EMS Discipline: Did it Contribute to Inflation Convergence? *

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Introduction

The EMS crisis of 1992-93 that led to the widening of the fluctuation margins and, in practice, to the abandonment of a formal exchange rate mechanism in the Community, gives cause for further reflection on the 13-year-long EMS experience.

Although a broad literature on the EMS has developed over the years, a striking aspect is the contrast between the theoretical and empirical contributions on the role played by the exchange rate mechanism on inflation convergence in the European Community. According to an often publicized view, one of the main objectives of the creation of the EMS was to foster convergence. This was rationalized in the theoretical literature with models in which EC countries' monetary authorities used the exchange rate link with the Deutsche Mark to "tie their hands" in order to follow anti-inflationary policies (Giavazzi and Pagano 1988).

This view has been challenged on analytical grounds (according to Rogoff, why not appoint a "conservative" central banker instead?), but most of all on empirical grounds. Evidence has been put forward suggesting that although member countries' inflation performance improved markedly after the inception of the EMS, the improvement was not significantly different from that of other industrial countries outside the EMS.

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The paper focuses on the cross-section comparison of inflation performance inside and outside the EMS. The first section reviews the evidence contained in the literature. The second examines some of the limitations of the analyses contained in the literature and presents new empirical evidence that takes account of some aspects that were previously ignored.

1. EMS disinflation in the literature

The impact of membership of the Exchange Rate Mechanism (ERM) of the EMS[1] on inflation performance has been examined by several authors. In particular, Giavazzi and Giovannini (1988) found that in most ERM countries, excluding Germany, inflation performance during the 1980s was better than would have been predicted on the basis of the structural macroeconomic relationships estimated in the 1970s, suggesting that a fundamental change took place with the inception of the ERM. Gressani *et al.* (1988) found that the exchange rate policy pursued in conjunction with the ERM contributed significantly to reducing the Italian inflation rate. Similar evidence was found by Giavazzi and Spaventa (1989).

Other authors have pointed out, however, that the disinflation achieved by the ERM countries was not significantly different from that of non- ERM OECD countries. Ungerer *et al.* (1986) estimated a cross-section inflation equation, derived on the basis of a simple demand for money function, for 22 OECD countries, with a dummy for the ERM countries. The coefficient of the dummy was negative, but it was found not to be statistically significant. Similar tests conducted by Collins (1988) and Eichengreen (1993) produced the same result, leading to the rejection of the hypothesis that ERM membership contributed significantly to reducing inflation.[2]

[1] It should be recalled that all the EC countries are members of the EMS but not all participate in its Exchange Rate Mechanism. However, for the purpose of this paper the terms EMS and ERM will be used interchangeably to refer to the Exchange Rate Mechanism.

[2] A similar conclusion was reached by Rogoff (1985) and De Grauwe (1990) on the basis of simple comparison of inflation data.

To assess the above conclusions, a similar test is performed. On the basis of a simple demand for money equation and taking first differences, the following equation can be derived for the cross-section estimation:

$$\Pi_t = c + \beta_1 \Delta y_t + \beta_2 \Delta m_t + \beta 3 \, (\Pi^e_t - \Pi^e_{t-1}) + \beta_4 \, ERM + \Sigma \, \gamma_i \, DUMyear_i$$

where Π_t is the rate of inflation, Δy_t the rate of growth of real income, Δm_t the rate of growth of M1 and Π^e_t the expected rate of inflation at time t, assumed for simplicity, as in the previous literature, to be equal to Π_t; *ERM* is a dummy equal to one for ERM countries during the 1979-90 period and zero for the other countries; *DUMyear* are dummy variables, one for each year of the observation period, with values equal to one for the given year for all countries independently of their ERM participation and zero for the other years, to capture common factors to all OECD countries (such as the price of oil) that may have had an impact on inflation.[3] All OECD countries are considered, except Turkey and Iceland (see Appendix). Following Eichengreen (1993) Germany is also excluded from the sample since the purpose of ERM membership was to reduce inflation differential with Germany.[4] As will be seen below this exclusion does not affect significantly the results.

It should be noted that the above reduced form equation does not specify the nature of the relationship between ERM membership and inflation performance, but only suggests that different factors than those considered in the other independent variables are involved. A further restriction is that the causal relationship between ERM membership and inflation performance is assumed to be unidirectional, *i.e.* that ERM membership may have an effect on inflation performance but the latter has no influence on whether a country is a member of the ERM.

[3] The dummy for 1990 is excluded, for normalization, to avoid perfect collinearity with the constant term. Eichengreen (1993) uses a common dummy variable for the 1979-85 and 1986-90 periods for all countries.

[4] This implies considering the ERM as a DM-peg system.

The first column of Tables 1 and 2 presents the results of the regressions with a specification similar to the one used in the previous literature. Table 1 refers to the 1974-90 period, Table 2 to 1979-90. The coefficients have the expected signs; that of the ERM dummy variable is negative, suggesting that ERM membership contributed to reducing inflation, but it is not statistically different from zero. This result confirms the assessment made in the previous literature, which rejects the hypothesis that the ERM made a statistically significant contribution to reducing inflation.

TABLE 1

RESULTS OF REGRESSION
(1974-90)

	1	2	3	4	5	6	7
c	4.11	5.38	5.53	7.03	4.35	4.38	7.35
	(3.95)	(5.25)	(5.58)	(5.85)	(4.22)	(3.45)	(6.32)
ΔM	.328	.266	.257	.211	.320	.364	.189
	(9.97)	(7.96)	(7.91)	(4.89)	(9.76)	(8.63)	(4.47)
ΔY	−.270	−.308	−.341	−.212	−.271	−.178	−.212
	(−2.57)	(−3.07)	(−3.48)	(−1.86)	(−2.60)	(−1.38)	(−1.91)
ΔΠ	.582	.564	.546	.512	.580	.554	.515
	(6.80)	(6.87)	(6.87)	(5.52)	(6.82)	(5.34)	(5.69)
ERM	−.763	−1.54	−1.54	−3.02			
	(−1.26)	(−2.57)	(−2.66)	(−4.54)			
ERMNB	–	–	–	–	1.59	−2.10	−3.92
					(−2.49)	(−2.91)	(−5.84)
AuSwi	–	−4.34	−4.17	−5.61	–	–	−5.87
		(−5.42)	(−5.37)	(−6.51)			(−7.05)
Snake	–	–	−4.13	−5.24	–	–	−5.33
			(−4.75)	(−5.47)			(−5.71)
R^2	.519	.560	.590	.638	.526	.540	.656
S.E.	4.25	4.07	3.94	3.96	4.22	4.45	3.86
obs.	340	340	340	255	340	255	255

The t-statistics are shown in brackets. The values and t-statistics for the 16 annual dummy variables are not reported; they are available from the author upon request.

TABLE 2

RESULTS OF REGRESSION
(1979-90)

	1′	2′	4′	5′	7′
c	4.32	5.38	6.43	4.60	6.83
	(3.99)	(4.96)	(4.84)	(4.29)	(5.35)
ΔM	.304	.251	.241	.294	.213
	(8.21)	(6.54)	(4.71)	(7.98)	(4.27)
ΔY	−.271	−.283	−.124	−.278	−.126
	(−2.06)	(−2.22)	(−.82)	(−2.13)	(−.86)
ΔΠ	.576	.571	.508	.569	.510
	(4.79)	(4.90)	(3.61)	(4.78)	(3.74)
ERM	−.820	−1.50	−2.85	–	–
	(−1.34)	(−2.42)	(−3.90)		
ERMNB	–	–	–	1.68	−3.78
				(−2.60)	(−5.17)
AuSwi	–	3.83	−5.20	–	−5.56
		(−3.91)	(−4.64)		(−5.20)
R^2	.468	.502	.559	.479	.586
S.E.	4.28	4.15	4.19	4.23	4.06
obs.	240	240	180	240	180

The t-statistics are shown in brackets. The values and t-statistics for the 11 annual dummy variables are not reported; they are available from the author upon request.

2. EMS disinflation examined more closely

The above result, as those previously obtained in the literature, clearly depends on a few implicit restrictions, especially as regards the institutional criterion for determining the countries whose policies were constrained by ERM participation.

The analysis conducted in the previous literature is subject to several objections. First, ERM membership is an option open only to EC countries, although not an obligation. Several non-EC European countries have applied for ERM membership or for some sort of association with it, but no agreement has ever been formalized. As a consequence, these non-EC countries have adopted policies aimed at

closely "shadowing" the ERM. This has been the case in particular for Austria and Switzerland.[5] Monetary policy in these two countries has basically been conducted by pegging their currencies to the DM, much along the lines of the exchange rate policy implemented by ERM countries.

To take this objection into account, a separate dummy for Austria and Switzerland is added in the regression equation. The results are shown in columns (2) and (2′). The coefficient for the dummy relative to Austria and Switzerland is significantly negative, in both periods. The fit of the regression is substantially improved. Furthermore, the standard error on the coefficient of the dummy variable for the ERM countries is sharply reduced; the hypothesis that the coefficient is significantly different from zero cannot be rejected. The restriction that the coefficients of the two dummy variables are identical for the 1979-90 period is accepted with a 5% upper limit of the F distribution.

A second aspect that has been neglected in the previous literature is that, when considering the 1974-90 period, the exchange rate policy followed before the creation of the EMS with the so-called "Snake" should also be taken into account.[6] Column (3) in Table 1 shows a separate dummy variable for this group of countries for the 1974-78 period. The coefficient on this latter dummy is significantly negative; that on the ERM dummy remains negative and the absolute value of the t-statistic increases.

A third objection is that in examining the effects of ERM membership, in particular the pegging with the DM, on inflation performance, the analysis should be mainly restricted to European countries. Although there may be a rationale for European countries, independently of their EC membership, to tie their currencies to the DM, it would make little sense for the US, Japan, or even Australia, to participate to the ERM or to conduct ERM-type monetary and exchange rate policies. The inclusion of these countries in the group to be compared with the ERM thus hardly seems justified. The comparison should rather be between European countries that chose to peg their currencies to the DM, unilaterally or within the ERM,

[5] This issue was pointed out in particular by Russo and Tullio (1988).

[6] The participants in the Snake were Germany, the Netherlands, Belgium, Sweden, Denmark and Norway. France and Italy participated for short periods of time.

and those that adopted substantially different exchange rate or monetary policies. Restricting the econometric analysis to European countries (15 rather than 20, see the Appendix), as is done in columns (4) and (4′), shows that the coefficient on the ERM dummy is statistically significant and negative. This suggests that within Europe ERM membership made a significant contribution to reducing inflation. ERM participation (other things being equal) enabled member countries to maintain their inflation rate about 3 percentage points below that of non-ERM European countries on average.

A final remark concerns the stringency of ERM membership. All the ERM countries participated with a margin of fluctuation of + 2.25%, except for Italy, which entered with a wide margin (± 6%) and adopted the narrow margin in 1990. To assess the impact of the more stringent version of the ERM, the dummy variable ERMNB is used. The results confirm that this group of countries strongly benefited, in terms of lower inflation, from the participation in the narrow band. Even without inserting a dummy variable for Austria and Switzerland, and implementing the same regressions as those performed in the previous literature, the coefficient is statistically significant and has a negative sign (columns 5 and 5′).

The remaining columns of Tables 1 and 2 report the results of other regressions.

The robustness of the results can be assessed through further statistical tests and sensitivity analyses using different data series for some exogenous variables. The analysis is restricted to specification number 7 (only European countries and dummy variables for the Snake period, Austria and Switzerland, and ERMNB for the 1974-90 period).[7]

First, account is taken in the calculation of the standard errors of the heteroschedasticity of residuals which may be present in cross-section estimation. The first column of Table 3 reports the corrected t-statistics of the estimates of specification 7. The absolute value of the t-statistic for the dummy variable for the ERM narrow-band countries increases (as well as that of the dummies for the Snake period and Austria and Switzerland).

In the second column, Germany is included in the sample, as member of the ERM and the Snake. The results are not significantly affected. The absolute value and the t-statistics of the coefficient on

[7] The same tests with other specifications produce similar results.

both the ERMNB and Snake variables increase and the fit of the equation improves. In the third column, the difference in inflation rates is replaced, in the tested equation, with the difference in long-term interest rates to assess whether a different specification of the demand for money affects the results. The coefficient and the t-statistics of the ERMNB variable are practically unaffected.[8]

The fourth column reports the results of a similar exercise using short-term interest rates instead of the inflation rate. The interest elasticity of the demand for money changes but the coefficient on the ERMNB variable is pratically unaffected and remains statistically significant.

In the fifth column of Table 3, the growth rate of M1 is replaced with its lagged value, to check for the existence of a simultaneity bias. The results show that neither the value of the coefficients nor their statistical significance are affected significantly.

TABLE 3

RESULTS OF REGRESSION
(1974-90)

	7.1	7.2	7.3	7.4	7.5	7.6
c	7.35 (7.51)	7.25 (7.51)	7.30 (6.82)	5.54 (5.07)	7.13 (6.66)	1.52 (1.97)
ΔM	.189 (4.56)	.199 (4.89)	.209 (4.94)	.228 (5.57)	.184 (4.45)	.071 (2.89)
ΔY	−.212 (−1.37)	−.211 (−1.38)	−.313 (−1.81)	−.218 (−1.38)	−.179 (−1.20)	−.089 (−.81)
$\Delta \Pi$	.515 (4.33)	.510 (4.37)	.560 (4.16)	1.224 (4.94)	.479 (3.92)	.739 (4.97)
ERMNB	−3.92 (−6.64)	−4.35 (−7.57)	−3.82 (−6.40)	−3.41 (−5.86)	−3.99 (−6.50)	−.858 (−2.51)
Auswi	−5.87 (−9.64)	−5.65 (−9.26)	−5.71 (−9.62)	−5.21 (−8.97)	−5.92 (−9.25)	−1.28 (−2.73)
Snake	−5.33 (−7.49)	−5.95 (−8.02)	−5.42 (−7.48)	−5.02 (−6.84)	−5.19 (−7.41)	−1.56 (−2.28)
Π_{-1}	–	–	–	–	–	.732 (13.50)
R^2	.656	.660	.639	.655	.656	.855
S.E.	3.86	3.83	3.96	3.87	3.87	2.51
Obs.	255	272	255	255	255	255

The t-statistics are shown in brackets; they are all corrected for heteroschedasticity. The values and t-statistics for the 16 annual dummy variables are not reported; they are available from the author upon request.

[8] All the t-statistics in Table 3 are corrected for heteroschedasticity.

Finally, the lagged value of the dependent variable is introduced as an independent variable to take account of the serial correlation of the latter series, following Ungerer *et al.* (1986).[9] The coefficient on the ERMNB variable remains significantly different from zero and negative. The long-term value of the coefficient (−3.17) is in line with that of the previous specifications.

Conclusions

The econometric results indicate that the ERM countries, which are part of a broader group of countries that pegged their exchange rate to the DM, achieved a larger reduction of inflation than the other OECD countries, in particular the European ones. Figure 1 shows the behaviour of the inflation rate in the ERM countries (excluding Germany), including the narrow-band subset, and in the rest of the OECD, distinguishing between European and non-European countries. Between 1980 and 1990 inflation fell by about 11 percentage points in the ERM countries and by 9 points in the narrow-band countries; in the non-ERM countries inflation fell by about 7 percentage points and in 1990 was higher than in the ERM by 4 percentage points in European countries and by 0.5 points in non-European countries (5.5 and 2 points with respect to the narrow-band countries). The data show that the disinflation in the ERM was more gradual, yet more substantial. After the disinflation of the 1980-86 period, the rate of inflation remained at a relatively lower level in the ERM than in the other areas.

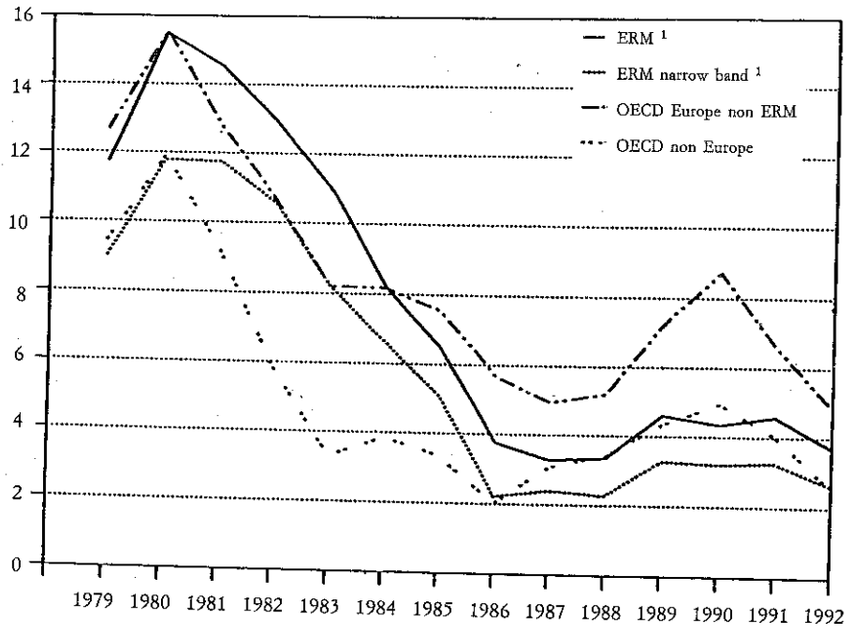
It may seem as a paradox that the EMS crisis came at a time when inflation convergence was at its highest level since the inception of the EMS: in June 1992 all countries whose currencies participated in the ERM narrow band recorded inflation rates lower than in Germany; the UK inflation was also lower than the German rate; the Italian and Spanish rates were higher, but by less than one percentage

[9] To avoid perfect multicollinearity, the difference in the inflation rate is replaced with the difference in long-term interest rates, as in specification 7.4.

point. This might suggest that the ERM was a viable system as long as inflation rates diverged and the exchange rate was a crucial target for the conduct of monetary policy in the high inflation countries. The success of the ERM in fostering inflation convergence might have *de facto* reduced, once convergence was achieved, the need for an exchange rate system and might therefore have been the cause of its premature death. This is a subject for further research.

FIGURE 1

INFLATION RATE



[1] Excluded Germany.

APPENDIX

RELATIVE GNP WEIGHTS OF THE COUNTRIES CONSIDERED

ERM			OECD Europe non ERM			OECD non Europe		
Belgium	6.9	1.2	Austria	5.7	0.8	Australia	3.2	1.9
Denmark	3.5	0.6	Finland	3.5	0.5	Canada	5.9	3.5
France	40.5	7.0	Greece	3.5	0.5	Japan	26.9	15.8
Ireland	1.7	0.3	Norway	3.5	0.5	New Zealand	0.5	0.3
Italy	37.6	6.5	Portugal	3.6	0.5	United States	63.5	37.4
Netherlands	9.8	1.7	Spain	23.4	3.3			
			Sweden	7.1	1.0			
			Switzerland	7.1	1.0			
			United Kingdom	42.6	6.0			
Total	100.0	17.3		100.0	14.1		100.0	58.9

Source: calculation based on OECD data.

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An Interview Survey of Bank Behaviour in the Netherlands *

Job Swank

1. Introduction

Thirty years ago, Hodgman (1963) reported on the results of interviews he had conducted with officers of 18 major commercial banks in the US. His questions were concerned with various aspects of banking, ranging from lending practices to dividend policy. It is safe to say, therefore, that the idea of revealing actual bank behaviour by taking interviews is not new. However, Hodgman's efforts have hardly been followed through the years, apart from a series of *ad hoc* surveys, focusing on specific issues of current interest.[1]

The apparent unpopularity of interview research into the behaviour of banks can be attributed to a number of factors. First, for obvious reasons, banks are generally reluctant to give outsiders a look behind the scenes, especially when the outsider has professional

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[1] Noteworthy examples are the Federal Reserve Board's *Senior Loan Officer Survey of Bank Lending Practices*, which is held on a regular basis but addresses different questions every time (*cf.* Brady 1985, and Wolfson and McLaughlin 1989), and a recent interview survey of international interbank relations conducted under the auspices of the BIS (1992).

relations with the banking supervisor. This imposes limits on the questions the interviewer may want to ask on strategic issues. Second, certain aspects of the banking firm are difficult to disclose solely on the basis of interviews. For example, while bank officers may have a rough idea of the existence of scale and scope (dis)economies in their firm, it is unlikely that they can exactly locate these in distinct banking departments. Third, informal interviews, as Hodgman had them, yield qualitative, sometimes vague and often dispersed information, which is hard to process. This urges the interviewer to give his own interpretation to the answers. In addition, qualitative response is usually not invariant to the hierarchical position and the perceptions of the particular interviewee, which brings a second element of subjectivity into the analysis. Last but not least, strategic or other considerations may lead officers to give answers that are inconsistent with the bank's actual behaviour. Hence, there is still a strong need for quantitative research, providing plausibility checks on the interview results.

On the other hand, quantitative research cannot answer all questions either, owing to deficiencies in statistical data and given the limitations of the applied methods. Therefore, in spite of the aforementioned drawbacks, I have endeavoured to follow Hodgman's example for a group of larger Dutch banks. The direct aim of this pursuit was to obtain inside information on all aspects of banking that might be relevant to the efficiency of monetary policy: asset and liability management, the objectives of banks, competition in financial markets, international capital mobility, interest rate determination, operating expenses, etc. Besides, some questions on issues of current interest could be included, dealing with the effects of (de)regulation, the recent bank mergers, financial innovations and so on.

The first version of the questionnaire was compiled along these lines and consisted of 64 questions. Most of these questions asked for very detailed information and required the interviewee to have a thorough knowledge of his organization. Preliminary consultations with banks revealed that such a set-up was not feasible, the main reason being that the participating banks had to incur considerable costs to produce reliable answers. It was decided, therefore, to settle for less detailed information and, more importantly, to drop all questions banks seemed to have problems with. As a consequence, a number of subjects had to be left aside, including the structure of real resource costs, the recent bank mergers and the effects of financial

innovations on profitability and risk exposure. Nevertheless, the survey has yielded some very interesting results, which may serve as a useful supplement to established perceptions of bank behaviour.

Seven commercial banks have participated in the survey, which together account for more than 75% of total bank assets in the Netherlands. The respondents have voluntarily cooperated on the condition of strict anonymity.[2] For that reason, no results for individual banks are mentioned. The only distinction made is between "large banks", having a balance sheet total of over 100 billion guilders each, and "small banks". Also for anonymity, the survey was conducted in writing and there were no discussions with the respondents to check the supplied information. To avoid noncommittal response, a classification of admissible answers was added to each question. With a few exceptions, the completion of the questionnaire came to ticking preselected options. This has brought some uniformity in the response, thereby easing the processing and interpretation of the outcomes. An obvious drawback of such a multiple-choice system is that the appropriate answers are given without any further explanation, but this was not felt prohibitive.

The rest of this paper is organized as follows. Section 2 gives a general impression of the results and lists the main conclusions. In subsequent sections, the outcomes of the survey are discussed by subjects: asset and liability management and the objectives of banks (Section 3), competition (Section 4), interest rate determination (Section 5), financial innovations (Section 6) and monetary policy (Section 7). The questions that were put to the banks are recorded in an appendix to this paper.

2. General impression

The results of the survey reveal that there is no such thing as the typical bank. Only in a few cases, all banks came up with the same

[2] Negotiations and correspondence about the survey were conducted with board chairmen, who were left to decide which officials in their organizations were in the best position to answer the questions. The report of the interview results of which this paper has been derived was submitted for approval of publication to the Netherlands Bankers Association, acting on behalf of the boards of directors of the participating banks.

answer. Major differences have been found for the importance of customer relations, including conditional sales and compensating balance requirements, and for the managerial objectives of banks. The response was also dispersed, albeit to a lesser extent, with regard to rate setting policies and the transmission of monetary policy to balance sheet items and interest rates.

Nevertheless, although consensus is rarely observed, there are a number of subjects on which most banks seem to agree with each other: the instruments used to control lending and funding, the criteria applied to determine the creditworthiness of business clients, and the market power of individual banks with respect to loans, deposits and payments services. All the participating banks have indicated that competition from foreign banks in domestic financial markets is not very substantial. This somewhat contradicts the widespread contention that there is perfect international capital mobility nowadays. In fact, competition from non-bank financial institutions in the Netherlands, such as insurance companies, pension funds and investment companies, is generally felt to be more severe, especially where mortgages and government loans are concerned.

On most issues, neither large banks nor small banks emerge from the survey as homogeneous and discernible groups. There are three exceptions. First, the managers of large banks attach a greater weight to maximization of market shares than the management of small banks. Second, only small banks claim to fine-tune commercial loan rates to specific credit risks, probably because they have a better knowledge of their borrowers. Another explanation might be that large banks are more inclined to discriminate between borrowers on the basis of collateral or other non-price terms, but this possibility is inconsistent with the results of the survey. Consequently, equilibrium credit rationing (in the sense of Jaffee and Modigliani 1969) is more likely to occur at large banks, which say to classify their business clients into risk groups. Third, with the exception of some hedging instruments, off balance sheet activities are found to be typical of large banks. Obviously, small banks are reluctant to expose themselves to the additional risks inherent in what Kareken (1987) calls "contingent commitment banking".

Notwithstanding the opening sentence of this section, I shall try to characterize the "average" bank (henceforth "the" bank) on the basis of the most frequently supplied answers. The bank manages its lending and funding activities in retail markets by a combination of

personal canvassing, advertising and interest rate setting. Moreover, business clients are encouraged to settle all their financial affairs with the bank. The incentives given include customer-related services, advising, persuasion and compensating balance requirements. The bank also tries to retain business clients by letting its lending decision depend on already existing credit or deposit relations with the loan applicant. Other, more decisive, considerations underlying the lending decision are the borrower's reputation and the profitability and solvency of the business firm concerned. Information about the relevant industry is of supplementary importance.

The bank's objective function includes both profitability and size as arguments. In addition, the management of the bank is quite risk-averse.[3] This is also evident from the fact that the bank applies internal standards of soundness which are more stringent than the restrictions imposed by the supervisor. As hypothesized by Hicks (1935) and elaborated by Galbraith (1967) and Caves (1970), risk-averse behaviour is likely to be displayed by firms that operate in imperfect output markets. The argument is that market power enables firms to sacrifice (expected) profits for greater certainty and that risk-averse managers feel attracted to these firms. Empirical evidence for US banks lends support to the proposition,[4] which according to the survey seems to hold for Dutch banks as well. Specifically, the ("average") bank acts as a price setter in the markets for loans, deposits and payments services, where it assumes to have some market power. So, while deregulation may have increased the degree of competition in these markets, they are still clearly oligopolistic. The pricing rules adopted by the bank are quite simple. Loan and deposit rates are linked to the central bank's discount rate, the interbank deposit rate, the government long-term bond yield or a combination of these rates. While differences in credit risk and solvency requirements are explicitly allowed for in the loan rates, neither loan rates nor deposit rates contain separate markups for operating expenses and liquidity requirements.

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[3] Similar findings have been reported for US banks by Stigum (1976), Saunders *et al.* (1990), Heggestad and Houston (1992) and Shrieves and Dahl (1992).

[4] Edwards and Heggestad (1973), Heggestad (1977) and Rhoades and Rutz (1982). See also Bourke (1989) for a cross section of banks in twelve countries or territories (including the Netherlands).

Major off balance sheet activities developed by the bank involve standby letters of credit, interest rate swaps, forward rate agreements and foreign currency swaps. Somewhat surprisingly, and in sharp contrast with current practices in the US, loan commitments are less popular. Interest rate swaps and forward rate agreements are not the only instruments the bank uses to hedge against interest rate risk, as is evident from the increased importance of variable rate mortgages since 1980. At the same time, however, the average maturity of time deposits and savings accounts has decreased, thereby aggravating the bank's mismatch problem.

Finally, a restrictive reserve requirement on excessive net lending[5] leads the bank to reduce its domestic security holdings, to increase its foreign security holdings, to reject the most risky loan applicants, to shift part of its lending off balance sheet and to increase its long-term domestic liabilities. In accordance with the latter reaction, the interest rates on long-term time deposits and savings accounts are raised. Interbank items, first-class business loans, mortgages and short-term deposits remain unaffected. The implied costs of required reserves are only passed on to clients contracting new loans other than mortgages and consumer credit.

3. Asset and liability management and the objectives of banks

Under this heading, the following matters have been raised: *i*) the instruments used to control lending and funding; *ii*) bank-client relationships and compensating balances; *iii*) credit rationing; *iv*) managerial objectives.

In connection with the latter subject, the banks were also asked to give their opinion on the existing supervisory requirements on liquidity and solvency.

[5] Net lending is defined as domestic loans and investments minus long-term domestic liabilities. See Section 7 for a brief account of monetary policy procedures in the Netherlands.

3.1 *Controlling lending and funding*

Banks can control their lending and funding activities in retail markets by varying the relevant interest rates or, more directly, by personal canvassing, advertising and credit rationing. With the exception of credit rationing, these instruments are intensively utilized for all types of loans and deposits. Canvassing is slightly more important in managing business loans, whereas interest rates play a more prominent role in controlling consumer credit, mortgages, demand deposits, time deposits and savings accounts, but this is only a difference of degree. Basically, price and non-price policies are considered to be complements of each other. While this finding may not be very surprising, most theories of bank behaviour completely ignore the fact that banks normally spend resources on searching and advertising in order to attract and retain clients, thereby overstating the role of interest rates as a transmission channel.

3.2 *Bank-client relationships and compensating balances*

Bank-client relationships are said to exist if customers are inclined to do all their business with one bank. This may imply that the borrowers of a bank also hold deposits at that bank (deposit relationship) or that borrowers do not switch banks whenever they need new credit (loan relationship). For the individual bank, the benefits of such behaviour are clear. First of all, the deposit relationship guarantees relatively cheap funding and, as argued by Kane and Malkiel (1965), it also reduces deposit volatility and thereby the bank's risk exposure. The loan relationship saves the bank on the costs of finding and screening prospective borrowers. Moreover, as the relationship with a borrower continues, the bank gets increasingly well-informed about the quality of that client. This informational advantage can be exploited by the bank as long as the client is not in a position to convey its reputation to competing banks (*cf.* Greenbaum *et al.* 1989, and Sharpe 1990).[6] The benefits of bank-client relationships

[6] The inability of most borrowers to convince outsiders of their creditworthiness is a major *raison d'être* of banks. Only the largest firms can afford to produce the publicly available information required to gain direct access to loanable funds. See Fama (1985).

for borrowers and depositors include convenience, the saved costs involved in transferring business from one bank to another and, of course, the preferential treatment received from the incumbent bank.

According to theoretical models by Wood (1974) and Van Loo (1980), this preferential treatment amounts to a reduction in the loan rate, with the specific concession depending on the strength of the relationship. The survey reveals that only a few banks support bank-client relationships in this way. Apparently, and in line with later observations, there is a certain reluctance to set a different loan rate for each individual client. As shown by a number of authors,[7] a rigid loan rate structure motivates allocative discrimination in favour of established customers and, sure enough, all banks interviewed apply existing credit or deposit relations as a (supplementary) criterion for deciding whether to grant or to reject a company's loan request. Other frequent policies aimed at sustaining bank-client relationships are the provision of customer-related services, advising and persuasion. In addition, most banks give regular business clients discounts off commissions.[8] Nowhere, however, are these customers offered payments services free of charge. Some banks, notably large ones, also promote bank-client relationships by putting incentive bonuses on top of the normal interest rates on demand and time deposits held by companies.

A more direct way to guarantee deposits is to require borrowers to hold compensating balances. While this practice is not found to be very important in the Netherlands, most banks interviewed expect their business borrowers to buy payments services from them.

3.3 *Credit rationing*

The subject of credit rationing has exercised many minds since Keynes (1930) brought up the possible existence of "an unsatisfied fringe of borrowers", through which banks could influence real investment activity while leaving loan rates unchanged. In much the same vein, Roosa (1951) and other adherents of the Availability Doctrine defended the proposition that monetary policy does not

[7] See, *e.g.*, Cukierman (1978) and Fried and Howitt (1980).

[8] Subsidization of banking services, such as check clearance, is viable if there is no perfect competition in deposit markets (*cf.* Startz 1983, and Faig-Aumalle 1987). As for the Netherlands, this condition seems to be fulfilled (see Section 4.1).

need high interest elasticities to be effective. In the 1960s, beginning with Hodgman's (1960) pioneering work, the emphasis shifted from the macroeconomic implications to the microeconomic foundations of credit rationing as an equilibrium phenomenon. The main idea is that credit rationing results from loan rate stickiness, which may be due to institutional constraints (Jaffee and Modigliani 1969), aversion to interest rate fluctuations (Fried and Howitt 1980, and Olekalns and Sibly 1992) and asymmetric information about the default risk of borrowers (Jaffee and Russell 1976, Keeton 1979, and Stiglitz and Weiss 1981). The latter study has triggered off a stream of information-based theories on the use of collateral requirements, which may or may not render credit rationing suboptimal.[9]

Recently, a renewed interest in the policy implications of credit rationing has shown up in papers by Blinder and Stiglitz (1983) and Blinder (1987). The authors contest the widespread view that the central bank affects economic activity through private money holdings.[10] In the spirit of the Availability Doctrine and with an appeal to the notions in Stiglitz and Weiss (1981), it is argued that a drain of reserves (brought about by open market operations) induces banks to reject the most risky loan applicants, which in turn leads to quantity rationing in the real economy. The importance of credit rationing as a transmission channel is asserted on the ground that most borrowers who are denied credit by their bank have no ready access to other banks or to open market credit, such as bonds and commercial paper. While some firms may have recourse to trade credit, albeit at a very high price (*cf.* Jaffee and Stiglitz 1990, p. 879), other rationed borrowers will be forced to cancel or postpone expenditure plans. This is what happened on a large scale during the Great Depression and what motivates the fear of a credit crunch (*cf.* Bernanke 1983).

[9] See Wette (1983), Bester (1985), Chan and Kanatas (1985), Besanko and Thakor (1987a and 1987b) and Chan and Thakor (1987).

[10] See also the contributions by other adherents of the "credit view", especially Bernanke (1983), Friedman (1983), Gertler (1988) and Bernanke and Blinder (1988 and 1992). However, these studies do not rely on credit rationing exclusively. According to Moore (1988a and 1988b), the quantity of money is completely demand determined (*i.e.*, credit driven). In his opinion, the central bank can only control the money supply through retail loan and deposit rates, which are somehow linked to the level of short-term open market rates (being the central bank's true control variable). Fand (1988) and Meulendyke (1988), among others, have challenged this view. Empirical evidence on the endogeneity of money is contained in Pollin (1991). See Moore (1991) for a comment.

Judging from empirical studies by King (1986), Sofianos *et al.* (1990) and Berger and Udell (1992), credit rationing in the US is not a significant macroeconomic phenomenon. One explanation, consistent with observations by Wojnilower (1980), is that most business loans in the US are made under commitment contracts, which tend to protect borrowers from being rationed.[11] As elaborated in Section 6.1, Dutch banks are generally less inclined to take on formal loan commitments, implying that credit rationing in the Netherlands is at least viable. This is confirmed by some other results of the survey, which are discussed below.

The first piece of evidence is that the structure of loan rates turns out to be quite rigid, especially at large banks. Business clients are usually classified into a limited number of risk groups and charged accordingly, while the interest rates on consumer credit and mortgage loans lack any differentiation on the basis of individual borrower characteristics. As demonstrated by Jaffee and Modigliani (1969) and Cukierman (1978), such imperfect rate discrimination may lead banks to deny some borrowers credit, specifically the most risky ones and those with whom there is no or only a weak deposit relationship. Commercial considerations (*i.e.*, competition and prohibitively high information costs) are advanced by the respondents as the main reason to refrain from more differentiated rate setting policies.

The potential significance of credit rationing is also evident from the fact that all banks included in the survey mention several grounds for denying a business client credit. Major criteria are the firm's reputation and profitability. In addition, most banks require prospective borrowers to have a minimum capital position.[12] The existence of personal or collateral security is of supplementary importance, next to a number of other factors: size and term of the loan, information about the relevant industry, other (expected) relations with the client, portfolio considerations, general economic conditions and supervisory restrictions. The majority of banks claims to ration the most risky borrowers as a reaction to tight monetary policy.

[11] The widespread use of loan commitments in the US also plays a key role in Moore's line of reasoning (see the preceding footnote).

[12] Guttentag and Herring (1984) have shown that minimum capital requirements are only sensible if loan rates are sticky.

3.4 *Managerial objectives*

Most theories of bank behaviour postulate that the individual bank aims at maximizing (expected) profits. A well-known variation on this theme, contained in bank portfolio models,[13] is that bank managers are risk-averse and trade off expected profits and risk, with risk defined as the variance of profits. Only a few authors have considered other management objectives, such as the size of the organization (Monti 1971 and 1972, Slovin and Sushka 1975, and Van Loo 1980) and soundness or liquidity (Luckett 1970, and Hendershott 1971). It is obvious from these studies that the specific aims of banks may have far-reaching implications for optimal asset and liability management and, hence, for the effectiveness of monetary policy.[14]

The survey reveals that the archetype of a risk-neutral bank which maximizes expected profits is on average incomplete and in some cases completely wrong. To be sure, most banks give great weight to high profit levels, but as a rule they are equally attached to large market shares. Some banks are even more expansionary, and consider profitability only a side condition or of secondary importance. For all that, there is a general tendency among banks to keep their risk exposure within bounds and to submit themselves to soundness constraints which are more stringent than those imposed by the supervisor, especially where capital adequacy is concerned. As for liquidity, a minority of banks says that regulation is restrictive.

Are these results very surprising? Not really. It is safe to say that most bankers are disinclined to believe that small is beautiful. They rather seek to become "global players", financial services centres, market leaders or whatever, provided that it is big. Such pursuits are not necessarily inconsistent with long-run profit maximization, which might explain why no respondent gives exclusive priority to profitability. To quote from a recent article on world banking in *The Economist* (May 2nd 1992, p. 3): "... over the past decade ... lending outstripped economic growth in many countries because banks assumed that loan growth was synonymous with higher profits". How-

[13] See, *e.g.*, Parkin (1970), Pyle (1971) and Hart and Jaffee (1974).

[14] The same is true of the risk preferences of banks (*cf.* Elyasiani 1983 and O'Hara 1983). Risk aversion also plays a key role in studies of bank capital regulation by Kahane (1977), Blair and Heggestad (1978), Koehn and Santomero (1980) and Kim and Santomero (1988).

ever, there are signs that the connection between size and profitability is not so close. First, empirical bank cost studies suggest that scale economies tend to disappear at high output levels,[15] and judging from the calculations in Swank (1993a), Dutch banks are no exception. Second, banks that have boosted their balance sheets in the 1970s with developing country loans had to sacrifice profits in later years due to huge loan loss provisions. Against this background, it is easy to understand why all banks included in the survey appear quite eager to control their risk exposure, their solvency and, albeit to a lesser extent, their liquidity position. Finally, it is important to note that managerial objectives other than maximum profits are only viable if there are imperfections in banking markets (*cf.* Edwards 1977). This condition is amply satisfied in the Netherlands, as will be evident from the next section.

4. Competition

Until recently, banking was a highly regulated industry in most countries. As a consequence, banks were more or less protected from the laws of competition prevailing in other sectors of the economy. Deregulation and the concomitant integration of international financial markets may have changed the picture drastically. Whether or not this has actually happened in the Netherlands is discussed in the present section, which successively deals with: *i*) the market power of banks with respect to loans, deposits and payments services; *ii*) competition from non-bank financial institutions; *iii*) international capital mobility and disintermediation.

4.1 *The market power of banks*

An individual bank has market power if it can change its interest rates or service charges independently of its competitors without

[15] For major references, see Clark (1988) and Humphrey (1990). The evidence on economies of scope is mixed.

jeopardizing its continuance. In that case, there is imperfect competition in the relevant market(s): oligopoly, monopolistic competition, etc. As demonstrated by VanHoose (1983, 1985 and 1988), the degree of competition in banking markets may be decisive for the optimal conduct of monetary policy. The intuition is that the dominance of price or quantity adjustments in response to, say, a change in reserve requirements depends crucially on the extent to which individual banks can take advantage of the interest elasticities of loan demand and deposit supply schedules.[16]

Most banks interviewed say that they have some market power with regard to a wide range of products, irrespective of the particular type of client concerned: business loans, consumer credit, mortgages, demand and time deposits, savings accounts and payments services. So, banking markets in the Netherlands are clearly imperfect and, hence, characterized by price setting behaviour. Some banks, however, feel that competition for *first-class* business loans is perfect, probably because the typical prime borrower can resort to the open market or to foreign banks.

4.2 *Competition from non-bank financial institutions*

Banks do not only compete with each other but also with other financial institutions, such as insurance companies, pension funds, mortgage banks and investment companies. Indeed, the bulk of total household savings in the Netherlands finds its way to pension funds, which tend to invest more than half of their resources in private placements and mortgage loans.[17] The existence of a large non-bank financial sector may seriously thwart the aims of monetary policy, which typically seizes upon the balance sheets of banks only.[18] However, as argued by Hörngren (1985, p. 216): "... the argument that non-banks automatically fill gaps left by regulated banks is not generally valid. It ignores the fact that the cost of funds for non-banks is affected by how banks react". As it turns out, it depends on the choice of instruments and objectives whether or not the central bank

[16] Mingo and Wolkowitz (1977) have shown that these elasticities also bear on the effectiveness of soundness constraints imposed by the regulator.

[17] See Van Loo (1988) and the statistical sources cited there.

[18] This is especially true for so-called selective credit controls (*cf.* Hodgman 1972).

should bother about the behaviour of non-bank financial institutions as a problem of monetary policy. This does not alter the fact, of course, that any policy restriction imposed on a subset of financial institutions distorts competition in financial markets and hence causes allocative inefficiency. Still, from a macroeconomic point of view, there may be enough reason to put up with such a side-effect.

Banks and other financial institutions have never been very compartmentalized in the Netherlands.[19] As a consequence, there are no credit markets which are completely dominated by banks. For example, at the end of 1992, only one fifth of the total stock of government loans (excluding bonds) was extended by banks. It is not surprising, therefore, that most banks interviewed (including all large ones) say that they experience close competition from non-bank financial institutions in this market. As for the other types of loans, banks have greater market shares, ranging from 41% for consumer credit to about 65% for business loans at the end of 1992. The majority of respondents claims to be faced with modest competition from non-bank financial institutions in these two markets. Competition among banks and non-banks in the market for home mortgages is unanimously called fierce. This is an unexpected outcome, since banks have succeeded in steadily increasing their share of the market during the past two decades, viz. from 51% in 1970 to 64% in 1992. In addition, the number of independent suppliers of mortgage loans has declined considerably in those years, owing to mergers, take-overs and acquisitions of controlling interest. On the other hand, econometric evidence in Swank (1993b) shows that competition for mortgages is much closer now than in the 1960s and 1970s. Apparently, the relation between competition and market structure is less transparent than is sometimes suggested, although most banks in the survey maintain to have some market power in mortgages (see Section 4.1). Finally, competition for time deposits and savings accounts is found to be intensified by the penetration of "insurance banks" and investment companies into the market for household savings.

[19] The main exception is that banks have the exclusive right to manage deposits and to provide the associated services.

4.3 *International capital mobility and disintermediation*

It is now widely accepted that the degree of international capital mobility is high and still increasing. Restrictions on external financial transactions have been lifted throughout the OECD-region, triggering off huge international capital flows and, in the sequel, a marked reduction in interest rate differentials between countries with fixed or quasi-fixed exchange rates (*cf.* Goldstein *et al.* 1991, and EC 1992a). The scope for independent monetary policy in these countries is generally thought to be very limited, since attempts to control bank lending and funding may easily cause borrowers and depositors to switch to foreign intermediaries. In addition, as far as deregulation has made it easier for borrowers to raise money directly in the open market (*e.g.*, by issuing commercial paper), the usefulness of money or credit as an intermediate target is likely to have decreased (*cf.* Modigliani and Papademos, 1987).

While it is undoubtedly true that financial markets have lost their traditional boundaries, it is rather questionable whether all types of bank customers have equal access to the new opportunities. Most households and firms in need of credit are not in a position to signal their quality to foreign banks, let alone to the open market. Indeed, as appears from Table 1, only the very large firms in the Netherlands owe a substantial (and increasing) part of their debt to foreign lenders and stand out by an appreciable (though far from high) degree of securitization. For other borrowers, banks remain indispensable to overcome problems of asymmetric information.[20] To quote O'Brien and Browne (1992, p. 6): "In no country do bank assets fall relative to output. This pattern ... may suggest that bank credit is maintaining an important role in financing economic activity, despite the increased presence of other sources of funds".

The latter suspicion is strongly supported by the results of the survey. In fact, not a single respondent complains about severe competition from foreign banks in any retail market. Only where first-class business loans are concerned, there seems to be some competitive pressure from abroad. In all other credit markets, including the market for government loans, the influence of foreign

[20] As shown by Diamond (1991), even firms with high credit ratings may have to rely on bank loans in periods of high interest rates or low economywide expected profits.

TABLE 1

FOREIGN DEBT AND SECURITIZED DEBT OF LARGE COMPANIES IN THE NETHERLANDS, AS A PERCENTAGE OF TOTAL DEBT, 1986-1990[a]

	1986	1987	1988	1989	1990
Foreign debt					
Firms with balance sheet total over 10 billion guilders	15	16	18	17	20
Other large firms	3	3	2	3	3
Securitized debt					
Firms with balance sheet total over 10 billion guilders	4	5	5	5	6
Other large firms	1	1	1	1	1

[a] Large companies include non-financial firms with balance sheet total over 10 million guilders. Foreign debt is measured exclusive of foreign trade credit. Securitized debt consists of bonds and commercial paper outstanding.
Source: Central Bureau of Statistics, *Statistiek Financiën van Ondernemingen* (various issues) and the Netherlands Bank (unpublished data).

lenders is nil according to most interviewees. This appears quite plausible, since the majority of banks says that more than 90% of their own foreign lending is limited to prime borrowers and that lending to non-residential households is negligible. As for time deposits and savings accounts, some competition from abroad is perceptible, which may be due to international differences in the fiscal treatment of private wealth and allowances of interest.

I have also tried to find out whether the banks' traditional lending activities are seriously threatened by disintermediation in general, including near-banking operations of business firms, pension funds and local authorities (issuance of money market loans, commercial paper, etc.). The survey reveals that this has not been a major problem in the past ten years, although some small banks were not able to answer a question to that effect. Similar findings emerge from a study by Van der Werff and Sluijter (1989), dealing with the intended and unintended effects of the latest ("informal") restriction on net lending in the Netherlands.

5. Interest rate determination

It is typical of oligopolistic banking markets that the relevant interest rates are set as a markup over one or more open market rates, such as money market rates and the government long-term bond yield. These reference, or base, rates represent the individual bank's opportunity costs of lending and deposit funding. The markups, which are negative in the case of deposits, may include risk premia and allowances for operating expenses. They may also reflect the incidence of reserve requirements and soundness constraints on different types of loans and deposits.

The participating banks were requested to specify the reference rates underlying their pricing rules. I have attempted to weigh the answers so as to get an overall idea of the relative importance of the base rates mentioned. The results of this rough calculation are recorded in Table 2. As it turns out, money market rates, including the central bank's discount rate (on promissory notes), play a major part in the banks' rate setting policies. Even the interest rates on long-term loans and deposits are partly linked to short-term open market rates, at least by some banks. Hence, at the margin, bank lending and funding may be quite sensitive to Dutch exchange rate policy, which normally proceeds through alterations in money market conditions.

Two other interesting results stand out. First, in contrast with what is sometimes suggested, the pricing of short-term business loans is not exclusively based on the central bank's discount rate. In effect, other money market rates, such as AIBOR (Amsterdam Interbank Offered Rate), are almost equally important, especially where prime borrowers are concerned. Second, the market power of banks with respect to consumer credit is obviously not very great, as banks largely conform to the relevant interest rates charged by competitors.

The respondents show some reluctance to employ separate markups for all kinds of features. Besides credit risks most banks systematically allow for solvency requirements when setting their loan rates, but only a minority takes explicit account of liquidity requirements in the determination of deposit rates. Moreover, loan rates rarely contain a separate markup for the costs of credit handling, presumably because the typical bank has difficulty discerning these costs from other operating expenses.

TABLE 2

APPROXIMATE WEIGHTS OF REFERENCE RATES IN THE DETERMINATION OF LOAN AND DEPOSIT RATES

	Central bank's discount rate	AIBOR[a] or other money market rate	Government long-term bond yield	Competitors' rate
Loan rates				
Short-term business loans:				
– prime borrowers	0.5	0.4	–	0.1
– other borrowers	0.5	0.3	–	0.2
Long-term business loans	–	0.2	0.6	0.2
Short-term consumer credit	–	0.4	–	0.6
Long-term consumer credit	–	0.1	0.3	0.6
Mortgage loans to households	–	0.2	0.6	0.2
Deposit rates				
Short-term time deposits	–	0.8	–	0.2
Long-term time deposits	–	0.4	0.4	0.2
Savings accounts	–	0.3	0.5	0.2

[a] Amsterdam Interbank Offered Rate.

6. Financial innovations

As elaborated by Akhtar (1984), the emergence of financial innovations in the past twenty years or so can be attributed to a number of factors. The most important of these are: high and volatile interest rates and exchange rates, high inflation rates, legal ceilings on deposit rates, and increased integration of domestic and international financial markets. The adoption of the new instruments was facilitated by the worldwide trend towards deregulation and by the increased availability of advanced computer technologies aimed at a rapid completion of financial transactions and information transfer.

Since Dutch banks have never been subject to deposit rate ceilings, a whole breed of financial innovations (MMMFs, sweep accounts, NOWs, CDs, etc.) is largely absent in the Netherlands. Indeed, some banks have issued CDs, but only on a very modest scale.[21] As a consequence, problems with the appropriate definition of money are less pressing than in the US, where deposit related innovations are quite common. The survey was confined, therefore, to innovations belonging to the so-called "risk shifting" group,[22] comprising off balance sheet activities and variable rate loans. In addition, the banks were asked after their motives for making innovations in their payments system. For reasons mentioned in the introduction to this paper, only a few aspects of financial innovations could be raised.

6.1 *Off balance sheet activities*

As is well-known, there is a great variety of off balance sheet activities. Following BIS (1986), the relevant instruments can be divided into three categories:

i) Bank guarantees (bankers' acceptances, standby letters of credit, loan commitments, note issuance facilities and revolving underwriting facilities);

ii) Instruments aimed at hedging interest rate risk (forward interest rate contracts, interest rate futures, interest rate swaps, interest rate options, forward rate agreements);

iii) Instruments aimed at hedging exchange rate risk (forward foreign currency contracts, foreign currency futures, foreign currency swaps, foreign currency options).

All *large* banks interviewed claim to use most of these products much more frequently than in 1980. Only bankers' acceptances and foreign currency futures have become or remained peripheral. In line with recent findings by the BIS (1992), the survey reveals that interest rate swaps (combined with forward rate agreements) and foreign currency swaps are the banks' major hedging instruments. Among the bank guarantees, standby letters of credit (SLCs) have the greatest weight with most respondents.[23] To some extent, this might reflect

[21] At the end of 1992, the amount of CDs outstanding was less than 1% of the banks' total liabilities.

[22] The characterization is due to Wenninger (1984, p. 257).

[23] In the US, SLCs have expanded enormously since the late 1970s. According to Bennett (1986), banks were quite ready to engage in such activities because of advantages in information costs and to avoid capital adequacy constraints and reserve requirements. Under the Basle Accord, SLCs and other bank guarantees are no longer exempt from solvency requirements (*cf.* Cornet 1990).

the increased importance of commercial paper and other forms of securitization in the Netherlands, for which SLCs may serve as a back-up facility.

Most business loans in the US are made under commitment contracts. A loan commitment entitles the buyer to borrow money from the issuing bank up to a specified amount and at an agreed interest rate, which is either fixed or linked to some market interest rate. In exchange for this right, the customer generally pays a fee on the unused part of the commitment. By purchasing a loan commitment, a borrower insures himself against credit rationing for the term of the contract, provided that his financial status does not decline materially during the period. Hence, on the macroeconomic level, the importance of credit rationing as a transmission mechanism is likely to decrease when the ratio of commitment loans to traditional loans rises. The central bank might be induced, then, to switch from targeting financial aggregates to a strategy based on interest rates. However, as elaborated by Duca and VanHoose (1990), even the latter type of conduct may be frustrated if borrowers are inclined to substitute between *variable rate* commitment loans and traditional *fixed rate* loans in response to changes in monetary tightness. In that case, monetary policy would alter the slope of the LM schedule and thereby expose itself to the well-known Lucas (1976) critique.

As yet, these reflections seem to have limited relevance to the Dutch situation, since commitment lending does not emerge from the survey as a widespread phenomenon.[24] Specifically, most banks interviewed, including all small ones, tend to grant less than 20% of their business loans under commitment contracts. Insofar as loan commitments are issued, at least half of them have fixed interest rates. This finding is at odds with current practice in the US and, what is more important, it implies that a substantial part of commitment banking in the Netherlands entails an interest rate risk.[25]

[24] This result proves nothing about the incidence of *informal* credit lines, which are quite common in the Netherlands. Unlike loan commitments, informal credit lines can be cancelled by the bank at any time without notice.

[25] As shown by Ho and Saunders (1983), it is generally impossible to completely hedge this risk with interest rate futures.

6.2 *Maturity shortening and variable rate loans*

The high interest levels in the late 1970s and the early 1980s have induced both households and firms to manage their transactions balances more efficiently. In a number of countries, banks reacted to this development by introducing a wide range of liquidity enhancing instruments. As discussed before, such innovations are rather rare in the Netherlands due to the long-standing absence of deposit rate regulation. However, changes in the public's liquidity preference may very well have caused a significant shortening of the average term of conventional time deposits and savings accounts, thereby increasing the typical bank's maturity mismatch. Banks, in turn, might have substituted roll-over loans and variable rate mortgages for fixed rate lending in an attempt to shift part of the higher interest rate risk onto borrowers. How this eventually affects financial fragility on an economywide scale remains to be seen. For, as Akhtar (1984, p. 22) notes: "... the management and reduction of risk is one of the important functions of financial intermediaries which they are (or at least should be) able to do better than ultimate economic agents". It should also be mentioned that maturity shortening and variable rate lending tend to make banks more responsive to monetary policy strategies in which short-term interest rates play a dominant part, as is the case in the Netherlands.

The suspicion that time deposits and savings accounts have become more liquid over the past decade is confirmed by almost all respondents. This is hardly surprising, as the short-term proportion of these liabilities has risen markedly through the years, from 78% at the end of 1982 to 87% at the end of 1992. While most banks are found to have reacted to this trend by raising the share of adjustable rate mortgages in their balance sheets, only a minority has also promoted roll-over loans.

6.3 *Innovations in the payments system*

A payments system "... consists of a defined group of institutions, and of a set of instruments and procedures, used to ensure the circulation of money within a geographical area, usually a country" (EC 1992b, p. 8). The typical payments system can be divided into two interrelated circuits, one referring to the transfers between banks

and their retail customers, and the other pertaining to interbank transfers. The latter circuit, which also includes the central bank as a settlement institution, is fairly sophisticated in the Netherlands. Its major processing device is an automated clearing house, called the Bank Giro Centre, which partly operates on a real-time basis.[26] The rest of this subsection is concerned with the retail circuit.

Compared with other countries, electronic payments services were rather late in the Netherlands. Only since 1985, cash dispensers and point of sale (POS) terminals have been implemented on a significant scale. Although the incidence of the latter instrument clearly lags behind the tremendous success of cash dispensers, the Dutch market for POS services has a great potential, as is evident from a recent study by Boeschoten (1992).[27] Specifically, provided that terminals become widespread, households are expected to increase the share of POS transfers in their total payments over the counter from 3% in 1990 to almost 40% in the future. Judging from the banks' annual reports, high growth rates are also foreseen for electronic banking services offered to business clients (cash management, Electronic Data Interchange, etc.). The prospects for home banking, which is still in its infancy, seem to be promising as well.

The survey reveals that the principal motive for banks to adopt technological innovations in their payments system is to reduce costs rather than to attract and retain clients. This is in line with current bank policies to raise or to introduce charges for traditional (paper-based) payments services, so as to move customers to use automated methods. These attempts may be reinforced by temporarily underpricing the new services. However, as stressed by Revell (1986), this kind of incentive pricing is likely to be problematic for banks whose interest margins have structurally declined owing to the increased tendency of customers to minimize deposit accounts that pay low interest rates. After all, this is what forced banks to reconsider their pricing policies for payments services in the first place.

[26] For further details on the Dutch interbank circuit, see BIS (1989, pp. 152-155).

[27] As in other countries, the development of POS systems has been hindered by a dragging dispute on the distribution of costs among banks and retailers.

7. Monetary policy

Monetary policy in the Netherlands is aimed at maintaining a credible link between the guilder and the Deutsche Mark, which serves as an intermediate target in seeking price level stability. The set of instruments includes money market operations, directed at controlling short-term interest rates, and a system of reserve requirements on domestic money creation, called the monetary cash reserve. While short-term interest rates are the main vehicle of Dutch exchange rate policy, they are unsuitable for securing structural stability of the exchange rate. This is where the monetary cash reserve comes in. The philosophy behind this unusual instrument, which directly seizes on both assets and liabilities of banks, can be described as follows. In a small open economy like the Netherlands, with no restrictions on international capital flows, the quantity of money is almost completely demand determined and, hence, beyond the reach of monetary policy. However, supposing that there is a stable relation between money demand and income (or another transactions indicator), the central bank is still in a position to control the *components* of money growth. These components include net lending by banks, being the major domestic source of money creation, and the national liquidity balance (notably the change in net foreign assets of banks), which is the foreign source of money creation. Now, the idea is that by targeting the growth rate of net lending on a normative prediction for income growth (*i.e.*, normal capacity growth plus an unavoidable inflation rate of 1% a year), prolonged national liquidity deficits can be prevented, thereby preserving long-run stability of the exchange rate.

It follows that for a successful implementation of the monetary cash reserve, at least three conditions should be met: *1*) money demand is stable, *2*) excessive money creation by banks causes a liquidity drain, and *3*) a prolonged liquidity drain undermines confidence in the stability of the exchange rate. As elaborated in the Netherlands Bank (1992, pp. 25-26), the validity of these premises has eroded through the years, which induced the central bank to decide that the monetary cash reserve is only to be activated under special circumstances. The present section discusses how this instrument, when it is restrictive, tends to affect bank behaviour. Though the issue in itself is of no immediate concern, given the

current, strong position of the guilder, the relevant interview results may shed some light on the typical reactions of banks to credit controls and reserve requirements in general.

Actually, the monetary cash reserve imposes a tax on excessive increases in net lending by banks, which is defined as domestic loans and investments minus long-term domestic liabilities. The expected direct effects of a tax rise on the banks' balance sheets are recorded in Table 3.[28] The survey shows that banks behave on average according to theory,[29] although some qualifications are in order. First, while all banks interviewed claim to increase their long-term domestic liabilities in response to a tax rise, the reactions on the assets side range from doing nothing to curtailing all types of domestic loans and investments. Second, insofar as banks are willing to reduce their lending activities, they seem more inclined to sell securities (*e.g.*, government bonds) than to ration borrowers. Granted that it is costly to establish a loan relationship with a client, such a preference for adjusting in "auction markets" rather than in "customer markets" may be optimal if the tax rise is expected to be short-lived (*cf.* Hörngren 1985). This does not restrain banks, however, from turning down the most risky loan applicants and from shifting some loans off balance. Incidentally, the latter effect is somewhat difficult to appreciate, since most respondents appear quite reluctant to cut down on prime borrowers, and yet these clients are the most likely candidates for receiving standby letters of credit or other bank guarantees.

TABLE 3

EXPECTED DIRECT EFFECTS OF THE MONETARY CASH RESERVE ON THE BALANCE SHEETS OF BANKS[a]

Assets		Liabilities	
Domestic loans	–	Short-term deposits	0
Domestic securities	–	*Long-term liabilities*	+
Net foreign assets	+	Net interbank items	±

[a] Items included in the definition of net lending are in italics.

[28] These first-order effects have been derived from a theoretical model in Swank (1993c).

[29] Interbank items are generally left unchanged.

A restrictive monetary cash reserve induces most banks in the survey (especially the small ones) to raise their interest rates on *new* government loans, on *new* business loans and on long-term time deposits and savings accounts. Evidently, and in line with the results discussed in Section 4, Dutch banks have sufficient market power to transmit a tightening of monetary policy to their loan and deposit rates without sustaining severe losses in their market shares or interest margins. This holds to a lesser degree, however, for mortgages and consumer credit, whose interest rates are adjusted to altered reserve requirements by only a minority of banks interviewed.

APPENDIX

Questions of the survey[1]

Section 1. Asset and liability management and the objectives of banks

Question 1

Please indicate how the bank controls the balance sheet items below (through interest rate setting, personal canvassing, credit rationing or otherwise):
- short-term business loans
- long-term business loans
- consumer credit
- mortgage loans to households
- demand deposits
- short-term time deposits
- long-term time deposits
- savings accounts

Question 2

Are (potential) business clients encouraged to settle all their financial affairs with the bank and, if so, what incentives are given?

Question 3

Are borrowers required to hold compensating balances or to complete certain payments transactions through the bank?

[1] The classification of admissible answers that was added to each question is omitted for brevity.