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The Implementation of Monetary Policy in a System with Zero Reserve Requirements

Discussion Paper No. 2
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The Implementation of Monetary Policy in a System with Zero Reserve Requirements

In an earlier discussion paper, dated 29 September 1987, the Bank of Canada set out a framework for monetary policy implementation in the absence of reserve requirements. The basic elements of that proposed system were a one week averaging period, no charge on daily overdrafts but a charge of twice Bank Rate on end-of-period advances, and target balances of $\frac{1}{4}$ of 1 per cent of Canadian dollar deposits. The target ratio, which was to be applied to the sum of the deposits of the direct clearer and any indirect clearers for which it acted, was intended as a form of compensating balance in return for the increased flexibility, in particular the overdraft arrangements, that the framework provided to direct clearers.

In meetings with the chartered bank and non-bank direct clearers, concern was expressed about the magnitude of the target balance, in particular whether the gains in increased flexibility from the proposed framework were sufficiently large as to justify the proposed target ratio. Subsequently, concerns were expressed by non-bank indirect clearers that they would indirectly be subjected to the $\frac{1}{4}$ per cent target balance ratio even though they did not receive the same benefit from the proposed framework as did the direct clearers.

The Bank has re-examined the system proposed in September 1987 from the standpoint of these concerns and has concluded that the target ratio of $\frac{1}{4}$ per cent of deposits did indeed raise some legitimate concerns.

In the rest of this note we propose an alternative method of implementing monetary policy in a system with zero reserve requirements. The primary objective of the proposed system continues to be to permit the Bank of Canada to exercise a degree of influence over very short-term interest rates similar to that under the current system. We begin with the details of the system as it would function after the complete elimination of reserve requirements. This is followed by a discussion of how the system would operate during a period in which reserve requirements were being phased out. We then sketch out the implications for this system, designed to operate under retroactive next-day settlement, of the introduction of a large value payment system with same-day settlement. We conclude with an appendix which illustrates the proposed system with some examples.

A. The proposed system under retroactive settlement and with zero reserve requirements

Under the revised proposal there would continue to be, as in the original proposal, a one-week averaging period, but the obligation on direct clearers to meet a positive cumulative target balance requirement (based on deposit liabilities) at the end of each period would be eliminated. However, daily overdraft loans from the Bank of Canada would no longer be without charge and would incur interest at the Bank Rate. The cumulative position of a direct clearer at the end of each averaging period would be calculated as previously, except that relatively small daily

overdraft loans that were within its line of credit at the Bank would not have to be offset by positive daily balances or an end-of-period advance.

1. Those banks and non-bank financial institutions that choose to be directly clearing members of the Canadian Payments Association, and therefore settle through the Bank of Canada, would have to maintain a zero or positive settlement balance each day in their accounts at the Bank of Canada. On days in which a direct clearer had a negative position at the Bank of Canada, it would have to take an overnight overdraft loan from the Bank of sufficient size to eliminate the negative position. Such overdraft loans would be at Bank Rate.
2. In addition, each direct clearer would have to meet a requirement that its "cumulative computed settlement balance" equal or exceed zero over an averaging period. The cumulative computed settlement balance would be defined as the sum of daily positive settlement balances, less the portion of any daily overdraft loan that was greater than the line of credit allocated to the direct clearer by the Bank of Canada.¹ The proposed averaging period would be one week and would end on Wednesday (except when Wednesday was a holiday). Fridays would typically have a weight of 3 in calculating the cumulative computed settlement balance over the averaging period.

Consider, for example, an institution with a line of credit of 100. An end-of-day balance (before overdraft loan) of -75 in the account of the institution at the Bank of Canada would require the institution to take an overdraft loan of 75. The resulting zero balance would be treated as the computed balance for purposes of averaging. However, an end-of-day balance (before overdraft loan) of -125 would require the institution to take an overdraft loan of 125, 25 in excess of the institution's line of credit. This would result in a computed balance of -25 on that day. Further examples are given in the Appendix to this note.

3. If a direct clearer had a negative cumulative computed settlement balance on the last day of the averaging period (which would result from overdraft loans greater than the line of credit on some days which were not offset by positive balances on other days), it would have to take an advance from the Bank of Canada equal to that amount. This end-of-period advance would also typically be at Bank Rate.
4. There would be no restrictions on the frequency of overdraft loans or advances. Cost considerations might lead a direct clearer to aim on a daily basis at an outcome that would involve taking an overdraft loan within the line of credit. That is, it would seek to

¹ Upon the introduction of the proposed system the Bank of Canada would allocate a revised line of credit to each direct clearer. The Bank would modify this line of credit if it should prove necessary for the efficient operation of the system.

reduce the probability of daily clearing outcomes that would lead to a positive balance or to an overdraft loan beyond the line of credit. Of course, the actual cumulative position during the course of an averaging period would influence the subsequent daily objectives of the direct clearer.

5. All borrowings from the Bank of Canada, whether overdraft loans or advances, would be collateralized as in the present system.
6. Arrangements between a direct clearer and an indirect clearer would be the result of direct negotiations between the institutions.
7. The structure outlined above would permit the Bank of Canada to influence short-term interest rates in a way very similar to that under the current system. That is, by using redeposits or drawdowns to vary the quantity of settlement balances above or below the levels desired by direct clearers, the Bank of Canada could induce downward or upward pressure on very short-term interest rates. The proposed structure would improve on the current system by changing the end of the averaging period to a Wednesday, thereby eliminating periods ending on Fridays or weekends, with a triple weight on the last day. The reduction in the length of the averaging period to one week would tend to shorten the time lag between Bank of Canada actions and movements of very short-term interest rates while retaining the smoothing benefits of an averaging system.

**B. The proposed system during the period
in which reserve requirements were being phased out**

The system described above could be introduced at the beginning of the period during which reserve requirements for chartered banks were being phased out gradually. The same rules would be in force except that for banks the cumulative computed settlement balance at the end of each weekly averaging period would have to equal or exceed the cumulative total of the amount of deposits required at the Bank of Canada to meet reserve requirements. Under these arrangements, relative cost considerations might, for example, lead a chartered bank direct clearer to aim at a daily balance at the Bank of Canada that was positive but somewhat lower than its average required holdings of Bank of Canada deposits for reserve purposes. In other words, the bank would seek to reduce the probability both of cumulative excess balances and of overdraft loans greater than its line of credit. The result could be a situation in which the bank took advances at the end of virtually every averaging period to meet the reserve requirement.

C. Transition to same-day settlement

The Canadian payments system appears to be evolving towards a situation in which the present paper-based system with a one-day lag before retroactive settlement will co-exist with a large-value electronic payments system with same-day settlement. It seems likely that there will be a gradual increase in usage of the large-value payments system, rather than an abrupt once-and-for-all switch. The system sketched out above would probably remain functional for at

least some period of time following the introduction of a large-value payments system. Eventually, however, as the latter captured an increasing share of the flows through the payments system, it would probably become necessary to restructure the way in which policy was implemented. An outline of two potential implementation systems under same-day settlement was presented in the note of 29 September 1987.

Appendix

Some examples:

The following table presents some examples of the effect under the proposed system of a variety of clearing outcomes on the account of a direct clearer at the Bank of Canada and hence on the overdraft loans and advances taken by the institution. In the examples there are zero reserve requirements and the direct clearer is assumed to have a line of credit of 100.

	End-of-day balance (before overdraft loan)	Overdraft loan	Daily closing settlement balance	Daily computed settlement balance	Cumulative computed settlement balance	End of averaging period advance
Thursday	25	-	25	25	25	
Friday	-125	125	0	-25 (x3)	-50	
Monday	-25	25	0	0	-50	
Tuesday	75	-	75	75	25	
Wednesday	-50	50	0	0	25	0
Thursday	-150	150	0	-50	-50	
Friday	25	-	25	25 (x3)	25	
Monday	-125	125	0	-25	0	
Tuesday	-50	50	0	0	0	
Wednesday	-75	75	0	0	0	0
Thursday	-50	50	0	0	0	
Friday	-75	75	0	0 (x 3)	0	
Monday	-125	125	0	-25	-25	
Tuesday	-25	25	0	0	-25	
Wednesday	-50	50	0	0	-25	25

The following table presents similar illustrations for a chartered bank during a period in which reserves are being phased out. It is assumed that the bank is required to hold a deposit of 50 at the Bank of Canada and has been allocated a line of credit of 25. Thus, the cumulative total of required deposits over the week will be 350.

	End-of-day balance (before overdraft loan)	Overdraft loan	Daily closing settlement balance	Daily computed settlement balance	Cumulative computed settlement balance	End of averaging period advance
Thursday	50	-	50	50	50	
Friday	25	-	25	25 (x 3)	125	
Monday	-20	20	0	0	125	
Tuesday	100	-	100	100	225	
Wednesday	75	-	75	75	300	50
Thursday	75	-	75	75	75	
Friday	0	-	0	0 (x 3)	75	
Monday	100	-	100	100	175	
Tuesday	-100	100	0	-75	100	
Wednesday	125	-	125	125	225	125