Glenn Stevens: Liquidity and the lender of last resort

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It is a great honour to be invited to deliver the Melville Lecture. Sir Leslie Melville is one of the revered father figures of the economics profession, and of central banking, in Australia.

I cannot claim to have known him, or ever met him. But it does not take long in reading about his contribution to the economic life of the nation to see what a remarkable man he was.

There are a number of people who have spoken eloquently of Melville's life, including previous speakers in this series. I cannot improve on those words. The interested reader can do no better than to consult a number of biographical essays written by Selwyn Cornish,[1] Ian Macfarlane's Inaugural Melville Lecture in 2002, and the first hand, and rather poignant, reminiscences in Ross Garnaut's 2004 Lecture.

My topic today is one that I think Melville would have been interested in, namely, the role of central banks as providers of liquidity and as lenders of last resort in times of crisis. I say "would", because there is nothing about it in his writings that I have been able to uncover. Perhaps this is because in the 1930s depression there were few bank failures in comparison with that in the 1890s, and other macroeconomic issues were more to the fore.[2] But there was some discussion at the Commonwealth Bank during the 1930s about supporting other institutions. Melville must have seen at least some of that discussion though it would have been very early in his time there. By the mid 1940s, moreover, Melville was intimately involved in the international discussions that led to the establishment of the IMF, which in many respects was intended to address the same issues in an international setting.

Had he been working in the circumstances in which we have lived recently, I am sure Melville would have been very engaged in discussion about the role of the central bank. So it seems an appropriate occasion on which to review our thinking on this important matter. With that assertion then, let me proceed.

I shall begin with the question: what do we mean by liquidity? I will then talk about the role of the central bank in supplying it. I will then go on to talk about the role of lender of last resort, why we need it, and the complications that arise in carrying out this role in the modern era. Through all this, my motivating question is: what lessons do we draw from, and what new questions are to be asked as a result of, the events of 2007 and 2008 for the central bank's role in managing liquidity for the system, and (perhaps) supplying it to individual entities?

I wish to state clearly at the outset that these remarks are prompted by what we have observed internationally over the past year, not by anything at home. The Australian financial system remains in good shape, as set out in the Reserve Bank's recent *Financial Stability Review*. Nothing said here should be taken as carrying any implication to the contrary.

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1 See Cornish (1993), Cornish (1999) and Cornish (2007) for essays.

2 In contrast to the depression of the 1890s where 54 of the 64 deposit taking financial intermediaries were forced to shut their doors, there were only three financial institutions that suspended payments during the 1930s. See Fitz Gibbon and Gizycki (2001).

Liquidity

The term "liquidity" is widely used but rarely defined. Until quite recently, the noun "liquidity" was often found to be preceded by the adjective "excess". That expression – "excess liquidity" – simply became shorthand, I think, for the low structure of global interest rates, the associated ease of obtaining credit and the tendency for leverage to rise. Of course, at a global level, that process is now in reverse.

For my purposes today, it is important to be more specific. There are several senses in which the word is used. *Transactional* liquidity is the ability to buy and sell assets without significantly affecting the price. The market for government debt in most advanced countries is usually thought to be pretty liquid in this sense. Some other markets can be rather less liquid. In the recent turmoil, such transactional liquidity as there had been for many complex financial products disappeared very quickly.

A second concept is *funding* liquidity, which is the ability of an intermediary to raise the necessary cash to fund, or continue to fund, its chosen set of assets. This sort of liquidity can also be pretty fickle. Over recent years, some firms' business models had been based on the assumption they could obtain liquidity easily and cheaply in wholesale funding markets. These models ended up being quite vulnerable to a disruption in market conditions. In these cases, managers needed to be very nimble, and probably a bit lucky, to re engineer their model quickly enough when conditions changed abruptly. Some were not that lucky.

The past year has re affirmed, contrary to some earlier predictions, the importance of the large core banks even in a world of more developed capital markets. Banks are a key source of funding liquidity for other institutions operating in financial markets – securitisation vehicles, structured investment vehicles (the so called SIVs), conduits, non bank intermediaries and so on. Funding pressures on those vehicles were quickly transmitted back to the core banks in numerous countries. When shocks to markets occur, it is therefore doubly important that banks be able to manage their own funding needs. In many instances, this proved to be more difficult over the past nine months than bankers had anticipated.

Not surprisingly, the recent turmoil has prompted many calls for the regulatory community to devote more resources to ensuring that banks strengthen their liquidity management. The reviews under way will be most useful if they address liquidity issues under conditions of market disruption, when everyone is scrambling for liquidity, not just firm specific events. Regulators will also be reviewing arrangements to facilitate the smoother functioning of markets at the national and international levels.

But there is another, rather important, sense in which the word "liquidity" is used, and in which I will use it today. Here I am referring to funds at the central bank – what we in Australia call exchange settlement funds, though they have differing names in various other countries. These balances are used by banks and other participants in the payments system to settle their obligations with each other and with the Reserve Bank. Individual institutions can borrow and lend these funds in the overnight market but, for the system as a whole, the only source of these funds is the central bank itself.[3]

I turn now, therefore, to a discussion of central bank liquidity operations.

Central bank liquidity operations

In normal times, liquidity operations are pretty straightforward. The central bank forecasts the inflows to and outflows from the system resulting from its own transactions and transactions

[3] Of course, the way the central bank conducts its own operations will have an effect on market conditions more generally. To that extent, the central bank affects 'liquidity' in the broader senses as described above, though its influence, while powerful, is not the only one at work.

by the government, and makes arrangements to offset these flows with new dealings that meet the system's demand for cash at the price – the interest rate – thought to be appropriate for monetary policy purposes.

On occasion, however, the private sector can experience considerable mood swings insofar as its demand for liquidity is concerned. Just this sort of thing happened at the beginning of August 2007 when, around the world, concerns about creditworthiness and general uncertainty in the wake of the US sub prime problems saw participants in money markets suddenly pull back. They became, individually, much less inclined to lend to others and much more keen to borrow and hoard funds, for fear of what might eventuate tomorrow. The upshot was that the system as a whole suddenly had a much higher demand for liquidity at the central bank than it had before.

In the face of a sudden flight to liquidity like this, it is the central bank's job to supply the necessary cash to meet the demand. This is a straightforward application of Bill Poole's (1970) result that when the shocks are predominantly to the demand for money, the central bank best stabilises the economy (admittedly a pretty simple stylised economy in the model) by meeting that demand. Technically, that is achieved by exchanging cash for other assets, through open market operations. This should, in my view, occur elastically at a constant interest rate.[4]

All of this assumes, though, that the private sector has enough assets that the central bank regards as being of acceptable quality to take onto its own balance sheet in exchange for the cash the private sector desires. The question then is how big a pool of such assets the financial system (and, by extension, individual institutions) should carry in normal times, and the extent to which central banks should be prepared to widen the eligibility criteria for its own operations under unusual circumstances.

There is a big philosophical issue here, and it has come more into focus as a result of the recent financial turmoil. Central banks' liquidity operations have traditionally been in a limited range of securities, often conducted with a select group of institutions, relying on them to "distribute" the liquidity to the rest of the system as needed. But capital markets have developed in ways never contemplated when those traditional approaches were established. It is much more likely than in the past that disturbances will originate in markets and involve counterparties which are several steps removed from the central bank's traditional sphere of direct operation.

How should central banks respond in this world? One approach, which has already been adopted to some extent by many central banks, is to widen the pool of eligible assets for central bank transactions – in effect liquefying more of the assets on the balance sheets of the intermediaries with which central banks already deal. This has been complemented by being prepared to deal with a broader range of institutions (the RBA was already prepared to deal with quite a wide range of counterparties even before the recent events).

A more radical step, which some people (though no current central bankers, to my knowledge) have proposed, would be for the central bank to transact directly in the markets where the problems originated, addressing them "at source". Willem Buiter and Anne Sibert (2007), for example, have proposed that central banks might be prepared to transact in instruments like Collateralised Debt Obligations – which have been at the core of the recent questions of liquidity and asset quality – in order to provide transactional liquidity.

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4 In our arrangements, the Reserve Bank ensures that, on a daily basis, that there are enough exchange settlement funds in the system as a whole to keep the interest rate for overnight loans in the money market – the 'cash rate' – at the level judged by the Reserve Bank Board to be appropriate for the economy's macroeconomic circumstances. If the system, for some reason, needs more funds than before, that will quite quickly be accommodated through our standard procedures.

These ideas raise significant questions. What would be the consequences were the entire balance sheets of a large set of institutions to, in effect, become highly liquid because any of the assets could be sold to the central bank at short notice (at a market price, assuming that could be determined, and a suitable over collateralisation of course)?

One view is that this would be a good thing, because, for the private sector, holding large amounts of low yielding assets in order to guard against occasional spikes in liquidity preference is costly. Arguably, this cost is unnecessary since the central bank can provide liquidity to the system on those occasions as needed, at little cost, against any asset it deems suitable. On this view, a reduction in "unnecessary" holdings of low yielding liquid assets would lower costs of intermediation and result in a higher real capital stock, raising per capita income over time.

But such ready provision of liquidity would trouble many people including, I suspect, most of my central banking forebears. An asset can be illiquid for several reasons, including genuine uncertainty about its underlying value. If private institutions took on additional liquidity risk, confident that the central bank would always help them out if liquidity conditions tightened, they could easily end up taking on more of these other risks as well. This would leave both them and the central bank in an awkward position at some future time should things take a turn for the worse. And for the central bank to act as a market maker of last resort in markets for more exotic instruments would be a very big step, potentially with many unforeseeable consequences.

These are pretty big questions. I suspect that they will increasingly be debated over time. My own view, given what we know at present, is that in periods of particularly unusual market duress, central banks should be prepared to move beyond the normal scope of operations to provide liquidity against a broad range of assets and over a longer maturity than might normally be considered. There are two provisos. First, the central bank has to be able to make a reasonable valuation decision about the underlying asset, and take sufficient excess collateral (a "haircut") to protect its own position. This probably rules out exotic instruments except under the most dire of circumstances. Second, a preparedness for forceful intervention in a crisis situation has to be balanced with some thinking about ways of restraining developments in the other direction when risk appetite is high. That, needless to say, is no easy matter.

The "lender of last resort"

Having talked about normal liquidity operations, we must then turn our attention to the role of lender of last resort, where the central bank lends to one specific entity, when no one else will. The first question is: why do we need it? The reason is the possibility – albeit a very remote one – that a panic could put overwhelming pressure on a perfectly sound institution that, though prudently managed, cannot possibly hold enough liquid assets to withstand the pressure unaided. Some entity has to be prepared to lend in such a situation if the market will not, otherwise the panic can imperil the institution concerned, and perhaps the financial system as well.[5]

The notion has quite a history. The earliest use of the term seems to have been attributed to Sir Francis Baring, who in 1797 referred to the Bank of England as "the dernier resort", able to provide funds to an entity when all other sources had been closed off.[6] Early writings on

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[5] I should be clear here that I am not talking about the narrow role where central banks routinely provide funds to an institution that has had some operational snag and found itself short of funds at the end of the day. Such standing facilities operate routinely in most countries. We are really interested here in the much more taxing situation where the standing facility is not adequate. This is where the lender of last resort really has an important decision to make, about whether to lend and, if so, on what terms.

[6] See Humphrey and Keleher (1984), p. 79.

the idea came from Henry Thornton (1802) and Walter Bagehot (1873). Thornton, writing in the late 18th and early 19th centuries, saw the Old Lady of Threadneedle Street as playing a stabilising role in times of crisis, to prevent a rapid reduction in credit caused by a shrinkage of the deposit base of the banking system.

Bagehot's classic *Lombard Street* appeared in 1873 with what has ever since been seen as the consummate statement of the responsibility of the lender of last resort. For Bagehot, it was clear that the Bank of England should lend substantial liquid resources on a secured basis to a financial institution that had reasonable asset quality (i.e. was solvent) but which faced short term funding difficulties. Bagehot's dictum was "Lend freely against good collateral at a high rate of interest". It is frequently quoted still, and has been referenced more often over the past year than for a long time.[7]

The question is how to put it into practice. Even leaving aside the obvious potential difficulties in assessing solvency in real time, the Bagehot formula leaves open two important questions:

- what is "good" collateral? and
- what is an appropriate rate of interest?

The collateral involved is not necessarily going to be the standard sort of liquid assets. By definition, much of that collateral may already have been used before the bank reached the point of needing a loan of last resort. So the assets in question are likely to be some part of the bank's loan book, or some physical asset of the bank. Presumably it is "good" if it is priced at a value that could be realised if necessary under "normal" market conditions. But for some assets, valuations are notoriously difficult, especially in periods of economic and financial distress where there is a large amount of uncertainty about where market pricing might eventually settle.

As for the interest rate, Bagehot's formula is often invoked with reference to a "penalty rate", even though he did not actually stipulate that.[8] It is customary to motivate the need for the penalty by pointing to moral hazard: the possibility that banks may behave imprudently if they expect to be "bailed out" inexpensively should they get into trouble. That is an important point. But how does one decide how much penalty is enough? Should it, like most penalties, be related to the extent of the misdemeanour? If the bank has just been incredibly unlucky, should the penalty be lighter than if it has been imprudent? Would we always be able to distinguish between those two cases?

Clearly, since the intention is to keep the bank operating, the penalty should not be so big that it leaves the bank's interest spread between assets and liabilities negative, since that would actually hasten insolvency.[9] Some aspects of the penalty are also likely to be non pecuniary for the institution per se, but nonetheless not ineffective. The price of official

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[7] In Australia's history, since Federation, there have been few instances where last resort support has been provided. The first was to the Primary Producers Bank by the Commonwealth Bank in 1931. The Reserve Bank also provided loans to three private banks in support of those banks' efforts to provide funds to illiquid building societies in 1974 and 1979 (see Fitz-Gibbon and Gizycki (2001)).

[8] Some commentators associate Bagehot's dictum with the application of a 'penalty' rate of interest. However, as Goodhart (1999) points out, Bagehot did not state that the interest rate necessarily needs to be above the market rate prevailing after the onset of the panic. While Bagehot insisted on a 'high' rate of interest, it seems that the only condition was that the interest rate be above the pre panic market rate.

[9] There is a case for it being relatively small, in fact, particularly if the 'haircut' taken on the collateral is large enough to reduce the risk to the central bank to a trivial size. Martin (2005) is in support of central banks providing last resort support at low interest rates if required. She concludes that one of the main reasons why Bagehot insisted on a imposing a high rate of interest was because England was operating under a gold standard at the time, and the Bank of England therefore had to ration overall liquidity. With this not a concern in today's world, Martin argues that central banks should be able to provide last resort loans at relatively low interest rates if need be.

assistance may, for example, involve the departure of the CEO, some other executives and some or all of the board, and losses for shareholders.

Apart from these issues, other potential complications can be noted. One is disclosure. In almost all circumstances, disclosure is highly desirable: an informed market is a fair and efficient one. But the communications surrounding emergency liquidity assistance are critical in determining the chances of success. It would appear that it was information that the Bank of England was about to offer assistance to Northern Rock – which, objectively, should have strengthened its position compared with the alternative – that precipitated the queues in the streets. Wholesale lenders to that institution would have already known that it was under pressure, but the news of official assistance told retail depositors, in effect, there was a problem and they reacted accordingly. The design of the UK deposit insurance system may also have been a contributor, in that less than full insurance and the possibility of a delay in receiving insured funds can add to the incentive for a run. In this complex situation, the UK authorities found it difficult to stabilise things, until the government issued a strong guarantee of Northern Rock's obligations.

A final issue is the re financing of the last resort loan in the private sector once the situation has stabilised. If there is ongoing general market turmoil, as in the case in question, then it can be difficult for a private firm to replace the public funding at a price that allows the bank in question to remain viable. In such an instance, the government faces the choice between providing the institution with longer term support – either a long term loan or taking ownership – subsidising a takeover or closing it. In the UK case, Northern Rock is being taken into public ownership for a time. In the US, the takeover of Bear Stearns – which, of course, is not strictly a bank – by JPMorgan Chase is being assisted by a long term facility provided by the Federal Reserve, which carries some credit risk for the Fed. In each case, there is ongoing discussion about what value the previous shareholders can reasonably expect to get from the resolution. The prospect of legal action is, of course, a potential further complication.

All this illustrates that the role of lender of last resort is actually quite challenging in the modern world. Thankfully, observations in the time series of large financial near failures are few, and recent ones have been in other countries. But when they do occur, it is important to learn as much as we can from them. Central banks and supervisory authorities around the world are seeking to do just that. No doubt very thorough evaluations and recommendations will appear in due course. At this point, I would summarise the general lessons from the recent events as follows.

First, well designed regular facilities that allow adequate access to central bank liquidity in times of pressure – either generalised or firm specific – are helpful in avoiding the authorities finding themselves in the position of needing to contemplate the extension of a loan of last resort.

Second, if firm specific assistance beyond the normal channels is required, the central bank has to have very quickly a clear idea of the solvency of the entity concerned, and of the quality of collateral available in order for the terms of any assistance to be set. A good deal of that information has to come from the prudential supervisor. Where that is not the central bank itself, this means that an effective relationship between the central bank and the supervisor is essential.

Third, the government needs to be involved early on, for several reasons. Apart from the fact that it owns the central bank and would therefore ultimately carry any risk the central bank might take on in these transactions, there is a need for clear and consistent communication by all the authorities at an early stage. Further, any decision to extend support to an insolvent institution on systemic or national interest grounds would be one properly taken by a government under advice, not a central bank itself.

Fourth, if support for an institution in difficulty were to turn out to be more than just temporary, the public sector would face difficult issues of how to structure that support. Any such support should, however, come at considerable cost to the private owners and managers of the troubled entity. Public sector support should not be used to “bail out” private shareholders or those who were responsible for running the troubled institution.

Conclusion

Australians have been observing the major financial events of the past year mainly from the sidelines. While there have been some pressures coming through to our system, the most dramatic outcomes have been offshore. We can, nonetheless, draw some conclusions from these events. We have learned, or perhaps re learned, a good deal about the nature of liquidity, markets and the role of central banks over the past year.

One key lesson is the importance of liquidity in markets and to institutions, something that perhaps had not been emphasised as much as it should have been in regulation, where the emphasis has been very much on capital. We have further learned that, under conditions of great uncertainty, liquidity pressures can erupt in markets that had seldom been affected in the past. Central banks have responded quickly and flexibly to such events, but it has proven difficult to contain the pressures fully. Some quite important questions remain for the longer run, which central banks will be considering.

A second lesson is the difficulty in resolving a problem with an individual institution under strained overall conditions. Bagehot’s formula provides only the most general of guidance; making it operational requires considerable judgement. If and when such an event comes, it tends to have its own unique elements and a particular set of circumstances as backdrop. Speed and flexibility in response are essential. So is consistent and early communication, since disclosure of support, if not managed very carefully, could turn out to make the situation worse rather than better.

A third lesson is that a loan of last resort is, in the end, probably simply bridging finance while a takeover or major re structure of the recipient institution is organised. The recipient would very likely see a change in its business model, management, board and ownership structure. It could well require a pretty clear statement of temporary government support. All of this would need to be organised very quickly.

To be in a position to help, central banks have to keep an ear closely tuned to market developments – a sceptical one in the years of good times, and a sensitive one in periods of duress. A very good working relationship with the prudential supervisor, where that is not the central bank, is also essential. This is the case in Australia.

I am not sure exactly what Sir Leslie Melville might have made of these conclusions. But we know that he responded practically and effectively to the issues of his day, which were concentrated around the role of policies in preserving economic and financial stability. I imagine he would expect those of us in the field 70 years later to be equally practical in the light of the experiences of our own time. These demonstrate all too clearly that for all its apparent sophistication, the modern financial system still needs the occasional stabilising hand of a government and/or central bank. Melville would certainly have recognised that very quickly. To meet these challenges, we will need to continue to adapt our own thinking and practices.

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