to introducing minimum liquidity requirements for nonbanks and to supplementing this with time-varying liquidity regulation for both banks and nonbanks.

Analyses of systemic liquidity require broad-based data. In this context, *Laurent Grillet-Aubert* presented an overview of the European Systemic Risk Board's (ESRB's) emerging framework for monitoring liquidity mismatches in nonbank financial intermediaries. Comprehensive reporting data are available for banks, but they hardly capture the interlinkages between banks and shadow banking. In fact, the re-

porting framework for shadow banking is only in the early stages of use. While recent initiatives address some of the gaps (e.g. the Money Markets Statistics Regulation or the Securities Financing Transactions Regulation), the ESRB has to draw on many different data sources to map out the interaction between the different segments of the financial sector. The recent ECB report on financial structures (ECB, 2015) similarly presents a range of data sources on which future analyses of systemic liquidity risk can build. The ESRB aims at publishing reports on market liquidity, shadow banking, and macroprudential policies beyond banking.

Julien Jardelot, who provided an overview of the ongoing review of the European Market Infrastructure Regulation (EMIR) and the Securities Financing Transactions Regulation (SFTR), underscored the importance of better data. These aim at filling regulatory gaps, strengthening supervision, increasing market transparency and reducing product complexity. Emphasis is currently placed on monitoring shadow banks better, e.g. through reporting requirements for repos, securities and commodity lending/borrowing, and margin lending transactions as well as rehypothecation. The reported data are indispensable for gauging systemic liquidity risk.

A crucial question for policy is the effect of market liquidity shocks on the real economy. In this light, *Puriya Abbassi* reported empirical evidence of the effects of interlinkages between banks and financial markets. The paper analyzes a highly granular data set for German banks over 2005 to 2012 and focuses on the spillover from banks' security trading to their credit supply to firms. During the crisis, banks with greater trading expertise are shown to have increased their investments in securities and especially in those securities that had suffered large price drops, with the strongest impact on low-rated and long-term securities. This behavior was particularly prevalent among better capitalized banks. On average, the return on these investments was positive, which indicates that stronger banks profit from asset fire sales of weaker banks. From a systemic perspective, these banks provided market liquidity at a time and for asset classes when and where it was most needed. However, the banks that increased their securities portfolios most are also found to have cut lending to the real economy most. In all, the paper illustrates how financial markets can influence bank behavior.

Further evidence of the interaction between markets and banks was presented by *Ronald Heijmans* and *Richard Heuver*. The paper combines data on unsecured and secured money markets with data on Eurosystem monetary policy operations. It finds that interest rate policy (based on the minimum bid rate) became less effective after the unsecured money market dried up and financial markets became fragmented. Increased turnover on secured money markets partly substituted for the reduction of unsecured turnover, but the former also dropped sharply after the first long-term refinancing operation (LTRO). In fact, as central bank operations expanded, the deposit rate came to be the effective policy rate. In sum, the paper provides evidence of the interaction between components of systemic liquidity and monetary policy (see also Schmitz, 2013 and 2015). This interaction should be taken into account in the development of macroprudential liquidity instruments.

Fundamental to the concept of systemic liquidity is that liquidity shocks can emanate from, or lead to, conta-

gion beyond the realm of the banking sector. Liquidity shocks can spread via direct links between financial institutions (one institution's asset being another's liability), via common exposures to funding markets and via the financial infrastructure. Against this background, *Dawid Żochowski* analyzed the resilience of central counterparties (CCPs). The point of departure is that CCPs, given the mandatory central clearing of all standardized OTC derivatives, have become "super-systemic." This underscores the need for stress testing CCPs by means of integrated stress scenarios for clearing members (banks) and asset prices. Based on the risk-sharing arrangements between CCPs and clearing members (the CCP loss absorption waterfall), contagion risks can be modeled and assessed. Eventually, the stress test methodology should also integrate potential contagion among CCPs. The insights from these network analyses can subsequently feed into policy contingencies.

3 Policy responses to systemic liquidity risks

Policymakers' awareness of systemic liquidity risk is rising (European Systemic Risk Board, 2014; Constâncio, 2015). However, a macroprudential policy response to these risks is subject to several preconditions. First, a deep understanding is needed of the drivers of systemic liquidity, both between different segments of the financial system and across time. Next, the market failures and externalities governing systemic liquidity need to be mapped out, to motivate the case for public intervention. Third, the impact on systemic liquidity of available tools for banks (LCR, NSFR), nonbank financial intermediaries (including leverage and liquidity requirements for investment funds) and market infrastructure (including margin requirements) needs to be assessed. Indeed, a macroprudential toolkit to address systemic liquidity is likely to integrate existing microprudential liquidity requirements. Currently, the LCR is in force in the EU and the NSFR is scheduled for introduction in 2018. Thus, policymakers need to assess the likely effects of these tools on bank behavior as well as potential unintended consequences.

To provide perspective, *Patty Duijm* and *Peter Wierts* presented evidence of the impact of the Dutch liquidity requirement (introduced in 2003 and similar to the LCR) on bank balance sheets. In the wake of a shock to their liquidity position, banks are found to adjust both their assets, increasing their liquidity risk-bearing capacity, and their liabilities, reducing their liquidity risk exposure (see also European Banking Authority, 2013). However, the adjustment on the liability side is more pronounced, especially when the shock threatens to cause a violation of the regulatory requirement. Moreover, developments in the liquidity ratio during 2007 to 2008 are shown not to have foreshadowed the systemic crisis that subsequently emerged. The authors thus uncover an aggregate liquidity cycle characterized by strong increases and decreases in both liquid assets and liabilities, which, however, largely cancel each other out in the Dutch liquidity ratio. The ratio is found to be procyclical, closely tracking the leverage cycle. The authors conclude that a macroprudential liquidity policy is needed to accompany the microprudential liquidity requirements.

In a similar vein, *Antoine Lallour* presented a study on the power of the NSFR as a predictor of bank failures during the financial crisis of 2008 and 2009. Based on bank balance sheet structures in 2006, the study finds that

while an NSFR-like ratio is correlated with subsequent bank failure, this result stems largely from the stability of liabilities (especially the level of retail deposits). Simpler ratios, such as the core funding ratio (CFR, deposits as a share of total assets), perform much better, especially in conjunction with the capital adequacy ratio. The results further point to the complementarity of liquidity and capital regulation, rather than substitutability (see also Puhr and Schmitz, 2014, and Basel Committee on Banking Supervision, 2015).

Michael Wedow proposed a way forward for macroprudential policy development in the area of systemic liquidity in the banking sector. While the legal foundations for macroprudential liquidity tools for the banking sector are in place, they have been applied in only five EU countries to date. In these cases, they addressed structural liquidity risks at the level of the banking system (e.g. foreign exchange mismatches). He questions the effectiveness of the LCR and the NSFR as macroprudential tools to address cyclical systemic risk given the static assumptions underlying these ratios. In fact, the systemic "liquidity illusion" may lead to an underestimation of liquidity risks in both the numerator and the denominator of the LCR, such that the LCR is unlikely to constitute a binding constraint on bank behavior during the buildup of systemic liquidity risk (this is in line with the findings of Duijm and Wierts). Wedow identifies potential instruments to address systemic liquidity risks, such as time-varying liquidity buffers or a Pigouvian tax. On the interaction between capital and liquidity requirements in addressing cyclical systemic liquidity risk, he concurs with Duijm and Wierts that the two are complements rather than substitutes. Activating the countercyclical capital buffer is unlikely to be sufficient to avoid the buildup of systemic liquidity risk and may need to be complemented by macroprudential liquidity tools. Finally, the design of macroprudential liquidity tools for banks has to take account of the potential interaction with monetary policy.

4 Roadmap for further work

The workshop was organized to stimulate policy development in the area of systemic liquidity. The following strands were identified for further work:

Metrics need to be developed that capture the dynamics of liquidity across the financial system and over the course of time. This work has to merge data and expertise on the banking sector, shadow banks, financial markets, asset encumbrance and interconnectedness. These metrics can help establish a minimum level of liquidity security to be maintained in the financial system.

The existence of market failures and negative externalities linked to systemic liquidity risks needs to be spelled out to justify public policy intervention.

Analysis is needed on the desirable coverage and instruments of macroprudential policy to contain systemic liquidity risk:

- Coverage determined by interconnectivity between banks, nonbank financial intermediaries, shadow banking, and financial markets as well as the inherent liquidity risks in these subsectors.
- Instruments to be assessed include:
  1. time-varying liquidity requirements for banking,
  2. quantitative minimum requirements beyond the banking sector, tailored to the maturity mismatches and interconnections of these sub-

sectors (e.g. liquidity buffers, redemption fees and redemption gates for mutual funds, and minimum haircuts for secured funding transactions),

3. periodic system-wide liquidity stress tests (see Schmitz, forthcoming), and
4. the removal of incentives to misprice and misallocate liquidity (e.g. regulatory arbitrage, underpriced insurance of systemic liquidity risk; see Basel Committee on Banking Supervision, 2014) in combination with credible exit strategies for illiquid banks and nonfinancial corporates as well as shadow banks.

Capital leverage and liquidity leverage are correlated. Nevertheless, evidence from the recent financial crisis suggests they are not substitutes. While adding countercyclical requirements to the leverage ratio will thus serve to limit systemic liquidity risks, analyses need to establish the added value of supplementary macroprudential liquidity requirements.

The CRR (Regulation (EU) No 575/2013, Capital Requirements Regulation) and the CRD IV (Directive 2013/36/EU, Capital Requirements Directive) provide for Pillar 2 liquidity requirements for the banking sector. However, for purposes of effectiveness, governance and transparency, macroprudential liquidity requirements should not overlap with Pillar 2 liquidity requirements.

The institutional allocation of systemic liquidity instruments requires further study. As systemic liquidity highlights the interlinkages across the financial system, any segregation of instruments across the different parts of the financial sector is unlikely to be optimal. Given financial integration across the euro area, as well as the interaction with monetary policy, the dynamics of systemic liquidity are likely to be determined primarily within the single currency area rather than the national financial systems. Macroprudential instruments and powers to address systemic liquidity risk could thus be granted to national designated authorities and could be coordinated for the euro area banking system by the ECB, which would have topping-up powers. This would dovetail with the current institutional setting for macroprudential policy and would reduce the inaction bias that is most likely during upswings characterized by liquidity illusion. At the same time, the ESRB could monitor systemic liquidity risk across the nonbank and market segments of the euro area and EU financial sector and, if needed, issue targeted warnings or recommendations for policy action.

These policy priorities have been discussed by the relevant ECB and ESRB bodies, and form an input to their work programs going forward.

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Julien Jardelot* (European Commission). Current developments: EMIR Review and the SFTR.

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