

Mark Carney: Principles for liquid markets

Remarks by Mr Mark Carney, Governor of the Bank of Canada, to the New York Association for Business Economics, New York, 22 May 2008.

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Over the past year, both private sector financial market participants and public sector authorities have been preoccupied with the topic of liquidity as never before. Throughout the financial market turbulence, private liquidity management has become tremendously important. In parallel, policy-makers have re-examined their roles and responsibilities for the provision of liquidity, as well as the methods they employ in doing so.

The Bank of Canada is certainly no exception. Recent events in financial markets have prompted us to think about why, how, and to whom we provide liquidity. Historically, discussions involving central banks and liquidity have revolved around the traditional role of the central bank as lender of last resort – providing sufficient liquidity to still-solvent deposit-taking financial institutions so they can continue to function. However, as recent events have made abundantly clear, policy-makers also have an interest in seeing that key markets have sufficient liquidity. Over the course of my remarks today, I will share some of the Bank of Canada's thinking on the principles for liquid markets.¹

What is liquidity and why do central banks care?

To begin, it would be useful to set out a definition of liquidity for the purposes of this speech.

Liquidity takes on different guises within the financial system. Central bankers worry about *aggregate system* or *macro liquidity*, because of its connection with interest rates, credit conditions, and future inflationary pressures. Investors are preoccupied with *market liquidity*, which refers to how readily they can buy or sell a financial asset without causing a significant movement in its price. Financial institutions are concerned with *balance sheet liquidity*, which refers broadly to the cash-like assets on balance sheets that can be used to settle payment obligations at short notice. Further, they care about *funding liquidity*, which refers to their ability to raise funds in money markets at reasonable premia.

There is a common element to these concepts. In all cases, liquidity refers to the ability to transact in specific assets at a predictable price.² For example, a broker-dealer wants to know that it can transact in securities at a price approximating that on the screen. For our purposes today, we can say that when this condition is satisfied, there is an appropriate amount of market liquidity.

This is important because liquid markets support economic efficiency. In most economies, financial markets are the channel through which scarce economic capital is allocated to the most productive uses and risk is distributed among those most willing to assume it. An efficient financial system is required for investors to receive the highest risk-adjusted returns on their investments, and for borrowers to minimize the costs of raising capital. Since the efficiency of the system suffers when markets function poorly, policy-makers have an interest in promoting well-functioning markets.

¹ For a more detailed discussion of some of the issues raised in this speech, see W. Engert, J. Selody, and C. Wilkins, "Financial Market Turmoil and Central Bank Intervention", *Financial System Review* (Ottawa: Bank of Canada, forthcoming).

² In the case of macro liquidity, "predictable price" is analogous with price stability as defined by the inflation target. In the Bank of Canada's case, this means a 2 per cent annual increase for the total consumer price index.

A central bank further desires well-functioning, liquid financial markets because they assist in the transmission of monetary policy. Movements in our policy interest rate set off a chain of events, beginning with movements in a series of prices in financial markets. Improperly functioning markets can make it more difficult to predict the effects of our monetary policy actions, thus complicating our task. It is important to keep in mind that central bank activities to support liquidity in specific markets or in specific institutions do not represent a change in the stance of monetary policy, which relates to macro liquidity. Rather, they are undertaken to address concerns about financial instability.

I want to pause on this point for emphasis. When the Bank of Canada conducts liquidity operations (such as term repos, or "purchase and resale agreements" (PRAs) as they are called in Canada), we are merely changing the *distribution* of liquidity in the financial system by changing the composition of our balance sheet. When we do term repos, we aim to hold fewer government treasury bills,³ which means that the private sector would hold more.⁴ We are injecting liquidity where the system had generated it before, essentially by exchanging less-liquid assets for more liquid ones. Moreover, when we roll over previous operations, as the Bank of Canada has done recently, the scale of the liquidity injection is held constant.

The overall level of liquidity in financial markets is determined primarily by market participants themselves. Under normal conditions, private agents supply sufficient liquidity such that injections of central bank liquidity are not needed. Financial institutions create liquidity by buying and selling assets to make the markets in which financial institutions fund themselves. The financial system is liquid because institutions regularly borrow from each other, and because they regularly buy and sell each others' short-term paper. There are times, however, when liquidity dries up as confidence erodes in the ability of private agents to remain in markets. When the regular process of lending and transacting slows down or stops, the lack of liquidity means that institutions are unable to transact assets at predictable prices at minimal cost, and financial markets become stressed. At such times, a central bank can help restore liquidity by directly or indirectly providing liquid assets in exchange for illiquid assets, thus helping to restore confidence in the ability of the private sector to generate liquidity.

What has happened to market liquidity since August?

A review of recent events helps to clarify the principles of liquidity provision.

The current situation in securitization markets serves as a good example of how information problems are at the root of market failure and how liquidity, or a liquidity shock, can cascade through markets.

The events of last summer represented a severe shock to markets. In particular, the realization of the potential scale of subprime losses and the associated loss of faith in structured products and rating agencies collectively created uncertainty about – and an associated loss of confidence in – counterparty credit quality. This uncertainty persisted because of the extreme asymmetric information among market participants, which impaired market makers' ability to transact with confidence and, therefore, to supply liquidity.

At the same time as the supply of liquidity was shrinking, demand for liquidity by financial institutions was rising dramatically – for two reasons. First, the reintermediation of off-

³ This occurs either by not replacing maturing treasury bills, or by selling them outright.

⁴ The other way in which term PRAs can be financed is by having more government deposits on our balance sheet. This means that there would be fewer government deposits on private sector balance sheets, and thus fewer liquid assets as well. Although the total size of the Bank of Canada's balance sheet increases in this scenario, the liabilities of the Bank to the private sector (currency plus private sector deposits) do not, so there is no monetary stimulus involved in this type of operation.

balance-sheet assets and contingent claims expanded, and continues to expand, along with bank balance sheets. Second, the banks' preference for liquidity increased because of uncertainty about these types of securities. In addition, the number of potential market participants for these securities has fallen as key investors have either disappeared – such as asset-backed commercial paper (ABCP) and structured investment vehicle conduits – or fled to safer havens – such as money market funds. The result has been a liquidity shock leaving interbank interest rate spreads over expected overnight levels substantially higher (at times, up to 90 basis points in some currencies) and considerably more volatile than historical norms. This widening in spreads reflects both a rise in the default-risk premium – largely related to a rise in actual and perceived counterparty risks – and a rise in the liquidity-risk premium – largely related to increased demand for liquidity by banks related to the rise in the amount of assets being reintermediated, and a contraction in the supply of bank-funding liquidity. The scale of the reintermediation process may matter. For example, in Canada, where it is less acute, interbank spreads have risen considerably less than in other jurisdictions.

Since our current system relies on transactions among an interconnected web of financial institutions, a liquidity shock can cascade quickly through the system. Concerns about the solvency of one institution can lead to liquidity hoarding and dysfunctional markets. This reduces the number of potential participants willing to transact in a market, which undermines price discovery. As a result, it becomes less likely that markets will price assets at their fundamental values, and the efficient allocation of resources and the distribution of risk are thus threatened, at potentially great cost to the economy. In such circumstances, the role of the central bank was accurately described more than a century ago by Walter Bagehot in *Lombard Street*: "Theory suggests, and experience proves, that in a panic the holders of the ultimate Bank reserve ... should lend to all that bring good securities quickly, freely, and readily."⁵ Note that Bagehot did not differentiate between deposit-taking institutions and market makers, stipulating only that the lending should be collateralized with "good securities." However, the idea that central banks should support the functioning of a broader range of markets through direct liquidity support is relatively new. Previously, it was believed that central banks could adequately support markets by allocating liquidity through banks, by altering liquidity in payments systems, or by changing the stance of monetary policy, and that this liquidity would flow unimpeded through the financial system.

The events of last summer have challenged this consensus. The financial system will be more stable, and the effects of monetary policy actions more predictable, if the central bank directly supports liquidity in a wider range of markets when appropriate. Such support, which would be expected to occur only during extraordinary circumstances, could entail expanding the range of terms, collateral, and counterparties for central bank operations beyond what is required for routine monetary policy operations.⁶

Considerations around a central bank decision to intervene

Let me elaborate on two of the words I just said: "when appropriate." How can a central bank determine, with any level of confidence, when actions to support market liquidity are appropriate? At the Bank of Canada, we have been thinking about the principles that would govern any facilities that we might offer.

⁵ W. Bagehot, *Lombard Street: a Description of the Money Market* (New York: Wiley, 1999) p. 173.

⁶ In the Bank of Canada's case, some of its legal authorities would need to be modernized in order to be able to carry out interventions to the same degree as other institutions. Amendments to the Bank of Canada Act that would address this issue are currently before Parliament.

A central bank may want to make several judgments before deciding to lend to market makers. In particular, it should ask itself four questions: First, is the impairment of the market temporary or permanent? Second, will the instruments at its disposal be effective? Third, what net benefits could come from intervention? Fourth, what are the likely costs?

In the heat of financial market turbulence, it is difficult to determine whether a situation of illiquidity (a market impairment) is temporary or permanent. To make this determination, it is useful to recall the Arrow-Debreu theorem of complete markets.⁷ In reality, complete markets do not exist because of information costs and because not all agents participate in all markets. A central bank must decide whether its provision of liquidity is a bridge – while information asymmetries are resolved and potential market participants return to the market – or whether it is a pier because there is a permanent impairment. To underscore the distinction, consider again three aspects of recent events.

First, before the current market turmoil, many investors relied on rating agencies for credit analysis about structured products, and this information was relatively inexpensive to obtain. The process of financial turbulence demonstrated that rating-agency judgments were not always reliable. Consequently, market participants are now relying more on their own credit analysis, thereby increasing the costs for investing in structured products considerably. It will take some time for rating agencies to re-establish their credibility.

Second, investors have discovered that there are considerable costs of accumulating independent information on non-standardized products in order to perform, at a minimum, risk-based analysis to check the opinions of credit-rating agencies. This is a case where markets themselves should be able to establish standards to minimize information costs. In the interim, the central bank or a regulatory body may help to reduce the costs of information. The Bank of Canada has adopted high disclosure standards for ABCP that it will accept as collateral in its Standing Liquidity Facility. This may encourage market participants to raise their own standards. Whether they do in the end will be their decision.

Third, recent problems raised concerns over the health of counterparties – initially tied to uncertainty about exposure to U.S. subprime mortgages and later to structured products in general. These concerns, while material, should prove temporary before being resolved by time and disclosure. This is why it is so important to implement immediately the best practices for disclosure endorsed last month by the G-7 finance ministers and central bank governors. This is a priority in Canada.

A central bank can supply liquidity to financial institutions and markets. However, it cannot create markets where there is no private desire for them, nor can it change the fundamental value of a security. Thus, when confronted with a market failure, a central bank should identify the basic nature of the failure and act when it judges that a shock has distorted the liquidity-risk premium embedded in the price of a security.

The most important potential cost of intervention is moral hazard – the risk that central bank actions might ratify or encourage behaviours that would increase the likelihood or severity of a future crisis. In today's circumstances, one might worry that market participants could alter their behaviour owing to a mistaken belief that central banks would never allow any counterparty to fail. Another concern is that in the future, banks would worry less about market liquidity and assume that central banks would always act to provide liquidity in any or all markets, even in cases of a very minor disruption. There could also be costs related to

⁷ The Arrow-Debreu theorem of complete markets states that there is a competitive equilibrium of prices so that aggregate supplies will equal aggregate demands for every commodity in the economy, and that there will be a price for every commodity, a market for every time period, and a forward price for every commodity at all time periods. The theorem is based on two important assumptions: participation of every agent in every market and complete information. See G. Debreu, *Theory of Value: An Axiomatic Analysis of Economic Equilibrium* (New Haven: Yale University Press, 1959).

distortions in markets caused by lending, or costs associated with the crowding out of private sector counterparties. The Financial Stability Forum recommendation that central banks have access to financial institutions' liquidity-management contingency plans has the potential to partially limit this aspect of moral hazard. Other mitigants can be found in the principles behind the conduct of these operations, which I will discuss in a moment.

First, one final consideration: How does a central bank know when intervention has been sufficiently successful for it to exit? Success should not necessarily be judged on the basis of spreads returning to predetermined levels, since fundamentals are likely to have changed during and because of the shock that caused the turmoil. Rather, judgments about the effectiveness of intervention should be based on evidence of better-functioning markets, such as higher volumes, narrowing bid-ask spreads, and reduced liquidity-risk premia even, potentially, if total risk premia do not fall. The absence of spread volatility at the end of each quarter would be another welcome sign of improving markets. In Canada, spreads indicative of bank funding costs (such as the spread between 3-month CDOR and the expected overnight rate as measured by 3-month overnight indexed swaps) have fallen markedly over the last few weeks, and are substantially below equivalent spreads in some other currencies. The results of the term PRA auctions held by the Bank of Canada have broadly shown a narrowing of the spread between the average yield and the expected overnight rate. In addition, the range of the collateral being pledged shows no sign of intensifying liquidity pressures.

Principles to guide intervention

Let me now elaborate on the five principles that we believe should guide interventions to support liquidity in markets.

First, lending to support market liquidity should **mitigate moral hazard**. Such measures include limited, selective intervention and the promotion of the sound supervision of liquidity-risk management.

Second, interventions should be **graduated**. The strength of the intervention should be calibrated to the severity of the problem, so as to guard against overreactions that could unnecessarily raise the costs of the intervention and potentially crowd out private agents.

Third, interventions should be **targeted**. A central bank should attempt to mitigate only those market failures that it is best placed to rectify. Specifically, central banks should concentrate on liquidity disruptions which, by their nature, are not permanent.

Fourth, intervention tools should be **well-designed** for the job at hand; that is, lending at a penalty rate to particular institutions is appropriate for institution-specific liquidity problems. Market-specific liquidity problems should be addressed with market transactions at competitive prices. Finally, when there are shortages of collateral, market transactions should be conducted in that collateral.⁸

In these regards, along with traditional central bank tools, such as lender-of-last-resort arrangements, a range of facilities is likely necessary. Each of these has distinct characteristics suitable for different circumstances. **Term purchase and resale agreements** could be offered to any financial market participant with marketable securities as the basis for the transaction. This type of transaction would be most useful when liquidity premia in money markets were distorted and associated with widespread liquidity problems in a particular asset class or maturity. **Term securities lending** would increase the supply of high-quality securities that could be used for collateral at times when such collateral was in short supply.

⁸ The Bank of Canada is currently constrained in its ability to ease collateral shortages, however, legislation currently before Parliament would address this issue.

It could also allow for a direct exchange of less-liquid securities for those that are more liquid, thus reducing the incentive to hoard precautionary liquidity. **Term loan facilities** could be most useful when liquidity premia in money markets were distorted because several financial institutions were facing liquidity shortages.

Fifth, and finally, interventions should **not create further market distortions**. Transactions should, to the extent possible, take place at market-determined prices and under conditions that are aligned with those in the market. This limits the possibility that the central bank will crowd out the return of markets. This is an important point, on which I will expand.

Under most circumstances, central bank provision of liquidity should be priced at an auction, where prices are set competitively, so that funding markets for the assets involved would not normally be distorted. A well-designed auction process can help institutions avoid any stigma associated with the receipt of central bank liquidity and minimize the possibility of confusion about lending at rates that differ from the key monetary policy interest rate. As well, an auction can provide a central bank with the flexibility needed to tailor the provision of liquidity to the specific need. Auctions can also provide the central bank with valuable information about the health of a particular market or participant. Finally, they can help to restart markets that have stopped by providing a multi-party mechanism to determine asset prices.⁹

The search for symmetry

Before closing, I would like to raise one final issue. Much of the discussion about central banks and liquidity in markets has been motivated by current circumstances, in which banks and market makers are unable to create a sufficient level of liquidity themselves. This is a one-sided approach to the issue. One of the reasons that the Bank of Canada's monetary policy has been successful in anchoring inflation expectations is that we implement policy symmetrically. Our actions are motivated as much by inflation threatening to fall below our target as by inflation threatening to rise above it. Indeed, our recent decisions to lower our key policy rate were motivated by a concern that future inflation was poised to remain below our 2 per cent target.

Is a symmetrical approach to liquidity also appropriate? As I mentioned earlier, a lack of liquidity can hamper the efficient allocation of resources and distribution of risk, and complicate the conduct of monetary policy. It is equally true that an overabundance of liquidity – or, more precisely, easy financing conditions for financial assets themselves – can have similar effects. Logically, if a central bank were concerned enough to lend to market makers in a time of scarce liquidity, would it not also want to borrow from the same institutions in periods of excess liquidity, again assuming that such periods could be determined with confidence?

Unfortunately, liquidity instruments such as those I have described today are poorly suited to this task. Central banks are the stores of liquidity in our economy, and can readily supply it by agreeing to take less-liquid assets from counterparties in exchange. Generally speaking, central banks are not set up to operate in reverse; that is, they do not have on their balance sheets a ready supply of illiquid assets that can be used to absorb excess liquidity held by banks or market makers. Moreover, during an asset boom, they may have limited influence over the confidence of financial market participants.

The principle, however, remains. Central banks and other authorities should be as concerned about the distortions and inefficiencies created by overly easy financing conditions, rapid credit growth, and excess confidence about future market liquidity as those created by a lack

⁹ To be clear, in these auctions, the price being determined is the price for borrowing central bank money against a given set of collateral. It is not the price to buy and sell the collateral outright or to lend cash unsecured.

of liquidity. So how can we achieve symmetry in our approach? In my opinion, it is worthwhile for policy-makers to consider the promotion of macro-prudential regulations that could serve to restrain pro-cyclical liquidity creation among banks and market makers when appropriate. To be clear, the same tests should apply in terms of "when appropriate." There would also be the added complication of determining where to house this regulatory authority, and how it would be coordinated across jurisdictions. Despite these issues, this is a serious concern that warrants closer attention.

Conclusion

The market turbulence that began last summer has eased in recent weeks. That progress, and perhaps the coincident start of the baseball season, has prompted some to muse about whether we are in the seventh, eighth, or ninth inning. I will not venture to be that precise, but I would note that baseball games frequently go into extra innings, and in any event, there is always another game and another season. It is important that we not let a sense of complacency distract us from learning the appropriate lessons, and acting accordingly, once the game begins again.