Bank of Canada Liquidity Actions in Response to the Financial Market Turmoil

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- *The Bank of Canada intervened repeatedly during the recent financial crisis to provide extraordinary liquidity directly to financial market participants in order to stabilize the financial system.*
- *Over this period, the Bank's traditional liquidity framework was expanded in four key areas: terms to maturity, amounts, counterparties, and eligible securities.*
- *New liquidity tools were developed in accordance with a set of guiding principles.*
- *Although the regular term PRA facility was the most heavily used, the availability of all of the Bank's extraordinary liquidity facilities may have mitigated market stress and helped to restore well-functioning markets.*

The Bank of Canada fosters the safety and efficiency of the financial system, both in Canada and internationally. One of the means used by the Bank to achieve this goal is to provide liquidity to the financial institutions, financial markets, and payment, clearing, and settlement systems that form Canada's financial system. During the recent financial crisis, the Bank of Canada developed a series of new liquidity tools, and used its traditional tools as well, to stabilize the financial system and limit the repercussions to the Canadian economy.

At the onset of the crisis, which began in August 2007 and continued into 2009, global credit markets experienced sharp reductions in market liquidity, which caused some financial institutions to experience considerable trading losses.[1] Financial institutions around the world generally became more cautious about lending to each other and began to hoard liquidity for precautionary purposes. The resulting increase in interbank borrowing costs spread to other markets. As funding costs increased and funding liquidity declined, the capacity and willingness of financial institutions to make markets was reduced. This contributed to further declines in market liquidity. At several points during the period, interbank lending and other short-term funding markets ceased to exist for terms greater than overnight. As risk aversion increased, institutions became reluctant to extend credit more broadly, with serious economic implications worldwide.

Given this backdrop, central banks and governments around the world undertook a number of unprecedented actions to stabilize the financial system and

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1 There are three types of liquidity relevant to financial markets. Market liquidity refers to the ease with which financial asset positions of reasonable size can be traded with little price impact. Funding liquidity refers to the ability of solvent institutions to obtain immediate means of payment to meet liabilities coming due. Central bank liquidity refers to access to money from the central bank.

reduce the severity of the ensuing global recession.[2] The Bank of Canada, along with other central banks, intervened repeatedly to provide liquidity to financial market participants to mitigate the risks of serious financial disturbances and improve credit conditions. This article is focused on the liquidity actions taken by the Bank during this period to ensure that adequate liquidity was available to key financial institutions in Canada.

The Bank's decisions to intervene in markets were based on judgments that its actions could reduce the liquidity distortions, and that the benefits of alleviating financial system dysfunction would outweigh the potential costs of taking on additional financial risk and creating incentives for moral hazard (Engert, Selody, and Wilkins 2008). The Bank's provision of extraordinary liquidity has been guided by the following five principles.

(i) Intervention should target distortions of system-wide importance.

(ii) Intervention should be graduated, commensurate with the severity of the problem.

(iii) The means of intervention should be well designed, using tools appropriate for the problem being addressed.

(iv) Intervention should be efficient and non-distortionary.

(v) Measures should be taken to mitigate moral hazard.

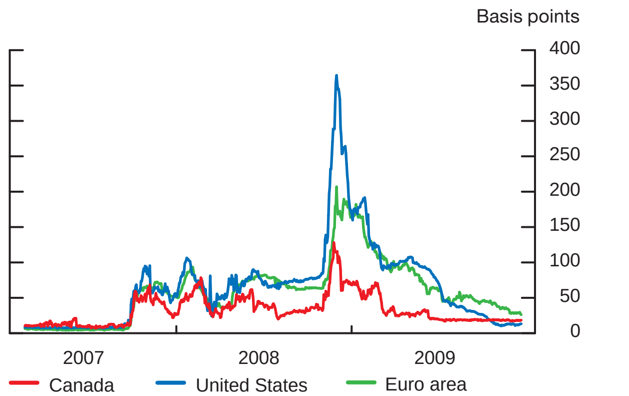
The following section reviews the extraordinary liquidity measures taken by the Bank to stabilize the financial system.[3] This is followed by a discussion of how the Bank applied the guiding principles set out above. An overview is then provided of how the various liquidity facilities implemented by the Bank in the past two years were used, including an assessment of their performance. The final section outlines outstanding issues for future consideration.

Liquidity Measures to Address the Financial Market Turmoil

During the summer and fall of 2007, the worsening performance of subprime mortgages in the United States led to investor concerns about asset-backed securities (ABS) backed in whole or in part by these mortgages. These concerns motivated a broad repricing of risk, first in the market for structured products, but then more broadly in global credit markets. Market participants became concerned about the financial health of counterparties, particularly of banks whose capital was perceived to be eroding, as trading losses mounted and reintermediation from securitized products occurred. This led to a significant increase in interest rate spreads and a reduction in liquidity in short-term bank-funding markets in many countries[4] (**Chart 1** shows spreads between the London Interbank Offered Rate (LIBOR), the European Interbank Offered Rate (EURIBOR), and the Canadian Dealer Offered Rate (CDOR) and the rates for overnight index swaps (OIS) in their respective regions). There is evidence that this increase in spreads, at least in Canada, reflected increases in both credit and liquidity risks. (See Garcia and Yang, this issue, for evidence using spreads on credit default swaps.)

In Canada, the immediate effects were most acute in the market for the short-term debt of banks and corporations. The market for asset-backed commercial paper (ABCP) froze, and Canadian-bank issuers

Chart 1: Spreads between 3-month interbank offered rates[a] and overnight index swap rates



a. For the United States, LIBOR; for the euro area, EURIBOR; and for Canada, CDOR.
Source: Bloomberg

2 See **Appendixes 1** and **2** for summaries of the initiatives undertaken over the 2007–09 period by the Bank of Canada and the federal government, respectively, in support of the financial system. A summary of the international initiatives, beginning in September 2008, is available at: <http://www.newyorkfed.org/research/global_economy/policyresponses.html>.

3 All data presented in this article are updated to 30 October 2009.

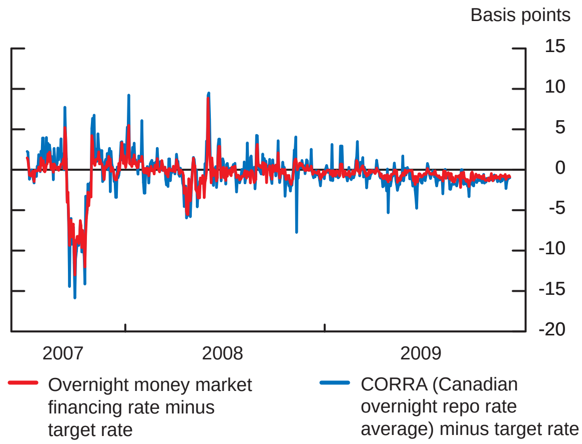
4 For a more detailed review of the circumstances that led to the financial crisis, see Carney (2008a) and International Monetary Fund (2007).

of ABCP were forced to take these securities back onto their balance sheets.[5] In an environment of increasing risk aversion, this restricted the ability of these institutions to meet their funding needs and made them more cautious with respect to liquidity management. Short-term credit markets—specifically ABCP, commercial paper (CP), bankers' acceptances (BAs), and interbank lending—as well as repo markets experienced sharp declines in market liquidity and large increases in spreads relative to expected overnight interest rates. For a short time in Canada, there was a reluctance to lend in the money market for terms longer than a few days, and for several months, activity in some short-term markets (e.g., CP) was reduced for terms greater than one week.

The Bank of Canada responded rapidly at the onset of the crisis, using its traditional liquidity tools.

The Bank of Canada responded rapidly at the onset of the crisis, using its traditional liquidity tools. At the time, the focus of the Bank's liquidity framework was to reinforce the target for the overnight rate (the key means for achieving the Bank's monetary policy objectives and the anchor of the yield curve) by adjusting overnight liquidity through transactions with a limited set of counterparties on the basis of the most liquid, high-quality securities. As pressures in short-term funding markets emerged, the Bank intervened by conducting overnight buyback operations of Government of Canada (GoC) securities with primary dealers and by increasing daily excess settlement balances in the financial system.[6]

Chart 2: Spreads between overnight rates in Canada and the target for the overnight rate



Source: Bank of Canada

These actions, which continued through the fall of 2007, supplied major financial institutions with liquidity at the shortest term and helped to contain overnight financing rates close to the Bank's target **(Chart 2)**.[7] (These traditional liquidity tools were effective throughout the period of financial market turmoil and continue to be an important component of the implementation of monetary policy in Canada.) In addition, the Bank's Standing Liquidity Facility continued to be available to address any temporary shortfalls of settlement balances in Canada's large-value payment system.[8] As well, the Bank stood ready to provide emergency lending assistance to solvent financial institutions facing serious and persistent liquidity problems.[9]

As the situation deteriorated, the Bank gradually expanded its liquidity framework in four areas: terms

5 See Kamhi and Tuer (2007) for a review of the developments regarding ABCP in Canada.

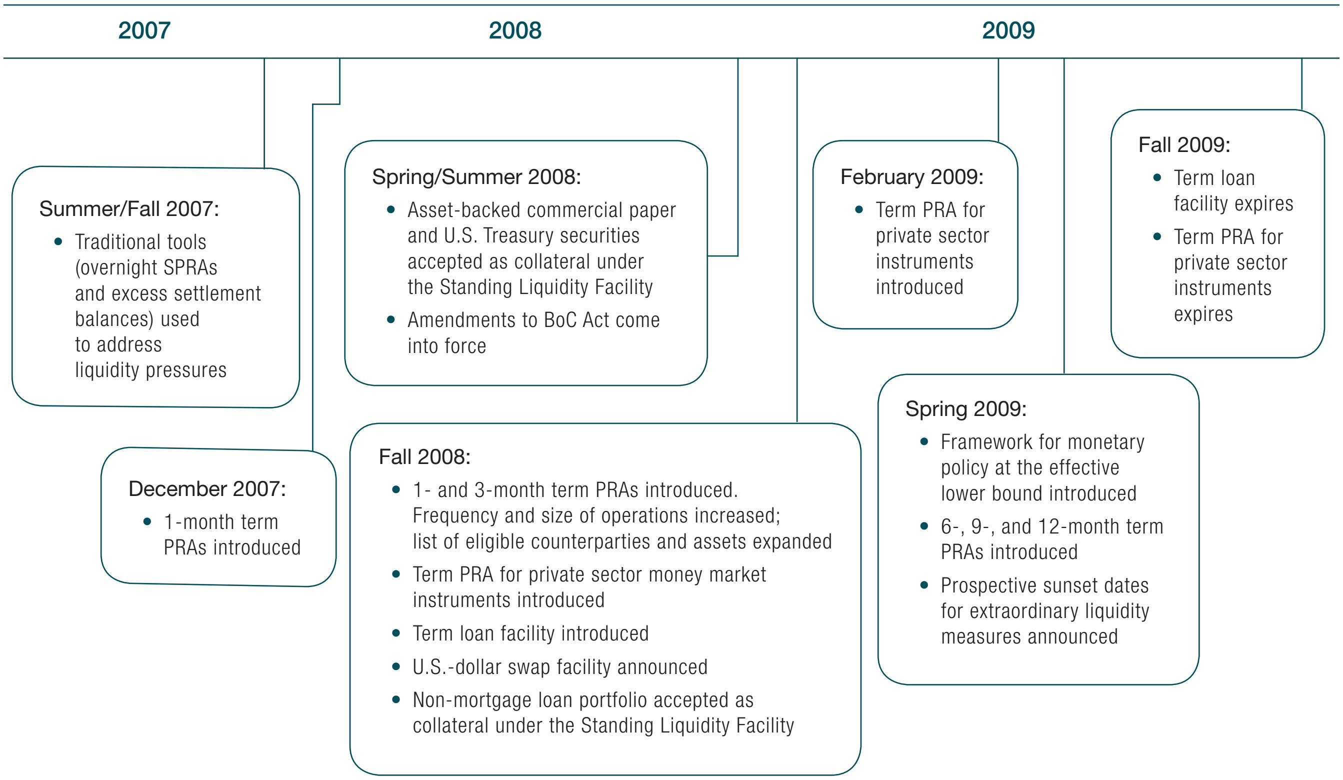
6 The target for the overnight interest rate can be reinforced through transactions using overnight special purchase and resale agreements (SPRAs) or sale and repurchase agreements (SRAs) at the target overnight rate. SPRAs are used to inject intraday liquidity if the collateralized overnight rate is trading above the target, and SRAs are used to withdraw intraday liquidity if the collateralized overnight rate is trading below the target. Typically, these transactions are sterilized at the end of the day (i.e., the cash impact of these transactions on the level of settlement balances in the financial system is offset), leaving daily aggregate liquidity unchanged. The Bank can also adjust target end-of-day settlement balances in the financial system to relieve pressures on the overnight interest rate. For more information on these and related considerations, see Engert, Gravelle, and Howard (2008).

7 The unusually large negative gap in August and September 2007 between collateralized overnight financing rates (the Canadian overnight repo rate average [CORRA] and the money market financing rate) and the Bank's target rate did not reflect broader overnight funding conditions. Indicators of *uncollateralized* overnight rates, such as overnight Northbound (U.S.-dollar/Canadian-dollar) swap rates and overnight Canadian-dollar LIBOR rates, were significantly higher than the target rate; this was corroborated by anecdotal evidence from market participants. This suggests that, at the time, some segmentation between domestic and foreign financial institutions was likely occurring in overnight funding markets.

8 The Standing Liquidity Facility supports settlement in the Large Value Transfer System (LVTS) by providing collateralized overnight loans to direct participants in the system that are experiencing temporary shortfalls in their settlement balances. For more information, see Engert, Gravelle, and Howard (2008).

9 See Bank of Canada (2004) for the Bank's lender-of-last-resort policies.

Figure 1: Evolution of the Bank of Canada's liquidity framework, 2007—09



Source: Bank of Canada

to maturity, amounts, counterparties, and eligible securities.[10] **Figure 1** summarizes this evolution.[11]

The trigger for the expansion of the Bank's liquidity framework came in the latter part of 2007. The financial reporting requirements of global banks (at fiscal year-ends) and related increases in funding needs had exacerbated the continuing desire to maintain a high level of balance-sheet liquidity. When combined with concerns about the soundness of some global financial institutions, credit market liquidity was further reduced around the world, including in Canada, and yield spreads rose on a broad range of credit assets. The spread between the rates in Canadian term money markets and the expected overnight rate increased markedly in late 2007. (**Chart 3** provides an example, using CDOR as an approximation of bank funding costs, and OIS rates to estimate expected overnight rates.[12]) These pressures diminished somewhat in the new year, only to re-emerge in March 2008 when Bear Stearns, a major U.S. investment bank, began experiencing severe credit and liquidity problems.[13]

To address these heightened pressures in short-term funding markets, in December 2007, the Bank of Canada conducted term purchase and resale agreements (PRAs) with primary dealers against an expanded set of eligible securities, with maturities

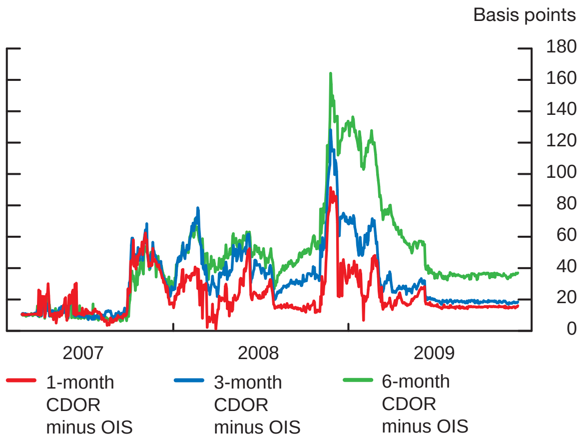
10 Other central banks took similar measures proportional to the severity of the financial market turmoil being experienced in their respective regions. See CGFS (2008) for a discussion of central bank actions up to the spring of 2008.

11 Amendments to the Bank of Canada Act came into force on 5 August 2008, providing the Bank with greater flexibility to purchase and sell a wider range of securities for the purposes of conducting monetary policy and supporting financial system stability. See Bank of Canada (2008) for more on these provisions.

12 CDOR is the average bid rate on Canadian BAs for specific terms to maturity, determined daily from a survey of principal market-makers, and provides the basis for a floating reference rate in Canadian-dollar wholesale and interest rate swap transactions. Since BA issuance and rates can vary widely across banks, CDOR is an imperfect measure of bank funding costs.

13 Bear Stearns experienced staggering losses on its securities portfolio and could not meet its obligations to creditors. The Federal Reserve averted the collapse of Bear Stearns by facilitating its purchase by JPMorgan Chase.

Chart 3: Spreads between Canadian bank funding costs and the expected overnight rate



Note: The Canadian Dealer Offered Rate (CDOR) is used to approximate bank funding costs, and overnight index swap (OIS) rates are used to approximate expected overnight rates.
Source: Bloomberg

extending over the 2007 year-end.[14] This marked the first time that liquidity operations extending beyond one business day were conducted to support funding liquidity; prior to December 2007, term PRAs had only been conducted on an occasional basis to address seasonal fluctuations in the demand for bank notes.[15] Term PRAs were offered again beginning in March 2008 on a biweekly basis. The Bank also expanded the set of assets acceptable as collateral to secure intraday exposures in the LVTS and, correspondingly, for loans provided under the Standing Liquidity Facility, to include certain types of ABCP[16] (in March 2008) and U.S. Treasury securities (in June 2008). These assets could replace other, more-liquid collateral pledged in the LVTS, which, in turn, could be used more easily by financial institutions to obtain market-based funding.

As pressures in global financial markets eased temporarily during the spring of 2008, the Bank wound down its term PRA operations. By June 2008, funding conditions in Canadian money markets for terms up to three months had improved relative to those in other major currencies. On 10 July 2008, the Bank announced that it would not renew maturing term PRA.

Severe financial market pressures re-emerged in the fall of 2008, sparked by a series of failures and near-failures of financial institutions in the United States and Europe. The most significant was the bankruptcy, in September 2008, of Lehman Brothers, a major U.S. financial institution. Concerns intensified about financial institution losses and capital adequacy, and already tight liquidity conditions in short-and long-term funding markets around the world became even more restrictive. By early October 2008, the ability of both financial and non-financial borrowers to obtain market-based financing was seriously impaired in global markets. Credit spreads spiked to unprecedented levels, and interbank and wholesale funding markets ceased to exist in many countries for terms longer than overnight.

The deterioration in Canadian financial markets was much less severe than elsewhere (Chart 1), although liquidity was limited at all maturities, and trading volumes were thin. Demand for BAs and ABCP was limited to maturities of less than one month, and the spread between CDOR and the expected overnight rate hit record levels (Chart 3). Canadian financial institutions became increasingly more conservative in their management of liquidity and their balance sheets, which adversely affected funding and market liquidity more generally.

The Bank aggressively expanded its provision of liquidity by transacting more frequently with a broader range of counterparties, for longer terms, and against a wider range of eligible securities.

The Bank of Canada acted promptly to ensure that adequate liquidity was available to financial institutions operating in Canada. First, term PRA transactions, under the existing terms and conditions, were quickly resumed on 19 September. The Bank also expanded its reciprocal currency swap arrangement with the Federal Reserve on 18 September, in order to be able to provide up to $10 billion of U.S.-dollar funding to domestic financial institutions, if necessary. (Such a need has never materialized in

14 The primary dealers are BMO Nesbitt Burns Inc., Casgrain & Company Ltd., CIBC World Markets Inc., Desjardins Securities Inc., Deutsche Bank Securities Ltd., HSBC Securities (Canada) Inc., Merrill Lynch Canada Inc., Laurentian Bank Securities Inc., National Bank Financial, RBC Dominion Securities Inc., Scotia Capital Inc., and the Toronto-Dominion Bank.
15 The Bank of Canada can purchase GoC securities via term repo transactions to temporarily increase its assets to offset a temporary increase in its bank note liabilities.
16 There are strict eligibility requirements for ABCP securities, such that only those securities with minimal credit and liquidity risk are accepted. See: <http://www.bankofcanada.ca/en/notices_fmd/2009/securities_collateral060309.pdf>.

Canada, nor was it expected to.)[17] This was part of various coordinated central bank actions designed to address elevated pressures in U.S.-dollar short-term funding markets.[18]

Shortly afterwards, the Bank aggressively expanded its provision of liquidity by transacting more frequently with a broader range of counterparties, for longer terms, and against a wider range of eligible securities. In particular, in response to increased pressures in term funding markets, the Bank again conducted term PRAs, but the frequency was increased to weekly (from the biweekly schedule followed earlier), eligible counterparties were expanded to include LVTS participants in addition to primary dealers, and a 3-month PRA maturity was added.[19] The Bank also temporarily broadened the list of securities eligible as assets in term PRA transactions to include own-issued ABCP, much of which had been taken back onto the balance sheets of banks.

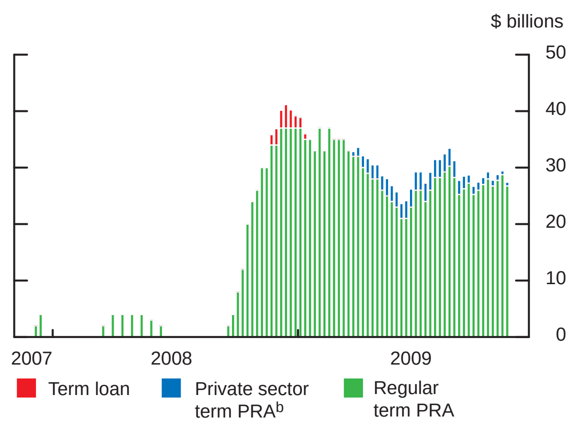
The Bank also took other measures to improve liquidity conditions. First, on 17 October 2008, the Bank decided to temporarily accept as collateral the Canadian-dollar non-mortgage loan portfolios of LVTS direct participants (at a collateral-to-portfolio value of 60 per cent). Initially, these assets were eligible to secure intraday exposures in the LVTS and, correspondingly, to secure loans under the Standing Liquidity Facility. Then, on 12 November, the Bank introduced a term loan facility for direct participants in the LVTS, also secured by Canadian-dollar non-mortgage loan portfolios. Through a weekly auction, the term loan facility provided a backstop source of collateralized funding at competitively determined rates (with the Bank Rate as the minimum bid rate). These measures enabled direct participants in the LVTS to use their non-marketable, illiquid balance-sheet assets as collateral for these specific purposes, thus permitting them to use conventional, liquid collateral elsewhere.

Second, on 14 October, the Bank introduced a term PRA facility aimed at other non-traditional counterparties—participants in the money market (ABCP, BAs, CP). This facility was expanded in February 2009 to provide liquidity to participants in Canadian private sector bond markets as well, and the list of securities accepted as collateral under this facility was correspondingly broadened to include investment-grade corporate bonds.

These various measures increased the amount of term liquidity outstanding to a peak of over $40 billion by December 2008, as shown in **Chart 4**.

With the passing of year-end 2008, the initiatives taken by central banks and governments around the world began to have an impact, and the global financial turmoil dissipated. Funding conditions, particularly for terms of three months or less, and the liquidity of bank balance sheets improved. This was echoed in Canadian money markets more generally, as improvements in bank liquidity positions encouraged their intermediary and market-making activities. The Bank continued to offer extraordinary liquidity through its various facilities on a weekly basis, and the outstanding amounts remained at relatively elevated levels into the spring. (The Bank also eased liquidity conditions by further reducing its target overnight rate

Chart 4: Amounts outstanding under the Bank's liquidity facilities[a]



a. End-of-week par values
b. Term PRA for private sector money market instruments before 20 March 2009
Source: Bank of Canada

17 Shortly afterward, the arrangement was expanded to provide up to $30 billion in U.S.-dollar funding. This agreement between the Bank of Canada and the Federal Reserve has since been extended to 1 February 2010. The need to use this facility has not arisen because difficulties with U.S.-dollar funding mainly occurred in overseas markets, owing to time zone differentials and larger U.S.-dollar requirements. In addition, the major banks in Canada have U.S. operations and access to the Federal Reserve's discount window for U.S.-dollar funds.

18 In addition, in early October 2008, the Bank reduced its target overnight rate by 50 basis points in a move coordinated with other central banks to ease the pressure on global monetary conditions. This step was taken outside of the Bank's schedule for the setting of the target overnight rate. This was quickly followed by further rate cuts in Canada, for a cumulative reduction of 200 basis points between October 2008 and January 2009.

19 The LVTS participants are Alberta Treasury Branches, Bank of America National Assoc., Bank of Montreal, Bank of Nova Scotia, BNP Paribas (Canada), Caisse centrale Desjardins, Canadian Imperial Bank of Commerce, Credit Union Central of Canada, HSBC Bank Canada, Laurentian Bank of Canada, National Bank of Canada, Royal Bank of Canada, State Street Bank and Trust Company, and the Toronto-Dominion Bank. The securities dealer affiliates of eight of these participants are Bank of Canada primary dealers.

at its January, March, and April 2009 fixed announcement dates.) In April 2009, regular term PRA operations became part of the Bank's framework to implement monetary policy at the effective lower bound for overnight interest rates (see **Box,** p.10).

Into the summer and fall of 2009, financial market conditions continued to improve, and participation at central bank liquidity operations indicated a reduced need for the Bank's liquidity support. Prospective sunset dates for all of the Bank's extraordinary liquidity operations were announced at the end of June.[20] At the end of July, the Bank lowered its pre-announced minimum amounts for the regular term PRA auctions as well as that for the term PRA for private sector instruments and the term loan facility. The Bank subsequently announced on 22 September that, at the end of October, the term loan facility and the term PRA facility for private sector instruments would expire and the frequency of regular term PRA auctions would be reduced to biweekly from weekly. Despite a reduction in the amount offered at each PRA auction, the longer maturity profile of these operations (in support of the Bank's conditional commitment) maintained the amount of term liquidity outstanding at about $27.5 billion by the end of October 2009. Finally, improved conditions in funding markets prompted the Bank to announce on 5 November that, beginning on 2 February 2010, it would gradually phase out its temporary measure allowing LVTS participants to assign their non-mortgage loan portfolios as eligible collateral for LVTS and Standing Liquidity Facility purposes.

Applying the Bank of Canada's Principles for Intervention

As noted above, in developing these additional liquidity tools during the financial crisis, the Bank was guided by a set of principles. This section considers how those principles were followed in practice.[21]

20 On 25 June, the Bank announced that the regular term PRA would continue through to at least 31 January 2010; assignment of the non-mortgage loan portfolio as collateral for the Standing Liquidity Facility would continue until at least 1 February 2010; the term PRA for private sector instruments and the term loan facility would continue through to at least the end of October 2009; and that the reciprocal currency swap arrangement with the Federal Reserve was extended to 1 February 2010.

21 As explained in Longworth (2008), the Bank's actions, including the development of new liquidity policies and principles, were influenced by ongoing work in the BIS Committee on the Global Financial System and the Markets Committee that was aimed at strengthening central bank effectiveness in dealing with liquidity problems. See, for example, CGFS (2008).

Principle (i): Target distortions of systemwide importance

Application of the Bank of Canada's traditional liquidity tools was the appropriate response in the early stages of the financial market turmoil, given that problems were limited to a relatively small segment of financial markets. When it became clear that liquidity distortions were taking on systemwide importance, the Bank intervened. Particularly at the end of 2007 and during the fourth quarter of 2008, money markets were not functioning efficiently, and this had broader implications for the financial system as the normal generation of liquidity among system participants broke down. Increasing uncertainty related to credit and liquidity risk caused a reduction in money market activity, reduced the overall supply of liquidity, and inhibited its distribution among market participants. Investors grew increasingly cautious, and banks became more conservative in managing risk. As access to short-term funding decreased with respect to both amounts and maturities, market-making and lending activities were also sufficiently constrained so as to pose serious risks to the financial system. Consequently, the Bank of Canada expanded its role to provide funding liquidity directly to market participants to stabilize the financial system and to limit spillover effects to the broader economy.

When it became clear that liquidity distortions were taking on systemwide importance, the Bank intervened.

Principle (ii): Intervention should be graduated, commensurate with the severity of the problem

As the severity of the conditions changed, so too did the Bank's actions. Initially, funding difficulties at financial institutions were addressed by injecting liquidity through traditional channels; i.e., by offering overnight liquidity via open market operations with primary dealers, which could then be channelled through to other borrowers in need of liquidity. As market funding pressures persisted and extended into longer maturities in late 2007 and early 2008, the Bank correspondingly offered term liquidity, again through its traditional counterparties, as conditions warranted. As the credit and liquidity pressures intensified in the fall of 2008, the Bank's response

Term Liquidity Operations at the Effective Lower Bound for Overnight Rates

On 21 April 2009, the Bank of Canada announced that it would reduce its target for the overnight rate to 25 basis points, which it considers to be the effective lower bound (ELB) for that rate. It also committed to holding its policy rate at 25 basis points until the end of June 2010, conditional on the outlook for inflation. The Bank Rate, the rate at which LVTS participants access overdraft loans via the Standing Liquidity Facility, was correspondingly lowered to 50 basis points.[1]

Several changes were made to the Bank's liquidity facilities to reinforce the Bank's conditional commitment, as well as to preserve the effective functioning of markets in a low interest rate environment.[2]

- First, minimum and maximum bid rates corresponding to the target overnight rate and the Bank Rate, respectively, were introduced for the regular term PRA facility. The minimum bid rate for the term PRA facility for private sector instruments was changed to the target overnight rate plus 25 basis points.
- Second, a portion of the Bank's existing stock of 1- and 3-month regular term PRAs were rolled over into 6- and 12-month terms. (In July 2009, the longest term for the regular term PRA was reduced from 12 months to 9 months and, in October, to 6 months; as of 31 October 2009, the longest maturity extends to 21 July 2010.)
- Third, a new standing overnight PRA facility was introduced for primary dealers, where funds could be accessed at the Bank Rate at their discretion rather than at the discretion of the Bank.
- The Bank also created excess settlement balances in the financial system; i.e., significantly more aggregate balances than required by direct participants in the LVTS. The Bank's target for daily settlement balances increased from $25 million to $3 billion.

With these changes, the Bank's term liquidity operations began to serve two objectives: financial system stability and monetary policy.

1 The deposit rate, i.e., the interest rate paid on settlement balances (deposits) held at the Bank by direct participants in the LVTS, remained at 25 basis points. Because institutions would not have the incentive to lend at market rates below the deposit rate when they can earn that rate on balances held at the Bank, the deposit rate would provide a floor for the overnight rate.

2 At very low interest rates, there is less incentive to participate in markets, owing to the compression of spreads and the corresponding reduction in potential trading profits.

escalated. Communications and actions were coordinated across central banks in recognition of the global nature of the problems and potential effects, and the Bank provided extraordinary term liquidity for larger amounts, for longer terms, to a broader set of counterparties, at more frequent intervals, and on the basis of a wider range of eligible securities. As general market conditions improved throughout the spring and into the early fall, the Bank gradually reduced the amounts of liquidity offered and discontinued facilities that were no longer required. The Bank's interventions thus evolved in accordance with the severity of the financial market dysfunction.

Principle (iii): Intervention must be well-designed; use the right tools for the job

As the market turbulence intensified in the fall of 2008, liquidity was not being reliably channelled beyond the Bank's traditional counterparties, nor was it accessible beyond the shortest terms or on the security of any but the most liquid and high-quality collateral. The Bank addressed this problem by providing liquidity to a wider range of financial institutions, at longer than usual terms, against a wider range of collateral. More specifically, money market liquidity problems were addressed by the Bank's term PRA facilities, while the term loan facility made liquidity available for financial institutions that may have had some difficulties in managing their balance sheets but whose difficulties were not serious enough to warrant emergency lending assistance. Further, adjustments in LVTS collateral enabled the release of conventional collateral for other uses (including term PRA with the Bank) and facilitated the subsequent establishment of the term loan facility, which is secured by the Canadian-dollar non-mortgage loan portfolios of LVTS direct participants. In these ways, the Bank implemented tools designed for particular market dislocations.

In providing liquidity during the crisis, the Bank relied heavily on buyback transactions (most notably, term PRA). From the Bank's perspective, these instruments are effective because they work through both demand and supply channels, but take on much less credit risk than an outright purchase. That is, counterparties that have access to central bank funding through PRAs should be more willing to extend term funding to other financial institutions and will have less precautionary demand for funding, since they have a greater assurance of meeting their liquidity needs.[22] Creditors, in turn, should be more willing to fund institutions that have access to term PRA because of the greater assurance of timely repayment (reduced counterparty risk). Moreover, PRAs that are offered through auction may also help price discovery at a time when price discovery is impaired. From the perspective of financial institutions, the term PRA facilities were effective because they provided a means of temporary funding and supported a return to more normal market conditions, at which point private sector sources of funding became more readily available.

Principle (iv): Minimize market distortions

The liquidity facilities introduced by the Bank were designed to minimize the risk of market distortion. The facilities use an auction mechanism to allocate liquidity so that the price of liquidity is determined competitively by the participants, rather than by the Bank of Canada. The simultaneous and anonymous participation of many financial institutions may also minimize the potential for stigma that might be attached to receiving funds from the central bank under conditions of heightened risk aversion in financial markets. Both the term PRA facility for private sector instruments and the term loan facility were designed as backstop facilities with appropriate minimum bid rates, which provided the Bank with a natural means to exit from these facilities when market sources of liquidity were a more cost-effective alternative for potential participants. In addition, the facilities were designed to preserve the existing market structures. For example, in the term PRA facility for private sector instruments, bidding by private sector market participants was done through primary dealers, which reduced the risk that the Bank of Canada would crowd out traditional market-makers. Primary dealers were not eligible counterparties for these term funds, because they have access to the regular term PRA. Primary dealers could only bid indirectly on behalf of those who were eligible. Finally, intervention is aimed at mitigating liquidity risk that, in the Bank's judgment, is not in line with fundamentals; it does not attempt to alter credit risk.

22 Chapman and Martin (2007) support the notion of providing central bank liquidity through a tiered structure, because the provision of liquidity by the central bank to all market participants more broadly can distort the price of credit risk in the market to which the liquidity is provided. When a central bank has relatively less information than market participants, it should delegate the monitoring of credit risk to a subset of the market.

Principle (v): Mitigate moral hazard[23]

The Bank of Canada has taken several precautions to mitigate the creation of perverse incentives that could adversely influence market behaviour. As noted above, the Bank intervened only in response to specific, extraordinary episodes of heightened liquidity pressures. Moreover, the liquidity facilities were introduced as temporary measures to reduce the incentives for eligible participants to change their behaviour. The Bank has also worked closely with the Office of the Superintendent of Financial Institutions, as well as with the federal Department of Finance and other domestic bodies that share information and coordinate actions on financial sector policy, to monitor the liquidity conditions and risk management of major financial institutions. As well, the Bank has monitored the results of each liquidity operation. With this and other financial market information (for example, spreads between CDOR and OIS rates), the Bank determines the appropriate minimum and actual auction amounts so that the availability of liquidity varies according to market conditions; i.e., with amounts increasing/decreasing only when conditions warrant. Finally, where applicable, the pricing of new facilities was constructed to preserve incentives to transact in private sector markets. For example, the minimum bid rates on the PRA facility for money market participants and the term loan facility were set to ensure that these facilities were only used as a backstop.

The Bank has taken several precautions to mitigate the creation of perverse incentives that could adversely influence market behaviour.

Use of the Bank of Canada's Liquidity Facilities

This section considers use of the regular term PRA facility, the term PRA facility for money market instruments, the term PRA facility for private sector instruments, and the term loan facility, and discusses how the liquidity facilities may have in turn affected broader financial market conditions. Because it has been the workhorse of the Bank's extraordinary liquidity facilities, most of the discussion is related to the regular term PRA facility.

Regular Term PRA

Participation: This facility has been used intensively by eligible participants, particularly during periods of stress in domestic short-term funding markets. Until the spring of 2009, the rate of participation at each operation was typically about 70 per cent of those eligible, indicating strong and widespread demand. From May 2009 onwards, however, the participation rate dropped steadily as other alternatives to central bank funding became more cost-effective.

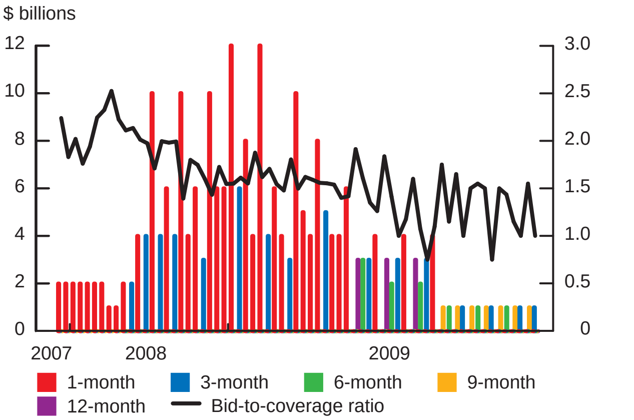
Bidding behaviour at the regular term PRA auctions has also reflected the demand for central bank funding, as measured by the bid-to-coverage ratio. As **Chart 5** illustrates, until the spring of 2009, the bid-to-coverage ratio ranged from about 1.5 to 2.5. The highest ratio was reached early in the crisis, but at that time the amount of funds offered by the Bank under the regular term PRA was relatively small, ranging from $1 billion to $2 billion. From October 2008 to July 2009, the auction sizes were greater, reaching as much as $12 billion, and bids submitted at individual auctions peaked at $19 billion. As the availability of shorter-term funds in the market improved in the spring of 2009, the bid-to-coverage ratio at the 1- and 3-month regular term PRA dropped. In contrast, bid-to-coverage ratios for the longer maturities recovered to levels seen earlier in the period, particularly once auction amounts were significantly reduced. Demand was higher for the newly introduced 6-, 9- and 12-month term funding, since auction participants wanted to lock in longer-term funding at attractive rates.

In sum, both participation rates and bidding behaviour reflected the changing demand for the regular term PRA facility as market conditions evolved over the period.

Securities used: A wide range of securities has been used in the regular term PRAs. As **Chart 6** shows, GoC securities typically made up less than 5 per cent of the securities used to acquire funds under the

23 Moral hazard is the prospect that a party protected from risk will behave differently from the way it would behave if it were fully exposed to the risk and, in particular, with less regard for the consequences of its actions, expecting another party to bear the consequences of those actions.

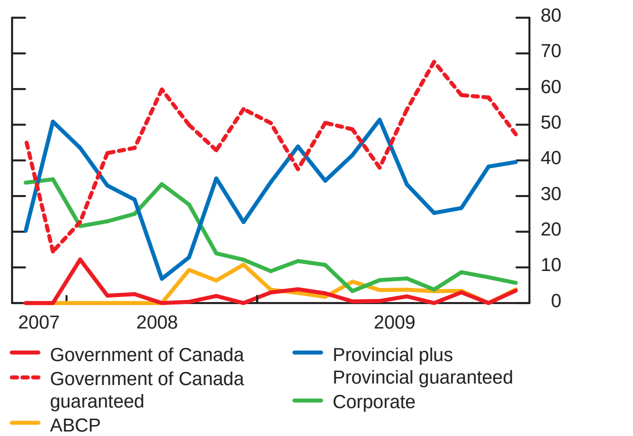
Chart 5: Term PRA: Auction size and bid-to-coverage ratios



Source: Bank of Canada

Chart 6: Distribution of securities purchased under the regular term PRA facility

Average percentage over monthly operations



Source: Bank of Canada

regular term PRA.[24] Increased aversion to liquidity risk meant that only the most liquid securities—GoC securities—could be funded in the market during the peak periods of financial market distress. As financial market conditions eased, participants continued to conserve their GoC securities for market funding rather than for central bank funding purposes. Consequently, less-liquid, but still high-quality securities issued by public sector entities have been heavily used in regular term PRA transactions with the Bank of Canada, including National Housing Act Mortgage-Backed Securities, Canada Mortgage Bonds issued by the Canada Housing Trust, and provincial government-issued and guaranteed bonds. Corporate bonds, corporate paper (including BAs), and ABCP have also been used to secure term PRA funding since they became eligible in the fall of 2008. These securities constitute about 30 per cent of those used during the most severe periods of market dislocation. ABCP represents a relatively small proportion of the securities used, indicating, in part, the significant decline in new issuance that occurred after July 2007. As this occurred, primary dealers reduced their market-making and, correspondingly, their holdings in these securities.[25] Overall, the types of securities used in the regular term PRA suggest that the Bank provided an important alternative source of funding for financial institutions, particularly when market-based funding for these assets was scarce.

Pricing: Other things being equal, the more aggressive the bidding for central bank funds (i.e., the higher the term PRA bid rates relative to the interest rate on market sources of funds), the greater the demand for the facility. In a PRA transaction, the Bank buys eligible securities from its counterparty and agrees to sell the securities back to the counterparty at the end of the term. As such, PRAs are a form of secured or collateralized lending. The difference between the average term PRA bid rate and the market rate on short-term, *unsecured* bank borrowing (represented by CDOR) is an indication of the degree to which participants needed or preferred to obtain liquidity from the central bank, particularly since central bank liquidity can only be obtained on a secured basis.[26] As well, the difference between the average term PRA bid rate, secured by a range of eligible securities, and the market rate on lending that is secured by GoC securities (represented by the OIS rate) provides a measure of the difficulty participants face obtaining funds secured by less-liquid securities.[27] In general,

24 From December 2007 to June 2008, eligible securities for the regular term PRA facility included GoC-issued and guaranteed securities, provincial government-issued and guaranteed securities, and financial corporate securities (BAs, bearer deposit notes). In the fall of 2008, this list was broadened to include non-financial corporate debt securities (commercial paper and investment-grade corporate bonds), own-issued ABCP of banks (subject to certain conditions, such as high credit quality), and U.S. Treasury securities.

25 The market value of outstanding bank-issued ABCP declined from about $85 billion in July 2007 to about $36 billion by the end of August 2009.

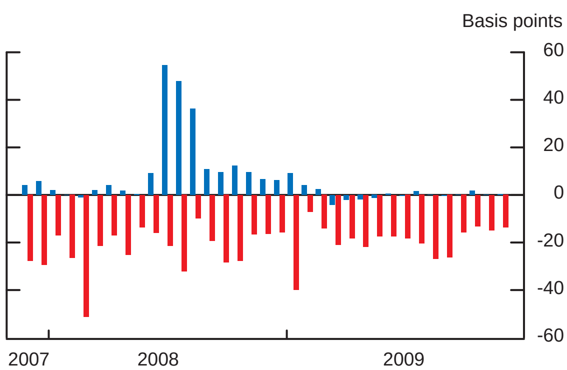
26 One would expect secured lending rates to be lower than unsecured lending rates, because the collateral exchanged reduces the lender's risk of financial loss; i.e., the spread between the average term PRA bid rates and CDOR rates would be negative.

27 OIS rates approximate the General Collateral repo rate over the term, where General Collateral in Canada is GoC securities. Therefore, the spread between the average term PRA bid rate and the OIS rate compares the cost of funding a range of (largely non-GoC) securities relative to the cost of funding GoC securities. One would expect this spread to be positive.

the greater these spreads, the greater the demand for funding via the Bank's regular term PRA facility.

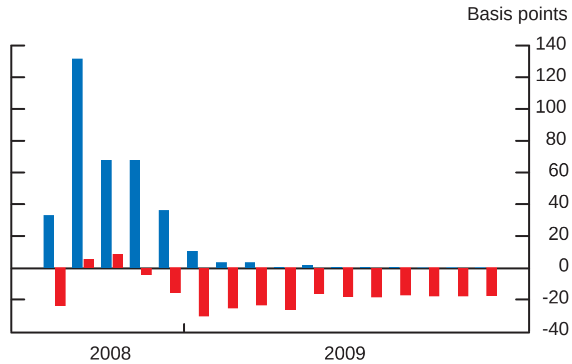
As **Chart 7** illustrates, from December 2007 to early 2009, the average bid rate at the 1-month regular term PRA auction was about 20 to 25 basis points lower than 1-month CDOR rates, although this negative spread was 30 basis points or more at several points during periods of financial market stress. In comparison, bids at the 3-month regular term PRA auction were *higher* than CDOR rates at the peak of the turmoil in the fall of 2008 **(Chart 8)**, resulting in a positive spread. Although this seems counterintuitive, this positive spread suggests that there was a significant demand for central bank funding during the market dysfunction. While 3-month BA rates (used to derive CDOR rates) were quoted over the fall of 2008, in fact, the ability of financial institutions to transact in these markets, particularly in October 2008, was very limited; i.e., market quotes were not reliable. At that time, interbank lending markets were dysfunctional in most major countries. In Canada, activity was almost exclusively limited to terms of one month or less, and only against the most liquid collateral. Such market conditions were also evidenced by the spread between the average bid rate and the OIS rate. These spreads widened considerably during this period, peaking in early October at 55 basis points for the 1-month regular term PRA and at 132 basis points for the 3-month term. The bids received at the term PRA auctions indicate that auction participants were highly motivated to fund their less-liquid securities through the Bank of Canada.

Chart 7: 1-month regular term PRA: Spreads between the average bid rate and the market rate



Source: Bank of Canada

Chart 8: 3-month regular term PRA: Spreads between the average bid rate and the market rate



Source: Bank of Canada

As these extreme market conditions settled down in early 2009, bidding at the regular term PRA auctions became much less aggressive, and spreads against market funding rates eventually stabilized within a relatively narrow range for both the 1- and 3-month terms. By the summer of 2009, average bids were 15 to 20 basis points lower than CDOR rates, and the spreads against OIS rates were well under 5 basis points. This continued into the fall of 2009. Overall, bidding at the Bank's term PRA auctions between 2007 and 2009 reflected the relative degree of stress experienced in term money markets over this period.

Market conditions: In examining the evolution of market rates for short-term funding in Canada over the 2007–09 period, it appears that the Bank's regular term PRA facility helped to improve the supply and distribution of term liquidity during periods of elevated financial market stress and, more generally, helped these markets to continue to function. At first, participation in the Bank's regular term PRA operations was a means for Canadian financial institutions to support their liquidity management at key points in the funding calendar in late 2007 and early 2008. Within a month of the introduction of the term PRA facility in December 2007, bank funding costs had stabilized, as demonstrated by spreads of CDOR over the expected overnight rate (Chart 3). Although the Bank of Canada's term PRA operations had been welcomed by the participants, at that time the operations may have had only a modest positive impact because the amounts were small ($1 billion to $2 billion) and were offered on a limited schedule, commensurate with the relatively strong liquidity position of eligible Canadian financial institutions. However, there was a commitment by the Bank to adjust its term liquidity operations according to the Bank's assessment of financial conditions.

As discussed above, the Bank of Canada's actions intensified in late 2008 as term funding pressures became more acute, and this likely had a larger impact on funding markets. In September 2008, CDOR-OIS spreads spiked higher by 60 basis points for 1-month terms (80 basis points for 3-month terms). The Bank reintroduced term PRAs on 19 September 2008, for larger amounts and on a more frequent basis, and within four weeks had injected over $20 billion of term liquidity into the financial system. The amount auctioned at the 15 October operation was substantial, $10 billion, and within the week CDOR spreads had fallen significantly (by about 40 basis points for the 1- and 3-month terms). The pace of term liquidity operations was maintained, and 1- and 3-month CDOR spreads began to stabilize towards the end of 2008.[28] Notwithstanding usual year-end pressures,[29] by early 2009, CDOR spreads for 1- and 3-month terms had returned to a range of 20–40 basis points, and anecdotal evidence pointed to more normal conditions in short-term money markets.

Following the 21 April reduction in the Bank of Canada's target overnight rate to the effective lower bound and the corresponding changes in its operating framework for monetary policy, funding conditions in Canada continued to improve into the fall of 2009. Regular term PRA operations maintained the amount of outstanding term liquidity between $25 and $30 billion. One- and 3-month CDOR-OIS spreads fell further and quickly stabilized into a very tight range over the summer and fall of 2009. Similar effects were also evident for longer-term money market rates. With the provision of 6- and 12-month term liquidity (and later, 9-month terms) by the Bank, CDOR spreads at these terms moved closer to shorter-term spreads—a direct result of the Bank's conditional commitment to keep its target overnight rate at ¼ per cent until the end of June 2010. Overall, CDOR spreads since May 2009 have remained relatively close to pre-crisis levels and, more generally, financial institutions are facing more-normal funding conditions.

28 Federal government initiatives also contributed significantly to the stabilization of Canadian financial markets (see **Appendix 2**). In addition, actions taken by other central banks and governments had a positive impact on global financial markets, from which Canada also benefited.

29 Another factor that weighed on Canadian money markets towards the end of 2008 was concern related to the protracted restructuring of non-bank-sponsored ABCP trusts in Canada.

Term PRA for Money Market Instruments and Term PRA for Private Sector Instruments

The term PRA facility for money market instruments was implemented to support money market participants (other than primary dealers and LVTS participants) who were unable to obtain funding from typical market sources because ABCP, BA, and CP markets were not functioning normally. From its introduction, participation was modest, and a small amount of term liquidity was provided under this facility. Only $25 million (the minimum allowable bid size) was outstanding on a fairly consistent basis until the end of January 2009 (Chart 4).

The term PRA facility for money market instruments was designed to be a backstop for private sector alternatives, and the minimum bid rate was set accordingly.

The likely reason for the modest use of this facility is that conditions in shorter-term money markets were not stressed enough to motivate a larger group of potential counterparties to participate; i.e., market funding could still be obtained. The facility was designed to be a backstop for private sector alternatives, and the minimum bid rate was set accordingly.[30] Another reason may be related to eligible participants: Only firms with significant activity in private sector money markets (and later, bond markets) could participate, and then only indirectly, by submitting bids through a primary dealer. The latter point may have deterred some potential counterparties from participating to avoid providing sensitive information to a primary dealer, which, in some cases, may have been a competitor. It may have also been the case that the initial list of eligible securities was not broad enough to encompass those sectors of the corporate market that were most in need of support.

With these factors in mind, the Bank announced in February 2009 that it would replace this facility with

30 The minimum bid rate was originally set as a spread of 75 basis points above the OIS rate. When the facility was replaced in March 2009, the minimum bid rate was decreased to 25 basis points above the greater of the OIS rate and the OIS rate plus the difference between the average yield of the preceding regular term PRA auction and the OIS rate for that operation. As indicated in the Box, the minimum rate was amended in April.

the term PRA for private sector instruments, which added corporate bonds to short-term corporate securities. The minimum bid rate was also reduced. Bidding through primary dealers was preserved, as mentioned earlier, to uphold the traditional structure of market-making in Canada. Despite the changes, the number of participants and the value of transactions was still relatively small, although participating institutions did increase the value of their submitted bids up to the maximum allowable. The amount of term funding allocated under the facility did rise modestly, to a peak of about $3 billion in the early summer of 2009 (Chart 4). Thereafter, participation waned, with several auctions receiving no bids at all. Because of the improvement in funding conditions for eligible participants, this facility was terminated at the end of October 2009.

Term Loan Facility

The term loan facility was designed to support LVTS direct participants in the management of their balance sheets in order to improve conditions in money and credit markets. For only a brief period at the end of 2008 was there any take-up of the Bank's regular weekly offering of 1-month term loans to LVTS direct participants. At its peak in early December 2008, funds outstanding from the term loan facility reached over $4 billion, but gradually subsided to zero after the end of 2008 (Chart 4).

This facility was also designed to be a backstop, with pricing and terms and conditions set accordingly.[31] In addition, all eligible participants had access to the Bank's regular term PRA facility.[32] As a result, the low level of demand for the term loan facility can be interpreted as indicating that these financial institutions had no serious difficulties obtaining term funding from other sources. Despite the lack of take-up, the Bank honoured its commitment to conduct weekly auctions of term loans to eligible institutions until the end of October 2009.

Summing up

As the preceding review shows, the regular term PRA facility was heavily used and appears to have contributed to reduced market stress and a return to well-functioning money markets. In contrast, there was relatively little demand or need for funding from the term PRA facility for money market instruments, the term PRA facility for private sector instruments, and the term loan facility, which were designed as backstops. Notwithstanding the general lack of use of the latter set of facilities, these arrangements provided liquidity support for some participants during the most difficult phases of the crisis, and thus may have mitigated subsequent disruptions specifically related to these institutions. As well, the presence of these facilities to the end of October 2009 helped to mitigate uncertainty among market participants about the availability of liquidity, if necessary.

Outstanding Issues

The global financial crisis has subsided, and financial conditions have improved significantly over the past six months, not just in Canada, but globally. Central banks and governments are now looking beyond the crisis, and are working to build a more resilient global financial system with the necessary market infrastructure, policies, and regulation. Canada is an active contributor to the G–20 agenda, working with its domestic and international partners in a wide range of areas.[33] With respect to the extraordinary actions discussed in this article, there are three topics on which the Bank of Canada is currently focused.

First, the Bank is interested in studying in more depth the effects of its extraordinary liquidity facilities on behaviour and, more generally, on the domestic financial system. A more rigorous empirical assessment should be made of the effects of the facilities during the financial crisis. In particular, it would be useful to determine the contribution of these facilities to mitigating the adverse effects of the crisis, compared with other potential contributing factors, such as actions taken by domestic financial institutions to improve their balance sheets, as well as actions taken by public authorities domestically and internationally to stabilize the global financial system. A comparison of Canada's experience with those of other countries that implemented extraordinary liquidity measures might also be useful. Further analysis could also assess the impact on the future behaviour of financial market participants, and, in particular, whether these actions generated moral hazard. Attention should also be devoted to whether the particular design of the

31 The minimum bid rate was set at the Bank Rate, which is the minimum rate against which the Bank can lend under the Bank of Canada Act.

32 Institutions eligible for the term loan facility were LVTS direct participants who had pledged their Canadian-dollar non-mortgage loan portfolios to the Bank as collateral for LVTS and Standing Liquidity Facility purposes.

33 See Bank of Canada (2009) and Carney (2009) for an overview of the G–20 strategy.

auction mechanisms used in the facilities were the most useful to facilitate price discovery and competition in bidding.

Second, this research could be used to inform questions related to the design of liquidity policies. In particular, one could ask (with the benefit of hindsight) whether the range of liquidity facilities that were developed was necessary and efficient. In addition, while these various facilities were designed as temporary arrangements, would it be appropriate to make available some form of liquidity facility on an ongoing, permanent basis so as to facilitate continuous functioning of core markets? If so, what mechanisms might be required to reduce the risk that central bank facilities, if used for extended periods, adversely affect the behaviour of financial institutions? If not, how should the Bank maintain sufficient flexibility and readiness to respond to potential future liquidity challenges?

Work is continuing on an international basis to enhance market and institutional resiliency, and thereby reduce the magnitude of the effects of future financial disturbances.

Finally, the Bank is interested in promoting resilient financial markets, and, hence, a resilient financial system, to support endogenous liquidity creation and to reduce the probability of financial stress requiring central bank intervention. To this end, work is continuing on an international basis to enhance market and institutional resiliency, and thereby reduce the magnitude of the effects of future financial disturbances. For example, under the guiding principles of the Financial Stability Forum, market incentives, transparency, regulation, and oversight are being examined in relation to leverage and liquidity.[34] The Bank will also continue to work to identify and communicate key emerging structural vulnerabilities in the global and domestic financial markets that are relevant to Canadian financial stability, including via its twice yearly *Financial System Review*. Similarly, the Bank will also provide leadership in the development of relevant policies and core market infrastructures so that these core markets are continuously open and the liquidity of the financial system is not compromised by similar events.[35]

34 Duguay (2008), for example, discusses strengthening the resiliency of the financial system.

35 Carney (2008b) discusses the importance of supporting continuously functioning core markets.

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Appendix 1: Bank of Canada Liquidity Facilities

	Term PRA	Term PRA for Private Sector Money Market Instruments	Term PRA for Private Sector Instruments	Term Loan Facility
Date announced	12 December 2007; modified most recently: 22 September 2009	14 October 2008; effective 27 October 2008. Discontinued 16 March 2009[b]	23 February 2009; effective 16 March 2009. Discontinued after 27 October 2009	12 November 2008. Discontinued after 28 October 2009
Purpose	Temporary facility to provide liquidity in support of the efficient functioning of financial markets and modified on 21 April 2009 to also reinforce the BoC's conditional statement regarding the expected future path of the target overnight rate	Temporary facility to support liquidity in private sector money market instruments. This facility was replaced by the Term PRA for Private Sector Instruments.	Temporary facility to support liquidity in markets for private sector instruments	Temporary term loan facility to give LVTS participants increased flexibility in the management of their balance sheets and to improve conditions in money and credit markets
Eligible participants	Canadian PDs in GoC securities and direct participants in the LVTS	PDs on a direct basis and money market participants on an indirect basis who can demonstrate significant activity in the Canadian-dollar private sector money markets and who are subject to federal or provincial regulation	Institutions that can demonstrate significant activity in the Canadian private sector money and/or bond markets and that are subject to federal or provincial regulation	Direct participants in the LVTS
Eligible collateral/ securities[a]	Securities issued or guaranteed by the Government of Canada; securities issued or guaranteed by a provincial government; BAs and promissory notes; CP and short-term municipal paper; ABCP that meets the BoC's eligibility criteria; corporate and municipal bonds. On a temporary basis: affiliated ABCP that meets the BoC's criteria. Securities are subject to credit and other criteria.	BAs, CP, ABCP that meets the BoC's eligibility criteria, promissory notes. Securities are subject to credit and other criteria.	BAs, CP, and ABCP that meet the BoC's eligibility criteria, promissory notes, corporate bonds. Securities are subject to credit and other criteria.	Canadian-dollar non-mortgage loan portfolios, subject to credit and other criteria.
Haircuts	Margin requirements available at: <http://www.bankofcanada.ca/en/financial/securities.pdf>	See margin requirements (URL in Column 1)	See margin requirements (URL in Column 1)	See margin requirements (URL in Column 1)
Pricing and type of auction	Multiple-yield competitive auction for a fixed par Canadian-dollar amount. Introduced minimum and maximum bid rates on 21 April 2009. Minimum bid rate: lower end of the operating band (25 basis points). Maximum bid rate: Bank Rate (50 bps)	Multiple-yield competitive auction for a fixed par Canadian-dollar amount, subject to a minimum bid rate set at a spread of 75 bps over the average of the BoC's target overnight rate and the 1-month OIS rate as observed by the Bank	Multiple-yield competitive auction for a fixed par Canadian-dollar amount, subject to a minimum bid rate set at a spread of 25 bps over the target overnight rate	Single-price auction for a fixed par Canadian-dollar amount. Minimum bid rate: Bank Rate. All winning bids will pay the minimum accepted yield.
Term	1, 3, 6, 9, and 12 months	2 weeks	1 and 3 months	1 month
Frequency	Biweekly	Weekly	Weekly	Weekly

a. Full details regarding eligible securities are available at <http://www.bankofcanada.ca/en/financial/securities.pdf> .
b. As of16 March 2009, this facility was replaced by the Term PRA for Private Sector Instruments.
Legend: ABCP = asset-backed commercial paper; BAs = bankers' acceptances; BoC = Bank of Canada; CP = commercial paper; CPA = Canadian Payments Association; ELB = effective lower bound; GoC = Government of Canada; LLR = Lender of Last Resort; LVTS = Large Value Transfer System; OIS = overnight index swap; PDs = primary dealers; SLF = Standing Liquidity Facility

Appendix 1: Bank of Canada Liquidity Facilities (cont'd)

	Sales and Repurchase Agreements (SRAs)/Special Purchase and Resale Agreements (SPRAs)	Overnight Standing Purchase and Resale Agreement (PRA) Facility	Standing Liquidity Facility (SLF)	Emergency Lending Assistance (ELA)
Date announced	Used since mid-1994	21 April 2009		
Purpose	Permanent tool of the BoC standard operating framework for the implementation of monetary policy. Used to reinforce the target overnight rate at the midpoint of the operating band. Under the ELB, SRAs would be used to reinforce the target overnight rate, which is the lower end of the operating band.	Temporary facility as part of the operating framework for the implementation of monetary policy at the ELB. This facility provides a funding backstop to PDs, similar to the overdraft facility for LVTS participants.	Permanent facility as part of the BoC's operating framework for the implementation of monetary policy and of the BoC's LLR framework. This facility aims to support settlement in the payments system by providing collateralized overnight loans to direct participants in the payments system who are experiencing temporary shortfalls in their settlement balances.	Permanent facility, part of the BoC's LLR framework. This facility provides extraordinary credit support to solvent institutions that are facing serious and persistent liquidity problems.
Eligible participants	PDs for GoC securities	PDs for GoC securities	Direct participants in the LVTS	Federally incorporated deposit-taking institutions that are CPA members that are solvent but face persistent liquidity problems and, in the case of an extraordinary and widespread event that would have significant adverse consequences for a provincial credit union or caisse populaire system, the Credit Union Central of Canada, a provincial credit union central, the Caisse centrale Desjardins, or the Federation des caisses Desjardins
Eligible collateral/ securities[a]	GoC securities	GoC securities	Securities issued or guaranteed by the Government of Canada, GoC stripped coupons and residuals, securities issued or guaranteed by a provincial government, BAs, and promissory notes, CP and short-term municipal paper, corporate, municipal and foreign-issuer bonds, marketable securities issued by the U.S. Treasury, ABCP that meets the BoC's eligibility criteria, and Special Deposit Accounts held at the Bank. Effective 20 October 2008 through to 1 February 2010, Canadian-dollar non-mortgage loan portfolios are also fully eligible. Securities are subject to credit and other criteria.	The BoC is willing to accept a broader range of collateral than for the SLF, including the Canadian-dollar non-mortgage loan portfolios, subject to credit and other criteria.
Haircuts	Margin requirements available at: <http://www.bankofcanada.ca/en/financial/securities.pdf>	See margin requirements (URL in Column 1)	See margin requirements (URL in Column 1)	See margin requirements (URL in Column 1)
Pricing	Overnight Target Rate	Bank Rate	Bank Rate	Minimum rate is the Bank Rate.
Term	Overnight	Overnight	Overnight	Maximum term to maturity: 6 months
Frequency	As required	Standing Facility	Standing Facility	As approved by BoC. Actual use is very rare.

a. Full details regarding eligible securities are available at <http://www.bankofcanada.ca/en/financial/securities.pdf> .
Legend: ABCP = asset-backed commercial paper; BAs = bankers' acceptances; BoC = Bank of Canada; CP = commercial paper; CPA = Canadian Payments Association; ELB = effective lower bound; GoC = Government of Canada; LLR = Lender of Last Resort; LVTS = Large Value Transfer System; OIS = overnight index swap; PDs = primary dealers; SLF = Standing Liquidity Facility

Appendix 2: Federal Government Initiatives in Response to the Financial Crisis

During the recent period of financial turmoil, the Government of Canada introduced a number of measures to respond to gaps in credit markets by providing up to $200 billion to improve access to financing for Canadian households and businesses. One of the key measures is the Insured Mortgage Purchase Program (IMPP), under which the government purchases, through the Canada Mortgage and Housing Corporation, pools of insured residential mortgages from Canadian financial institutions. As uncertainty in global financial markets swelled, the ability of Canadian financial institutions to fund their lending activity became impaired. Through the IMPP, these institutions could mobilize assets on their balance sheet and obtain a significant and stable means of long-term financing. Thus, the IMPP enabled financial institutions to continue to provide credit to Canadian households, businesses, and the economy. The IMPP was complementary to the provision of extraordinary liquidity by the Bank of Canada, which, by virtue of the Bank of Canada Act, is legally restricted from acquiring an interest in mortgages.

A summary of the initiatives taken by the federal government in response to the financial crisis is presented in chronological order below.

- July 2008: CMHC's Canada Mortgage Bonds (CMB) Program was expanded to add a 10-year maturity.
- October 2008: The IMPP was introduced to purchase, through the Canada Mortgage and Housing Corporation (CMHC), up to $25 billion in insured mortgage pools.
  - The maximum amount was subsequently raised to $75 billion in November 2008 and to $125 billion in January 2009.
  - About $66 billion in mortgages had been purchased by the end of October.
- October 2008: The Canadian Lenders Assurance Facility (CLAF) was set up as a temporary facility to provide insurance on the wholesale borrowing of federally regulated (and elegible, provincially regulated) deposit-taking institutions. This was undertaken to ensure that Canadian institutions were not put at a competitive disadvantage relative to foreign competitors when raising funds in wholesale markets. It has not been used to date.
- November 2008: The Office of the Superintendent of Financial Institutions (OSFI) announced that the limit for preferred shares within the capital rules for OSFI-regulated institutions would increase to 40 per cent.
- December 2008: The Canadian and Ontario governments jointly announced financial assistance to the automotive sector via a $4 billion loan facility to the Canadian subsidiaries of General Motors and Chrysler. Between 30 March and 15 July 2009, a total of USD $12.4 million was disbursed.
- January 2009: The Canadian Secured Credit Facility (CSCF) was introduced in the 2009–2010 Federal Budget to purchase up to $12 billion in newly securitized term asset-backed securities (ABS) backed by loans and leases on vehicles and equipment. The facility is managed by the Business Development Bank of Canada (BDC).
- January 2009: Changes were made to improve the capacity of the Canada Deposit Insurance Corporation (CDIC) to respond to troubled financial institutions:
  - CDIC's borrowing limit was increased from $6 to $15 billion;
  - CDIC was allowed the ability to establish a bridge institution as an additional resolution tool.
- January 2009: The Business Credit Availability Program (BCAP) was introduced to improve access to financing for Canadian businesses by providing new resources and flexibilities to Export Development Canada (EDC) and the Business Development Bank of Canada (BDC), combined with enhanced co-operation between private sector lenders and those Crown corporations.
  - The government injected an additional $350 million in capital in both EDC and BDC.
  - EDC's and BDC's borrowing limits were increased.
  - EDC's mandate was temporarily expanded to enable it to support financing in the domestic market.
- May 2009: The Canadian Life Insurers Assurance Facility (CLIAF) was established as a temporary

Appendix 2: Federal Government Initiatives in Response to the Financial Crisis (cont'd)

facility to provide insurance on the wholesale borrowing of federally regulated life insurers. This was undertaken to ensure that Canadian institutions were not put at a competitive disadvantage relative to foreign competitors when raising funds in wholesale markets. It has not been used to date.