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Implementation of Monetary Policy in a Regime with Zero Reserve Requirements

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Abstract

Monetary policy can be implemented effectively without reserve requirements as long as cost incentives ensure a predictable demand for settlement balances. A central bank can then achieve the level of short-term interest rates that it desires, using market-oriented instruments only. In Canada, the framework provided by rules on interbank payments settlement and by the costs of deficits and surpluses on settlement accounts provides a strong incentive for the banks and other clearing institutions to target zero balances. Reforms of this framework, to follow the introduction of the Large-Value Transfer System, will ensure its continued effectiveness and make it more transparent. An appendix outlines the process by which reserve requirements were phased out in Canada.

Résumé

La politique monétaire peut être mise en oeuvre avec efficacité dans un système libre de réserves obligatoires à la condition que des incitations financières rendent prévisible la demande d'encaisses de règlement. Si cette condition est respectée, la banque centrale est en mesure d'amener les taux d'intérêt à court terme au niveau souhaité au moyen uniquement d'instruments axés sur le marché. Au Canada, le cadre défini par les règles relatives au règlement des paiements interbancaires et par les coûts associés aux découverts ou aux excédents qu'enregistrent les comptes de règlement incite fortement les banques et les autres institutions participant à la compensation à viser un solde nul. Dès la mise en service du système de transfert de paiements de grande valeur, ce cadre sera redéfini afin de préserver son efficacité et de le rendre plus transparent. L'auteur expose en annexe les diverses étapes de l'élimination progressive des réserves obligatoires au Canada.

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1 Introduction and summary

Monetary policy can be implemented effectively with zero reserve requirements. A number of countries now have no requirement, such as Australia, Belgium, Canada, Sweden and the United Kingdom. In others, including the United States and France, the level of minimum deposits at the central bank has fallen to very low levels, in large part because banks have found ways to avoid reserve requirements.

This paper outlines a general framework for implementing monetary policy in a regime with zero reserve requirements, focussing on the case of Canada.

Hierarchy of variables in the transmission of monetary policy

Instrument		Proximate target	Transmission		Intermediate target, or indicator or information variable		Goal
Supply of settlement balances; very short-term interest rate	→	Short-term interest rates	Structure of interest rates Exchange rate Asset prices Credit	→	Money stocks	→	Price stability

The above schema shows the train of transmission for monetary policy in a market economy. It starts on the left with policy instruments, which the central bank directly controls, proceeds through a sequence of proximate targets, indicators and transmission variables, and finishes on the right with the ultimate goal of price stability.[1] In more detail, the transmission mechanism involves:

- *Instruments to control the supply and cost of settlement balances (bank reserves)*

  - Open-market operations or transfers of government deposits may be used.

  - The interest rate at which these balances are supplied may be set. The central bank may vary its lending and deposit rates, and it may also announce target rates.

- *Proximate target*
  The proximate target is the level of interest rates in the interbank money market (usually the overnight rate).

1. Although technically the instruments of monetary policy might be directed towards other objectives, it is widely recognized that the main contribution that monetary policy can make to economic prosperity is to achieve and maintain price stability. Indeed, this objective is often written into central bank laws. Many countries use a fixed exchange rate against a hard currency as a means to achieve domestic price stability.

- *Transmission variables*
  The most important are the level and structure of interest rates, but the exchange rate is also very important in economies with floating exchange rates, such as Canada.
- *Intermediate targets*
  These include the exchange rate, monetary conditions, the money supply, etc.[2]
- *The ultimate goal*
  In a market economy, the ultimate goal is to maintain a stable value of the domestic currency, and the settings of policy instruments should be varied in accordance with this objective.

This paper focusses on the link between the first two concepts. It is concerned with the technical question of how the central bank, using market-oriented instruments only, might achieve the level of short-term interest rates that it desires.[3] An important conclusion is that more transparent alternative mechanisms can be employed to produce any of the results that might achieved through positive reserve requirements.

The layout of the paper is as follows. Section 2 describes some general principles that apply to systems with zero reserve requirements. Section 3 describes the framework of rules, incentives and practices that will apply in Canada after the installation of the electronic payments system — the Large-Value Transfer System (LVTS) — in 1997.[4] Section 4 describes the operations used to neutralize unwanted effects on the supply of settlement balances that arise from government transactions. Section 5 describes the nature of the equilibrium position in the market for overnight funds. Section 6 argues that it is appropriate to use the very short-term interest rate, rather than the monetary base, as the proximate target for monetary policy implementation.

2. In Canada and a number of other countries, the tightness of monetary conditions is measured by a weighted sum of the short-term interest rate and the exchange value of the currency — see C. Freedman, "The use of indicators and of the Monetary Conditions Index in Canada," in T.J.T. Baliño and C. Cottarelli, *Frameworks for Monetary Stability: Policy Issues and Country Experiences* (1994).

3. This paper does not consider how zero reserves might work in a system with quantitative operating guidelines for, say, the growth of domestic credit.

4. The current framework (initiated in 1992) is somewhat more complicated because: (1) it allows no interest payments on deposits at the Bank of Canada; and (2) it contains a significant degree of uncertainty about settlement balances following the daily cheque clearing, which will be removed by the LVTS.

Background: economic disadvantages of reserve requirements
Reserve requirements force banks to hold liabilities of the public sector that pay no return, and are therefore effectively a tax on financial intermediation by banks. This tax has three adverse effects:

- *Unclear incidence*
  Banks will pass the tax on to their clients to the extent they can, by reducing the rates on deposits and by raising the rates on loans. In practice small depositors and small borrowers have the least opportunity to move their business elsewhere. Therefore small bank clients probably shoulder most of the burden of the tax.
- *Arbitrary discrimination*
  Non-bank institutions that offer competing services to domestic banks are not subject to the tax.
- *Reserve avoidance*
  Deposits are booked at non-bank subsidiaries within bank conglomerates or are moved off-shore. This has been a primary reason for the decline in the ratio of reserves to total assets of the banking system in countries with required reserves.

In a world in which traditional segmentations between different types of financial activity, as well as barriers to foreign competition, have been melting away, it has become increasingly difficult (a) to justify reserve requirements on banks, and (b) to make them effective.

2 General principles for policy implementation with zero reserves

2.1 Controlling the supply of settlement balances

In a market economy the central bank influences monetary conditions through its control of key items on its balance sheet. In particular, it must be able to set with precision the quantity of balances held by the banks for the settlement of payments. In a regime with reserve requirements, settlement balances are typically counted as reserves.

The instruments[5] at the discretion of the central bank to control the quantity of settlement balances are:

5. In other words, the instruments that may be used to provide or remove “unborrowed reserves.”

- *Open-market operations*
  To increase the supply of balances the central bank buys securities in the open market, to reduce the supply, it sells. The most common operation involves repurchase transactions, either repos or reverse repos, which in Canada are known as Special Purchase and Resale Agreements (SPRA) and Sale and Repurchase Agreements (SRA) respectively. These are quite flexible as to maturity, but are usually for terms of one or a few days. Outright transactions in short-term securities are also quite common, but they lack the flexibility of repos.
- *Transfers of government deposits between the books of the central bank and those of commercial banks*
  The Bank of Canada relies on its power as fiscal agent for the government to determine the location of government deposits. Government deposits are transferred from the central bank to commercial banks to increase the supply of balances, and vice versa to reduce it.[6] Allocation of government term deposits is done by auction for terms of one day (i.e., overnight) to seven days (or occasionally somewhat longer). Operationally there is little difference between, for example, an overnight government deposit auction and a tendered overnight repo.

2.2 Ensuring a determinate demand for settlement balances

It is not sufficient for the implementation of monetary policy that the central bank be able to control the supply of settlement balances. It is also necessary for the commercial banks to have a *determinate demand* for these balances on a daily basis; in other words, to have firm targets each day for the quantity of settlement balances that they desire to hold. Otherwise, if the demand curve shifts erratically, a given supply of balances will produce unpredictable effects on monetary conditions in the economy. In particular, the central bank would not then have an adequate degree of influence over short-term interest rates, which are essentially determined in the market for settlement balances.

To ensure that there is a determinate demand for balances, a zero-reserves framework has to contain a set of *rules and incentives that motivate the banking system to target zero settlement balances at the central bank*. These consist of:

- rules obliging the banks to settle payments through transfers of balances at the central bank
- symmetric treatment of deficits and surpluses settlement accounts. That is, for any bank the cost of an overdraft at the central bank should be equal to the opportunity cost of holding a surplus balance.

6. In fact, the supply of settlement balances has traditionally been determined by means of a retroactive "drawdown/redeposit" of government demand deposits. The retroactive mechanism will be discontinued with the introduction of the LVTS (see Section 4).

Appropriate cost incentives become very important in the absence of minimum reserve regulations. Deficits on settlement accounts must be subject to a charge in excess of the interest rate in the overnight market to encourage banks to seek financing actively in the market rather than to rely passively on automatic financing from the central bank.[7] Likewise, to encourage banks to lend out surpluses on settlement accounts in the market, the yield on a surplus at the central bank must be less than that in the money market.

Cost-minimizing banks will target zero balances if the charge for borrowing from the central bank on its settlement account is equal to the opportunity cost of holding a surplus on this account; that is, if the costs of deficits and surpluses are symmetric.[8] The two following illustrations may shed some light on this concept.

Illustration 1: a 50-basis-point spread between borrowing and deposit rates at the central bank
For example, suppose the rates on overnight accommodation at the central bank are 4.75 per cent for surpluses and 5.25 per cent for deficits, and the overnight rate in the market is 5 per cent. The net of cost of a surplus or a deficit is then 0.25 per cent, and the least-cost position for a bank is zero balances. Moreover, because the costs are symmetric, cost-minimizing banks will target zero each day.

Illustration 2: the rate on deposits is fixed at 0 per cent
The borrowing rate then has to be *twice* the market rate.[a] For example, if the overnight rate in the market is 5 per cent, the central bank must charge 10 per cent for overdrafts. In this case the opportunity cost of a surplus would be the 5 per cent foregone from lending in the market, and the *net* cost of a deficit would also be equal to 5 per cent — the 10 per cent charge *less* the 5 per cent earned by these funds in the market. Thus, the opportunity cost of the surplus is equal to the net cost of a deficit. Again, because of this symmetry, each bank's least-cost target for settlement balances is zero.

a. These illustrations assume that there is no maintenance period for settlement balances, which is generally the case in zero-reserve regimes.

7. In some countries, administrative measures may also be used to deter banks from borrowing from the central bank on a regular basis. However, the Bank of Canada relies purely on the cost factor.

8. Longworth (1989) mathematically derives cost-minimizing strategies for banks in a system with an averaging period for the maintenance of settlement balances.

2.3 Avoiding volatility in the short-term interest rate

Reserve requirements, *in conjunction with an averaging period for reserve maintenance*, can provide a useful buffer against transitory disturbances in the money market.[9] For example, if there is an unexpected fall in the overall supply of settlement balances on a given day early in the maintenance period, the banks can allow their reserves to fall temporarily below the required amount. Later in the maintenance period they can hold a quantity of excess reserves sufficient to restore the required level for the period as a whole. If there were no reserves, or if there were no averaging period, the banks would be forced to bid strongly for overnight funds in the money market, forcing the overnight interest rate up sharply. In the case of a temporary surplus of settlement balances, if no interest were paid on deposits at the central bank, the reverse would occur — the overnight interest rate would plunge to a very low level.

Also, market speculation by banks, based on their short-run interest rate expectations, can help reduce the volatility of the interest rate. If they think that the interest rate on a given day is temporarily high, they can lend more aggressively, and hence willingly go into temporary deficit. This would increase the supply of overnight funds on the day in question, and thereby tend to reduce the overnight interest rate. The banks would regain the required level of reserves by reversing their lending strategy later in the maintenance period. The opposite actions would be taken if the overnight interest rate seemed to be unduly low. If the banks' expectations were correct, their speculative activity would tend to smooth out the movements in the overnight interest rate from one day to the next.

An alternative — and more transparent — way to smooth the overnight interest rate would be simply to narrow the spread between the rate for surpluses and that for deficits on settlement accounts.

3 The Canadian framework

This section outlines the framework for monetary policy implementation to be used after 1997.[10] This framework will allow the Bank to influence the overnight interest rate in a simple and transparent manner. It has also been designed to encourage participants to deal directly with each other and with the market in general, rather than with the central bank, when they adjust their surplus or deficit positions.

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9. Economists at the U.S. Federal Reserve System and the German Bundesbank have recently argued that the interest-smoothing effect is the most important function of reserve requirements. The potential volatility of the overnight rate in the United States and Germany stems from the zero rate of return on settlement balances, and the tradition against borrowing from the central bank.

10. The details are taken from Bank of Canada (1996).

3.1 Operating range

As the centrepiece of its policy implementation, the Bank of Canada will announce a 50-basis-point operating range for the overnight interest rate in the money market. The upper and lower limits of the range would be established by the rates applied to the deficits and surpluses of the participants with the Bank of Canada following settlement of LVTS.[11]

The rates applied to participants' positions with the Bank of Canada are expected to establish the boundaries of the operating range for the following reasons:

- Deficits on the books of the Bank of Canada at the end of the day (the LVTS will settle at 8 p.m. each day) would be financed at the Bank Rate, defined as the upper end of the operating range, by a collateralized overdraft. That is, participants would be able to finance a deficit at the end of the day at the Bank Rate upon presentation of eligible collateral to the Bank of Canada. This would put a cap on the rates they would be prepared to pay during that day for overnight borrowings in the market.
- Participants with surplus balances at the end of the LVTS day would receive interest on these balances at a rate 50 basis points below the Bank Rate, i.e., the bottom of the operating range. A participant would therefore be unlikely to accept a lower rate on its overnight funds from a borrower in the market. Thus, the floor on overnight rates would probably be the Bank Rate less 50 basis points.
- Changes in the operating range, and hence in the Bank Rate, would typically be announced early in the morning of the effective date. In the event of a shock during the day that required an immediate policy response, the Bank would announce a change in the operating range effective the next day. Although in this case overnight rates would not reflect the new operating range until the day after the announcement, short-term rates, such as for the benchmark 1- and 3-month maturities, would adjust at once. In both cases, the rates applicable to accounts at the Bank of Canada at the end of the day would be known with certainty by money market traders early in the day.[12]
- The 50-basis-point spread will provide a fairly strong cost incentive for participants to deal in the market rather than to rely on the central bank, and the cost of overnight loans in the market would thus fluctuate between the rate on positive settlement balances and the Bank Rate. The typical spread between bids and offers on overnight funds in the market is not more than 1/8 per cent, and can be as low as a few basis points. Therefore it should always be possible for lenders and borrowers to negotiate a rate that is mutually more favorable than the rates available at the Bank of Canada.

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11. Under the existing (1996) system, the Bank announces changes in its operating range by intervening in the money market with offers of "Special Purchase and Resale Agreements" (SPRAs) or "Sale and Repurchase Agreements" (SRAs) to signal the new upper or lower limit. The Bank has also adopted the practice of issuing a press release for these announcements.

12. If, on the contrary, this certainty were not assured, the overnight rate during the day might move outside the existing operating band on expectations of a change in the band later in the day.

3.2 Pre-settlement trading

The overall supply of settlement balances, which is precisely controlled by the Bank of Canada, would be maintained at zero each day so that overnight rates in the market would typically be within the band and not at either boundary.

There will be a *pre-settlement trading period* of about half an hour after the close of client business on the LVTS (6 p.m. eastern time). Pre-settlement trading will allow each participant to achieve a zero balance, regardless of the distribution of client payments. Participants in surplus as a result of client transactions could lend to those with deficits. Movements in interest rates would be constrained by the operating range.

3.3 Target for the overnight interest rate

Within the operating range of the proposed system, the Bank would offer limited amounts of SPRAs or SRAs (repos or reverse repos) to signal a specific *policy target rate*. The rate would be announced at a regular time in the morning, say 9:00 a.m. If the market rate is close to the target rate during morning trading, as is usually the case, the Bank need not actually arrange any transactions. However, if the market rate diverges from the target, then at noon the Bank would initiate transactions at the announced interest rate.

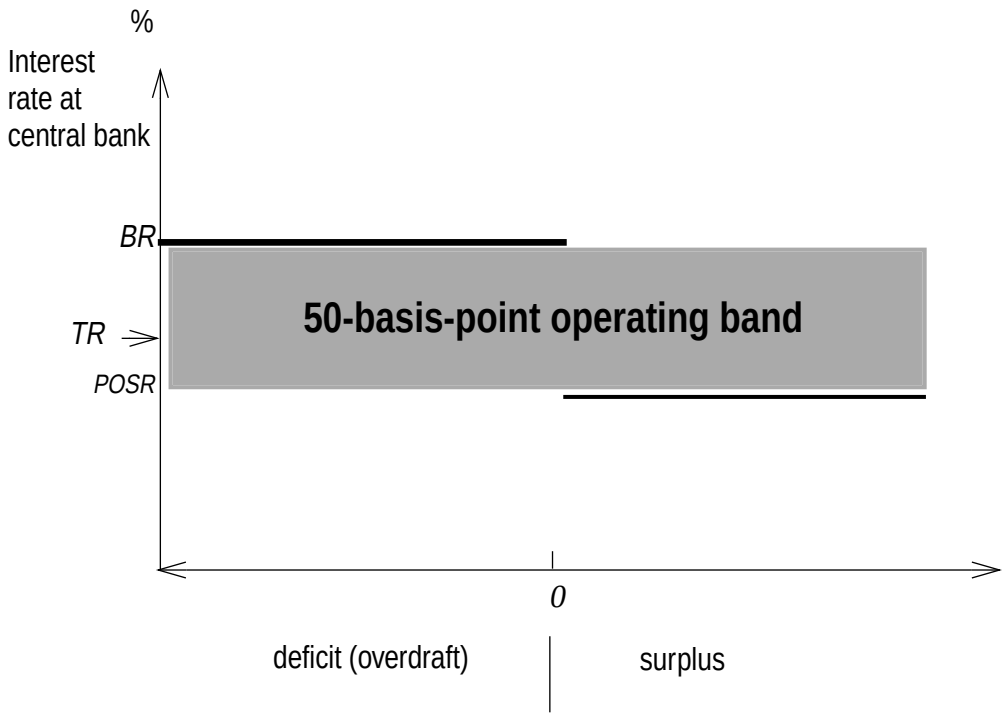
The main purpose of indicating a target rate is to provide the market with a signal as to what the next movement in the operating band might be. Thus, a target in the middle of the band would indicate that the Bank of Canada thought that the existing band was appropriate for the time being. A target in the top half of the band would indicate that the Bank was contemplating raising the band, while a rate in the bottom half would indicate that a reduction was under consideration.

Thus, the central bank would be able to gauge the likely market reaction to a change in the band before it is actually put into effect. If the reaction were adverse — for example, if reducing the target rate led to heavy selling of the Canadian dollar, or to an increase in long-term interest rates — the Bank would then have the option of not pursuing the change in the band.

3.4 Illustration

The system framework is illustrated in Figure 1. The rate charged on overdrafts at the central bank is BR and that paid on surpluses is POSR. The spread between these two rates will encourage the participants to target a zero balance every day.

Figure 1
Treatment of settlement accounts at the Bank of Canada: operating band and target for the overnight rate



BR: the Bank Rate
POSR: rate on positive balance = BR-0.50
TR: a policy target rate

4 Process for neutralizing government flows

The central bank in Canada, as in most countries, acts as banker for the government. This means that government payments flows affect the central bank balance sheet, and hence the supply of settlement balances. For example, on a day when net government receipts are very heavy, there would be a large net transfer from the banks to the government. In the absence of any offsetting action by the central bank, these would result in a drop in the supply of settlement balances. To keep monetary conditions unchanged, the central bank would undertake a *neutralizing operation* to offset the effect of the government payment items. In this case an open-market purchase or a transfer of government deposits from the central banks to the commercial banks could be used to replenish the stock of balances for the day.

The Bank of Canada has full information on the net effect of all government payments flows at about 4 p.m. each day, at which point it has all the data it needs to neutralize the net receipt or disbursement precisely. Shortly after this, and before the start of the pre-settlement trading period, the Bank will conduct the appropriate neutralizing operation. In general this will imply that during pre-settlement trading the supply of balances will be zero, such that deficits at some banks are matched by surpluses at others. Pre-settlement trading of interbank deposits will allow both these groups to flatten their settlement balance positions at interest rates within the operating band.

The instrument for setting the level of settlement balances in Canada is transfers of government deposits. This will be retained under the LVTS for neutralizing the potential impact of public sector transactions on the supply of balances.[13] However, under the new system the current retroactive "drawdown/redeposit" mechanism for these transfers would no longer be appropriate. Instead the Bank of Canada will auction the government's demand balances every day for same-day settlement through the LVTS. In effect, these deposits would become short-term deposits. Maturing amounts will be transferred back to the books of the Bank of Canada, and new deposits will be transferred to the successful auction bidders.

5 Money market equilibrium

Generally with zero reserve requirements the demand for balances is quite inelastic with respect to interest rates. In implementing monetary policy, the key variable controlled by the central bank is the price banks must pay at the margin to achieve zero positions.

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13. In most advanced countries, open-market buyback operations — purchase/resale transactions or sale/repurchase transactions — are used. There would be little difficulty to using this alternative in Canada, but the Bank considers the transfer of government deposits somewhat more convenient. For example, the daily neutralizing operations are then clearly distinct from the Bank's open-market operations, which are aimed directly at influencing the overnight interest rate.

Figure 2
Market equilibrium

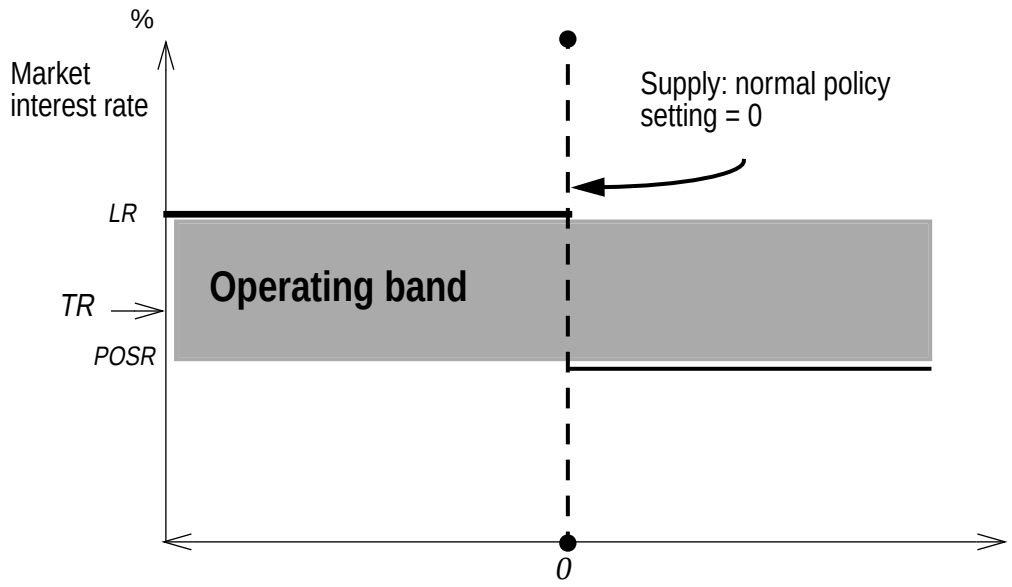

Figure 2, which is very similar to Figure 1 except that the *market rate* is plotted on the vertical axis instead of the rates applied to accounts at the central bank, depicts market equilibrium under such a regime.

The *demand schedule* for settlement balances is represented by the horizontal solid lines. If the market rate were above the effective lending rate of the central bank, the demand for *negative balances* on clearing accounts would be indefinitely large: in other words, the demand schedule would be a flat line at the overnight rate equal to *LR*, the central bank overnight lending rate. At a market rate equal to the return on positive balances at the central bank, the demand schedule would also be a horizontal line, since the demand for positive balances would then be indefinitely large. At rates in between these bounds, the demand for balances would be zero.

The *supply of balances* will normally be set at zero by the Bank of Canada.

Market arbitrage will ensure that the equilibrium interest rate is within the operating band, and that on average the overnight rate will be at the centre of this band. However, since equality of demand and supply is represented by the intersection of two vertical lines (at the zero quantity), on any given day the precise overnight rate at which the market settles is indeterminate within the 50-basis-point operating band. The actual rate will be affected by a variety of technical factors, such as the size and distribution of clearing imbalances

among the banks. This implies that the realized rate will generally differ somewhat from the target indicated at the start of the day by the Bank of Canada.

The process of implementing monetary policy in this framework consists of ensuring that the short-run funding requirements of the clearing institutions are met at the margin at a cost determined by the central bank.

6 Interest rate as the operating target

This paper assumes that the very short-term interest rate is used as the proximate target of monetary policy. However, there may be pitfalls in this procedure if it is applied too rigidly. These may be encountered because policymakers do not know with certainty what the equilibrium rate should be, and they cannot observe the *real* rate of interest. In a period of intensifying inflationary pressures, expectations of inflation may be growing strongly. If nominal interest rates are held constant by the monetary authority, real interest rates, adjusted for expectations of inflation, will actually be declining, and policy will be inappropriately lax. Such a phenomenon became widespread in the 1970s and, as a result, a number of monetary theorists argued that an interest rate operating target does not provide an adequate anchor for the price level.

From today's perspective, the problem of the 1970s is widely perceived not as the use of an interest rate operating target as such, but as the use inadequate guides for setting the interest rate. In that period, many central banks adhered to a given interest rate target for far too long after inflationary pressures became evident. Since that time an extensive literature on policy rules for the short-term interest rate has developed.[14] These rules set the interest rate as a function of the deviation of current inflation from the target, and often as a function of the output gap as well. In the process used by the Bank of Canada, the short-term interest rate setting is guided by a model forecast in which a policy reaction function targets the rate of inflation six to eight quarters ahead (Coletti et al. 1993). In each of these cases, the system does have a nominal anchor, because the interest rate is varied promptly in line with the requirements of a specific objective for inflation control.[15]

14. Important contributions include Fuhrer (1994), Goodfriend (1991) and Taylor (1993).

15. Other variables as well as interest rates are important in the transmission mechanism, e.g., the exchange rate, other asset prices and the availability of credit. However, central bank actions would bring these into play via changes in the policy-determined short-term interest rate.

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Appendix
The phasing out of chartered bank reserve requirements in Canada

Reserve requirements were phased out over a two-year period starting June 1992. As of that month, fractional requirements applied to chartered bank deposits were abolished. The *dollar amount* of requirements was then reduced from the average level of the preceding 12 months by 3 per cent every 6 months until June 1994, when the remaining requirement was entirely removed.

Prior to 1992, minimum holdings of "primary reserves" had been imposed on the chartered banks.[1] The requirement was set for each calendar month as a fraction of their average deposits over a lagged calculation period. Specifically, until 1992 the requirement and its enforcement involved the following elements:[2]

- *Four-week calculation period*
  "Statutory deposits," on which a given month's requirement was based, were defined as the average over the four consecutive Wednesdays ending with the second Wednesday of the previous month.
- *Reserve ratios*
  The statutory minimum ratios prior to their removal were: 10 per cent on demand deposits; 2 per cent on notice deposits totalling less than $500 million; 3 per cent on notice deposits totalling more than $500 million; and 3 per cent on residents' foreign currency deposits.
- *Primary reserves*
  Currency, measured on the same lagged basis as statutory deposits, and deposits at the Bank of Canada counted as primary reserves.
- *Bi-monthly averaging or maintenance period*
  The average daily holding of reserves over the first 15 days of each month, and again over the remainder of the month, had to exceed the statutory minimum. For each bank at the start of any such half month, therefore, required reserves and the level of currency holdings for reserve purposes were predetermined. The difference between them gave the level of "required deposits" at the Bank of Canada.
- *Interest charges and rules governing advances*
  The reserve requirement was enforced by discouraging the frequent use of central bank credit through charges and rules against excessive borrowing. Advances from the Bank

1. But not on other deposit-taking institutions. Increasing recognition that this was inimical to efficiency, as well as somewhat unfair, was a major factor in the retraction of these requirements.

2. For further information on the role of the reserve requirement in the implementation of monetary policy see Clinton (1991) and Howard (1992).

of Canada were required if (1) a bank had insufficient balances to settle a net deficit in the clearings on a given day, or if (2) a bank had a reserve deficit at the end of a maintenance period. Advances were charged interest at the Bank Rate or higher, the charge increasing as the scale and frequency of borrowing by a given bank increased. This generally meant that the cost of more than one advance during a maintenance period would be substantially above overnight interest rates in the market.

Chart A1 gives a longer-term quantitative picture of the phasing-out process.[3] It can be seen from the upper panel that the absolute dollar magnitude of the minimum statutory requirement hardly changed from 1984 to 1992. Since the currency held by the chartered banks for clients' needs continued to grow over this period — especially notes for stocking automatic banking machines — required deposits at the Bank of Canada fell quite rapidly. Thus, whereas in 1981 aggregate required deposits were about $5.5 billion, by early 1992 they were less than $1.5 billion. The decline in the quantitative importance of reserve requirements prior to their formal removal is even more strongly evident in the lower panel of the chart, which plots requirements as a proportion of the overall Canadian dollar assets of the banking system. Required reserves declined from over 4 1/2 per cent of total assets in 1981 to less than 1 1/2 per cent in early 1992, and required deposits fell from over 3 1/2 per cent to less than 1/2 per cent.

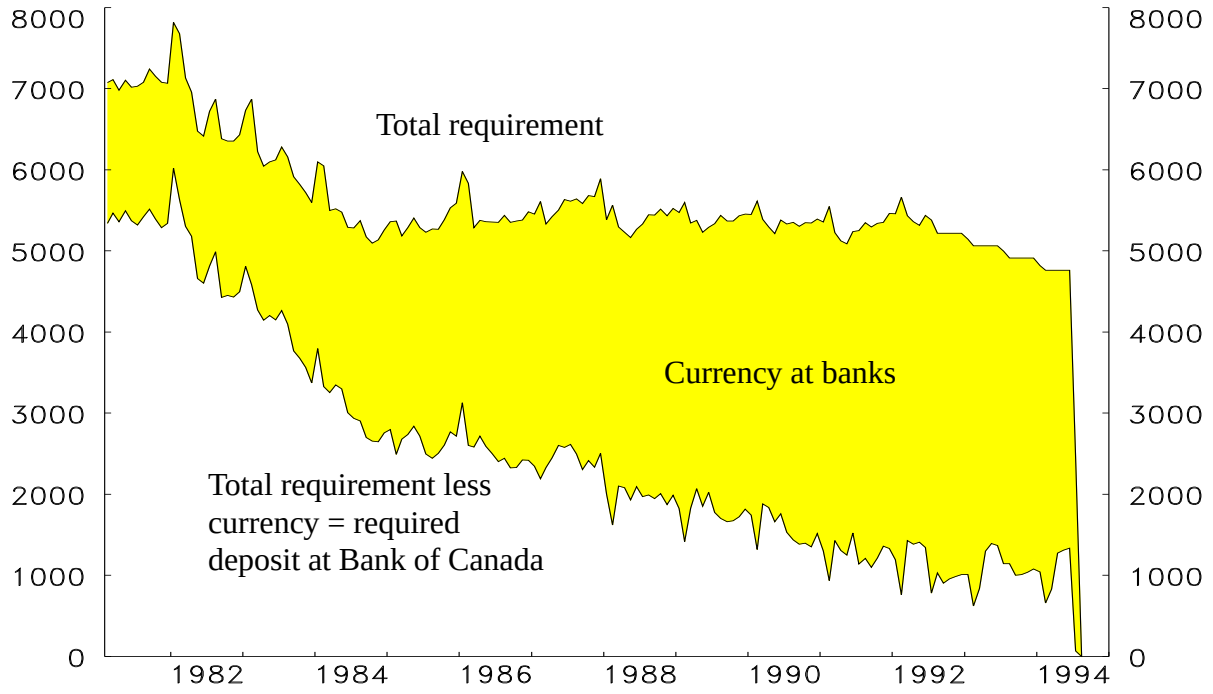
The 1980 Bank Act was a significant factor in this decline. Most important, it permitted the chartered banks to book deposits at mortgage loan subsidiaries not subject to reserve requirements; these deposits subsequently increased rapidly. Also, it enacted some modest reductions in minimum ratios. An additional reason for the decline in the overall ratio of required reserves to total bank assets was an increase in term deposits relative to demand deposits.

3. The figure for required total reserves used in the chart is equal to the published series (Cansim No. B810) less some technical adjustments that obscure the monotonic downward trend after 1992.

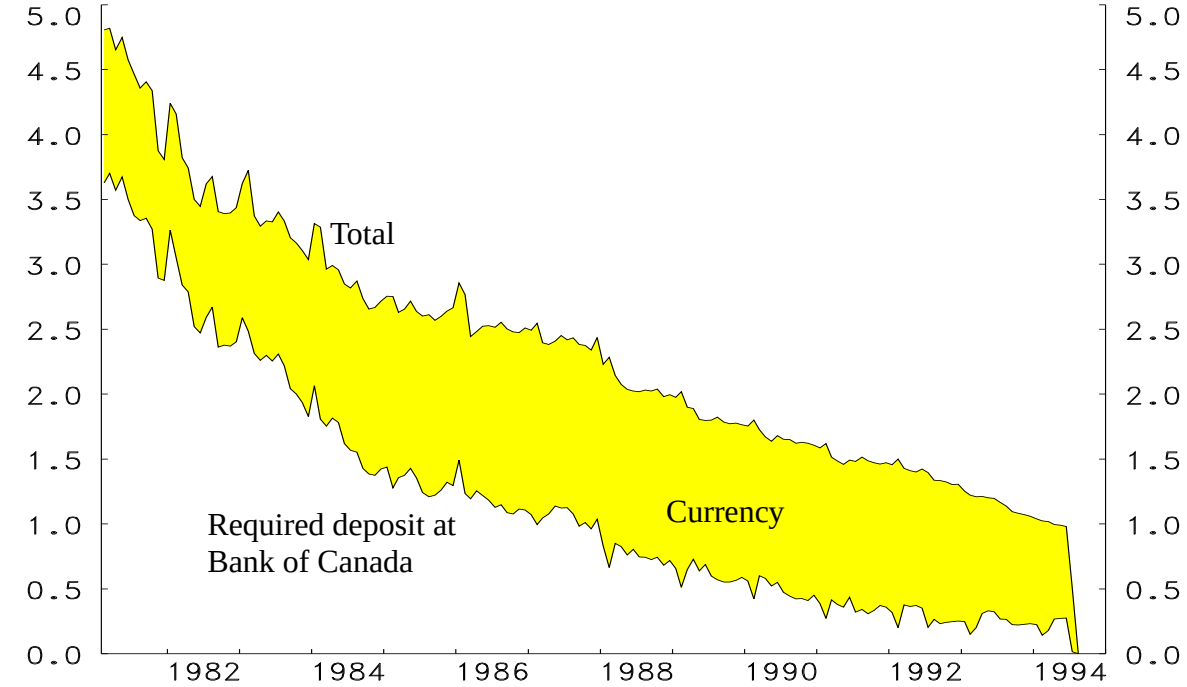
Chart A1

Chartered bank reserve requirements

$million



% **Percentage of Canadian-dollar major assets** **%**



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