

# Introduction

Alexandra Heath and Mark Manning

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In today's diverse and globally interconnected financial system, a wide range of intermediaries are involved in the process of channelling funds from savings to investments and providing risk sharing, insurance and transactions services to households and firms. For smooth flow of funds it is critical that this complex system operates effectively. This in turn relies on stable and efficient markets in which intermediaries can fund their activities and access liquidity.

These markets clearly broke down in the global financial crisis that began in 2007. Indeed, the failure of funding and interbank markets was a major contributor to the severity of the crisis. Uncertainty as to individual institutions' exposures to problem securitised assets, or to other institutions with such exposures, led to a loss of trust and confidence in unsecured markets. Institutions began to hoard liquidity or engage in fire sales of less-liquid assets. At some points during the financial crisis, large segments of the financial system ceased to function almost overnight, leaving certain non-financial markets in many economies, such as that for real estate, without access to finance. Central banks had to step in with decisive monetary policy action and special programs to support the flow of liquidity. And governments were forced to offer guarantees of wholesale funding as well as retail deposits to underpin risk-sharing activity between intermediaries.

Against this backdrop, the theme of the 25th annual RBA Conference was liquidity and funding markets. The objectives were threefold:

- To examine how the role of these markets has evolved over time and how academics and policymakers have changed the way they think about these markets in light of the experience during the crisis.
- To understand better the dynamics at play during the financial crisis – such as the role of different intermediary types and the role of collateral markets – and to identify the particular points of vulnerability highlighted by the crisis.
- To reflect on the policy response to the crisis, examining how the exit from unconventional monetary policies and implementation of the breadth of regulatory change that has followed could transform the way that liquidity flows through the financial system and how funding markets function.

The first session focused on the evolution of funding markets and liquidity. The two papers presented in this session look at the evolving roles of different markets and intermediaries. The paper by Manmohan Singh maps out the shadow banking system, focusing on the 'financial lubrication' provided by markets for collateral. Singh highlights the importance of these markets for channelling liquidity within and between the bank and non-bank sectors, and observes that the effectiveness of these markets may have declined since the onset of the financial crisis. In particular, Singh points to both regulatory and behavioural factors that have driven a fall in 'collateral velocity' – the number of times, on average, that a single piece of collateral is re-used

in a given period. This has reduced the 'effective' supply of collateral precisely when demand for collateral is increasing. Much of the discussion centred around the policy implications of the developments described in Singh's paper. Key questions emerged such as: What is the optimal level of collateral velocity? How does collateral velocity translate to real economic outcomes?

Collateral is also a central theme in the second paper, by Alexandra Heath, Gerard Kelly and Mark Manning. A key element of the post-crisis reform agenda has been to strengthen counterparty risk management and reduce interconnectedness in over-the-counter (OTC) derivative markets by requiring that exposures be collateralised and that standardised trades be cleared through central counterparties (CCPs). Given assumptions about the structure of OTC derivative markets and the characteristics of OTC products, the paper starts by examining exposures and collateral demands under alternative clearing arrangements. The paper goes on to consider the implications for financial stability of alternative arrangements revealing a trade-off between the benefits of collateralisation in managing counterparty credit risk and the costs in terms of increased liquidity risk as the balance sheet becomes more encumbered. Finally, the paper observes that the costs associated with higher liquidity risk could fall disproportionately on non-dealer institutions that may not be natural holders of collateral-eligible securities. In particular, these institutions may benefit less from netting positions in a CCP because they have fewer counterparties and they often have exposures that are not offsetting; that is, they tend to be in one 'direction'. In discussion, it was acknowledged that the model could usefully be refined further, and that taking the model to 'real' data would help to establish the economic significance of the results.

The second session was given over to the keynote address by Franklin Allen. Presenting joint work with Elena Carletti, Allen reviewed the academic literature on liquidity and funding markets. The paper describes how the academic community is refining its thinking in light of the crisis and highlights where important questions remain unanswered. While past crises have tended to be characterised by runs, the effectiveness of deposit insurance and other guarantees meant that deposits remained among the most stable forms of funding during the recent crisis. Instead, the crisis was largely characterised by the failure of interbank markets. Existing literature neither helped to predict nor manage this phenomenon. Since the onset of the crisis, a great deal of academic work has sought to deepen our understanding of the interbank market and explain observed developments. Allen also considers outstanding questions in the real estate market. He observes that the tendency for 'boom-bust' cycles in the real estate market was amplified in the crisis by the shift to securitised funding. Again, the literature in this area is not rich enough to fully explain what happened. Overall, it was acknowledged in discussion that, while the literature was catching up, much work remained to be done to explain developments during the crisis, and that we needed to be careful not to fall into the trap of 'fighting the last war'.

The third session examined the role of central banks more closely. The first paper, by Grahame Johnson and Eric Santor, presents a rich analysis of core funding markets. In the authors' framework, core funding markets are identified according to how central they are to the financial system, the absence of ready substitutes, and the propensity for contagion in the event of a disruption to their functioning. With reference to experience of the financial crisis, the paper proposes five principles for the design and implementation of central bank intervention. That is, intervention should be targeted, graduated and well designed, and it should aim to minimise

unintended market distortions and mitigate moral hazard. In discussion, participants questioned where to draw the line when identifying core markets, but generally agreed that it was instructive to articulate a framework for central bank intervention.

A notable change in behaviour for some central banks since the onset of the crisis has been the pursuit of unconventional monetary policies. The second paper in the third session, by Morten Bech and Cyril Monnet, examines whether existing models can explain the stylised facts around how conditions in the interbank markets vary with the level of excess reserves, which are used as a metric for unconventional monetary policy. In particular, they note four facts: higher excess reserves drive overnight interbank rates towards the bottom of the interest rate corridor, reduce volatility and reduce market volume. Also, higher credit risk for an institution raises the overnight rate it pays. The authors develop a common framework to test the predictions of three models and find that introducing a 'directed search' mechanism for banks to trade reserves allows all four stylised facts to be explained.

The final paper in the session, by Morten Bech and Todd Keister, considers how central bank policy may need to adapt to accommodate the Liquidity Coverage Ratio (LCR) introduced under Basel III. The LCR is a means of promoting liquidity self-insurance in the banking sector by requiring that banks hold a minimum quantum of high-quality liquid assets (HQLA). In some jurisdictions, however – including Australia – there is insufficient HQLA. Accordingly, the Basel rules specify that a committed liquidity facility (CLF), offered by a central bank for a fee, is an acceptable alternative approach to meet the requirement. This paper examines the economics of such facilities, and in particular the incentives they create and how they should be priced. The authors conclude that an optimal pricing policy for a CLF will encourage banks to satisfy the LCR as far as possible using HQLA, while at the same time maintaining the liquidity premium in the market at a reasonable level.

The final two papers of the conference were presented in a session that aimed to draw links between liquidity and funding markets, and monetary and financial stability. The first paper, by Silvia Miranda Agrippino and Hélène Rey, examines funding flows, asset prices and macroeconomic outcomes in 'carry-trade' economies. The paper builds on the observation that some economies are susceptible to large cyclical inflows and outflows of capital, often motivated by a search for yield. Using data for a sample of relatively small open economies, the authors confirm the procyclicality of capital inflows to these economies, observing that these are highly correlated with a global 'risk' factor, proxied by the Chicago Board Options Exchange Market Volatility Index (VIX). The VIX is also correlated with risky asset prices in the recipient countries, including property prices. Much of the subsequent discussion centred around the validity of the VIX as a proxy for the global factor. The authors were encouraged to consider other volatility measures.

The final paper, by Prasanna Gai, Andrew Haldane, Sujit Kapadia and Benjamin Nelson, returns to the collateral theme from earlier in the conference. The authors explore the trade-offs in secured funding markets, drawing out the macroprudential risks associated with rising levels of asset encumbrance. A key concern – particularly where the extent of encumbrance is opaque – is that a run by unsecured creditors becomes more likely. The authors show that this channel is highly procyclical: as collateral values decline, secured creditors will demand more collateral, which further encumbers balance sheets and leaves fewer assets available for unsecured creditors. This in turn increases their incentive to withdraw funding. The paper considers potential policy responses,

including disclosure of encumbrance, caps on asset encumbrance, and cyclical policies such as time-varying haircuts or liquidity requirements on secured funding transactions.

The policy panel drew together the discussion of the preceding day and a half. Panellists acknowledged that the crisis had revealed tensions and interdependencies for which the academic and policy communities were not prepared. An unprecedented response from governments and central banks prevented an even more severe outcome, and the deep and wideranging regulatory agenda pursued since the crisis aims to correct the worst shortcomings identified in the design of the financial system. Kevin Nixon stressed that the system remained in transition as regulatory reforms were implemented and that we didn't yet know what the eventual equilibrium would look like. Indeed, there was a risk associated with not fully understanding the combined effects of all the regulatory reforms in train. Richard Portes, by contrast, queried whether regulators were doing enough, and expressed the concern that industry lobbyists were succeeding in weakening regulators' resolve and watering down reforms. Jean-Pierre Danthine understood and appreciated the desire to see material regulatory change, and acknowledged that there was much more to be done. Taking the example of implementing the LCR in Switzerland, however, he demonstrated the complexity of the reform process and the importance of thinking through the issues carefully before proceeding with new regulation.