Operational procedures and tactical approaches of monetary policy in Belgium

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Introduction

The present characteristics of monetary policy in Belgium result from two major decisions. First, in June 1990, the Government committed itself to pegging the Belgian franc firmly to the EMS currencies which are regarded as stability anchors. This linking means that the parity of the Belgian franc against the German mark – whose last modification dates from January 1987 – will not be changed in the event of a realignment within the ERM and that the National Bank of Belgium (NBB) aims at limiting the fluctuations of the franc around this central rate. The widening of the ERM fluctuation margins on 2nd August 1993 did not change Belgium's monetary policy strategy, although the exchange rate objective was pursued with more flexibility in a first stage. Secondly, in January 1991, a monetary reform radically changed the operational framework of monetary policy.

The same strategy – exchange rate targeting – was thus pursued by means of very different operational procedures, before and after January 1991. However, there are some links between the strategy and the operational framework. For example, the central bank has to be able to control short-term interest rates with more precision than within a strategy with medium-term or less precise targets. At the same time, the central bank intends to make this control superfluous, by guiding market expectations. Furthermore, there is no room for monetary base targeting. Finally, the central bank also intervenes in the foreign exchange market; its money market management has, at times, to cope with large swings in liquidity due to these interventions.

Basically the NBB has two categories of instruments at its disposal: interest rate policy and, to some extent, foreign exchange interventions. It implements the interest rate policy through the announcement of its own rates and through its liquidity management.

The first section of this paper describes the operational procedures used in the interest rate policy. The second section analyses the tactical choices made in Belgium in implementing monetary policy.

1 Operational procedures

1.1 The evolution of the operational framework

During the last decades Belgium's monetary policy has moved away from an instrumentarium wherein regulations played an important part, towards a framework with instruments which are in accordance with market mechanisms.

Formally, the NBB still has certain regulatory powers. It is a member of the Board of the Belgian-Luxembourg Foreign Exchange Institute (BLEI), which stipulates the foreign exchange regulations for the Belgian-Luxembourg Economic Union. Also, under the law of 28th December 1973, it can make recommendations concerning monetary policy to the financial intermediaries. These may impose the holding of compulsory reserves, the containment of credit, etc. Nowadays this arsenal of regulations is not used. The two-tier foreign exchange market was abolished in March 1990 and the Foreign Exchange Institute now has only an essentially statistical function. The last monetary policy recommendations were made in 1981 (compulsory holding of public securities on the asset side of the financial intermediaries' balance sheets).

From the middle of the 1970s to January 1991, Belgian interest rate policy relied almost entirely on the discretionary setting by the NBB, in consultation with the Minister of Finance, of the rates on short-term Treasury bills in Belgian francs. Owing to the size of Belgium's short-term government debt, and to the issuing technique (on tap), these monetary procedures proved extremely effective in controlling domestic money market rates.

However, this way of conducting monetary policy exhibited a number of specific characteristics, different from other countries, and which became increasingly serious disadvantages:

- the NBB could not make use of a diversified "instrument mix" in interaction with the money market as most central banks do, but had to rely almost exclusively on one single instrument;[1]
- the instrument of monetary policy, the rate on Treasury bills, was involved in both monetary and budgetary policy;
- the issuing technique applied to Treasury bills, which were only available to resident financial institutions without competition from non-financial enterprises and from non-residents, implied that the Belgian Treasury had to pay an interest rate that was higher than the going interbank rates. This was in contrast to other industrialised countries where Treasury bills are scarce quality investment instruments with returns below other money market rates; and
- by adapting their Treasury bill portfolio, financial intermediaries were able to pass on their possible liquidity shortages or surpluses nearly completely to the Treasury. Hence the assistance which the Bank in principle gave to the money market as a whole, in fact, took the form of assistance to the State and, consequently, could be regarded as monetary financing of the government deficit.

While the system was very efficient in steering money market rates, the structural disadvantages (higher financing costs for the Treasury and the absence of a separation between the central bank and the Treasury) made reform necessary.

The reform, which came into force on 29th January 1991, had two main components: the creation of an efficient market for Treasury bills accessible to a broader range of investors and the adaptation of the operational framework of monetary policy. It has to be seen in the context of broader reforms of the Belgian financial markets at the end of the 1980s and the beginning of the 1990s, which also concerned the government bond market and the stock exchange. These changes were induced by several challenges: the process of European financial integration, the growing internationalisation of financial markets and the need for a more effective management of public debt.

The reform of the instruments of monetary policy attuned Belgian monetary policy to the practices of central banking in the major countries. It constituted an important step in the preparation of the future integration of the NBB in the European System of Central Banks.

A crucial element of the reform was the clearer separation of the responsibilities of monetary and budgetary policy, as the fixing of the interest rates on Treasury bills became the responsibility of the Treasury and no longer of the central bank. Furthermore, the central bank credit to the government became strictly limited to an overdraft facility with a ceiling of BF 15 billion and for the sole purpose of facilitating the Treasury's day-to-day cash management. A new convention between the Minister of Finance and the Bank determined the procedure whereby the NBB must be kept informed of all foreign exchange loans envisaged by the government and whereby the Bank may call for consultation with the Minister of Finance if it considers that such loans are liable to jeopardise the effectiveness of monetary or exchange rate policy.

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[1] In order to enlarge the monetary instrumentarium, a system of periodical allocations of credits by tender was introduced in March 1989.

The Bank's autonomy in the conduct of monetary policy was further confirmed by a provision of the law of 22nd March 1993 concerning the status and supervision of credit institutions, which abolished the right of veto of the Minister of Finance with regard to monetary policy. Another article of that law forbids the financing by the central bank of public authorities and public undertakings other than credit institutions, which had already been considerably limited by the monetary reform of January 1991. An agreement was also concluded in order to avoid excessive fluctuations in the deposit of the State with the Bank.

Since the reform of January 1991, the NBB conducts monetary policy mainly by operations affecting its balance sheet. The Bank influences short-term interest rates by varying the conditions and the quantity of credit it grants to financial institutions.

1.2 Interest rate policy instruments

The operations of the NBB in the money market can be divided into three important categories: provision of structural liquidity to the financial institutions, direct interventions in the money market and the mechanism of daily closing advances and deposits.

1.2.1 Provision of structural liquidity

The Bank has two instruments for the provision of structural liquidity to the financial institutions: a facility for the mobilisation of trade bills and periodical allocations of credit by tender. The main importance of these facilities is that the interest rates applied to them indicate the orientation of the interest rate policy of the Bank.

The facility for the mobilisation of trade bills was introduced on 17th June 1991. Its role consists essentially of giving the NBB the possibility of fixing a discount rate having a symbolic value.[2] This facility is accessible to the financial intermediaries at a privileged rate, but only for limited amounts. Resident credit institutions of the BLEU can mobilise trade bills at any time in the form of repurchase agreements for a period of not less than 15 days and not more than 60 days, for a limited amount of maximum BF 5 billion, with the Rediscount and Guarantee Institute (RGI), which refinances itself at the Bank.

The periodical allocations of credit by tender are usually made "in terms of volume", at a previously announced interest rate which corresponds to the so-called central rate. This is the rate for end-of-day advances and deposits of primary dealers, which can be changed daily. This central rate represents a more precise signal regarding the desired orientation of money market interest rates.[3]

The tender operations, open to all resident credit institutions of the BLEU, are currently organised each Monday, payment by the Bank being made two days later. These lendings have to be covered by collateral: they take, at the choice of the participants, the form of advances against the pledging of public securities or of repurchase agreements in respect of trade bills with the RGI. Presently they are for one week, but the Bank has at times also allocated credit for two, three or four weeks. If the total amount of the tenders – which the Bank can limit up to the credit lines granted to the current account advances – is higher than the Bank considers desirable, it distributes its lending according to a scale fixed during the tender operation.

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2 There was no discount rate at the start of the new system. It appeared useful, however, to have an official rate similar to the Bundesbank's discount rate.

3 Initially, the interest rate on credits by tender indicated the general orientation of the interest rate policy of the Bank. However, as the need arose to indicate changes in interest rate policy between two tenders, the NBB introduced the term "central rate" for the rate for end-of-day advances and deposits of primary dealers (see 1.2.3), which can be changed daily.

The Bank has sometimes also invited credit institutions to tender in terms of both amounts and interest rates. In such cases it can either accept the successful tenders at the single limit rate ("Dutch auction") or accept them at the rates initially proposed by the tenderers ("American auction").

1.2.2 Direct interventions in the money market

By its direct interventions in the money market the National Bank each day influences the liquidity of the financial intermediaries. It modifies primarily the volume of its lending, accepting the most favourable rates offered by the market. In order to fix the volume of its interventions the Bank takes into account, on the one hand, the expected movement of the note circulation and the exchange reserves and, on the other hand, the desired level of strain in the money market – which will be reflected by daily closing surpluses or deficits – depending in the desired orientation of interest rates.

The NBB makes use of a wide range of intervention techniques, which it mostly applies by inviting the "primary dealers" (credit institutions in charge of stimulating the secondary market for public securities) to participate in a quick "American auction". The instruments used by the Bank are:

- "Repurchase agreements" or "repos". These are agreements for the sale and repurchase of securities. This is the type of intervention which is, at present, very frequently used by the Bank. These operations, whereby the Bank buys securities spot and resells them forward – generally only a few days forward – can be likened to fixed-term advances, the period to maturity of the securities serving as collateral being unimportant in this connection. They have no direct effect on the yield of these securities. "Reverse repos" are the same operations, but in the opposite direction. By selling securities spot and repurchasing them forward, the Bank can tighten the cash positions of the financial intermediaries;
- Currency swaps. These spot purchases or sales of foreign currencies against Belgian francs, coupled with forward transactions in the opposite direction, do not modify the exchange rate risk run by the Bank. Like security repos, swaps do not directly influence the prices of the underlying assets, in this case the exchange rate for the Belgian franc;
- Deposits in the interbank market. As these deposits are not secured, the Bank itself sets limits for each individual party concerned. These operations are mostly at one day;
- Outright purchases or sales of securities. Unlike repos, they have a direct influence on the prices of the traded securities.

1.2.3 The mechanism of daily closing advances and deposits

The mechanism of daily closing advances and deposits, even though relatively marginal in terms of outstanding amounts, serves as a support for the effectiveness of the direct interventions in the money market. The central rate and the other rates applicable to closing surpluses and deficits also indicate the orientation of the Bank's interest rate policy.

In order to meet their residual deficits, resident credit institutions of the BLEU may resort to the Bank's current account advances, subject to the provision of collateral. Daily closing surpluses can be deposited with the Rediscount and Guarantee Institute (RGI), which reinvests them at the Bank. The "primary dealers" enjoy a special rate, called central rate, for their advances and deposits up to BF 350 million, that is a total of BF 5.3 billion. Moreover, all resident credit institutions of the BLEU have been granted substantial individual credit lines, totalling BF 220 billion; within these lines, credits are granted at the normal rate for advances, which is above the market rate. An

institution which has liquidity requirements in excess of its credit line can obtain advances against pledged security "above the ceiling", at a considerably higher penalty rate. In the same way, deposits with the RGI are remunerated at rates below the central rate. The reduction in the rate is smaller in respect of a first tranche of these deposits, equal to 5% of the above-mentioned credit lines, than on the second tranche, the so-called overstepping tranche.

1.2.4 Structure of official interest rates

All this produces a sort of hierarchy of NBB interest rates (see Table 1). The central rate indicates the orientation of monetary policy. The discount rate and the rate for advances "above the ceiling" are official rates having a symbolic value. The influence of the several other rates on the overnight rate of the money market depends on the way in which the NBB manages liquidity and as such on the volume of the direct interventions in the money market. Thus, the marginal financing cost of the credit institutions corresponds with the central rate when the residual deficit or surplus of the money market is small. It may, however, climb to the rate for ordinary advances should liquidity be tightened.

Table 1
Official interest rates*
In percentages

Rate for current account advances beyond credit lines	6.00
Rate for current account advances within credit lines	4.25
Central rate	3.00
Discount rate	2.50
RGI's rate for daily closing surpluses, ordinary tranche	2.00
RGI's rate for daily closing surpluses, overstepping tranche	1.00

* On 30th September 1996.

1.3 Experience with the new system

The NBB has at its disposal an operational framework which allows it to react quickly to changes in the Bundesbank's interest rates as well as to tensions on the foreign exchange market. The system is characterised by a multiplicity of official rates but some of them have a mainly symbolic function. In fact, the central rate is the key official rate which is usually the most relevant in influencing money market rates: the Bank most often manages liquidity in order to obtain small end-of-day balances. In some circumstances, however, the Bank created large end-of-day deficits in order to drive financial institutions to the Bank's current account advances, thereby exerting a more discreet upward pressure on money market rates.

The system is also characterised by a very active management of money market liquidity, as the targeting of end-of-day balances is part of the policy to influence interest rates. In the absence of any reserve requirement system with averaging provision – which could act as a buffer for liquidity shocks – the Bank intervenes frequently in the money market. This liquidity management implies that money market rates are not automatically influenced by changes in liquidity due to "autonomous factors", such as variations in the demand for banknotes or in NBB's net foreign assets. There will be no volatility of short-term interest rates due to technical factors. In contrast volatility may be accepted for monetary policy reasons, e.g. in case of strains in the foreign exchange market.

The targeting of end-of-day balances requires accurate forecasts of liquidity needs. This poses no major problem within the very-short-time horizon – two days – of liquidity management.

The main "autonomous factors" are changes in net foreign assets and in note circulation (see their volatility in Table 2). Foreign exchange transactions are usually settled with a two-day lag. An econometric forecast of the demand for banknotes is made, the standard error of which is around BF 0.6 billion. As regards the deposits of the Belgian State and the Luxembourg State,[4] two agreements were signed in 1993 with a view to avoiding unexpected changes: a ceiling is imposed on the deposits (BF 15 billion for the Belgian State, BF 0.5 billion for the Luxembourg State); the Belgian Treasury has to communicate its forecasts, and differences between realised and foreseen amounts exceeding BF 2 billion are penalised; movements in the deposit of the Luxembourg State have to be notified two days in advance.

Table 2
Transactions of the National Bank of Belgium
In billions of Belgian francs

	Average outstanding amount		Standard deviation of daily variations	
	1994	1995	1994	1995
1. Autonomous factors	-87.4	38.2	5.0	6.2
1.1 Note circulation (-)	-424.8	-410.9	2.7	2.8
1.2 Net foreign assets*	328.7	439.7	4.1	5.5
1.3 Deposit of the Belgian State (-)	-1.7	-1.4	1.2	1.0
1.4 Deposit of the Luxembourg State (-)	-0.5	-0.1	0.0	0.1
1.5 Miscellaneous net assets	10.9	10.9	1.5	1.2
2. Regulation of the money market by the NBB	87.4	-38.2	5.0	6.2
2.1 Restrictive currency swaps (-)	-60.7	-175.2	4.2	5.4
2.2 Structural liquidity assistance	28.8	17.6	4.1	2.4
2.2.1 Trade bills	3.9	2.6	0.1	0.0
2.2.2 Credits granted by tenders	24.9	14.9	4.1	2.4
2.3 Other direct interventions in the money market (net)	118.2	117.1	7.0	5.4
2.3.1 Securities purchased in the market	27.4	21.8	1.3	0.7
2.3.2 Very-short-term repurchase agreements	89.7	94.5	7.1	5.8
2.3.3 Enlarging currency swaps	0.1	0.0	1.3	0.4
2.3.4 Interbank deposits or loans (-)	1.1	0.8	2.7	2.5
2.4 Coverage or absorption (-) of residual money market balances	1.1	2.3	4.6	3.4
2.4.1 Current account advances	3.1	4.2	4.3	3.0
2.4.2 Daily closing surpluses (-)	-2.0	-1.9	1.2	1.0

* At historical cost and before currency swaps.

Another agreement between the NBB and the Belgian State relates to the exchange of information about the foreign currency debt of the Kingdom. Variations in this debt are often used as a device for sterilising the liquidity effects of foreign exchange interventions made by the Bank. Since

4 According to the law of 22nd March 1993, public entities have no access to central bank credit.

1992 the NBB has purchased large amounts of foreign currencies. Part of these were sold to the Treasury in order to reimburse part of its foreign currency debt.

Nevertheless this was not sufficient to sterilise the liquidity effects of interventions in the foreign exchange market, which threatened to flood the money market. The Bank has made extensive use of restrictive currency swaps to keep the money market "en Banque".

Foreign currency swaps are frequently used to offset the effect of interventions, but they are not considered as "active" monetary policy instruments. Indeed, like other central banks, the Bank has a preference for conducting monetary policy through operations registered at the asset side of its balance sheet.

In contrast, central bank credits are explicitly used to steer money market rates. The Bank prefers to give mainly short-term credits to financial intermediaries in order to keep the money market well under control. Structural liquidity assistance is not so important. Mobilisation of trade bills and credits granted by tender amounted to BF 3 and 15 billion respectively, on average, in 1995, compared to BF 117 billion for credits granted through direct interventions in the money market.[5] Most of these direct interventions take the form of very-short-term repurchase agreements, which amounted to BF 95 billion in 1995. These repos are very actively used by the Bank in its management of the money market, as is also apparent in the high standard deviation of their daily variations. The portfolio of Treasury bills amounted to BF 22 billion but was fairly stable. The size of the NBB's balance sheet leaves no room for significant transactions in the bond market.

Finally, it can be observed that end-of-day deposits are very small when there is an overall deficit and that current account advances are very small when there is an overall surplus. The start of the real time gross settlement system ELLIPS on 24th September 1996 did not modify this feature, which is probably the sign of an efficient functioning of the interbank market.

1.4 The influence of monetary policy on money market interest rates

As mentioned, the Bank steers money market interest rates both through the announcement of its own interest rates and through its management of money market liquidity. These monetary policy instruments only exert a direct influence on very-short-term interest rates (up to one week). In view of the depth and liquidity of the secondary market for Treasury bills, the Bank's outright purchases and sales in this market, limited in volume, can have only a very marginal direct effect on one to three-month rates, possibly reinforced by an announcement effect. The Bank mainly influences longer money market rates by altering market participants' expectations, through its control over very-short-term rates.

In fact, the Bank is able to steer money market rates in the desired direction; thus one-month and three-month interbank rates – which are the most important for influencing short-term capital movements – follow the trend set by the Bank's rates.

In the equations in Table 3, changes in Belgian short-term interest rate differentials with respect to the Deutsche mark (one-month and three-month Euro-rates) are explained by differences in official interest rate policy (the Belgian central rate minus the repo rate of the Bundesbank) and the DM/BF exchange rate. The estimations were made on the basis of daily data[6] for the period from 10th February 1991 to 20th August 1996.

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5 The credits granted by tender in 1995 were somewhat below what the Bank would have been willing to give, as financial institutions, which expected mostly declines in interest rates, were not very much interested in the tender credits.

6 One must bear in mind that high frequency data often violate the usual hypotheses made in time-series econometrics. During a period of tensions, the volatility of the daily interest and exchange rates increases sharply, whereas after the crisis it quickly returns to its pre-crisis level. Since interest and exchange rates have been much more volatile at some

Table 3
Determination of interest rate differentials against the DM
Period: 11th February 1991 to 20th August 1996

Explanatory variables	Lags, in days	Dependent variable	
		Change in one-month Euro-rate differential	Change in three-month Euro-rate differential
Long-term effect:			
[*(RBEF-RDEM)xx - (NBB-BUBA)*]	1	-0.171*	-0.074*
		(0.043)	(0.023)
Short-term effect:			
Δ *(NBB-BUBA)*	0	0.671*	0.530*
		(0.147)	(0.141)
Δ *(RBEF-RDEM)xx*	1, 2	-0.087	-0.118
		(0.094)	(0.075)
		0.003	-0.020
		(0.056)	(0.063)
Δ log(*ER*)	1, 2	54.262*	40.225*
		(10.381)	(7.178)
		14.943**	10.850**
		(7.912)	(6.561)
Balance	1, 2	2.513**	0.635
		(1.409)	(1.168)
		1.266	0.696
		(1.815)	(1.498)
Dummy:			
2nd August 1993		-2.776*	-2.299*
		(0.158)	(0.101)
4th August 1993		3.803*	1.534*
		(0.174)	(0.167)
Constant		0.009*	0.006**
		(0.004)	(0.003)
SEE		0.152	0.119
R^2		0.612	0.491
DW		1.804	1.99

*(**) significant at the 95% (90%) level.
Consistent Standard-error between brackets; the covariance matrix has been corrected for heteroskedasticity in the residuals following Newey-West.
Notation: *(RBEF-RDEM)xx*: differential between Euro-BF and Euro-DM for the maturity concerned, *NBB*: NBB central rate, *BUBA*: Bundesbank repo rate, *ER*: DM/BF exchange rate, *Balance*: end-of-day deficit or surplus in trillions.

Changes in the one-month (Euro-rate) differential are strongly influenced by differences in official interest rates between Belgium and Germany and by the evolution of the DM/BF exchange rate. In the long run, we impose the constraint that market and official rate differentials cannot move away and we can see from the adjustment coefficient that market rates move to close the gap.

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times than at others, their variance changes over time. This problem, called "heteroskedasticity", leaves the O.L.S. estimator unbiased but inconsistent. In order to make inference about the estimated parameters, one needs to obtain a consistent estimator of the covariance matrix. Here, the correction suggested by Newey-West (1987) is used.

The results for the three-month (Euro-rate) differential are similar, but the impact of changes in the official rates is smaller. This confirms the results of Périlleux and Wouters (1994) for Belgium, and Dale (1993) for the United Kingdom, that the influence of official rates tends to diminish with maturity.

It is also noteworthy that, contrary to the study of Périlleux and Wouters (1994), the liquidity policy of the Bank has no significant effect on the interest rate differential: the coefficient of the end-of-day deficit or surplus is not significant at the 5% level, neither for the one-month nor for the three-month differential. The difference in result, compared to Périlleux and Wouters, can probably be explained by the period under investigation. They considered the period 8th February 1991 to 11th October 1993. Since then the liquidity policy of the Bank has been much more neutral.

2. Tactical aspects

In this section we focus on two major questions. Is there an evolution in the way the Bank copes with the short-term trade-offs between exchange rate changes, interest rate changes and interventions in the foreign exchange markets? Which tactical choices are made in implementing the interest rate policy?

2.1 Short-term trade-offs

Especially since June 1990, when the government decided to peg the Belgian franc to the most stable EMS currencies, the exchange rate objective has become more precise. The Bank will, except in special circumstances, opt for a close relationship between the Belgian franc and the Deutsche mark. Moreover, until now, the Bank prefers the franc to be slightly above rather than slightly below the central rate against the mark, as this strengthens the image and credibility of the anchoring of the franc to the mark. For the same reason, the Bank does not like a too strong position of the franc either.

Obviously, the ERM crisis of 1993 was the only example of special circumstances. Applying the new ERM rules in order to discourage speculation, the Bank accepted in a first stage a greater volatility of the exchange rate. At the same time, the Bank showed by its interest rate policy that it remained determined to maintain its strategy. This firmness and the new budgetary package contributed to the restoration of the credibility of the exchange rate policy. The 1993 experience probably still acts as a deterrent for speculation against the franc.

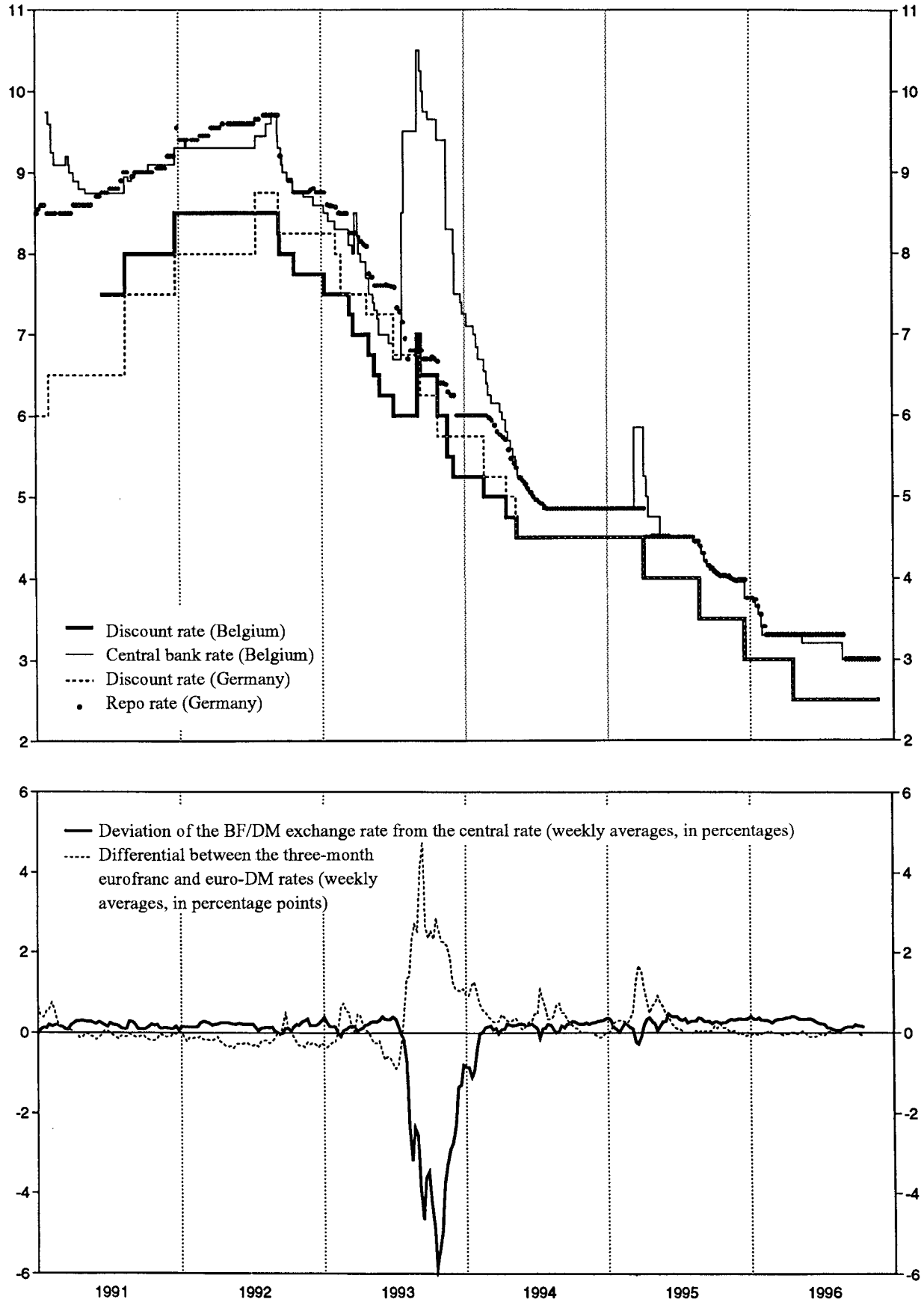
After the ERM crisis of 1993, the Bank shadowed German official interest rates even more closely than before. Since 13th May 1994 the Belgian discount rate has been identical to the German discount rate, while also the Belgian central rate has generally been similar to the German repo rate (see Graph 1). This interest rate policy strengthens the identification of the franc with the mark. On the other hand, the Bank does not hesitate to react promptly to downward pressures on the franc.

As the Bank has pursued its objective of exchange rate stability with a greater degree of precision, interest rate policy has been supplemented by interventions in the foreign exchange markets. Since 1992, the Bank has intervened more frequently in the foreign exchange markets. The speculative crises in the ERM are certainly an important explanation for this. However, since 1994, a reluctance to lower interest rates below the level of German interest rates has led to important purchases of foreign currencies also in quiet periods, in order to counter upward pressures on the franc due to, among other things, the large current account surplus of the BLEU.

Graph 1

Official interest rates in Belgium and Germany and interest rate and exchange rate differentials of the franc in relation to the Deutsche mark

In percentages and percentage points



2.2 Tactical choices made in implementing the interest rate policy

Regarding the interest rate policy of the Bank, one can discern a certain asymmetry between increases and decreases in interest rates (see Table 4). Increases in the central rate are generally larger, and happen less frequently and with greater intervals than decreases. The same tendencies are also apparent for changes in the discount rate.

Table 4
Asymmetries in interest rate policy

	Central rate[1]			Discount rate[4]		
	Average duration between changes[2]	**Average size of change[3]**	**Number of occurences**	**Average duration between changes[2]**	**Average size of change[3]**	**Number of occurences**
- -	9	14	83	45	33	19
+ -	10	24	7	94	37	2
+ +	17	45	9	88	50	1
- +	55	35	7	42	100	1

Notation: - - decrease after decrease; + - decrease after rise; + + rise after rise; - + rise after decrease.
[1] From 29th January 1991 to 28th August 1996. [2] In working days. [3] In basis points. [4] From 17th June 1991 to 28th August 1996.

One should be careful in interpreting these results, as the interest rate policy of the Bank is to a large extent determined by moves of the Bundesbank. Moreover, Germany, for most of the period under consideration, experienced a decline in interest rates. Therefore the data do not cover a full interest rate cycle. However, given the primacy of the exchange rate objective, there are good reasons for the Bank to increase interest rates strongly in the case of speculative pressure, and to be careful when lowering rates when the tensions recede.

Following Eichengreen et al. (1994), we define crises or tensions as large movements in interest rates and exchange rates and we construct a composite index with these variables.[7] The components are weighted so that their volatilities are equal:

$$index = \%\Delta ER + .988\ \Delta RBEF$$

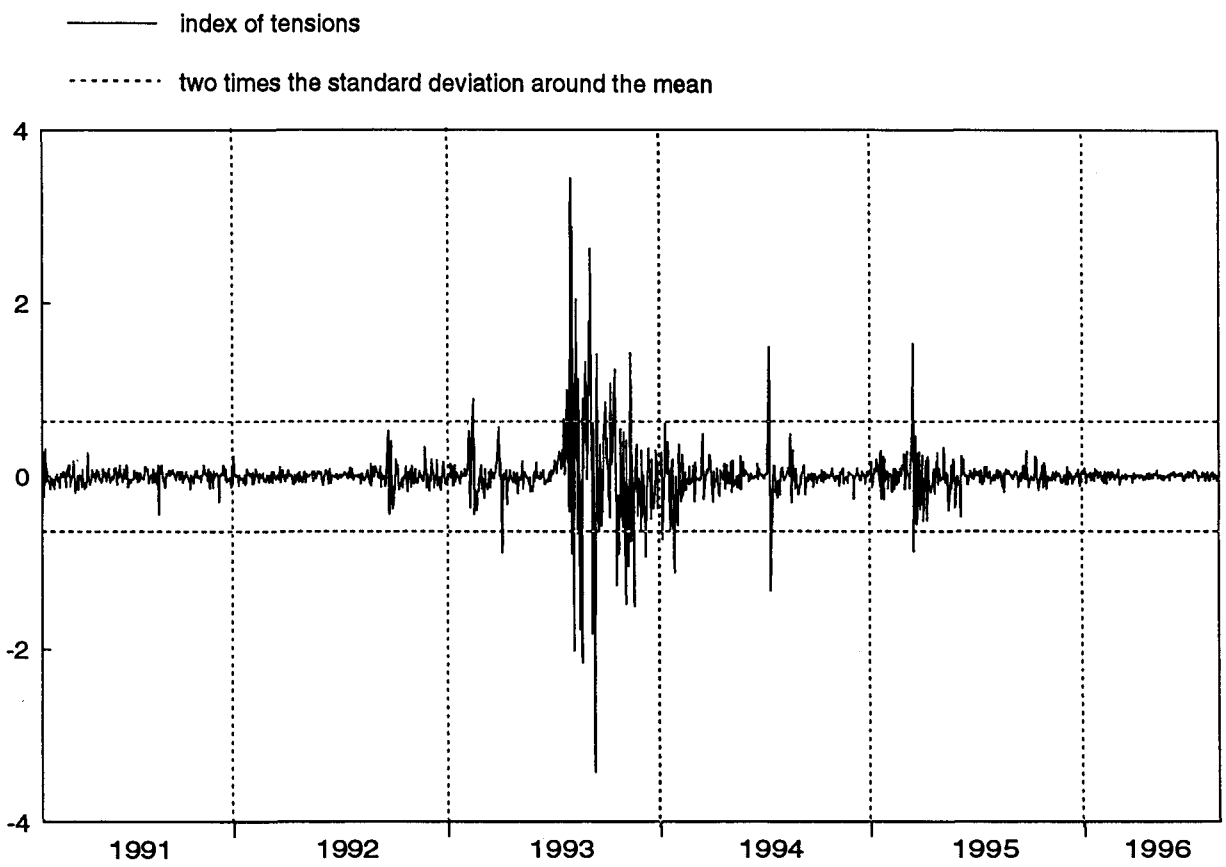
where $\%\Delta ER$ is the annualised first difference of logarithm of the DM/BF exchange rate, a positive value means a depreciating franc, and *RBEF* is the first difference in the one-month Euro-BF rate expressed on a yearly basis.

The evolution of this *index*, as well as a corridor constituted by two times its standard deviation around its sample mean, are shown in Graph 2. A value of the index above the upper limit means a depreciating franc and increases in short-term interest rates. From this observation, only one period of sustained tensions appears, from 19th July to 7th December 1993. It corresponds to the period of general turmoil in the ERM, with downward pressures on the franc dominating until mid-October and the reversal of these speculative pressures occuring afterwards (see Graph 3).

[7] The use of a composite index has the advantage of defining tensions by something other than only the interest rate differential that we want to analyse.

Graph 2

Index of tensions on the Belgian franc foreign exchange market



Asymmetry is evident in this period, as sharp increases in the central rate were not followed by decreases of the same size. Despite the commitment to the exchange rate peg, many speculators believed at that time that, as a consequence of the extent of the turmoil in the ERM, the monetary authorities would have to abandon this policy. If these expectations lead market participants to require interest rates of such a high level that they could be considered unsustainable, it would be difficult for the authorities to prove their determination to maintain the peg. Once public declarations are no longer sufficient, the only way for monetary authorities to gain (or rebuild) credibility is to maintain their policy stance after a speculative attack. This strategy, while giving rise to some asymmetry because it does not allow fast and important interest rate cuts in the days or even weeks following the jump, should contribute to lowering market participants' expectations of a change in monetary policy objective after a speculative attack.

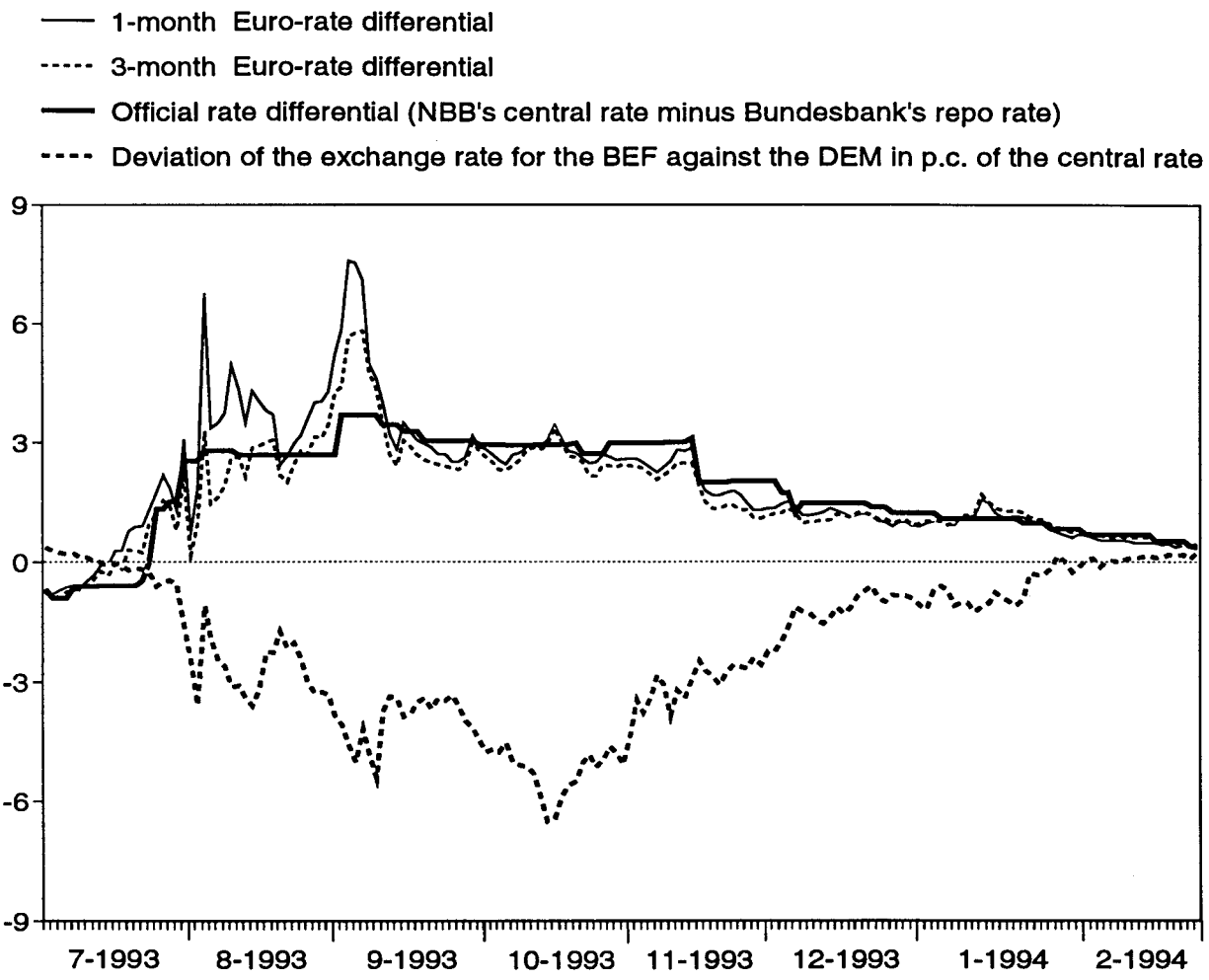
Another element which plays a role in interest rate decisions is the stance of budgetary policy. For instance, in March 1993, when the Belgian government offered its resignation, the central bank increased its official rates in order to prevent speculative pressures against the franc. In November 1993, when the adoption of the global plan for employment, competitiveness and social security by the government improved the credibility of Belgian economic policy, the Bank was able to reduce its official rates significantly, without affecting the franc.

Finally, it can be observed that, as the Bank's reaction function is rather clearly revealed, a rise in official interest rates is not always necessary when pressures on the foreign exchange market are slight. For example, in February 1993, July and August 1994, market interest rates rose spontaneously. In February 1993, this rise was also supported by the liquidity policy of the Bank,

Graph 3

BF/DM exchange rate and differentials of market and official interest rates against German rates

ERM crisis of 1993



which aimed at creating end-of-day deficits.[8] Such an action was not even necessary in 1994, as market participants learned from the Bank's attitude in the 1993 crisis. On each occasion pressures quickly disappeared.

In Table 5, we estimate the daily behaviour of the variation in the DM/BF euro-rate differential over the period from 11th February 1991 to 20th August 1996. Since most of the sizeable changes in both explanatory and dependent variables took place during periods of tensions, we also estimate the relationship separately for the period of tensions identified above. These daily changes are explained by adjustments to a long-run equilibrium, and by lagged variations in the exchange rate. Since we are not interested in just the correlation between official and market rates but want to have more insight into the interplay between objectives and instruments, end-of-day balances and interventions in the foreign exchange market are also introduced among the regressors to check the possibility of changing weights placed by the Bank on its instruments-objectives trade-off. To allow the introduction of interventions, we make the identifying restriction that interventions do not respond immediately to a change in market interest rates.

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[8] There is also an asymmetry in the liquidity management, as the Bank sometimes created large end-of-day deficits but never created large surpluses.

Table 5
Interest rate equation

Explanatory variables	Lags, in days	Overall period: 11th February 1991 - 20th August 1996	Period of higher volatility: 19th July 1993 - 7th December 1993
Long-term effect:			
[(*RBEF-RDEM*)*1m* -	1	-0.184	-0.278
(*NBB-BUBA*)+14.8 log(*ER*)]		(0.041)	(0.070)
Short-term effect:			
Δ+(*NBB-BUBA*)	0	0.665	0.467
		(0.184)	(0.218)
Δ-(*NBB-BUBA*)	0	0.445	0.325
		(0.106)	(0.157)
Δ log(*ER*)	1	53.370	47.596
		(12.826)	(13.094)
Inter	0	-0.0082	-0.0203
		(0.0028)	(0.0073)
Balance	1	0.0024*	0.0079
		(0.0013)	(0.0040)
Dummy:			
2nd August 1993		-3.148	-3.374
		(0.160)	(0.252)
4th August 1993		3.879	3.794
		(0.181)	(0.274)
Constant		0.017	-0.134
		(0.004)	(0.047)
SEE		0.149	0.406
R^2		0.626	0.750
DW		1.892	1.737

The dependent variable is Δ(*RBEF-RDEM*)*1m*.
Consistent standard-error between brackets; the covariance matrix has been corrected for heteroskedasticity in the residuals following Newey-West.
Notation: (*RBEF-RDEM*)*1m*: differential between one-month Euro-BF and Euro-DM, *NBB*: NBB central rate, *BUBA*: Bundesbank repo rate, *ER*: DM/BF exchange rate, *Inter*: interventions in foreign exchange markets, *Balance*: end-of-day deficit or surplus in trillions. Δ+, Δ- are respectively the positive and negative changes in the official rate differential.
* Not significantly different from zero.

We first focus on the long-term effect (first row). It has been estimated over the overall period in a first step, using three lags on each variable and assuming Gaussian errors.[9] The first point to note is that long-term disequilibria play a role for changes in interest rate differential, and this remains valid whatever the estimation period considered. Thus, if the official rate differential is modified without affecting the exchange rate – in fact, since 1990, it has remained around the parity – we already know from Section 1.4 that the adjustment of market rates will not be immediately and fully completed. Therefore a disequilibrium will occur. However, this disequilibrium will not persist since this long-term relation has to hold and adjustments will come from market interest rates.

9 The Johansen procedure has been used and the restriction that market rate and official rate differentials have the same coefficient with opposite sign was not rejected. This is the most robust procedure to obtain long-term relations in the presence of heteroskedasticity, see Gonzalo (1994).

As to the short-term effects, movements of official rate differentials have been decomposed into two separate variables – increases and decreases. As shown previously, changes in market rate differentials are strongly influenced by official rates. However, the impact of increases in official rate differentials becomes slightly weaker when the sample period is reduced to the period of tensions of 1993. This lower response of market rates to official rate increases may come from the fact that during exchange rate crises, the market incorporates an increase in risk premium before official rate movements. The overall period results show a very weak effect of both interventions and end-of-day balances, while the period of tension is characterised by a strengthening of the coefficients of these variables, which is the outcome of a more active management of these instruments in the face of a speculative attack. One must interpret the sign of the effect of interventions cautiously since it may be caused by reverse causality. If the franc is under pressure, both currency sales and interest rate differentials have to increase. But interventions undoubtedly help to limit the depreciation which, in turn, reduces the interest rate differential the day after. Consequently, one cannot infer anything from this coefficient about the final effect of interventions on market interest rates. This would require the estimation of a complete system with exchange rate and reaction functions.

These differences in coefficients between estimation periods probably result from a strategy that tries and succeeds to assert the credibility of an exchange rate objective. At the time of a speculative attack, it is very likely that the most important channel of influence of increases in official rates acts, in fact, through expectations, by giving market participants a clear signal. For a signal to be clear, it must be sizeable. The upward jump in the central rate and its stabilisation afterwards, by reducing uncertainty about the future exchange rate level, may reduce the required rate of return on Belgian franc-denominated assets and, consequently, it may not be fully translated into market rates.

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