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Work in Progress: The Bank of Canada's Response to the Financial Turbulence

Good afternoon. It's been a little over a year since the first effects of a series of financial dislocations were felt. The financial turbulence over the past year has been costly and difficult for many individuals and financial institutions; it's been challenging for policy-makers; and it's had implications for the overall economy. But the episode has also led many to re-examine their assessment of risks, to question risk-management practices, and to improve policies and operations. This has certainly been the case at the Bank of Canada.

In my remarks today, I'd like to describe how the Bank responded to the liquidity aspect of the turbulence as the year unfolded, and the changes that we made in our liquidity-policy framework, both to deal with problems as they arose and to improve our ability to operate in the future. I'll also provide an overview of current conditions in Canadian credit markets and a brief comment on economic developments since we published our *Monetary Policy Report Update* in mid-July. I'll begin by providing a summary of the origins of the turbulence.

Origins of the Financial Turbulence

For a number of years, desired world savings exceeded desired world investment. As a result, long-term real interest rates decreased around the world, which led investors, in their "search for yield," to take on risk at lower premiums than they had demanded in the past, and to accept much higher levels of leverage in financial products and on their balance sheets to obtain their hoped-for returns. The search for yield also led to rapid growth in the demand for, and development of, more complex structured financial products, such as collateralized debt obligations (CDOs) backed by asset-backed securities or by other CDOs and asset-backed commercial paper (ABCP) backed by CDOs, some of which, after 2000, were based on U.S. subprime mortgages.

These complex instruments were rated by credit-rating agencies using the same scale that they had used in the past for "plain-vanilla" corporate debt. Some sellers of these complex financial instruments emphasized that these products were highly rated − many were AAA − but placed little emphasis on their other features. A number of investors failed to do their own due diligence and instead relied too much on credit ratings as a measure of the overall risk in holding these complex debt instruments. Among other things, they failed to take into account risks other than credit risks, in particular, market and liquidity risks. The complexity of these instruments frequently made them opaque, and too often investors put their money and confidence into vehicles that they did not fully understand.

The basic loan quality of U.S. subprime mortgages worsened through 2005 and 2006, although this worsening did not become broadly apparent to the investors in securitized mortgages until the first half of 2007.[1] Subprime loans were premised on continued increases in house prices. When house prices stopped rising, the belated realization by rating agencies of the poor quality of these loans resulted in the downgrading of structured products with exposure to subprime mortgages, often by several notches. These instruments were held by a variety of investment funds, including many sponsored by banks. Indeed, some products were held directly by banks themselves. Investors soon came to realize that highly rated structured-debt instruments could fall substantially in value and were subject to severe downgrades. As a result, they began to shun almost any type of structured product − either because the complexity of these products made it difficult for many market participants to understand them, and therefore to accurately price the attendant risk, or because they were really looking to hold only true AAA assets. In Canada, these instruments included ABCP. Following the onset of the crisis, non-bank-sponsored ABCP stopped rolling over in Canada, which led to the standstill under the Montreal Accord. As time passed, the markets for securitized products became much less liquid to varying degrees across instruments.

As market players observed the downgrades of structured products based on U.S. subprime mortgages and the drying up of ABCP markets, two additional concerns emerged. First was a concern about the financial health of counterparties, particularly banks, as marked-to-market losses eroded capital. Second was a concern that securitization would proceed at a much slower pace than in the past, thus requiring reintermediation that would result in a more rapid expansion of bank balance sheets and an associated need for capital. These two concerns led to a significant increase in interest rate spreads and to a decline in the liquidity of short-term bank-funding markets in many countries.

Now, it is important to note that the decline in the liquidity of bank-funding markets and the decline in the liquidity of asset markets in general are not unrelated. Indeed, there are theoretical reasons to believe that market liquidity and the funding liquidity of banks with trading operations are mutually reinforcing, thus leading to the possibility of a "liquidity spiral" in a downward or upward direction.[2] This possibility arises because first, the ability of traders to provide market liquidity depends on the amount of funding they have and, second, the amount of funding they have, through capital and margin loans, depends on market liquidity. This second linkage arises because, with mark-to-market accounting, asset-price movements affect capital and because, empirically, margins tend to rise when

[1] The problem was exacerbated by the originate-to-distribute model, which led to misaligned incentives for the U.S. originators of subprime mortgages.

[2] See M. K. Brunnermeier and L. H. Pedersen, "Market Liquidity and Funding Liquidity," forthcoming in *Review of Financial Studies* and M. K. Brunnermeier, "Deciphering the 2007−08 Liquidity and Credit Crunch," forthcoming in *Journal of Economic Perspectives*.

asset prices fall.[3] On a different note, I would add that the leverage of trading operations is strongly procyclical, falling when asset prices fall and rising when they rise.[4]

The decline in market liquidity, especially bank-funding liquidity, was of utmost concern to central banks. So how did the Bank of Canada respond?

The Liquidity Policy Response

Last month, the Bank for International Settlements' Committee on the Global Financial System (CGFS) released an important report[5] that summarized central bank responses to the financial turbulence and put forward seven recommendations aimed at strengthening central bank effectiveness in dealing with liquidity problems, including funding-market pressures. As these recommendations were developed over a number of months, they were, in many cases, already being implemented by individual central banks. I thought it would be useful to use these recommendations as an organizing device to summarize what we at the Bank of Canada have done since last August in terms of actions and the development of new liquidity policies and principles.

The first recommendation is that a central bank should make sure that its operational framework is capable of achieving its policy rate target − even in times of turmoil. Both before and during the crisis, the means by which the Bank reinforced its target overnight rate, when necessary, were the intraday use of one-day repo transactions − special purchase and resale agreements (SPRAs) and sale and repurchase agreements (SRAs) − and, at the end of the day, the setting of the target for next-day settlement balances. These policy tools were used aggressively from 9 August of last year to 30 April of this year to reinforce the target for the overnight rate.[6] Because they proved effective, there has been no policy or operational change directly related to this recommendation (Chart 1: Overnight Rate Minus Target Overnight Rate).

The second and third recommendations aim at the central bank's ability to conduct liquidity operations effectively, even when key markets are illiquid. In concrete terms, this means that the central bank should be prepared, if necessary, to take steps that go beyond adjusting the aggregate supply of reserves, including providing an increased volume of term funds, conducting operations against a broad range of collateral, and conducting operations with a broad range of counterparties.

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[3] Brunnermeier and Pedersen, op. cit., note that, empirically, margins tend to rise when there are large drops in asset prices. They also note that changes in margins can be destabilizing to both asset-market liquidity and funding liquidity.

[4] See T. Adrian and H. S. Shin, "Liquidity and Leverage" (Staff Report No. 328, Federal Reserve Bank of New York, May 2008).

[5] "Central Bank Operations in Response to the Financial Turmoil," a report submitted by a study group established by the Committee on the Global Financial System, at the Bank for International Settlements. The report is available at: < http://www.bis.org/publ/cgfs31.pdf?noframes=1 >.

[6] The frequency and size of overnight liquidity injections (SPRAs) was greater than normal on 9 and 10 August 2007, in early October, from mid-November to early January 2008, as well as ahead of the 30 April quarter end for chartered banks. The level of settlement balances in the payments system was generally (but not always) targeted at higher-than-normal levels over these periods. Since 30 April, the frequency of SPRA operations has been much less, with most occurring around the banks' 31 July quarter end.

To this end, the Bank modified three of its policy tools. First, in August of last year, the Bank temporarily expanded the range of securities that are eligible for overnight operations. Second, between December 2007 and January 2008, and again between March and June of this year, the Bank conducted a series of term purchase and resale agreements (PRAs) − typically of 28 days − against a broader-than-normal range of securities.[7] Third, late last year, the Bank announced that the range of acceptable collateral for its Standing Liquidity Facility would be expanded to include a subset of ABCP sponsored by deposit-taking institutions, and U.S. Treasuries. Specified types of ABCP became acceptable on 31 March 2008, and U.S. Treasuries became acceptable on 30 June 2008.

Steps have also been taken to modernize the Bank of Canada Act. Amendments to the Act, designed to allow the Bank more flexibility in providing liquidity to the financial system in response to changing circumstances, were passed by Parliament, and have recently been proclaimed. The amendments will allow the Bank to use an even broader range of securities in its buyback operations, importantly, those of a term nature.

Under the revised policy, the Bank may choose to engage in buyback operations to address a situation of financial system stress that could have material macroeconomic consequences. In this "exceptional" circumstance, the Bank may buy and sell securities *beyond* Government of Canada bonds and treasury bills, and for a period longer than one day. The list of securities that may be used in such transactions can be found in the Bank's policy, which was published in the *Canada Gazette* on 26 July 2008.[8] I should stress that the Bank is not obligated to accept the full range of these securities for any particular transaction.

The extent to which the Bank would exercise this power, once the state of affairs was deemed to be "exceptional," would be governed by a set of principles for Bank of Canada market intervention. I will describe these principles when I come to the final recommendation of the CGFS report.

We also recently announced that a term securities-lending facility and a term loan facility could be used in certain circumstances.[9] While the Bank currently has a securities-lending facility (whereby it makes available from its balance sheet Government of Canada securities that are temporarily in high demand in the market), the loans under this facility have a term of one business day and are intended to address stresses in the repo market for a single security. The term securities-lending operations would be used to provide longer-term liquidity more broadly to financial market participants by increasing the supply of high-quality securities that could be used for collateral at times when there

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7 While the Bank had used term PRAs in the past, it had done so to manage its own balance sheet during seasonal, temporary peaks in liabilities; over the past year, however, the primary purpose was to increase liquidity in money markets.

8 The policy for buying and selling securities under subsection 18.1(1) of the Bank of Canada Act is available at: < http://www.bankofcanada.ca/en/markets/pdf/policy_gazette-e.pdf >.

9 For context, see W. Engert, J. Selody, and C. Wilkins, "Financial Market Turmoil and Central Bank Intervention," *Financial System Review* (Ottawa: Bank of Canada, June 2008): 71−78, available at: < http://www.bankofcanada.ca/en/fsr/2008/fsr_0608.pdf >.

is a shortage. Term loan facilities would be most useful when liquidity premiums in money markets are distorted and when at least two deposit-taking financial institutions face liquidity shortages.

The fourth recommendation addresses the possibility that channels for distributing liquidity across borders can become impaired in times of turmoil, and the need for central banks to consider accepting assets denominated in foreign currency, or establishing foreign exchange swap lines among themselves. To address this issue, as noted earlier, the range of acceptable collateral for the Standing Liquidity Facility was expanded to include U.S. Treasuries, effective 30 June. Swap lines also help to avoid bottlenecks in the international distribution of liquidity, potentially enabling domestic institutions to obtain foreign currency liquidity. For many years, the Bank of Canada has had a swap line with the Federal Reserve in the United States to give it access to U.S. dollars. This facility was not needed in the recent period of turmoil, however, and may not be used often, if at all, because most Canadian banks have U.S. branches or subsidiaries, and thus have access to U.S.-dollar funding through the Fed's discount window.

The fifth recommendation is to enhance communication with market participants and the media during times of financial stress. Over the past year, in addition to its normal communications on regular operations, the Bank actively communicated any unusual steps taken in its operations, as well as the reasons for those steps. Members of the Bank's Governing Council spoke publicly on several occasions about the situation as it evolved, and about our response.[10] Staff at the Bank regularly communicate with market participants about funding needs, and these communications proved important when liquidity was under pressure. In late spring, Governor Carney made clear which market conditions we would consider to end a form of intervention, such as term PRA, and this message was given in advance of the announcement that the Bank would not renew the term PRA maturing 26 June. Throughout this turbulent year, we have been clear about our liquidity operations, both when we expanded them and when we became the first major central bank to end special operations.

The sixth recommendation is to reduce the stigma associated with the use of standing lending facilities by, for example, enhancing the understanding of all market participants regarding the role of such facilities and, where applicable, designing new facilities that should have less stigma than was associated with past instances of emergency assistance. Both before and during this period of turbulence, little stigma was associated with the use of the Bank of Canada's Standing Liquidity Facility, which offers one-day loans for

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[10] See, for example, D. Dodge, "Turbulence in Credit Markets: Causes, Effects, and Lessons To Be Learned" (speech to the Vancouver Board of Trade, 25 September 2007), available at: < http://www.bankofcanada.ca/en/speeches/2007/sp07-17.html >; D. Longworth, "Liquidity, Liquidity, Liquidity" (speech to the Investment Industry Association of Canada, 3 October 2007), available at: < http://www.bankofcanada.ca/en/speeches/2007/sp07-18.html >; M. Carney, "Addressing Financial Market Turbulence" (speech to the Toronto Board of Trade, 13 March 2008), available at: < http://www.bankofcanada.ca/en/speeches/2008/sp08-3.html >; D. Longworth, "Credit Markets, Financial Stability, and Monetary Policy" (speech to the Global Investment Conference, 10 April 2008), available at: < http://www.bankofcanada.ca/en/speeches/2008/sp08-5.html >; and M. Carney, "Principles for Liquid Markets" (speech to the New York Association for Business Economics, 22 May 2008), available at: < http://www.bankofcanada.ca/en/speeches/2008/sp08-6.html >.

temporary, and typically relatively small, liquidity needs. The term-loan facility that we are considering should have little stigma attached to its use, because it will be offered at the Bank's discretion at times of stress that involve more than one deposit-taking financial institution.[11]

The final recommendation in the CGFS report is aimed at limiting moral hazard. The report suggests that central banks carefully weigh the expected benefits of actions to re-establish liquidity against their potential costs and, where necessary, introduce safeguards against the distortion of incentives. The events of the past year have prompted us to re-examine the issue of moral hazard in the provision of liquidity. An article in the June *Financial System Review*[12] outlines a set of principles to guide the central bank on when and how to supply liquidity to financial markets. These principles, which clarify the extremely limited cases in which the Bank of Canada might intervene in financial markets, are useful in limiting moral hazard. Here is a summary of the principles:

- first, intervention should be targeted, aimed at mitigating only those market failures of systemwide importance with macroeconomic consequence that can be rectified by a central bank providing liquidity
- second, intervention should be commensurate with the severity of the problem
- third, intervention should use the right tools for the job: market-based transactions, provided through auction mechanisms, should be used to deal with marketwide liquidity problems, while loans should be used to address liquidity shortages affecting specific institutions
- fourth, intervention should be at market-determined prices to minimize distortions
- and fifth, the central bank should use measures that include limited, selective intervention; an element of coinsurance; penalty rates as appropriate; and the promotion of sound supervision of liquidity-risk management.

So that's a summary of the steps we've taken since last August to address the concerns covered in the CGFS report (see summary table).

Other central banks have also been working towards the same goals. The CGFS report suggests that central bank actions in response to the market turbulence have been effective in that they have "reduced, though not resolved," tensions in short-term money markets, thereby mitigating the damage to the economy. However, it has been much more difficult to address funding-market pressures in the broader sense, particularly in term, unsecured markets. The report notes that "the assessment of central banks about their ability to deal with such market pressures depends crucially on the pressures' origins: how much came from liquidity concerns, which are amenable to central bank actions, and how much from counterparty risk or other concerns, which are beyond the reach of central bank operations. Overall, the judgment was that tensions would have been more acute and more damaging without the forceful interventions of central banks."

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[11] The Federal Reserve's Term Auction Facility, similar to the Bank of Canada's proposed term-loan facility, has significantly less stigma than its discount window lending.

[12] See W. Engert, J. Selody and C. Wilkins, "Financial Market Turmoil and Central Bank Intervention," op. cit. Also see M. Carney, "Principles for Liquid Markets," op. cit.

That does not mean that our work in dealing with the broad policy lessons from this period of financial turbulence is done. One important set of issues being studied is how fluctuations in the financial sector play out in the real economy, and how regulations and practices − including the regulation of financial institutions − can dampen or exacerbate these fluctuations. Under the umbrella of the Financial Stability Forum, various international committees have been looking at these important issues and are considering a variety of proposals. It is important to reduce procyclicality in the financial system − perhaps including the key aspects of leverage and liquidity − in order to reduce the magnitude of the effects of future financial disturbances.

I'd like to turn now to the current state of the markets.

The Current State of the Markets

Although credit conditions in Canada remain challenging, they are better in many respects than those in other major markets. For example, short-term credit spreads, as measured by the spread between short-term lending rates and the expected overnight rate, have narrowed significantly in recent months (Chart 2: Spreads between 3-Month LIBOR and OIS). In large part, the lower short-term credit spreads in Canada reflect the healthier state of Canadian financial institutions. This relative strength is also shown in the smaller decline in stock market valuations for Canadian financial institutions relative to their foreign peers over the past 14 months (Chart 3: Performance of Financial Sector Equities). Nevertheless, there remains a risk that ongoing strains in global financial markets could have further implications for Canada.

While the average effective borrowing *spreads* faced by banks, non-financial businesses, and households have increased by about 75 basis points vis-à-vis the overnight rate since the onset of turbulence in financial markets last summer, this increase has been more than offset by the cumulative 150-basis-point reduction in the target overnight rate. As a result, the effective borrowing *costs* faced by banks, businesses, and households are estimated to have fallen by about 75 basis points over the past year. Chart 4 (Bank Funding Costs) indicates one element of increased funding costs for banks.

Reflecting the recent contraction in economic activity and generally challenging credit market conditions, growth in business credit has slowed in recent quarters (Chart 5: Yield Spreads on Canadian Corporate Bonds). In contrast, growth in household credit remains robust (Chart 6: Business and Household Credit). This likely reflects high levels of employment and past increases in wealth and real income. Nonetheless, the continued strength in household credit growth is somewhat surprising, given the moderation of activity in the housing market and the reported decline in consumer confidence. The growth of household credit is expected to moderate in coming months.

Recent Economic Developments

The ongoing turbulence in global financial markets has been one of three major developments affecting the Canadian economy − the others being the protracted weakness in the U.S. economy and the sharp changes in the prices of certain commodities, energy in particular.

In the second quarter of 2008, U.S. economic growth was somewhat stronger than expected at the time of the July *Monetary Policy Report Update*, while growth in the Japanese and European economies was somewhat weaker than expected. Recent data also suggest that Canadian GDP growth in the second quarter was likely somewhat weaker than expected.

Weakness in overall global growth has been a major reason for the downturn in commodity prices, particularly energy prices, since mid-July. In turn, this downturn has been a significant factor in the declining value of the Canadian dollar in U.S. dollar terms. These two developments will have opposing effects on the demand for Canadian goods and services.

In July, total CPI inflation was 3.4 per cent, and core inflation was 1.5 per cent. The Bank of Canada continues to expect that both total CPI inflation and core inflation will converge on the 2 per cent inflation target in the second half of 2009. However, the recent decline in the spot and futures prices of energy means that the temporary spike in total CPI inflation between now and the first quarter of 2009 should be lower than projected in the July *Update*.

The Bank will continue to carefully monitor the evolution of risks, together with economic and financial developments in the Canadian and global economies, and to set monetary policy consistent with achieving the inflation target over the medium term.

Conclusion

In conclusion, I want to stress that the problems of the past year posed challenges, and they offered lessons for individuals, businesses, and policy-makers.

Two conclusions can be drawn from how these problems played out in Canada. First, the financial system is sound, and the Canadian financial, non-financial, and household sectors are strong enough to deal with the problems we have seen in financial markets.

Second, we can all do better. Over the course of this turbulent year, financial firms and individuals *have* learned to do better − to better understand and manage the risks that come with investing and the use of credit. This is a welcome outcome. The past year has been a learning experience for all of us, including central banks and other policy-makers. The Bank of Canada’s policy tools were tested. Generally speaking, they were up to the job. Where we saw opportunities to improve, develop, and refine our liquidity-policy framework, we took them.

Financial stability and liquid markets are important to the health of the economy. With an expanded set of tools, the Bank of Canada will continue to support the stability and efficiency of the financial system and thus contribute to the well-being of Canadians.