

# Arbetsrapport

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## Swedish Monetary Policy: Institutions, Targets, and Instruments

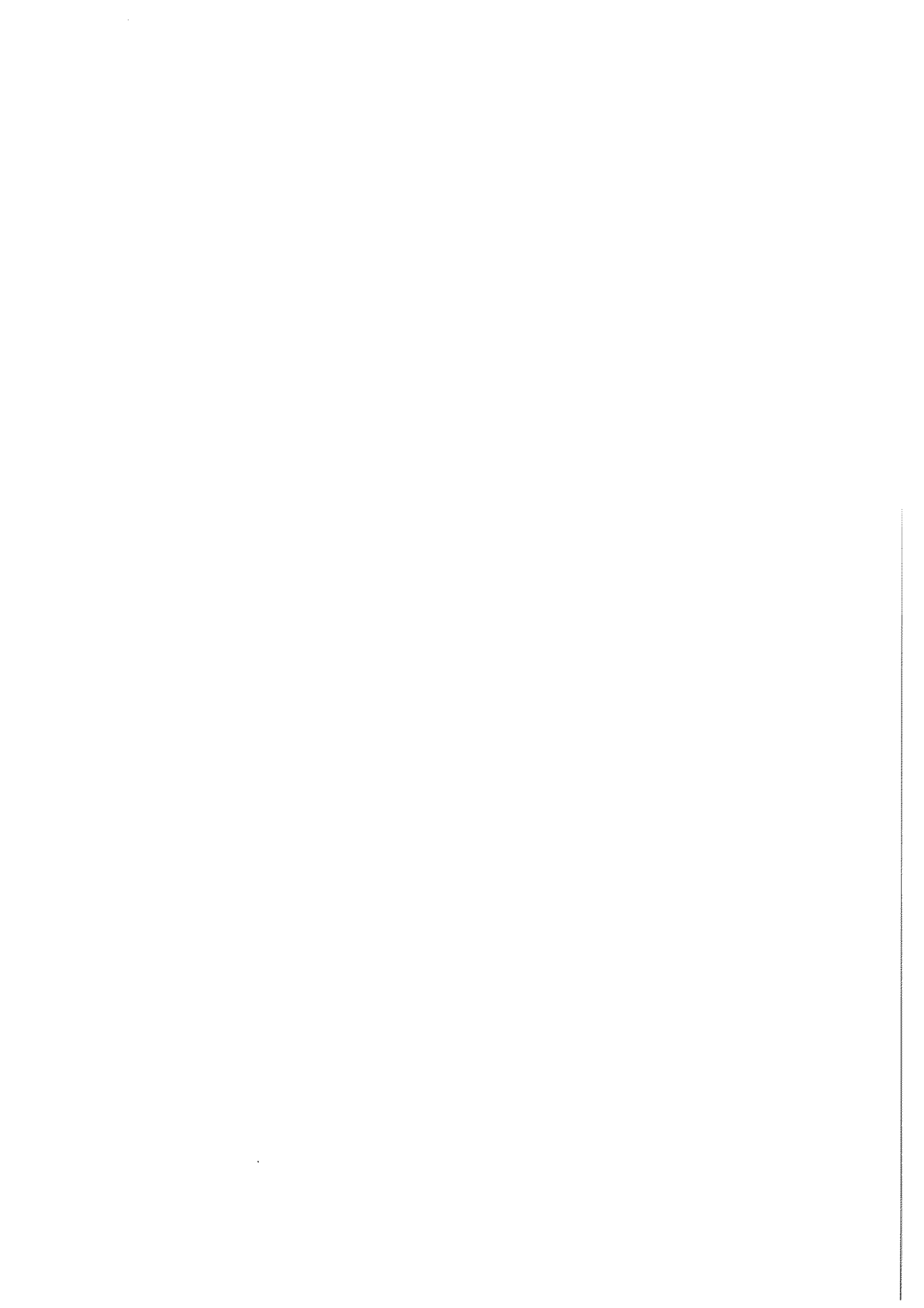
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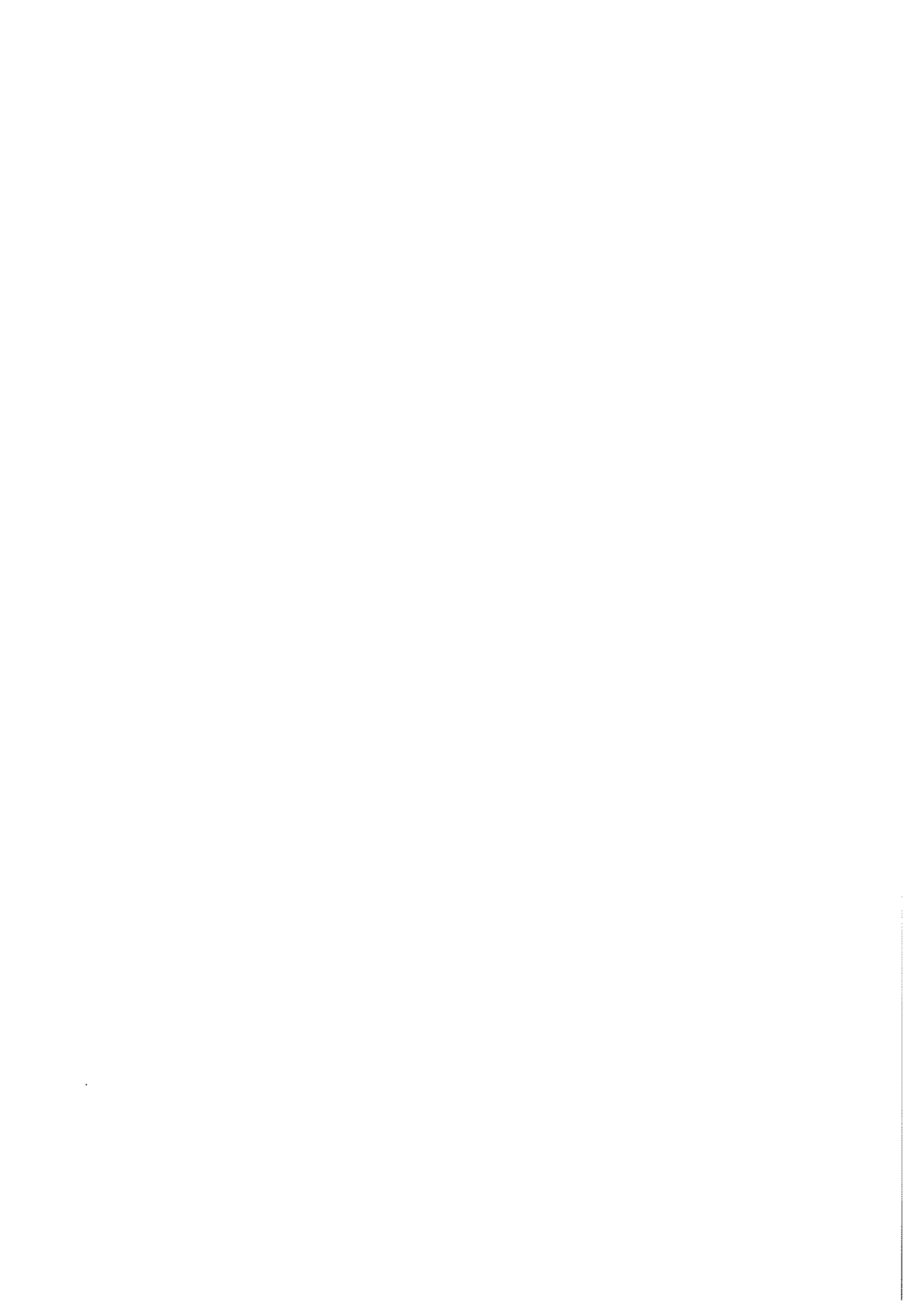
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## 1 Introduction

The orientation and techniques of monetary policy in Sweden in the beginning of the 1990s have virtually nothing in common with the system in use ten years earlier. The main driving force behind these drastic changes has, as in other countries, been the development of financial markets, both domestically and internationally. In a complex interplay, deregulations and autonomous market developments have in just a few years combined to completely transform the institutional framework in which monetary policy is implemented. The shift from regulatory policy instruments, such as interest rate ceilings and credit controls, to a market oriented policy was made possible by the development of financial markets on which the central bank could intervene, while at the same time contributing to the growth of these markets.<sup>1</sup> Sweden is certainly not unique in this respects as similar shifts have taken place in most industrialized countries.<sup>2</sup>

In this paper, we will describe the operating procedures of monetary policy and how they have been adjusted to handle the new financial environment. Of particular importance in a country with a fixed exchange rate is the establishment and maintenance of the credibility of the exchange rate regime. This has been, and continues to be, a major factor in both the orientation and implementation of monetary policy.

The paper is organized as follows. The legal and institutional framework of monetary policy is discussed in section 2, including the relation between the Riksbank and other policy making bodies. In section 3, Swedish monetary policy is described in terms of the standard classification of ultimate targets, intermediate targets, and instruments. The operating procedures are analyzed in detail in section 4 and in section 5 some issues related to central bank secrecy are raised. Section 6 discusses the efficacy of monetary policy under a fixed exchange rate, in particular, its role in enhancing the credibility of the exchange rate regime. Some brief concluding comments are offered in section 7.

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1 The Swedish deregulation process is described by Englund (1990).

2 See, e.g., Batten et al. (1990) and Kneeshaw and Van den Bergh (1989) for recent international reviews.

## 2 The institutional framework

The basic responsibilities of Sveriges Riksbank, the Swedish central bank, are laid down in the Swedish constitution. It is stipulated that the Riksbank is responsible for foreign exchange and monetary policies and for promoting an efficient payments system. No targets for monetary policy are pointed out in either the constitution or the law governing the activities of the Riksbank.

A revision of that law came into force on January 1, 1989. It did not change the basic institutional framework, however. The Riksbank is accountable to the parliament and not to the government. This is based on a very long tradition and a result of struggles, not least in the 18th century, between the parliament and the king over the control of the printing presses. The constitutional framework and the potential sources of conflict are very different today, of course, but no one has seen any reason to change this feature of the system.

The influence exercised by the parliament is mostly indirect. The Riksbank submits its annual report, containing both accounting information and a report on monetary and foreign exchange policy in the past year, to the parliament. The parliament also decides on the disposition of the Riksbank's profits, but this decision is based on an established rule; 80 percent of a five year moving average of the surplus is paid to the government. The Governor of the Riksbank meets, at least twice a year, with the finance committee of the parliament in hearings about the Riksbank's views on the economic situation and current policy issues. In recent years, the finance committee has issued statements concerning monetary policy, but they have no formal role as guidelines for the Riksbank and often take the form of general comments supporting the overall direction of the monetary and exchange rate policy.

The influence of the parliament on the Riksbank is instead through the election of the members of the Governing Board. The Board of the Riksbank consists of eight members. Seven of them are elected by the parliament for three year terms, coinciding with the period between parliamentary elections. The Board therefore reflects the current composition of the parliament. The majority of the members and their deputies are also members of the parliament. This means that the Riksbank, like all central banks, is under political influence, but also that the Riksbank, through the Board members and the information that they get at Board meetings, has direct links to the parliament.

The eighth member is the Governor, who is elected by the other members of the Board. His (or her) term of office was extended to five years in the revised law. This step was taken in order to emphasize that the position as Governor should not be a political one. The chairman is elected by the Board members

appointed by the parliament among themselves, which is also a change compared to the previous law, when the chairman was appointed by the government. The Governor may not be elected either chairman or vice chairman of the Board.

The Board must meet at least every second week and when the parliament is in session (from October to June) it usually meets every week. As the highest decision making body in the Riksbank, the Board is ultimately responsible also for monetary and exchange rate policy. General policy guidelines are presented to the Board by the Governor for discussion and review. They may include not only a basic strategy, but also contingent plans and the policy options available in case the external circumstances should change.

On the basis of general guidelines approved by the Board, the implementation of monetary policy is delegated to the Governor. Interventions in domestic money markets and the foreign exchange market are thus made without direct consultations with the Board. If a major policy change is necessary, the Governor would inform the members of the Board and obtain an informal approval, but no formal Board meeting would have to be called.

In recent years, the techniques for monetary policy have been revised in ways which put the operative instruments for implementing the policy guidelines more effectively in the hands of the Governor. This can be seen as a necessary adjustment to the developments of financial markets. In an often volatile policy environment, the ability to react quickly to changes in the markets is essential, not least in a system with a fixed exchange rate. Thus, the discount rate, reserve requirements, and the conditions on which private banks are given access to central bank credit via the discount window, changes in which by law require decisions by the Board, are no longer used as instruments for short-run monetary control. The operative instruments are instead market interventions of various kinds, where the law allows the Governor to take the decisions.

The law stipulates that the Riksbank is responsible for monetary and exchange rate policy. The Riksbank is instructed in law to consult the government prior to making policy decisions of "major importance". If the government should disagree with the proposed action, it has no formal means through which it can overrule or delay decisions made by the Riksbank, however. This is a direct reflection of the fact that the Riksbank is accountable to the parliament and not to the government. There are therefore no formal rules for how a conflict between the Riksbank and the government should be resolved. It is the Riksbank's view that would prevail.

## The institutional framework

If the government holds the majority of the seats in the parliament and therefore also the majority in the Board, a conflict is unlikely, unless party discipline is weak and the representatives on the Board choose not to take the government's side. The likelihood of a conflict could increase in a situation where there is a minority government which does not hold the majority of the seats on the Governing Board. The Riksbank could then block the government from changing monetary or exchange rate policies. So far, no such conflicts have arisen.

In practice, there are regular contacts between the Riksbank and the government on an informal basis, under normal circumstances leading to a consensus on the direction of policy. The general commitment to a fixed exchange rate effectively means that there is relatively little scope for an independent monetary policy, and, hence, also little scope for disagreement about what the central bank should do in terms of interest rate or exchange rate policy.

The formal relations between the central bank and the government and the importance of the central bank's legal status have been given increased attention in recent years, both in the academic literature and in the policy debate in many countries. Sweden is no exception and we will return to these issues in section 6 in connection with the discussion of the problems of ensuring credibility of monetary and exchange rate policies.



### 3 Monetary policy targets

It is standard practice to distinguish between *ultimate targets* (or *goals*), *intermediate targets*, *indicators*, and *instruments* of monetary policy. This classification scheme is also very useful as a frame of reference for descriptions and analyses of economic policies, although the distinctions are not always clear-cut and the links between instruments and targets are often difficult to verify.<sup>3</sup>

Instruments are variables that are subject to direct control by policy makers. Ultimate targets, on the other hand, are variables that are important in their own right for economic welfare and therefore can be expected to appear in the policy makers' objective function. Any variables that fall in between, in the sense that they link instruments to ultimate targets, are defined as intermediate targets. As this chain is often quite long, it is inevitable that one encounters a multitude of intermediate targets.<sup>4</sup> It goes without saying that the assumed links are also quite tenuous. Given the current state of knowledge on aggregate economic relationships, the theoretical and empirical basis for economic policy making is anything but firm. The following description of the "visions" underlying Swedish monetary policy should be read with this reservation in mind.

Starting with the ultimate target, there is no doubt, although this principle is not laid down in law, that the attainment of price stability is the most important goal of central bank policy in Sweden (as in most other countries). It is widely agreed that a nominal anchor is an essential ingredient in a policy aimed at price stability. The nominal anchor in the Swedish case is the fixed exchange rate. Since the exchange rate is not an important variable in itself, it must be classified as an intermediate target.

The general motives for using the exchange rate as a nominal anchor are well-known. By pegging the krona, a long-term constraint on the domestic inflation rate is obtained. For the fixed rate to be viable, the domestic price level cannot deviate by too much from the level pertaining in the countries included in the currency basket that forms the basis of the Swedish fixed

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3 For a recent and more detailed discussion of these concepts, see, e.g., McCallum (1990).

4 The fourth class of variables, i.e., indicators that are used as information variables on the stance of policy and the development of the economy, does not play an important role for monetary policy in a fixed exchange rate system. The general role of indicator variables will be discussed below.

exchange rate system.<sup>5</sup> Should a deviation arise, an internal adjustment will have to come about through changes in nominal prices and wages that restore relative prices and costs: In slightly more formal terms, the fixed exchange rate reflects that the major concern is with internal, nominal shocks, in particular relating to price and wage formation.

A commitment to a fixed exchange rate is also expected to reduce the probability of such nominal shocks by acting as a disciplinary force on price and wage setting behavior. Employers and employees should be made aware that they will have to bear the consequences, in terms of low profits and high unemployment, of their own decisions. Given the prevalence of nominal shocks, a non-accommodating exchange rate policy is expected to stabilize both the price level and the development of the domestic economy in general.<sup>6</sup>

In effect, the target is not absolute but relative price stability, i.e., Sweden is willing to accept the international long-term rate of inflation. The inflation norm will depend on the composition of the currency basket as the target inflation rate, in principle, is a (basket-weighted) average of inflation in the countries included in the currency basket. The Swedish basket is constructed using trade weights, i.e., with an eye to keeping "competitiveness" rather than the price level stable. Given that the Swedish economy historically is more inflation prone than many other industrialized countries there is still something to be gained by adjusting to the international average given by the currency basket.

Given the commitment to a fixed exchange rate, it is not meaningful to try to distinguish between monetary and exchange rate policies as two separate policy areas. Monetary policy has to be subordinated to the target of keeping the exchange rate at the predetermined level. In the very short run, the value of the krona is stabilized with the help of direct interventions in the foreign exchange market. However, for the fixed exchange rate regime to be viable and credible, it is essential that secular outflows and, although the constraints are less binding in this case, inflows of foreign currency can be prevented. Major losses of foreign exchanges reserves could be interpreted by private agents as an indication that a change in the exchange rate peg is inevitable and set off a "currency crisis" in the form of a run on the central bank. The foreign

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5 The functioning of the currency basket system is described by, e.g., Hörngren and Järnhäll (1990) and Ringström (1987).

6 In the face of other shocks, e.g., a real terms-of-trade shock, a fixed exchange rate may not be conducive to price stability, of course. The discussion of optimal exchange rate arrangements is beyond the scope of this paper, however.

exchange reserves can therefore be seen as a secondary intermediate target, i.e., policy has to be adjusted so as to keep them on a stable path.

As the private capital account is the most flexible component in the transactions affecting supply and demand in the foreign exchange market, this target can only be achieved if domestic interest rates are adjusted so as to conform to the return required by investors on holdings of assets denominated in Swedish kronor. Money market interest rates, as crucial determinants of international portfolio decisions, thus become intermediate targets at the operative level. Based on the observed pressure on the krona and the foreign exchange market interventions needed to keep the krona inside its target zone, the operative instruments are adjusted so as to keep money market interest rates, in effect, interest rate differentials relative to other currencies, at levels that keep the foreign exchange reserves on a stable path. The interest rates considered important in this regard are (approximately) in the area up to nine months maturity.

The commitment to letting interest rates reach whatever level necessary to induce private investors to voluntarily hold the outstanding stock of krona assets is very strong and considered an integral part of the fixed exchange regime. It is further strengthened by the rule that the government shall not increase its borrowing in foreign currency. This rule was introduced in 1984 and acts as a constraint on both monetary and budget policies. In the 1970s, foreign currency borrowing was considered a cheap way of financing the government budget deficit, which had the additional effect of adding to the foreign exchange reserves and compensating for the losses that came via the substantial current account deficits recorded during this period. Other things equal, this (presumably) made it possible to keep domestic interest rates at a lower level than if the required inflow should have been generated by a private capital account surplus. Indirectly, this policy thus also made domestic borrowing cheaper for the government and may have tended to undermine fiscal discipline.<sup>7</sup>

By giving up the option to borrow in foreign currency, the authorities have signaled their intention to follow policies that keep *private* foreign currency transactions in balance, so that, e.g., a current account deficit is balanced by a private capital account surplus. This requires that the credibility of the fixed exchange rate is maintained and, in case any doubt should arise, that interest

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<sup>7</sup> The credit market regulations then in force worked in the same direction as they were partly aimed at securing cheap funding for the public sector. In this respect, the deregulation of financial markets may have contributed to strengthening fiscal discipline as government borrowing now only is available at market determined terms.

rates are adjusted so as to stop any run on the foreign exchange reserves. In this regard, there is no room for a trade-off either with respect to what domestic demand conditions might suggest or to concerns for financial fragility.

This (necessarily brief) description shows that Swedish monetary policy uses interest rates as operative targets. These targets are not set independently, however, but are derived from the need to align domestic interest rates to the market's required return on krona assets. The latter, in turn, depends on interest rates abroad, basically a basket weighted average of foreign interest rates, and any additional return (positive or negative) that investors may require because of expected exchange rate changes or exchange rate uncertainty.<sup>8</sup> The fixed exchange rate also implies that quantitative variables, e.g., the money stock or the credit volume, must be seen as demand determined and more or less impossible to influence with the help of monetary policy instruments.

The fact that money and credit are demand determined implies that they may be seen as indicator variables, reflecting changes in the business cycle or other developments. They do not provide any information that is useful for the formulation of monetary policy, however, as this is tied down by the fixed exchange rate. On the other hand, if for example a rapid increase in the demand for credit is observed, this might indicate that changes in other areas of economic policy are called for. It can, in other words, function as an indicator that is useful for fiscal or tax policies.

The fixed exchange rate policy inevitably also limits the ability to use monetary policy for domestic purposes, e.g., as an instrument to influence aggregate demand. In the period from 1987 to 1989, when the Swedish economy experienced a period of excess demand and high inflation, the Riksbank tried to keep domestic interest rates as high as possible in an attempt to exploit the scope for independent monetary policy that existed. The resulting increase in the foreign exchange reserves was manageable in the sense that the Riksbank was able to offset the direct liquidity effects. The scope for sterilization is limited, however, and therefore also the ability to raise the interest rate differential over the level required in the market.

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<sup>8</sup> See Hörngren and Vredin (1989) for a discussion of the determination of interest rates in currency basket systems. Svensson (1990) analyzes the effects of the target zone of the currency index for interest rate differentials.

These limits cannot be determined with any precision, but the levels reached have at least been insufficient to stop the rapid expansion of household credit that has followed in the wake of the deregulation of financial markets. This is far from surprising given that the after tax real rate of interest for household borrowers in certain periods has been at or below zero.<sup>9</sup> The recently enacted tax reform in Sweden will lower the deductibility of nominal interest rate costs and thus make households more sensitive to nominal interest rate changes. The ability to influence interest rates that exists will therefore have a stronger effect on household credit demand. However, given that interest rates depend primarily on factors that the Riksbank does not control, the tax reform does not make monetary policy much more useful for influencing aggregate demand.

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<sup>9</sup> In this respect, credit demand should have been seen as indicating the need for changes in the tax system. This is an example of how financial aggregates, under a fixed exchange rate, might be useful as policy indicators outside the area of monetary policy.

## 4 Instruments and policy implementation

In the preceding section, we concluded that money market interest rates, based on their (assumed) importance for short-term capital flows, are treated as operative (intermediate) targets for monetary policy.<sup>10</sup> Given the fixed exchange rate, the issue is really *how*, i.e., along what path, interest rates are to be adjusted to conform to the market's required return. The Riksbank has chosen to take an active part in the adjustment process, using techniques that permit smoothing of interest rate fluctuations under normal circumstances while at the same time making it possible for the Riksbank to lead the market and signal the need for higher interest rates in situations where the krona comes under pressure. In this section, we will describe the operating procedures, which are based on discount window borrowing, and discuss their properties in some detail.

### 4.1 The techniques for discount window borrowing

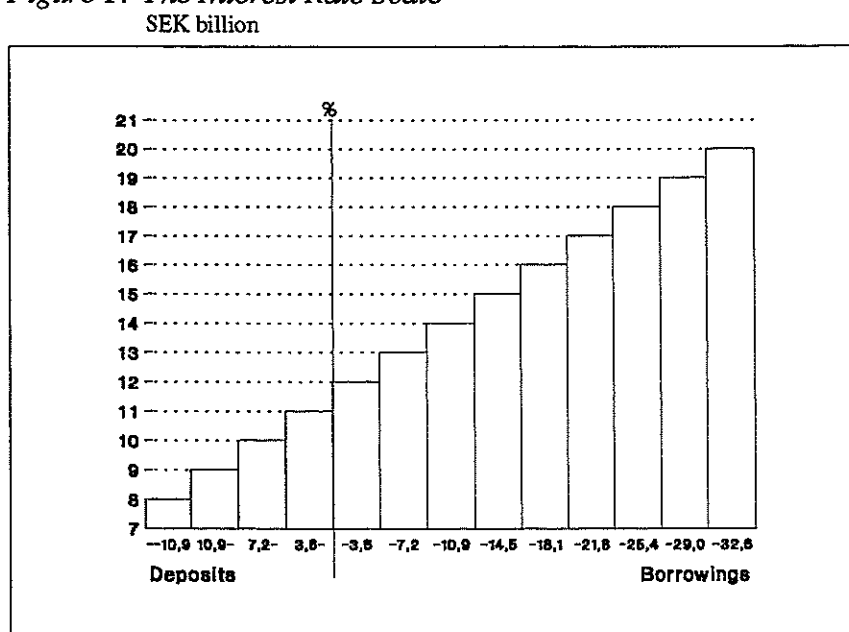
Interest rate control is focused at the very short end of the maturity spectrum in that the Riksbank uses the terms for access to borrowed reserves in the central bank - the discount window - to control the overnight interbank interest rate.<sup>11</sup> Like in many other countries, the interest rate on borrowed reserves is an important policy variable. The Swedish system is based on a predetermined supply function for borrowed reserves. As shown in Figure 1, borrowed reserves can also be negative, i.e., the Riksbank accepts deposits from banks on predetermined terms. The system is symmetric and works in exactly the same way irrespective of whether borrowed reserves are positive or negative. Depending on the amount deposited or borrowed, the interest rate paid or charged ranges from 8 to 20 percent. For borrowing above the 20 percent level

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10 The belief in the connection between interest rates and private capital flows is strong, although it has proved difficult to find corroborating evidence using econometric models. For a study using Swedish data, see Vredin (1988).

11 Note that the discount rate that the Riksbank announces no longer has any connection to the terms for bank borrowing. The discount rate, which is included as a reference rate in a large number of laws and private contracts, is adjusted with a lag to the development of market rates and not used to influence them.

Figure 1. The Interest Rate Scale



an arbitrarily high interest rate may be charged. A supply function of this form is defined for each bank, where the size of the steps is related to the capital base of the bank. The curve shown in Figure 1 is the aggregate supply function, which is the relation that is relevant for monetary policy purposes.<sup>12</sup>

It should be noted that this form of lending is functionally and legally completely separate from the emergency credits that the Riksbank can give as lender of last resort. The purpose of this system is exclusively to help the Riksbank control interest rates. The supply function for borrowed reserves can be interpreted as a "menu" of interest rate levels available to the Riksbank. Given that reserve demand is determined by reserve requirements based on lagged reserve accounting (and that the demand for cash is highly stable), the Riksbank can, by controlling the supply of non-borrowed reserves, force (or induce) the banks to adjust their borrowing so as end up at the target step on the supply function.<sup>13</sup> For example, if the current situation is such that an

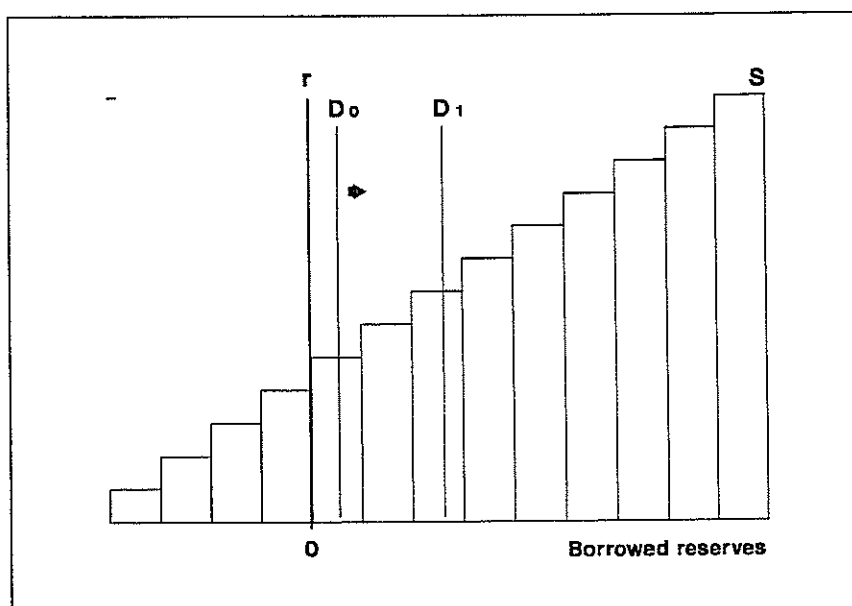
12 The similarities to, e.g., the German system, described by Batten et al. (1990), should be obvious. There the discount rate, the variable repurchase rate, and the lombard rate form a supply function with three steps.

13 The supply of non-borrowed reserves is determined by the size of the foreign exchange reserves and the central bank's net holdings of domestic assets. Reserve requirements are used to fix total demand for bank reserves, but not as an instrument for effecting short-run liquidity changes. Note also that the required reserve ratio has no independent effect on the money stock in a system based on interest rate targeting; see Goodfriend and King (1988, p. 7).

interest rate of 12 percent is considered appropriate, the Riksbank has to make sure that the difference between the total demand for reserves, which is essentially predetermined, and the supply of non-borrowed reserves is in the range from zero 0 to 3.6 billion. In order to raise the interest rate, the Riksbank has to reduce the supply of non-borrowed reserves, e.g., by reducing its holdings of government bonds. As illustrated in Figure 2, this shifts the demand for borrowed reserves to the right and forces the banks to pay more for their marginal borrowing in the Riksbank.<sup>14</sup> Interbank arbitrage will make sure that all banks borrow at the same step in their individual supply functions.

The most important instrument for short-term control of non-borrowed reserves is repurchase and reversed repurchase agreements, also known as "repos", that the Riksbank makes with the market makers in government bills, i.e., banks and some non-bank brokerage firms.<sup>15</sup> On a daily basis, the Riksbank makes internal forecasts of the components on its own balance sheet in order to compare the autonomous supply of non-borrowed reserves to the level required to hit the target interest rate. If liquidity is low so that the banks

*Figure 2. Shift in Demand for Borrowed Reserves*



- 14 For simplicity, the demand curve in Figure 2 is drawn as a vertical line. This is correct in the very short run, e.g., within a given market day. If the time perspective is lengthened, the interest elasticity of capital flows will influence the slope of the demand curve as the demand for borrowed reserves is affected by changes in foreign exchange reserves. For a more general analysis of this type of system for discount window borrowing, see Englund et al. (1989).
- 15 Formally, a repurchase agreement is a combination of an open market purchase and a forward contract to resell the assets at a future date.



would end up too high on the scale, e.g., at 15 percent instead of 12, the Riksbank announces that it is willing to buy assets worth 10 billion kronor using a repurchase agreement. If the liquidity in the banking system is too high, a similar reverse repo is announced. The quota is allocated via an auction, usually with interest rate tender. This means that the Riksbank does not tell the market what interest rate level it is aiming for, i.e., the interest rate target is not made public.

Normally, the repo transactions will cover a period of three to seven days, depending on market conditions and the stability of the liquidity situation. Since the Riksbank does not have the ambition to fine-tune the non-borrowed reserves position, overnight borrowing may, in an otherwise stable situation, be allowed to fluctuate from one step to another during a given repo period. It is usually considered sufficient if the target interest rate level is reached as an average over one or two repo periods. Of course, the width of the steps in the scale has been set so as to give a wide enough "target area" for the liquidity forecast to reach the desired level of precision. It is also possible to adjust liquidity during a repo period by making forward transactions in the foreign exchange market.

In situations when interest rates and foreign currency flows are volatile or the market is uncertain about the Riksbank's intentions, the Riksbank uses one day repos. Under these circumstances, volume tender may also be used as this enables the Riksbank to announce explicitly the interest rate level for which it is aiming. One day repos also make it possible to change policy at short notice, since a new repo is announced each day. Of course, it would be possible to have two or more repo transactions of different length outstanding, but this procedure has so far not been used.

In addition, the Riksbank on occasion uses interventions in the spot market for government bills to indicate its intentions concerning money market rates. This option has been used primarily in situations when the market participants have expected lower overnight rates, which has pushed money market rates down. The Riksbank has then tried to signal that it does not want to see lower interest rates. These interventions are based on an implicit target zone for interest rates on bills with 3 to 9 months maturity, but these targets are not enforced as effectively as those for the overnight rate. Spot transactions are normally not used as an instrument for changing the non-borrowed reserves position, i.e., the signaling effect is the primary consideration. The Riksbank will therefore acknowledge that it makes money market interventions, although the volumes are not disclosed.

## 4.2 Operative characteristics

The techniques for discount window borrowing described above have several attractive characteristics from an operative point of view. First, they give a mechanism for automatic adjustment of interest rates to major losses of foreign exchange reserves as, other things equal, this moves the banking system to a higher step on the supply function. At the same time it can help stabilize interest rates in the presence of minor swings in liquidity. The Riksbank has emphasized that it does not try to fine-tune liquidity and experience has also taught the market not to react to daily movements from one step to the next that occur in otherwise stable situations. It is thus possible to smooth short-term interest rate fluctuations also at the very short end of the yield curve.

Second, and in practice more important than the automatic stabilization, these procedures offer a considerable degree of flexibility. The wide range of interest rates available makes it possible to react quickly to market developments and change interest rates without direct consultations with the Board. The Board takes the (purely technical) decision on the shape of the supply function. Once this has been announced, the Governor is able to set interest rates anywhere in the range between 8 and 20 percent. As discussed in section 2, this is done subject to guidelines approved by the Board, but, in particular in situations when market developments are uncertain, the Governor may be given a relatively broad mandate.

Until 1985, the Riksbank used a system for discount window borrowing with an effectively horizontal supply curve, i.e., unlimited borrowing at a constant interest rate. This led to automatic sterilization of the liquidity effects of losses of foreign exchange reserves. As each interest rate change required a formal decision by the Board, this tended to cause delays in policy adjustments and lead to increased fluctuations in foreign exchange reserves. The step-shaped supply function in the current system is a solution to this problem.<sup>16</sup>

Third, as the Riksbank can move the banks along the supply curve by varying liquidity, it is possible to change interest rates without making public announcements. The system thus offers a degree of "anonymity" that, under some circumstances, may be useful. Of course, if this is deemed desirable, it is also possible to make major announcement in connection with policy changes, which means that it is flexible also in this respect.

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16 A comparison between the functioning of the two systems is made by Englund et al. (1989).

In the case of large losses of foreign exchange reserves, a typical pattern is that interest rates are raised in major steps, e.g., two or three percentage points. This is accompanied by public announcements, using repo auctions with volume tender, press releases, etc., in order to signal that the outflows must and will be stopped. The Riksbank may also make spot market interventions to indicate the target that it has for money market rates. As the market participants regain their faith in the exchange rate and the currency flows are reversed, money market interest rates begin to fall. The Riksbank will then lower the marginal overnight borrowing rate by letting the supply of non-borrowed reserves rise or changing the size of the repos. These changes will typically not be announced, but the market will gradually discover that the banks are borrowing at a lower step and interbank rates will fall accordingly. In this way, a smooth downward adjustment of both the overnight and money market rates is achieved.

Technically, a system where an interest rate on borrowed reserves is announced daily, for example, offers an even greater degree of flexibility and any uncertainty in the liquidity forecasts can be ignored.<sup>17</sup> However, this flexibility may in fact be imaginary. Every change in the interest rate will have to be motivated and discussed publicly. Frequent changes will therefore put a heavy organizational burden on the central bank. In addition, the central bank may come under external pressure to try to change interest rates in ways which are not conducive to long-term stabilization of the exchange rate. The pedagogical problem of explaining that the central bank under fixed exchange rates does not *control* interest rates even though it may initiate changes in their level may be aggravated.

For these reasons, it may prove to be more difficult to make modifications in policy than in a system where interest rates may be allowed to go up or down without announcements in a seemingly autonomous fashion.<sup>18</sup> Other things equal, these forces may tend to delay adjustments in policy and magnify swings in foreign exchange reserves, much like the former Swedish system with a fixed borrowing rate did.

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17 In terms of Figure 2, the borrowed reserves supply function would become horizontal at the announced interest rate level. A somewhat more elaborate version of such a system is used, e.g., by Bank of Norway.

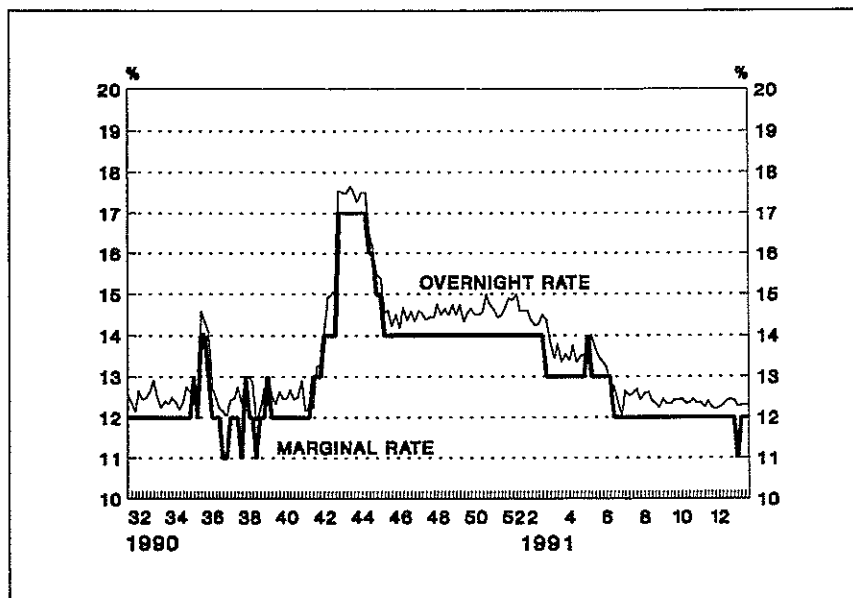
18 Some other issues related to central bank secrecy are raised in section 5.

### 4.3 The effects on interest rate developments

In addition to these operative characteristics of the system, it is of course relevant to consider the results in terms of the links between policy instruments and intermediate targets. Under perfect information, the procedures described above would give complete control over the overnight interest rate, as no bank would be willing to pay more for overnight funds than the rate offered by the central bank. However, neither the Riksbank nor the market participants have perfect information about bank liquidity. The two most important sources of uncertainty are future changes in foreign exchange reserves, that may occur as a result of foreign exchange market interventions, and changes in the government's line of credit in the Riksbank, that depend on unexpected swings in public sector cash flows. The variations are small enough to be more or less irrelevant for the Riksbank's control of overnight rates, however.

For the participants in the interbank market the uncertainty about the liquidity situation is greater and also more important. They have to base the rates that they quote for overnight funds on a forecast of what the Riksbank's current intentions are, i.e., for which step in the supply function it is aiming. The aggregate liquidity position is not disclosed until after the interbank market has closed. Given that all trades are made under uncertainty about the actual liquidity situation and that the interbank market is not perfectly competitive, the overnight rate is usually somewhat higher than the marginal borrowing rate.

*Figure 3. Marginal and Overnight Interest Rates*

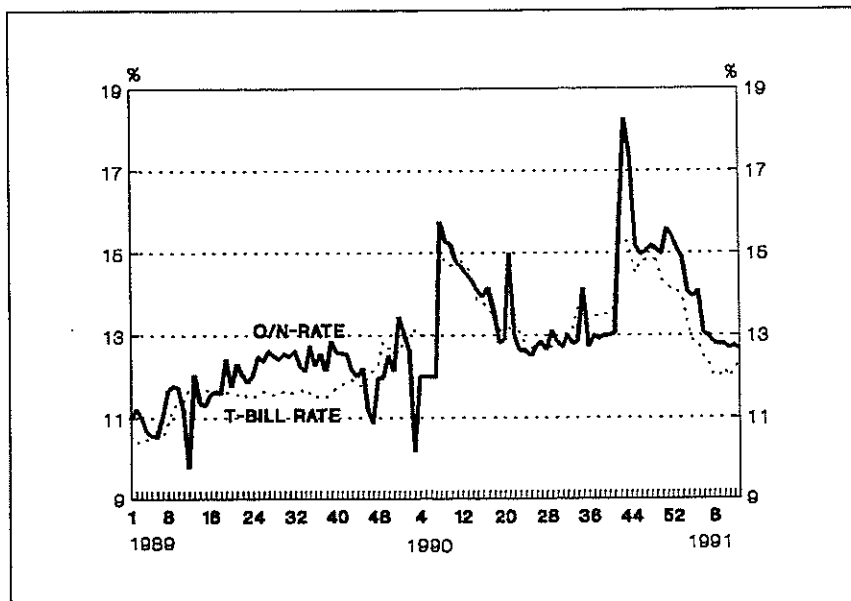


This is illustrated in Figure 3, which covers the period from August to March 1991. The target interest rate until October 9 was 12 percent and the overnight rate varied between 12 and 13 percent. The deviations in the marginal rate from the target level are examples of the normal fluctuations, with the exception of the jump to the 14 percent level at the end of August. This was caused by a failure from the banks to put in enough competitive bids to fill the quota in a repo auction. The Riksbank decided not to compensate this tightening of the liquidity in order to strengthen the market participants' incentives to use the repos properly.

An intentional tightening of liquidity, effected by reducing the size of the announced repo, was made on October 10. This raised the borrowing rate to 13 percent. As it was done without an announcement, the market did not discover this change immediately and the overnight rate was lower than the borrowing rate, which otherwise does not happen. When interest rates were raised in two steps to 17 percent, this was announced through repos with volume tender and thus had a direct impact on the overnight rate. When the foreign exchange market began to settle down during the month of November, the Riksbank lowered the marginal borrowing rate in three steps to 14 percent. As Figure 3 shows, the overnight rate followed closely also in this phase. By February 1991, the marginal borrowing rate was back at 12 percent, the level prevailing prior to the October crisis.

Given that money market rates are more important as intermediate targets than the overnight rate, it is interesting to study also the relation between longer

Figure 4. Overnight and 6 month T-bill Rates



money market rates and the very short rates that the Riksbank controls. This is illustrated in Figure 4, which shows the overnight rate, for ease of comparison expressed in terms of effective yield, and the rate on six-month government bills for the period January 1989 to March 1991.<sup>19</sup>

Based on the expectations hypothesis of the term structure of interest rates, the Riksbank would be able to control the six-month rate if it could convince the market that it will keep the overnight rate constant for the next six months. Market expectations depend not only on the Riksbank's current intentions, however. If the market expects that lower interest rates will be required to prevent excessive growth of the foreign exchange reserves, the six-month rate will tend to fall below the borrowing rate set by the Riksbank and vice versa if the market expects higher overnight rates in the immediate future. The difficulties of using the overnight rate to influence longer interest rates are increasing the further out on the yield curve one gets. For example, ten year bond rates are usually not much affected by changes in the borrowing rate.

In Figure 4, periods when the market rate is below the marginal rate for borrowed reserves, as for example from April to November 1989, are those when the Riksbank for domestic policy purposes has tried to prevent a drop in money market rates. It holds up the very short end of the term structure by keeping the borrowing rate high, but the market doubts its ability to maintain this level in the face of major inflows that will tend to liquidize the banking system. September-October 1990 is an example of the opposite case, when the market expected higher short-term rates in response to increased uncertainty about the economy. The imperfect correlation shown in Figure 4 can therefore not be seen as a deficiency in the Riksbank's operating procedures, but reflects constraints under which Swedish monetary policy works, irrespective of the techniques used.

The advantages of the system in terms of flexibility are illustrated by cases where drastic increases in the marginal borrowing rate are used to signal that the Riksbank wants to raise money market rates. An example of such an intervention is seen in February 1990, when the banks were moved from the 12 to the 15 percent step on the supply function. This raised the six-month rate by about 2 percentage points. This was possible because it coincided with increased uncertainty about the Swedish economy, i.e., the Riksbank used the overnight rate to signal that it was willing to lead the increase in the interest rate level rather than to wait and let the market adjust it.

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19 The horizontal segments in the curves in February 1990 are due to a labor market conflict in the banking sector that closed the Swedish money market for three weeks.

The techniques thus work effectively in situations when the Riksbank wants to signal policy changes that are in broad agreement with market expectations. They cannot be expected to increase the possibilities for the Riksbank to go against the market, but neither could, e.g., a policy based on spot interventions in the money market. Given a high interest rate elasticity of capital flows, such attempts would also be thwarted by uncontrollable inflows or outflows.

Nevertheless, the focus on the overnight rate might appear inconsistent with the belief that money market rates are more important for capital flows. It is possible that operating procedures aimed at controlling money market rates directly rather than via the overnight rate would be more effective. However, one effect of targeting the overnight rate and letting the money market rate vary within a wider target zone is that market interest rates respond to changes in the demand for krona assets in a way that tends to stabilize capital flows. If the Riksbank tried to target, say, the six-month rate directly, such market induced changes would be dampened, which, given the inevitable lags in policy decisions, could make capital flows more volatile by delaying interest rate changes. Policies based on the overnight rate can be adjusted with a somewhat greater lag without disturbing the market. This is the case especially if the central bank has the reputation of adjusting its interest rate targets to levels consistent with balanced capital flows. Changes in the demand for krona assets, which will affect the foreign exchange reserves, will then have an immediate impact on market interest rates via expectations.

Interpreted in this way, Swedish policy procedures can be seen as a compromise between short-term interest rate smoothing under normal conditions, and quick and partly automatic stabilization of foreign exchange reserves in situations where the krona comes under pressure. There is clearly a trade-off between interest rate smoothing, in general, and stabilization of foreign exchange reserves (or any other quantitative target). It is also fair to question why interest rate smoothing is considered desirable, especially as it is focused at the very short end of the term structure. A priori, and assuming that stability matters in an economic sense, stable money or bond market rate would seem to be more important for both financial and real economic decisions. The Riksbank is certainly not unique in this respect, however, as targeting of short-term nominal interest rate appears to be the rule rather than the exception among major central banks.<sup>20</sup> This behavior seems to be based on tradition and practical experience among policy makers rather than on well-established

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20 See, e.g., Batten et al. (1990).

theoretical and empirical links. In general, it seems that little is known about the effects of interest rate smoothing.<sup>21</sup>

It is beyond the scope of this paper to provide a formal analysis of the rationale and effects of interest rate smoothing in an economy of Swedish type. One simple interpretation would be that for a country that must align its interest rates with international developments, it is also natural to adopt principles for interest rate targeting similar to those used in the major countries. It may be that in a world with highly integrated financial markets, central banks tend to use similar procedures. If so, the observation that interest rate smoothing appears to be a general rule in most countries could be seen as an example of international policy coordination. This does not answer the question why central banks have converged on this particular rule, however.

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21 For a theoretical rationalization of nominal interest rate targeting, see Barro (1989). He uses a closed economy model, however, which makes it difficult to apply the results directly to the Swedish case, and does not distinguish between short and long-term rates.



## 5 Monetary policy, signaling, and secrecy

In the preceding discussion of the operating procedures, we noted that the Riksbank normally prefers to reveal to the market neither the target interest rate level, nor its forecast of the current liquidity situation. The latter would effectively disclose the intended policy as it would be possible for the market to add to it the size of the announced repo and deduce the interest rate target that way. The signal that is given to the market is thus a noisy one.<sup>22</sup>

This is an example of central bank secrecy, as the Riksbank chooses to reveal neither all the general information that it has available, nor its own current policy targets. The Riksbank is certainly not unique among central banks in this respect. There are a number of areas, e.g., related to exchange rate policy, where secrecy is natural and essential, but there are other examples where more economic analysis is needed to evaluate the (often very general) arguments in favor of secrecy, that seem to be based on experience and tradition. Based on standard financial market analysis, conventional wisdom would say that markets work better the better the information that market participants have and the more evenly the information is distributed. One question that should be addressed is the reasons why certain types of central bank information do not fit into this pattern. To illustrate some of the issues involved, we will discuss another example of information filtering that the Riksbank uses.<sup>23</sup>

The uncertainty in the market about the aggregate liquidity position has the additional effect of enabling the Riksbank to filter another important signal, namely, the magnitude of foreign exchange market interventions. The Riksbank's balance sheet is published four times per month and includes a report on the private currency flow, defined as the change in foreign exchange reserves adjusted for government transactions in foreign currencies. This figure is important to market participants because it gives an indication of the upward or downward pressure that the krona has been under in the preceding reporting period. An outflow may be seen as indication that an increase in interest rates is needed to stop the losses of reserves, a signal that tends to raise market interest rates. In most cases, this is also in line with the Riksbank's intentions as it helps to stabilize currency flows.

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22 Some motives for this were discussed in section 4.2, e.g., that interest rates can be changed without public announcements.

23 See Goodfriend (1986) for an interesting discussion of central bank secrecy with special reference to the United States. See also Lewis (1990).

However, one may also envisage a situation where a huge outflow gives rise to uncertainty among market participants about the ability or willingness to raise interest rates sufficiently to cut off the outflow. Potentially, this could, through self-reinforcing expectations, precipitate a major run on the foreign exchange reserves, that could only be stopped by raising interest rates to extreme levels.

Similarly, huge inflows could signal to the market that the Riksbank soon will be forced to lower the marginal borrowing rate, which via standard expectations effects tends to lower money market rates. The reported currency flows are studied eagerly not only by active market participants, but are also discussed in the more general policy debate. Huge inflows may have the effect of strengthening pressure groups that advocate lower interest rates, as they can claim that monetary policy is "tighter" than needed to defend the krona. In a situation where the Riksbank, perhaps for domestic policy purposes, wants to keep interest rates high, a reduction in the reported inflow might help to reduce expectations of lower short-term rates, both directly and indirectly. This can thus be seen as an attempt to raise the Riksbank's ability to affect the interest rate differential, i.e., to increase the scope for a monetary policy that is independent, not only of international factors, but also of domestic pressure groups.

In order to influence expectations, the Riksbank will therefore on occasion, in connection with major outflows or inflows, use the forward foreign exchange market to adjust the reported change in the foreign exchange reserves. For example, if a major outflow has occurred, the Riksbank may sell foreign currencies forward. The counterpart, often a Swedish bank, will have sold kronor forward and will buy kronor spot to cover this position. The net result is that the loss of foreign exchange reserves is lifted off the Riksbank's balance sheet and a smaller currency outflow is reported to the public. This is thus a technique for filtering out extreme outflows and inflows.

It is worth pointing out that the forward transactions are made with banks that are also active as market makers in the money market. Even though individual banks do not know the full extent of the Riksbank's transactions and cannot determine whether a given trade is related to an increase in the forward position or the renewal of a maturing contract, they get an informational advantage relative to non-bank market makers and investors in the money market. Whether they can profit from the fact that they observe a (distorted) signal concerning the "true" currency flows is unknown, but the Riksbank's transactions do affect the distribution of information in the economy.

The effects of these forward market transactions are difficult to determine, as the expectations that are to be influenced are not observable. In general, the effects will, like with most signaling techniques, to a large extent depend on how the market participants choose to interpret the information provided. Here, some adverse effects may arise. For example, it is possible that by underreporting the losses of foreign exchange reserves, the Riksbank reduces the impact on market interest rates, tending to lead to larger swings in reserves.

This example presumes that the market participants believe the signal given by the Riksbank, which is not necessarily the case. They are aware of the fact that the Riksbank uses the forward market to filter currency flows and inevitably interpret the reported figures with this in mind.<sup>24</sup> They may therefore tend to multiply the figures reported with a number greater than one. In a case where the Riksbank chooses to report the actual figure, for example, in order to motivate and support an increase in the marginal borrowing rate that it has made, the market may think that it was in fact much bigger and start speculating about a crisis that will force the Riksbank to change the value of the krona. Under these circumstances, the filtering may make expectations more unstable than if currency flows were always reported accurately.

It is clear that the filtering of currency outflows has to be done with care in order to work well in the really critical situations. The problem is to distinguish cases where self-fulfilling expectations may arise from those where an accurate outflow report contributes to stabilizing the market. Ultimately, the likelihood of destabilizing expectations will depend on the overall credibility of the fixed exchange regime. If this can be maintained, there will be no runs on the foreign exchange reserves and, hence, no need for filtering the data.

Destabilizing expectations in connection with inflows are less of a problem. A fundamental question in this case is the magnitude of the domestic macroeconomic effects of (marginally) higher money market rates. The argument for filtering of currency flows is simply that higher nominal interest rates, other things equal, exert a downward pressure on demand. Again, the uncertainty about the quantitative importance of this mechanism is considerable. Irrespective of its current role, it seems inevitable that the possibility to affect domestic interest rates for these purposes will also be reduced once credibility in the fixed exchange rate regime has been firmly established. This brings us to the topic of the next section.

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<sup>24</sup> The Riksbank's forward market position is reported with a lag of three months, which means that the market can form their expectations on the basis of previous behavior.

## 6 Credibility and the efficacy of monetary policy

Given a fixed exchange rate, the efficacy of monetary policy cannot be discussed in terms of its effects on conventional nominal (intermediate) targets such as nominal income or the money stock.<sup>25</sup> Its short-run task is to keep domestic interest rates in line with the market's required return on krona assets, which, as discussed above, is relatively simple using the available instruments. However, seen in a wider perspective, it is clearly not irrelevant at what interest rate differential relative to other countries that this target is achieved. This will depend, first and foremost, on the trust that the market puts in the fixed exchange rate. Monetary policy must therefore be evaluated on the basis of its contribution to maintaining the credibility of the exchange rate regime. Credibility is an illusive concept, however, which makes it difficult to come up with even qualitative assessments of what role a certain type of policy may have.

At a general level, there are basically two ways for policy makers to strengthen the credibility of a certain policy regime. One is by establishing a record of "sticking to the rules" also in situations when this is (in some sense) costly. The other is by making binding commitments not to deviate from the rules, i.e., by limiting the set of actions that can be taken in the future.

Looking at Swedish monetary policy from this perspective, several of the changes discussed above can be interpreted as attempts to enhance credibility. The Riksbank's decisions to raise interest rates drastically in connection with losses of foreign exchange reserves and increased uncertainty, e.g., in February and October 1990, are demonstrations of the willingness to live up to the rule that private currency flows must be kept stable. As discussed in section 3, the rule that the government shall not increase its borrowing in foreign currency can be seen as a commitment to this type of policy.<sup>26</sup>

On a wider scale, the whole process of deregulation, not least the lifting of foreign exchange controls, can be interpreted as a commitment to a policy through which the fixed exchange rate can be defended without resort to

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25 To the extent that monetary policy can exert an independent influence, the relevant measure of its effect is the *deviation* from the levels that would have prevailed in the absence of central bank interventions. It goes without saying that such effects are extremely difficult to measure.

26 The constraint on foreign currency borrowing is an example of a policy signal that is open to several interpretations. The policy makers may also signal that they will not change the exchange rate by having a *large* debt in foreign currency as this implies that the government would incur losses if it should decide to devalue the domestic currency.

regulatory instruments. By giving up the regulations, the policy makers try to demonstrate their willingness and faith in their own ability to achieve the policy targets by *using* the markets rather than preventing them from functioning. In the case of foreign exchange controls, this policy has been codified in a new law that severely limits the possibilities of imposing constraints on foreign currency transactions.<sup>27</sup>

Steps that strengthen even further the commitment to the announced policy regime can be used to increase credibility directly. The discussion in Sweden in this area has focused on two such strategies. One is tying the krona closer to the European Monetary System (EMS), the other to change the legal framework governing the Riksbank in ways that increase its independence.<sup>28</sup>

The EMS alternative could potentially be helpful, but it is constrained by the fact that the EC countries currently are unwilling to let non-member countries take part in the system. In the short run, a peg of the krona to the ecu would be as unilateral as the peg to the currency basket. Sweden would therefore not be committed to a multilateral international agreement, which (other things equal) will tend to reduce the effect of such a step on the credibility of the exchange rate regime.

The decision to replace a unilaterally defined currency basket with an ecu peg was taken by Norway in October 1990. One purpose was to signal that Norway wants closer ties with the EMS as soon as other forms of association are made possible. To the extent that this is interpreted as an indication of a stronger commitment, this may strengthen the market's belief in the fixity of the Norwegian krona. Similar proposals have been put forward in the domestic policy discussion in Sweden.

The Swedish government has recently appointed a committee with the task to review the legal framework governing the Riksbank. The committee is instructed to study the possibilities to change the composition of the Board, the term of office of the Board members, and other steps that would support a long-term perspective in monetary policy decision making. The question of whether a formal goal for the Riksbank, such as price stability, is to be written in to the law is also to be studied.

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27 The criterion in peacetime is that "the foreign exchange market and exchange rate policy come under severe strain due to exceptional short-term capital movements". This is copied from a directive proposal from the European Community.

28 For a review of the motives for central bank independence, see Swinburne and Castello-Branco (1989).

The appointment of this committee is motivated by the ambition to strengthen the position of the Riksbank relative to the political sphere. However, as constitutional issues are involved, changes will take time. Although the intentions expressed in the instructions to the committee may act as a signal of where the system is heading, this is therefore not an immediate remedy to the current problems, even disregarding the uncertainty about how important the formal rules governing the central bank are for the economic stability of a country.

## 7 Concluding comments

In this paper, we have described the institutional structure and operating procedures of Swedish monetary policy. We have emphasized that Swedish monetary policy, both in terms of intermediate targets and instruments, is conditioned by the fixed exchange rate regime. The operating procedures have been adjusted in recent years so as to enable the Riksbank to defend the exchange rate target with the help of interventions that use the market mechanism rather than regulate it. The current operating procedures have proved to be effective in this respect. They allow the Riksbank to combine short-term interest rate smoothing with the ability to raise interest rates drastically in order to prevent currency outflows from undermining the fixed exchange rate. These changes, including the deregulation of financial markets, have contributed to strengthening the credibility of the exchange rate regime.

Recent experience, in particular the pressure against the krona during the fall of 1990, indicates that this has not been sufficient to eliminate the uncertainty about future policy. The problems are related to the failure of controlling the domestic inflation rate and keeping it in line with international developments. The current imbalances cannot be rectified by monetary policy, however. The high domestic interest rates in Sweden simply indicate that monetary policy has lived up to the commitment to allow interest rates to rise to whatever level needed to prevent a persistent outflow of foreign exchange reserves. The Riksbank thus contributes to credibility by "sticking to the rules".

It is not the task of monetary policy to bring interest rates down. This responsibility must fall on fiscal policy, an area in which the constraints imposed by a permanently fixed exchange rate have not yet been observed with sufficient stringency. The result is that economic policy as a whole has not been perceived as consistent with the commitment to a fixed exchange rate. This must now be corrected. Economic policy must be clearly and unambiguously aimed at long-term price stability. This will require both changes in fiscal policy and reforms in the structure of the Swedish public sector and public policy, in general. The struggle to establish the general credibility discussed above is thus an ongoing process in Sweden, where the discussions about the appropriate additional measures are and will be continuing.

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