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FINANCIAL CHAOS: THE POLITICAL
ECONOMY OF THE BANK OF CANADA IN
EXTRAORDINARY TIMES.**

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MONETARY POLICY IN A PERIOD OF FINANCIAL CHAOS: THE POLITICAL ECONOMY OF THE BANK OF CANADA IN EXTRAORDINARY TIMES

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INTRODUCTION

The events that have unfolded since August 2007 were no doubt of an extraordinary magnitude. There were many troubling signs before that date but, with the exception of those closely involved with financial markets, few seemed to care. Furthermore, we kept being told by chief economists and regulators that “the fundamentals” were sound. Then, as European investors became nervous when it became known that two large German banks were on the brink of bankruptcy because of their large holdings of US mortgage-backed securities, no one felt safe. Banks that were in a surplus position in the clearing and settlement system refused to lend on the interbank market to banks in a debit clearing position. As a gridlock commenced to take place, the interbank interest rate shot up, forcing the European Central Bank to provide nearly unlimited amounts of clearing balances to money markets in an effort to keep the overnight interest rate near its benchmark level and to make sure that clearing accounts would be settled.

In Canada, there was also a scare on the interbank market, as the Bank of Canada was forced to engage in large repos operations on August 9 and 10, 2007, to keep the overnight rate at its target level, leaving nearly a billion and a half dollars in excess settlement balances on those two days, and hundreds of millions during the subsequent weeks, as shown in Figure 1. But the greatest impact was on the market for asset-backed commercial paper (ABCP). Back in 1998, a little-known company – Coventree – had started a profitable business, funding purchases of US mortgage-backed securities and mortgage derivatives by issuing short-term debt – the ABCP. Coventree was soon to be imitated by banks and other non-bank conduits. But as the European conduits based on US mortgage-backed securities and derivatives were going down or were freezing withdrawals, a sufficiently large number of investors were declining to rollover their take in ABCP, and hence on the morning of August 13, Coventree could not deliver. The foreign banks that were supposed to provide liquidity refused to extend a credit line, and so did the Bank of Canada which declined to participate at a meeting that was called during the previous weekend. Other non-bank ABCP issuers at first rejoiced at the

difficulties that Coventree was experiencing, believing that a rival had been knocked over, but then within a few hours they realized that they were about to suffer the same fate. The entire non-bank ABCP market froze. Meanwhile the ABCP market sponsored by Canadian banks nearly shut down.

The crisis seemed to subside, however. As early as the 6th of September 2007, only three weeks after having decided to expand its list of collateral eligible for repo transactions so that banks could offer asset-backed commercial paper in exchange for liquidity-creating Special Purchase and Resale Agreements (SPRA), the Bank of Canada rescinded its decision. As similar events unfolded elsewhere, once more observers were led to believe that central bankers had cleverly avoided further financial trouble. It seemed that the self-regulating forces of the financial system were sufficiently strong to make it resilient enough to face large losses, and that these would have no impact on the real economy. This illusion was about to persevere for another year or so, with some hiccups in financial markets and the stock market, but then, in the Fall of 2008, the financial storm was everywhere, with one shocking news following another. The US government-sponsored agencies Freddie Mac and Fanny Mae had to be rescued, Wall Street banks tumbled one after the other, two large US banks – Washington Mutual and Wachovia – had to be acquired, and the giant insurer AIG had to be bailed out by the US government, as were then a string of large European banks, including the whole Icelandic banking system. It then became clear to all, especially following the refusal of the American government and the Fed to rescue the Lehman Brothers bank that the financial crisis would spread to the real economy in a serious way. As a consequence of all this turmoil, on the 19th of September 2008 the Bank of Canada started weekly auctions for term repos, called term PRAs, based on 28-days or 91-days operations. Despite these term repos, the Bank of Canada was forced once more to engage in standard one-day repo operations to keep the overnight rate near its target level in September and October 2008, also leaving extra settlement balances in the payment system, as shown in Figure 2.

INFLATION AUTISM

Amusingly, while the rest of the world was crumbling into financial chaos and depression, officials at the Bank of Canada were going around making speeches about how best to measure inflation (Murray 2008) and about whether the Bank should adopt lower inflation targets or move towards price level targeting (Duguay 2007, Jenkins 2007).¹ At a time when one would have thought that financial stability would become the main concern of the Bank, its officials are still persuaded that “low, stable, and predictable inflation is the best contribution that monetary policy can make to the economic and the financial welfare of Canadians” (Bank of Canada, 2009, p. 25). This comes as a leitmotiv in exactly, or nearly exactly, the same terms in all the speeches of Bank officials, before, during or after the crisis. Indeed, Bank officials have gone so far

¹ To be fair, the Governor of the Bank, David Dodge, did make a speech identifying the main causes of the financial crisis as early as September 12, 2007. Still, this was one month after the gridlock on interbank markets. Subsequently, as one would expect, there have been many other speeches by various Bank officials about the financial crisis.

as to say that “an inflation-targeting regime is the best monetary policy regime for reducing the probability that asset-price bubbles will develop in the first place” (Selody and Wilkins, 2004, p. 6), being seemingly unaware that direct financial regulation would most likely do a much better job. Instead the Bank seems to be worried about both cassandras – namely the belief that prices are about to drop continuously and rentiers thinking that inflation will soon take off when problems miraculously disappear. To quash these fears, Deputy Governor Murray (2009, p. 5) has reiterated that “any unconventional action initiated by the Bank must have as its primary objective the achievement and maintenance of the Bank’s 2 per cent inflation target”. So if any action is taken, it is not to stop the economy from reaching double-digit unemployment rates; rather it is to bring back the inflation rate towards its target.

When assessing the action that it must take to do so, bank officials claim that they are looking at least 18 months in the future. Indeed the New Consensus model which is now the bread and butter of central bankers, known as ToTEM at the Bank of Canada, is based on the assumption that the entrepreneurs form forward-looking expectations with regards to inflation. In the past, the Bank was using some measure of the NAIRU to estimate future inflation, but with the rate of unemployment being a rather politically-sensitive variable and with a poor forecasting record, this was changed to the rate of capacity utilization in the 1990s. Then, as the so-called Taylor rule came to the forefront, output potential became the fashionable variable bound to produce a correct estimate of the path to be followed by inflation in the future, with the lag being estimated to be something like 18 or 24 months. While the Bank of Canada is pretty transparent in most of what it does, its measure of potential output and its associated output gap is quite obscure. Ironically, most recently, the Bank has provided a somewhat more explicit definition of its output gap, relating it to the discrepancy between the growth rate of the economy and its natural rate, tied to productivity growth and the growth of the labour force (Bank of Canada, 2009, p. 12). This however is not reassuring in the least, as the Bank forecasters seem to be quite unable to predict future rates of real growth, even only 12 or 6 months in advance. Table 1 compares the actual semester growth rates of real GDP, as measured by the national income and expenditure accounts, with the forecasts of the Bank, 12 months or 6 months before the middle of the semester in question. The Table shows that the Bank can err on both sides. Also, obviously, as most private forecasters, forecasters at the Bank of Canada have completely under-estimated the negative impact of the financial crisis on the real economy. In any case, as long as the Bank is unaware of a major shift, its 12-month GDP growth forecast seems to oscillate around 2.8%.

Sill, even more amusing is the fact that the Bank of Canada is now getting into a web of contradictions. Research being carried at the Bank and elsewhere seems to indicate that the economy would benefit from any of the three alternatives being advocated by the very best of the economics profession: setting a price level target, setting an inflation rate target closer to zero percent, and setting a deflation rate target (a *negative* inflation rate target), equal to the rate of growth of productivity so that the target interest rate is zero, as in Milton Friedman’s celebrated but widely ignored essay on the optimal quantity of money. Although this research is based on abstract neoclassical theorizing about allocative efficiency, the models manage to provide numerical estimates of the potential

welfare gains of moving inflation rates from 2 percent to 0 percent, but the estimates vary from 1 percent of GDP to as little as 0.1 percent of GDP (Amano et al., 2009).

If the Bank believes that such gains are worth going after and that the scholars advocating such alternatives have anything to say about the real world, it would seem that now is the best time to put into practice any of these three alternatives. As of June 2009, the rate of inflation/deflation based on the CPI is at a 15-year low of -0.3% on a twelve months basis, that is to say, the rate is essentially at zero. Since the main objection against lowering the inflation target is the short-run cost endured during the transition to the lower inflation rate, such costs would be avoided if the target was being changed now. One could object that while the overall inflation rate is zero, the core inflation rate is still somewhat high. Indeed, the core inflation has been barely below 2% during the first half of 2009. But then, if the core inflation rate is right on target, why is it that the target interest rate has been set at 1% or below since January 2009.

The answer naturally is that the Bank cannot ignore what is going on in financial markets or in the rest of the world when setting the target overnight rate. With the Canadian economy being in a recession and with unemployment rates quickly rising, and with banks and other financial institutions still being provided with help by the central bank and the Canadian government, it is clear that all these academic discussions about zero inflation targeting need to consider another problem, often highlighted by some Bank officials in the past, that of the zero lower bound on nominal interest rates. It is often claimed, on the basis of the new consensus model so popular among central bankers, that price level targeting would help to alleviate the problems of the zero lower bound in achieving contra-cyclical monetary policy. However, such claims are hard to swallow when more realistic assumptions are entertained, such as inflation expectations being based on past rates, the presence of large commodity and energy shocks, and the frequency of wild fluctuations in the exchange rate, as experienced by Canada over the last couple of years, with the Canadian dollar moving up to US\$1.09, then free-falling to US\$0.77 less than a year later, only to move back up to US\$0.90.

Whatever happens to the debate on the proper inflation target, or even whether there should be inflation targeting, “the significance of the zero lower bound has increased significantly in the aftermath of the 2007 subprime-mortgage meltdown ...” (Amano et al. 2009, p. 9). Zero interest rates are not anymore a remote possibility associated with the case of Japan; it has become a reality for the US and Canada. And with inflation rates quickly reaching zero, it is clear that the Fed and the Bank of Canada are now unable to set negative real interest rates to boost their economies, as seems to be needed to crank up the economy. Thus the standard monetary instrument of central bankers, based on Wicksellian rules, has reached its limits, making the central bank unable to pursue a more expansionary monetary policy. These difficulties associated with the zero lower bound on nominal interest rates have been extended by the rising spreads between the overnight rate and market rates. The spreads since the beginning of the crisis have become highly volatile and have now been much higher than what they were before the crisis, thus reinforcing the difficulties in achieving negative real rates of interest when needed, as shown in Figure 3. Furthermore, all these problems are being compounded by the more

stringent credit conditions. As can be seen in Figure 4, loan officers have been tightening lending conditions since the third quarter of 2007, when the crisis erupted, and nearly two years later, these credit conditions are still being tightened. Thus monetary policy is even more restrictive than a strict reading of the values taken by the real overnight rate.

ZERO-INTEREST RATE POLICIES (ZIRP)

What else then has the Bank of Canada been able to do, or what does it intend to do in the future? In a recent document, the Bank of Canada (2009b) has outlined a non-conventional approach to monetary policy, which is supposed to go beyond the currently helpless features of the so-called conventional approach based on interest rate targeting, inspired by a Wicksellian framework, which some authors associate with a reaction function akin to the Taylor rule. Since this approach becomes helpless under the zero-lower bound on nominal interest rates, the Bank of Canada has devised a new framework – a zero-interest rate policy (ZIRP). This ZIRP is based on four pillars.

1. A conditional promise to keep the target overnight rate where it is for more than a year;
2. A deposit rate on bank balances equal to the target overnight rate;
3. Credit easing: the Bank purchases certain private sector assets in certain credit markets, to ease pressures on these markets
4. Quantitative easing, or unsterilized operations, designed to increase bank reserves.

The Bank of Canada makes announcements about future target overnight interest rates, promising as it just did on April 21st 2009 that it will keep the target interest rate at low levels, in this case at 0.25% for more than a year. By so doing the Bank hopes to change expectations about future interest rates, thus bringing down medium-term rates. The announcements are conditional on the future behaviour of inflation rates, so as to tame fears about future high inflation rates, and thus insuring that medium-term rates fall relative to the overnight rate. If interest rates were set without any consideration of possible inflationary pressures, the announcement might lead instead to rising medium-term rates. The Governor of the Bank of Canada, Mark Carney (2009, p. 3) has claimed that this first unconventional feature has been quite successful, since, as a result of the conditional statement, “interest rates across the maturity horizon of the commitment fell”, as can be verified with the help of Figure 5.

The second unconventional feature of ZIRP has been the decision to set the deposit rate on bank settlement balances at the target overnight rate. Normally, as shown in Figure 6, the rate on central bank advances to private banks is set 25 basis points above the target overnight rate, while the rate on positive balances (i.e., the deposits of banks at the central bank) is set 25 basis points below the target rate. The Bank then insures that the overall amount of settlement balances in the system be exactly equal to zero, or nearly zero, as shown in Figure 6, so that the actual overnight rate stands right in the middle of the corridor, at or nearly at the target overnight rate. However, under the current circumstances, where the target rate was brought down from 0.50% to 0.25%, this would have meant a rate of interest on bank balances at 0%. We would have been back to the

old situation where bank reserves were not remunerated. An alternative would have been to shrink the corridor between the Bank rate on advances and the rate on bank balances from 50 basis points (as shown in Figure 6) to 25 points, as suggested in Figure 7. The Bank could have kept the target overnight rate at 0.25% while remunerating the deposit balances at the Bank at some positive rate, here 0.125%. Past experience has certainly demonstrated that it is possible for the Bank to narrow the corridor to 25 basis points.

The Bank decided otherwise however, opting for a third scheme, outlined in Figure 8, where the target overnight rate and the rate on positive balances are equal to each other at 0.25%, while the Bank rate on advances stands at 0.50%. Had the Bank of Canada kept the other part of its implementation tool, setting the overall amount of settlement balances at zero as usual, the actual overnight rate would have trended around the middle of this corridor, around 0.375%. To avoid this, the Bank now sets on a daily basis an excess amount of settlement balances in the system, to the tune of 3 billion dollars. By doing so, there are always more banks in the clearing and settlement system that find themselves in a surplus position than there are in a deficit position. In other words, within the Canadian main clearing system – the Large Value Transfer System (LVTS) – the amount of positive LVTS balances is always larger than the amount of negative LVTS balances. As a result, the overnight rate is being pushed down to 0.25%, because banks in a surplus position know that they are unlikely to find a counterparty and hence have no choice besides depositing their surplus balances at the Bank of Canada at 0.25%.

QUANTITATIVE EASING

The 3 billion dollars daily excess settlement balances is a form of quantitative easing since, in the standard lingo of textbooks, banks now hold 3 billion dollars of excess reserves every day. The only difference between the current situation of bank reserves at 3 billion dollars and the standard interpretation of quantitative easing is that the reserves are now being provided by moving around government deposits – actually through auctions – whereas the strict definition of quantitative easing as defined by the Bank of Canada would see the excess reserves being provided by open market operations. In reality, central banks have to conduct defensive operations on a daily basis, and the amount of reserves left in the monetary system has very little correlation with the size or even the sign of open market operations being conducted (Eichner 1985). This is because whenever the central bank and the government enter into financial transactions with the rest of the economy, a surplus or a deficit of settlement balances gets created. The central bank thus needs to neutralize the effects of these operations, as long as it wishes to achieve a given interest rate target. These neutralizing operations are no different from the sterilizing operations that need to be conducted when a country operates on a fixed exchange rate regime and desires to keep interest rates at a given level.

One may wonder why the corridor as described by Figure 8 would apply instead of that of Figure 7. It may be because of rising pressures from old-style monetarists at the Bank of Canada. Ever since the Bank moved to a Wicksellian approach, there has been pressures within and outside the Bank to reintroduce some monetarist elements in policy implementation (Engert and Selody, 1998; Laidler, 1999). Providing the banks with a

large amount of positive settlement balances – what used to be called excess bank reserves – is a move which seems to follow the strictures of monetarism, according to which an increase in bank reserves would generate an increase in the money supply and in the rate of inflation. It might be just the kind of compromise that would keep peace within the Bank and that would stall criticism from Monetarist-friendly academics. Table 2 below shows the introduction of these bank reserves in the balance sheet of the central bank.

There is a lot of irony with the current situation. What is now called conventional monetary policy is a slightly modified version of the kind of policy implementation advocated since the late 1950s by heterodox and post-Keynesian economists such as Richard Kahn (1972) and Nicholas Kaldor (1964) and that was put forth by Bank of England officials to the Radcliffe Committee. It has become conventional policy once more since the early 1990s, after the demise of monetarism in the mid 1980s. By contrast, unconventional monetary policy, in particular quantitative easing, is the kind of monetary policy implementation that can be found in nearly every neoclassical textbook and that central bank economists faked to pursue in an effort to appease their academic colleagues and as a response to both politicians and an outraged public (Bindseil, 2004; Tucker, 2004). Officials at the Bank of Canada are quite aware of this paradox, and are obviously uncomfortable with it, as the following statement shows.

“Although quantitative easing is now referred to as an unconventional monetary policy tool, the purchase of government securities is, in fact, the conventional textbook approach to monetary policy.... In practice, most central banks have chosen to conduct monetary policy by targeting the price of liquidity because the relationship between the amount of liquidity provided by the central bank and monetary aggregates on the one hand, and between monetary aggregates and aggregate demand and inflation on the other, are not very stable.” (Bank of Canada, 2009b, p. 26).

The Bank of Canada thus feels compelled to recall that monetary aggregates are very badly correlated with price inflation, and that base money is also very badly correlated with the money supply. To provide excess bank reserves, as recommended by Monetarists, central banks must decline to sterilize its liquidity creating financial operations or it must conduct open market operations by purchasing assets. As pointed out by Deputy Governor John Murray (2009), “All quantitative easing is, by definition, ‘unsterilized’. Although this is correctly viewed as unconventional, it closely resembles the way monetary policy is described in most undergraduate textbooks, and is broadly similar to how it was conducted in the heyday of monetarism”. Murray misleadingly insinuates that such a technique has been implemented before, namely during the 1975-1982 monetarist experiment in Canada. What can really be said is that quantitative easing is an attempt to put in practice what academics have been preaching in their textbooks for decades from their ivory towers. It is merely monetarism but in reverse gear. While monetarist policy of the 1970s was implemented to reduce the rate of inflation, current monetarist quantitative easing is being applied to generate an *increase* in the rate of inflation.

As a result, the claims of quantitative easing are just as misleading as the claims of monetarism of the 1970s and early 1980s. Bank of Canada officials claim that “The expansion of the amount of settlement balances available to [banks] would encourage them to acquire assets or increase the supply of credit to households and businesses. This would increase the supply of deposits” (Bank of Canada, 2009b, p. 26), adding that quantitative easing injects “additional central bank reserves into the financial system, which deposit-taking institutions can use to generate additional loans” (Murray, 2009). In our opinion, these statements are misleading and indeed completely wrong. They rely on the monetarist causation, endorsed in all neoclassical textbooks, which goes from reserves to credit and monetary aggregates. It implies that banks wait to get reserves before granting new loans. This has been demonstrated to be completely false in the world of no compulsory reserves in which we live since 1994. In any event, even before 1994, as argued by a former official at the Bank of Canada, the task of central banks is precisely to provide the amount of base money that banks require (Clinton, 1991). Banks do not wait for new reserves to grant credit. What they are looking for are creditworthy borrowers.

Quantitative easing is an essentially useless channel. It assumes that credit is supply-constrained. It assumes that banks will grant more loans because they have more settlement balances. Both of these assumptions are likely to be false, at least in Canada. With the possible exception of its impact on the term structure of interest rates, the only effect of quantitative easing might be to lower interest rates on some assets relative to the target overnight rate, as these assets are being purchased by the central bank through its open market operations. It is doubtful that the amplitude of these interest rate changes will have any impact on private borrowing or on the exchange rate. Indeed, in Japan, which has had experience with zero interest rates for many years, quantitative easing was pursued relentlessly between 2001 and 2004, but with no effect, as “the expansion of reserves has not been associated with an expansion of bank lending” (MacLean, 2006, p. 96). Indeed, officials at the Bank of Japan did not themselves believe that quantitative easing could on its own be of any help, but they tried it anyway as a result of the pressure and advice of international experts. As Ito (2004, p. 27) notes in relation to the Bank of Japan, “Given that the interest rate is zero, no policy measures are available to lift the inflation rate to positive territory... The Bank did not have the tools to achieve it”.

CREDIT EASING

Whereas quantitative easing targets the liability side of the balance sheet of a central bank, credit easing – the only other tool left – targets the asset side of its balance sheet. In a sense, this is the tool that has been most pursued in Canada, but not necessarily or exclusively by the Bank of Canada. In fact, credit easing has shown that central bank independence is an illusion. Once again, at least to some extent, this has been recognized by officials at the Bank of Canada.

Just as the boundary between monetary stability and financial stability becomes increasingly blurred in the midst of a financial crisis, so too does the boundary between monetary and fiscal policy actions. It isn't uncommon for

both central bank and governments to initiate credit-easing measures, and it is important that the two work together (Murray, 2009).

Indeed, while the size of the balance sheet of the Bank of Canada moved up from \$53 billion in August 2008 to \$80 billion in March 2009, the total amount of Government of Canada securities outstanding jumped from \$402 billion to \$497 billion during the same time period. This increase in the amount of gross debt of the Canadian government is totally unrelated to government deficits, since the 2008-2009 fiscal year showed a nearly balanced budget. Thus, all of this, or nearly all of this, occurred before the Canadian government started racking up large deficits as a result of the economic recession. The increase in the outstanding gross debt must therefore be (nearly) entirely attributed to the efforts of the Canadian government to conduct credit easing in collaboration with the Bank of Canada.

Where did the \$100 billion or so of additional Canadian government securities go? To a large extent, they ended up on the balance sheet of the banks. This is shown in Table 3, where the major assets of Canadian banks are shown as of August 2008 and March 2009. The amount of T-bills and Canadian government bonds held by banks has risen by \$110 billion during these seven months, while banks managed to get rid of corporate securities and mortgages, reducing the sum of these assets by a combined nearly similar amount. But then, where did the mortgages go? They were purchased by the Canada Mortgage and Housing Corporation (CMHC) to the tune of \$51 billion as of March 2009, through the Insured Mortgage Purchase Program launched in September 2008 (Government of Canada, Department of Finance, 2009, p. 117). Indeed \$125 billion has been set aside for this program (\$25 and \$50 billion in the September 2008 and November 2008 announcements, and another \$50 billion in the January 2009 budget), although the program now seems to be stalling as banks are more reluctant to give out their mortgages.

But then, how did the CMHC acquire the mortgages? They acquired them by obtaining loans from the federal government. Credit easing through the Insured Mortgage Purchase Program may thus be understood through Table 4, which provides a series of balance sheets. The federal government makes a loan to the CMHC, which allows the banks to offload their mortgages onto the CMHC. The federal government loan is financed by the issue of securities. These securities in turn are sold to banks, which purchase them with the proceeds of the sale of their mortgage assets to the CMHC.

Credit easing can be understood through two processes. We already outlined the first one, which does not involve the central bank. The second process corresponds to the term PRA facility, that is, the various term purchase and resale agreements conducted by the Bank of Canada since mid-September 2008. As is well-known these repo operations are equivalent to making a collateralized loan, but with the collateral being legally in the hands of the lender. The Bank was then agreeing to purchase for one month or three months various public or private assets. The composition of these assets has varied through time, as shown in Table 5, with banks and primary dealers offering as collateral either long-term securities or less liquid assets, such as asset-backed commercial paper issued by conduits that had been sponsored by banks, the market of which, as explained earlier, had

been nearly collapsing for a lack of customers. Still, about 50% of the collateral backing term PRAs is systematically made up of federal government securities. Pure credit easing however, involves neutralizing operations. Neutralization occurs when the Bank of Canada sells its holdings of treasury bills to the banks or the primary dealers. That the Bank conducts such outright sales to neutralize the effect of the repo operations associated with credit easing is quite obvious in the notice that announces these sales for ‘balance sheet management purposes’. The Bank explains that “this transaction will partially offset the temporary increase in assets associated with the term purchase and resale transactions” announced the previous day (Bank of Canada, 2008).

During the first two weeks of October 2008, the Bank of Canada was selling the treasury bills that it held on its own balance sheet. The increase of term PRAs on the asset side of the balance sheet of the Bank of Canada were thus being compensated by a fall of an almost exactly equal amount of Treasury bills also on the asset side of the balance sheet of the Bank of Canada. In other words, the central bank was exchanging advances to the private sector in lieu of advances to the public sector. Thus, in this case and during the period going from July 2008 to mid October 2008, the size of the balance sheet of the Bank of Canada did not change by much.²

However, as happened with the Fed, from mid October on, the Bank of Canada started to follow a different approach in its efforts to provide more liquidity to term credit markets. From then on, the size of the balance sheet of the Bank of Canada grew very quickly, as the Bank was acquiring treasury bills newly issued by the Government of Canada, providing the Canadian government with deposits at the Bank in return. The acquired treasury bills were then sold in turn to the banks as a way to neutralize the effects of the liquidity-creating term repo operations. In so doing, the Bank managed to keep its stock of treasury bills at an approximately constant level, while the size of its balance sheet grew by the sum of the granted term advances and term PRAs. Table 6 outlines the sequence of monetary operations conducted by the Bank of Canada and their impact on LVTs balances, with the last row of the Table representing the final result of the previous three operations.

The term PRA operations have a double impact. On the one hand, they tend to reduce interest rates on the assets acquired as collateral by the Bank of Canada, as their supply in private portfolios gets reduced. On the other hand, banks wind up with a more liquid balance sheet, as they can easily sell their newly acquired Treasury bills or use them for their own repo operations to obtain cash. To sum up, term repo operations can be understood as transactions that remove less liquid assets from the balance sheets of banks – mainly long-term federal, provincial, municipal and corporate securities as well as asset-backed corporate paper – putting in their place the highly liquid treasury bills.

Figures 9 and 10 illustrates the two variants of the credit easing mechanism involving the central bank, by showing the evolution of the balance sheet of the Bank of Canada from July 2008 to June 2009. The size of the balance sheet reached its peak on April 1st 2009.

² Although there was a \$4 billion increase in the last two weeks of September, along the same line as the subsequent \$10 billion increase of the last two weeks of October.

At that time, the Bank's holdings of T-bills had fallen by about \$8 billion relative to July 2008, while the amount of PRAs had increased by \$34 billion, for a net addition of about \$26 billion. As a counterpart, on the liability side, the government deposits had also increased by about \$26 billion. During both time periods, there was hardly any change in the size of the monetary base (notes plus bank reserves). More recently, as can be seen from Figure 9, the credit easing operations have tended to go into reverse gear, perhaps an indication that tensions on term financial credit markets are not as severe as they used to be in the last quarter of 2008 and the first quarter of 2009.

Table 7 describes, in a very rough and approximate way, what has been going on at the level of the entire economy between August 2008 and March 2009. We use a matrix based on the quadruple entry principle, first outlined by Copeland (1949), where by definition, the sum of each row and of each column must be zero, so that there is no black hole. As a result, any change in one cell induces at least three other changes, since each row and each column must sum to zero. A liability carries a negative sign, and thus -100 then means an increase of 100 in this liability, while +100 would imply a reduction in that liability. An asset carries a positive sign, and thus -45 then means a decrease of 45 in the holdings of that asset. The table supposes that the economy can be divided into six sectors: the federal government, the central bank on its own, banks, non-bank financial institutions or the shadow banking sector, financial government business entities (essentially the CMHC), and households. Changes in the balance sheets of firms have been left out.

The changes that are represented illustrate what we consider to be stylized facts. The changes in the balance sheet of the central bank are nearly exactly those given by the actual data of Figures 9 and 10. Changes in the balance sheet of the government are also quite close to reality, with the government issuing 100 worth of new securities, the counterpart of which are their deposits at the Bank of Canada and advances to government agencies. In the case of banks, changes in holdings of government securities, in mortgages and in repos also reflect actual numbers. Other changes are essentially illustrative, with the assumption that households and the shadow banking system (say mutual funds) hold more banking deposits. It is also assumed that banks make more loans to non-bank financial institutions, essentially because households hold less asset-backed corporate paper previously issued by the shadow banking sector. The last two changes thus force this sector to borrow funds from the banking system and to sell part of its mortgage portfolio to financial government business entities. This sector, as pointed out earlier, holds more mortgages thanks to advances from the government.

CONCLUSION

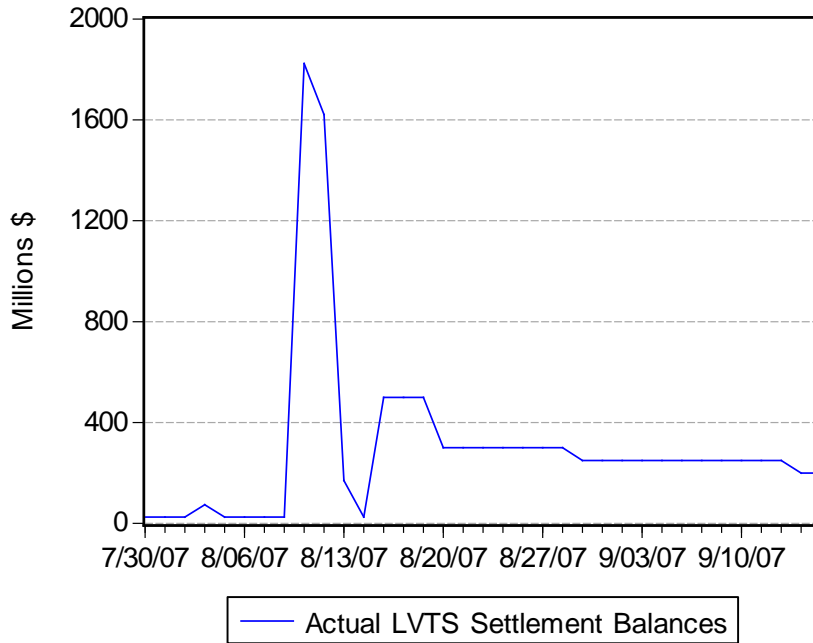
The ongoing financial crisis since the summer of 2007 has revealed the underlying structural weakness of the monetary policy system put in place since the early 1990s when the Bank of Canada officially adopted a hybrid Wicksellian policy of inflation targeting via interest rate setting. In a deep recession in which the forces of deflation are present, the zero lower bound on nominal interest rates prevents the central bank from conducting discretionary interest rate policy much as it did during the 1930s. In ensuring

that interbank settlement balances remain persistently positive, the Bank of Canada has *de facto* pegged the overnight rate at approximately zero for the immediate future unless, we are told, inflation reveals its head again. The conventional monetary policy view, in which the “maestro” at the central Bank conducts discretionary interest rate policy and the fiscal authorities sit as mere spectators, has been shattered by the current financial crisis.

What has come to predominate in this new ZIRP environment is a set of unconventional policy measures – quantitative and credit easing – affecting both the asset and liability sides of banks’ balance sheets. These policy choices may be considered as offshoots of the critical role of central banks as purveyors of liquidity. However they are now being justified within a policy framework that bring us back to the heydays of monetarism. This is particularly so with quantitative easing which, according to its advocates, is conceived of something more than a measure that pins down the settlement balances of banks in a positive position in order to ensure that the overnight rate remains at its minimum level. Positive LVTS settlement balances are now seen as the supply-side infusion that would sustain bank lending in times of crisis. Credit easing, on the other hand, affects the composition of bank assets through term repo operations by transforming less liquid into more liquid bank assets.

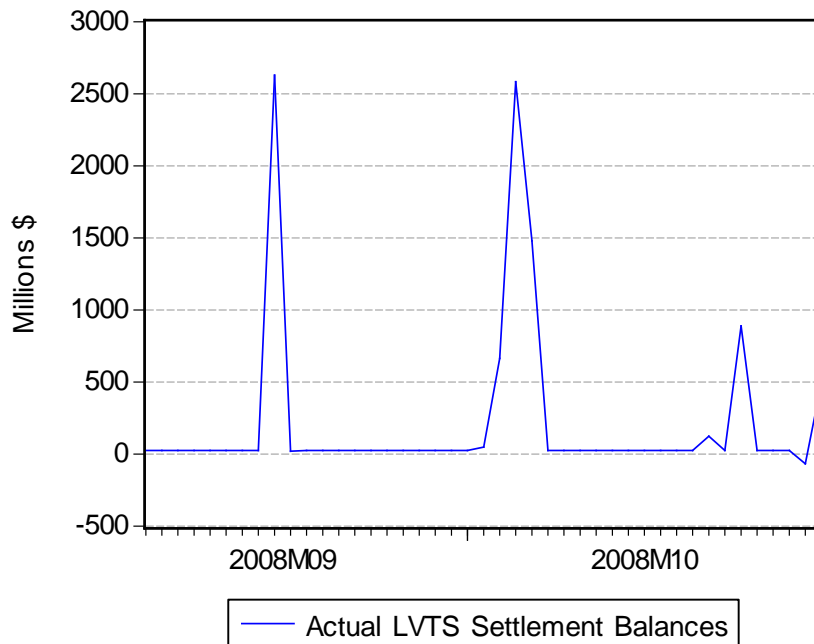
As we pointed out, none of these measures can *per se* generate bank credit expansion since banks are not liquidity constrained but rather face a scarcity of creditworthy borrowers. The abandonment of discretionary interest rate policy and the replacement of the latter with *ad hoc* tinkering on the supply side imply that central bankers have not yet learned the fundamental lessons of the 1930s as crystallized in the central bank metaphor of “pushing on a string.” During times of deep recession, the monetary emperor has no clothes. Central banks can only be a useful appendage to expansionary fiscal policy, with the latter doing the important work of reversing the downward trajectory of the private sector.

Figure 1: Actual LVTS balances, July-September 2007



Source: Bank of Canada, <http://www.bank-banque-canada.ca/en/rates/interest-look.html>

Figure 2: Actual LVTS balances, September-October 2008



Source: Bank of Canada, <http://www.bank-banque-canada.ca/en/rates/interest-look.html>

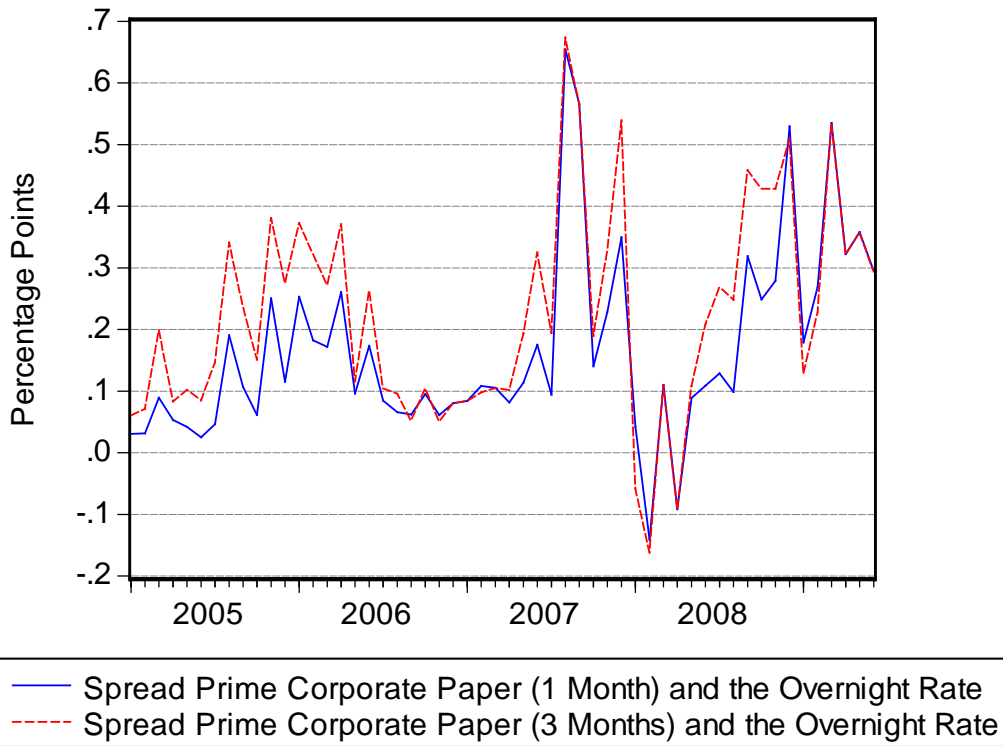
Table 1: Realized real GDP quarter-over quarter percentage change, averaged per semester, versus base-case projections of the Bank of Canada

Year	2006		2007		2008		2009	
Semester	I	II	I	II	I	II	I	II
Realized rates	2.85	1.6	3.9	1.4	0.5	-0.7	-1.5 (1st qtr)	
12 months ahead	*	2.9	2.9	2.7	2.8	2.5	2.7	2.2
6 months ahead	2.9	3.2	2.5	2.6	2.1	1.8	0.4	0.7

* Not shown in April 2005 Report.

Source: Various issues of the *Monetary Policy Report* of the Bank of Canada; and Statistics Canada, *National Income and Expenditure Accounts*, and *Canadian Economic Accounts Quarterly Review*.

Figure 3: Evolution of spreads between prime corporate paper rates and the overnight rate, Canada, 2005-2009



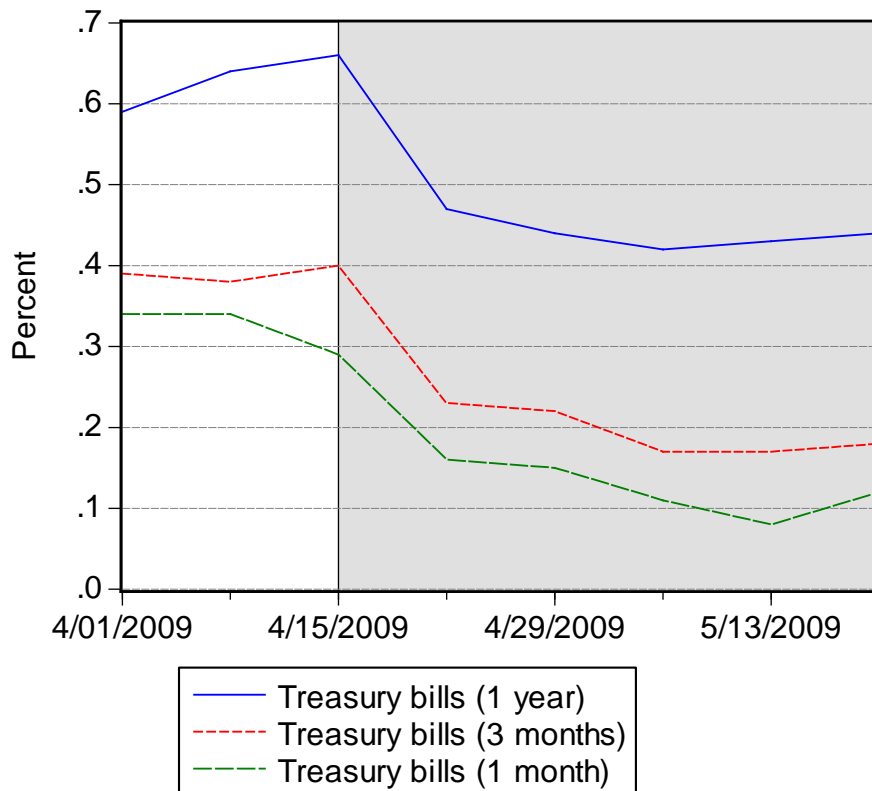
Source: Statistics Canada, CANSIM II, Series V122491, V122509, and V39050.

Figure 4: Overall business-lending conditions: Balance of opinions



Source: Bank of Canada website, Senior Loan Officer Survey, 13 July 2009.

Figure 5: Yields on Canadian government bills after promise to keep interest rates down on April 21, 2009 (April-May 2009, weekly observations)



Source: Statistics Canada, CANSIM series V121777, V121778, and V121780.

Figure 6: The standard corridor framework of the Bank of Canada

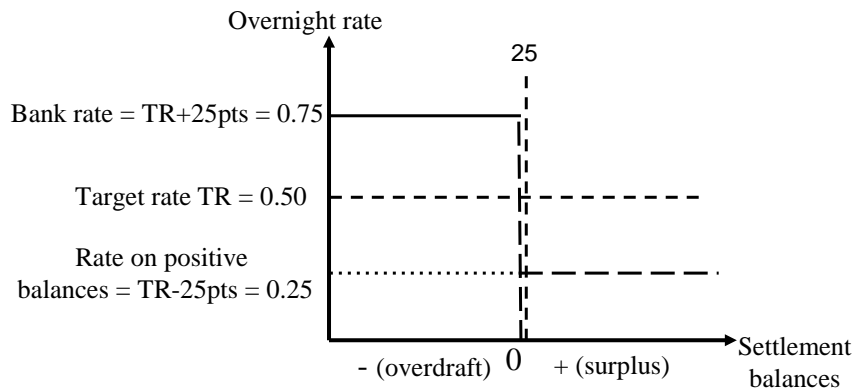


Figure 7: An alternative corridor framework

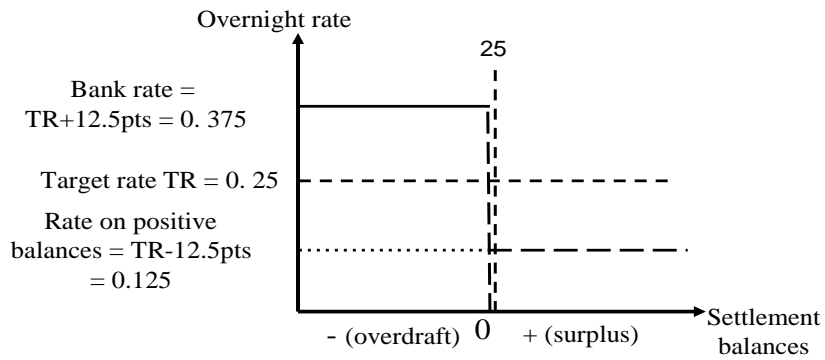


Figure 8: The new ZIRP corridor framework of the Bank of Canada

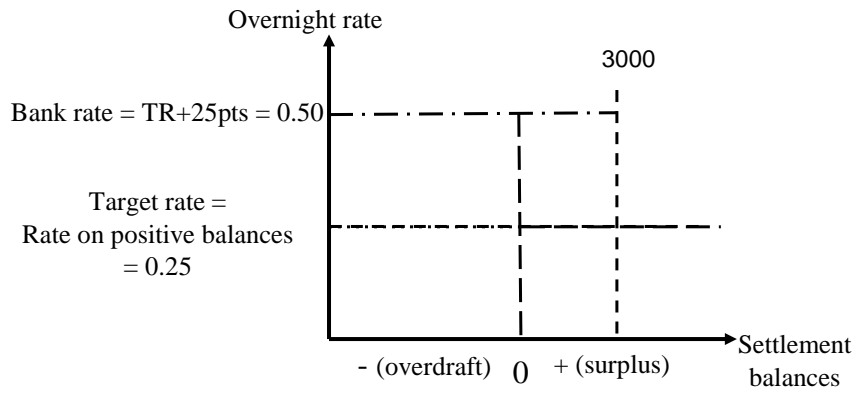


Table 2: Quantitative easing in a mild form: Excess settlement balances

Assets			Liabilities		
	March 2009	May 2009		March 2009	May 2009
Bills	13.8	13.1	Notes	51.2	52.0
Bonds	31.5	32.5	Govt deposits	28.1	19.1
PRA	34.8	29.4	Bank reserves	0	3.0

Table 3: Evolution of the assets of chartered banks, August 2008 to March 2009

Chartered bank assets		
	August 2008	March 2009
Mortgages	487	434
Corporate securities	168	116
T-bills	28	53
Canadian govt bonds	126	211
Total	1733	1787

Table 4: The CMHC acquires mortgages with loans from the federal government

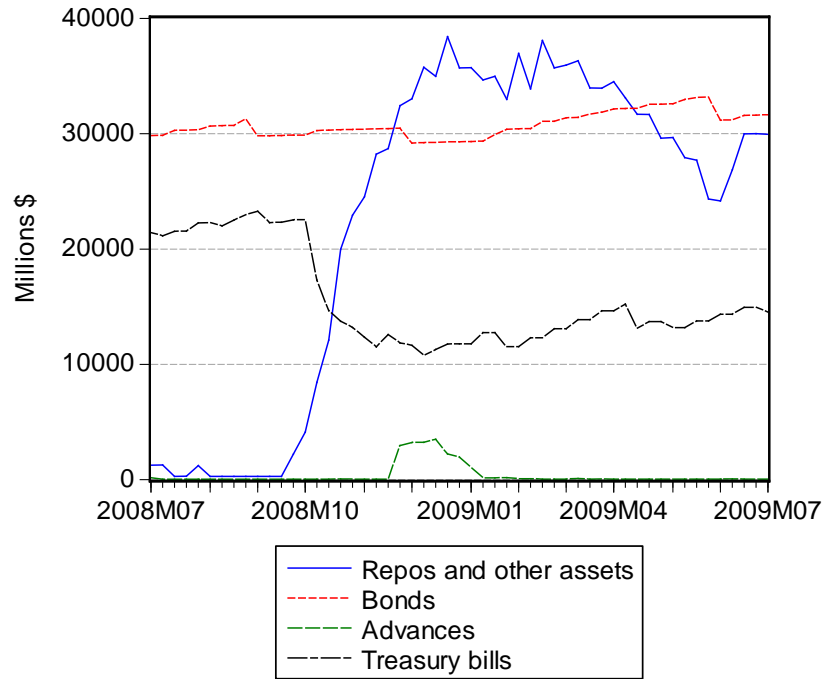
Banks		CHMC	
Assets	Liabilities	Assets	Liabilities
Mortgages -\$50 B		Mortgages +\$50 B	Loans from the federal govt +\$50 B
Govt bonds +\$50 B			
Federal government			
Assets		Liabilities	
Claims on CMHC +\$50 B		Government bonds +\$50 B	

Table 5: Composition of the term purchase and resale agreements conducted by the Bank of Canada (in billions of dollars)

	2008		2009				
	November	December	January	February	March	April	May
Government of Canada securities	16.0	20.7	20.6	18.2	18.7	14.5	
Provincial securities	9.8	8.0	11.1	13.1	11.1	10.6	
Municipal securities	0	0.1	0.2	0.2	0.2	0.1	
Corporate securities	5.7	5.6	3.7	3.9	4.8	4.7	
ABCP	2.9	3.2	2.5	1.5	1.1	0.9	
Total	34.5	37.7	38.2	35.6	35.8	29.4	

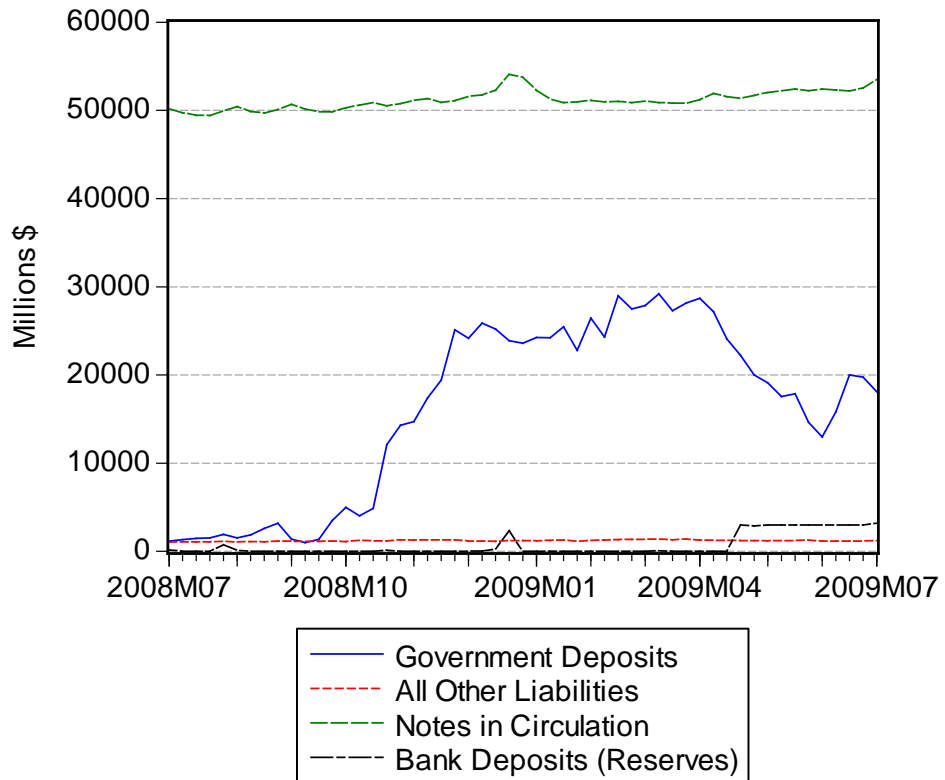
Source: Supplementary information of balance sheet loans and receivables, Bank of Canada, various months, <http://www.bankofcanada.ca/en/about/index.html>

Figure 9: Evolution of the assets of the Bank of Canada, July 2008 to June 2009



Source: Statistics Canada, CANSIM Series V36612, V36613, V36634, V36635, and V44201362.

Figure 10: Evolution of the liabilities of the Bank of Canada, July 2008 to June 2009



Source: Statistics Canada, CANSIM Series V36625, V36628, V36632, and V36636.

Table 6: Impact of term PRA operations on LVTS balances when the size of the balance sheet of the Bank of Canada is rising

Banks		Bank of Canada	
Assets	Liabilities	Assets	Liabilities
Long-term securities -\$30 B LVTS balances +\$30 B		Term RPAs +\$30 B LVTS balances -\$30 B	
		T-bills +\$30 B	Government deposits +\$30 B
T-bills +\$30 B LVTS balances -\$30 B		T-bills -\$30 B LVTS balances +\$30 B	
Long-term securities -\$30 B T-bills +\$30 B		Term RPAs +\$30 B	Government deposits +\$30 B

Table 7: Indicative evolution of various balance sheets from the recognition of the existence of a financial crisis (August 2008) to its peak (March 2009)

	Govt	B of C	Banks	NBFI	FGBE	House'lds
T-Bills	-100	-10	+110			
Mortgages			-45	-30	+75	
Deposits at B of C	+25	-25				
Deposits at banks			-50	+20		+30
ABCP				+30		-30
Bank loan			+20	-20		
PRA		+35	-35			
Claims	+75				-75	
Total	0	0	0	0	0	0

B of C: Bank of Canada; NBFI: non-banking financial institution; FGBE: financial government business entity (here in particular the CMHC).

A liability carries a negative sign, and thus -100 then means an increase of 100 in this liability. An asset carries a positive sign, and thus -45 then means a decrease of 45 in the holdings of that asset.

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