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Working Paper

The impact of banking behaviour on monetary strategy in Europe

Beiträge zur angewandten Wirtschaftsforschung, No. 13

Provided in Cooperation with:

University of Münster, Münster Center for Economic Policy (MEP)

Suggested Citation: Borchert, Manfred (2005) : The impact of banking behaviour on monetary strategy in Europe, Beiträge zur angewandten Wirtschaftsforschung, No. 13, Westfälische Wilhelms-Universität Münster, Centrum für Angewandte Wirtschaftsforschung (CAWM), Münster

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Beiträge zur angewandten Wirtschaftsforschung

Nr. 13 (2005)

Vorläufige Fassung! Nicht im Handel!

**The Impact of Banking Behaviour
on Monetary Strategy in Europe**

revised and extended edition 2005

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Abstract: The Impact of Banking Behaviour on Monetary Strategy in Europe

– Revised and extended edition 2005 –

At present, Western European banks are increasingly branching out into asset management as well as the consulting business, which cannot be influenced directly by monetary controls. We have therefore conducted a factor analysis of banks' balance-sheet items, and we have also plotted figures from banks' income statements. Our analyses fulfil a triple purpose. First, they shed much light on the positioning strategies deployed by European banks. Secondly, they reveal various tendencies in respect of the refinancing strategies that are adopted when credits are granted to non-banks. Thirdly, they facilitate an assessment of the effectiveness of monetary policy. There is clear evidence that the European Central Bank's money supply policy will prove progressively less efficient as banks resort increasingly to refinancing by assets and continue to expand their banking services by building up their consulting businesses.

Key words: Banking structure

Banking market

Banks' business strategies

JEL-classification: E 50, E 51, E 58, G 21

The Impact of Banking Behaviour on Monetary Strategy in Europe*

Manfred Borchert

Introduction

The way monetary targeting is managed depends on how money is defined, and money may be defined in many different ways. All current definitions, however, have one thing in common, namely they invariably comprise liability items in banks' balance sheets. Consequently, these balance sheets remain unchanged (a) when banks provide assistance to customers who wish to raise funds in the capital markets; and (b) if banks – at least partially – refinance loans via assets (securities), they exert no influence whatever on the quantity of money.

However, even if banks refinance their loans by liability items, reference to the quantity of money M3 can be problematic because the means of payment (M1) and the amount of liquidity within the banking sector (M3-M1) develop in opposite directions, a process which will be neutralized – at least partially – within the aggregate M3. Consequently, broad money is determined endogenously; “the starting point of this endogeneity thesis is the assertion that it is loans that cause deposits (and not the other way around).”¹

Until the early 1980s, the continental European financial system was largely bank-based, while the U.S. and U.K. systems had become market-based. In 1994, only 16% of the capital borrowed by firms in the U.S. came from banks, while 49% was raised by issuing securities. By contrast, 80% of corporate borrowing in Germany was from banks and only 10% from securities markets.² Over the last twenty years, the European financial system has become more market-based due to two factors: (a) improvements in the processing and transmission of information and (b) the process of European integration.³ Because firms around the world use equity markets to raise capital for investment⁴, this trend has been reinforced by the

* This contribution was completed in June until August 2005, during a research visit to the *International Monetary Fund* in Washington, D.C. (USA).

¹ Cf. Caporale/Howells 2001: 548.

² Cf. Rajan/Zingales 2003: 5.

³ Cf. Rajan/Zingales 2003: 57.

⁴ Cf. Kim/Weisbach 2005: 22.

transition to a single European currency, which was launched as early as 1999, although the new coins and banknotes were not issued until 2002.

Section 1 outlines the prospects of the Western European banks. Owing to the introduction of the euro, every bank within the EMU zone can now expand its market area beyond its national borders. European banks are now increasingly expanding into asset management as well as the consulting business, – activities which enable them to raise funds for customers in ways which cannot be influenced by monetary controls.

Section 2 examines the positioning of Europe's big banks with the aid of a factor analysis of balance-sheet items and a graphical representation of income statements. Our analyses reveal different trends in the refinancing strategies that are adopted when credits are granted to non-banks (refinancing by assets and refinancing by liabilities). The adjustments of equity capital also play a considerable role.

Section 3 attempts to assess the effectiveness of monetary policy by drawing inferences from the development of the European banking market. The *European Central Bank's* money supply policy will prove increasingly inefficient if banks continue refinancing by assets and expanding their banking services by branching out into the consulting business.

1. The Incentives offered by the New Currency

As we have already pointed out, the way monetary targeting is managed depends on how money is defined, and all the current definitions comprise liability items in banks' balance sheets. It follows, therefore, that monetary policy aims essentially at influencing the composition of liability items in banks' balance sheets.

assets		liabilities	
cash	} B	bank deposits	d _b
central bank deposits		<i>non-bank deposits (d_{nb}):</i>	
loans to banks	l _b	demand deposits	d _d
loans to customers	l _c	other deposits	d _o
securities	s _a	debt securities in issue	s _i
other assets	o _a	capital	c
		other liabilities	o _i

Assuming, for simplicity, that $o_a = o_l$, the bank's balance sheet may be represented by the following equation:

$$(1) \quad B + l_b + l_c + s_a = d_b + (d_d + d_o) + s_l + c.$$

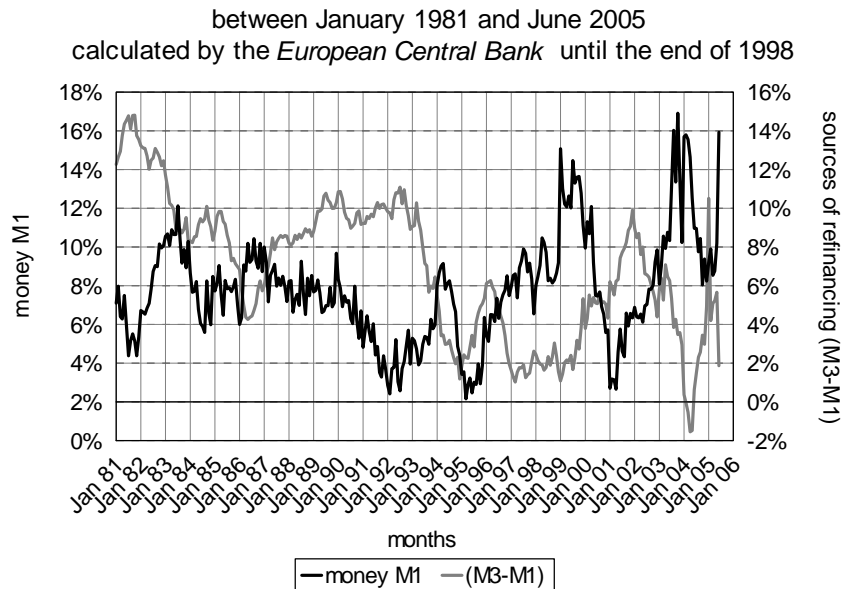
Since monetary targeting usually seeks to influence $(B + d_d + d_o + s_l)$, banks exert little effect on the money supply when they refinance loans via assets or provide assistance to customers who wish to raise funds in the capital markets. Furthermore, if we assume that $l_b = d_b$ ⁵, equation (2) follows logically from equation (1):

$$(2) \quad l_c = f(B, s_a, d_{nd}, s_l, c), \quad \text{with } d_{nb} = d_d + d_o.$$

Equation (2) contains all relevant variables which will be analyzed below.

In the past, the success of the monetary policy pursued by the *Deutsche Bundesbank* was primarily due to the fact that German investors financed their investments mainly by bank loans which in turn were refinanced by deposits (d_o) and debt securities in issue (s_l). As can be seen from Figure 1, the same is probably true for most of the countries which have signed up for EMU.

Figure 1: Annual change in the quantity of money within the EMU



Source: The author's own calculations based on data from the monthly reports of the *European Central Bank*

⁵ Loans to banks (l_b) and bank deposits (d_b) are used mainly for settlements between banks.

When there was an increase in the rate of change of $M1$ ⁶, there was almost invariably a decrease in the rate of change of refinancing sources⁷, and these sources were equal to the difference between $M3$ and $M1$ ⁸. This phenomenon can be explained by the fact that new bank loans can only be financed by demand deposits if customers can be persuaded to convert some of their idle demand deposits into deposits represented by $(M3-M1)$.

There are still considerable differences in the ways in which European banks refinance loans, but the arrival of the euro has brought about dramatic changes in this domain by enabling all the banks within the *European Monetary Union* (EMU) to create uniform means of payment.⁹ It is now possible for money created in one member state to be used as a means of payment in another member state. The geographic radius of banking activity has been enlarged, but at the same time, domestic banks have lost the protection previously afforded by Europe's national currencies¹⁰. In order to withstand the full blast of Europe-wide competition, they will have no choice but to adapt to the new situation.

Since competition will squeeze margins in the traditional banking sector, banks may seek new sources of profit beyond the ambit of conventional commercial banking¹¹. In other words, they may be tempted to expand their activities in areas such as investment banking and consulting banking. "Credit institutions within Europe are mainly expanding into asset management and the business of investment services in general".¹²

Under the terms of the *Basle Accord I* (1988), large credits have to be notified if they exceed 8% of the bank's equity capital. The way this regulation is applied depends on the risk category into which a credit falls¹³. A credit granted to a single bank client may not exceed 25% of the bank's equity capital¹⁴. The *Basle Accord II*, which became effective by 2005,

⁶ $M1$ comprises the monetary base held by non-banks and demand deposits d_d .

⁷ The refinancing sources comprise deposits d_o and debt securities in issue s_1 with an original duration of two years.

⁸ The only exception was 1990, the year when German reunification brought about an extension of Germany's currency area.

⁹ Cf. Borchert 1999: 59.

¹⁰ Cf. Bagliano/Dalmazzo/Marini 1999: 979.

¹¹ Cf. Milbourn/Boot/Thakor 1999: 196.

¹² Cf. European Central Bank 2000: 14.

¹³ Cf. Walsh 1994: 50.

¹⁴ Cf. Norton 1994: 214.

tightens the minimum capital requirements by including credit risk as well as explicit capital requirements for operational risk¹⁵.

Summary: Traditionally, European banks have refinanced credits by means of liability items in their balance sheets. Owing to the introduction of the euro, every bank within the EMU zone can now expand its market area beyond its national borders. This results in increased competition which is inducing banks to resort to mergers and acquisitions (M&A) with a view to achieving cost reductions, synergy effects and, most important, increases in equity capital. Furthermore, Western European banks are now expanding increasingly into asset management as well as into consulting business – activities which enable them to raise funds for customers in ways which cannot be influenced directly by monetary controls.

2. The Positioning of the Big Banks in Western Europe

What is causing a stir in the general public is above all the way the Western European banking sector is being restructured by M&A, with large banks shifting their business focus from book credit allocation to credit brokerage via the market. At the same time, the banks' share of pure interest income is declining in favour of the share of revenue from consulting banking, investment banking and wholesale banking (credit brokerage).

The following analysis focuses on the major European banks. All the results reported here are based on data provided by the balance sheets of large banks for the years 1999 to 2004.¹⁶ We ignore the activities of small banks, which we assume to consist mainly of cost cutting and shifting their customers' deposits.

In the following analysis, the 50 largest banks in Europe are referred to by the numbers appended to their names in Appendix II-f¹⁷. No distinction has been made between countries which have already signed up for the single currency, those which will probably join EMU in the not too distant future (Great Britain, Denmark and Sweden), and those which have decided to remain outside (Switzerland).

¹⁵ Cf. Basle Committee on Banking Supervision 2001: 1.

¹⁶ The balance sheets for the large European banks are summarized in Appendix II.

¹⁷ WGZ-Bank (# 54) – listed in Appendix II-f – is not one of the largest European banks.

2.1. Factor Analysis of balance sheets

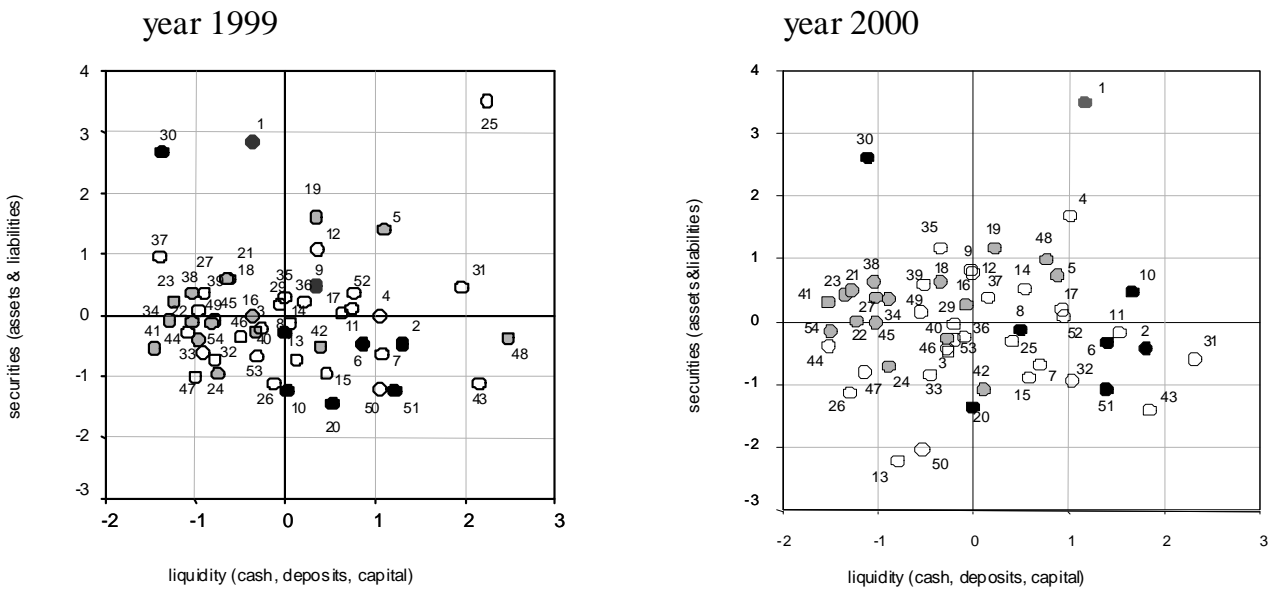
A factor analysis was conducted in which normalised key data from large European banks were reduced to two factors. Where there is a large number of interdependent variables (e.g. balance sheet items) of different objects (e.g. banks), a factor analysis can be used to extract certain underlying independent factors, thereby reducing the number of explanatory variables. The correlation between these factors and the original variables yields the “factor loadings” presented in the Varimax-rotated factor matrix in Table 1 for the years 1999 to 2004 in Appendix I. The coordinate axes in figures 2 to 5 represent mean values of the factors obtained for the sample that was selected. For details, see Appendix I.

For the years between 1999 and 2004 our analysis of balance-sheet items always yields two factors, which are different in their components.

For the years **1999** and **2000**, *Factor 1* was interpreted as **liquidity** (B, d_{nb}, c) and *Factor 2* as **securities** (s_a, s_l). As can be seen from Figure 2, securities play a prominent role in cases where bank loans to non-banks have to be refinanced. It should, however, be borne in mind that the German banks (light shading) include many *Landesbanken*, which act as central banks for Germany’s *Sparkassen* (savings banks), and which traditionally rely heavily on securities in issue as a source of refinancing. – In order to provide additional information, British banks are denoted by black dots and Swiss banks by dark grey dots.

The variable capital c – which is a component of *Factor 1* in the years 1999 and 2000 – serves as a constraint when banks offer loans to customers, reflecting the impact of *Basle Accord I*. *Factor 1*, therefore, can be described as “liquidity of first order”. Both, securities (assets) and securities in issue (liabilities) or *Factor 2* respectively, might be seen as the modern version of refinancing, or: “liquidity of second order”.

Figure 2: The refinancing methods used by Western European banks, 1999 and 2000



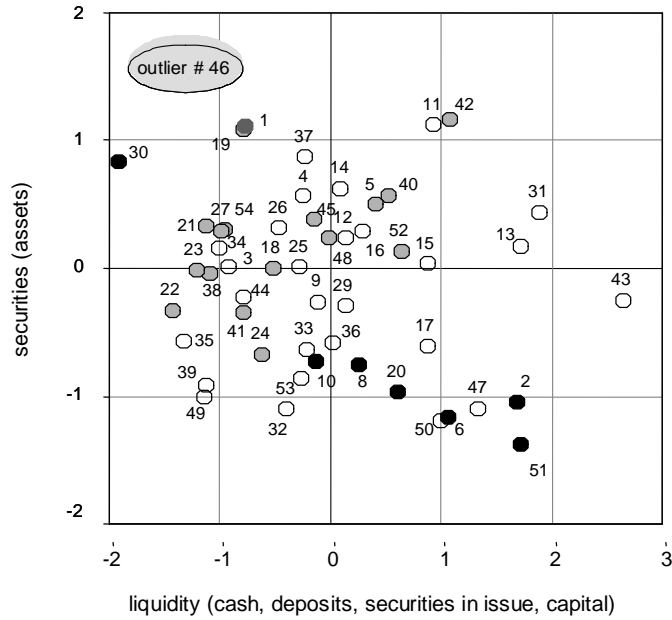
Source: The author's own calculations based on data provided by the 50 largest European banks

Apart from some outliers, most of the banks under observation are grouped around the average of both factors (zero-lines of the co-ordinates).

When *in 2001* banks began to prepare for *Basle Accord II*, they had to take precautionary measures. Securities in issue (liabilities) s_l remained a liquidity item for refinancing credits, whereas securities (assets) now served as a precautionary risk item. Capital c continued to serve as a constraint when offering loans (*Basle Accord I*), but became increasingly a risk item (*Basle Accord II*). Therefore, in Figure 3 *Factor 1* now includes cash, deposits, securities in issue as well as capital and was interpreted as “liquidity” (B, d_{nb}, s_l, c). *Factor 2* is represented only by securities (s_a).

Surprisingly, nearly all British banks refinance their credit supply via securities (assets) below the average level.

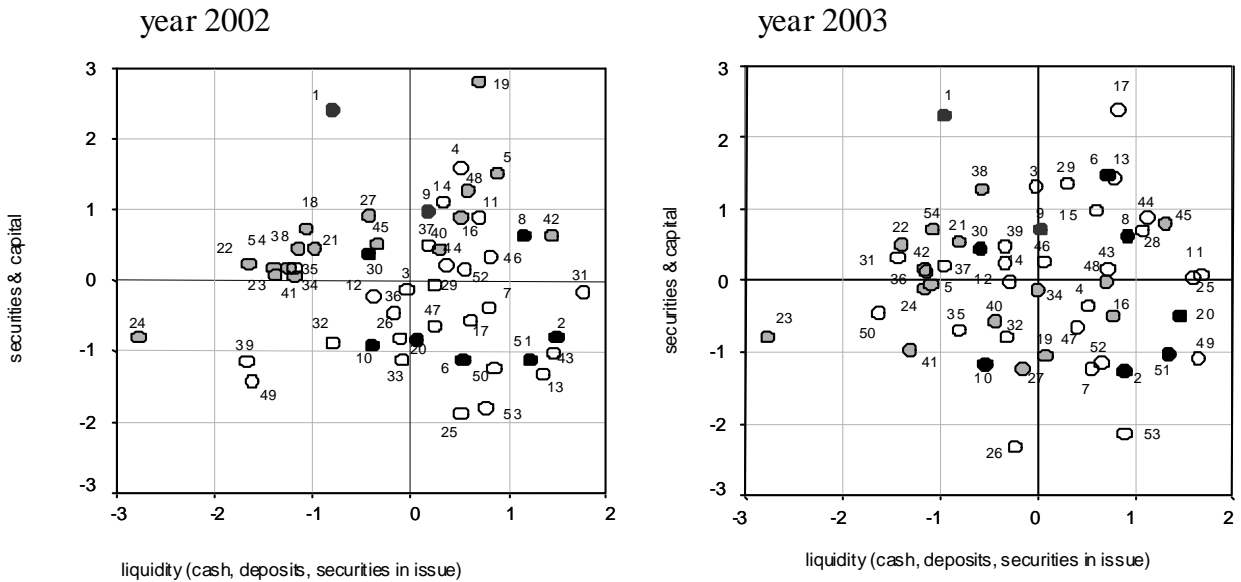
Figure 3: The transition period in 2001



Source: The author's own calculations based on data provided by the 50 largest European banks

This development was consolidated in the years 2002 and 2003, so in Figure 4 *Factor 1* can be interpreted as “general liquidity” (B, d_{nb}, s_l) and *Factor 2* as a “precautionary risk item” (s_a, c).

Figure 4: The refinancing methods used by Western European banks, 2002 and 2003

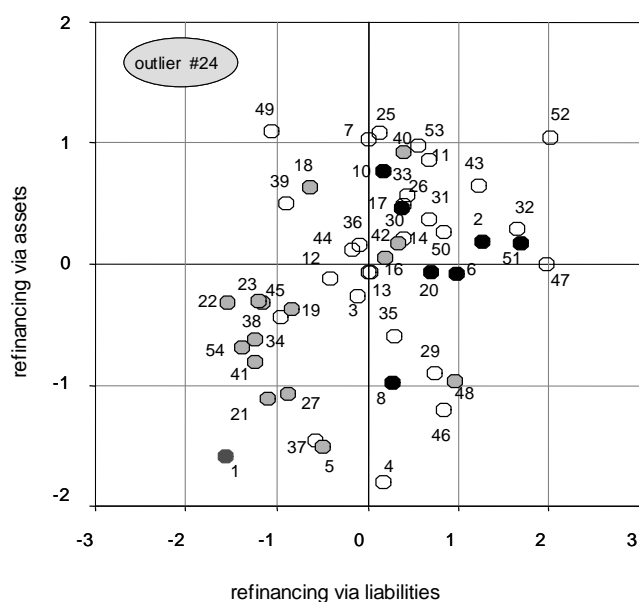


Source: The author's own calculations based on data provided by the 50 largest European banks

Even though *Factor 2* could be interpreted as a precautionary risk item, at the same time it also serves as a source of refinancing of the banks' credit supply.

In **2004** one can recognise a return to the traditional refinancing methods like Anglo Saxon-type and German-type.

Figure 5: The refinancing methods used by Western European banks, 2004



Source: The author's own calculations based on data provided by the 50 largest European banks

In Figure 5 *Factor 1* was interpreted as “liabilities” (c , d_{nb} , s_l) and *Factor 2* as “assets” (B , s_a).

When we compare the figures for 1999 until 2004, we see that the compositions of the two factors differ. In all the years under discussion, it were the balance-sheet items s_a and d_{nb} that had the same significance for the banks. The other items changed their relevance for the banks' activities; this was true especially for item c . One reason for this change is that European banks had to prepare for *Basle Accord II*. Furthermore, the banks' balance sheet structure will no doubt be modified by disintermediation and developments in the capital markets.¹⁸

¹⁸ Cf. Belaisch/Kodres/Levy/Ubide 2001: 38.

Summary: All the banks are now increasingly refinancing their credit supply by items not directly subject to monetary control. Whichever type of security banks opt for, the quantity of money more and more remains almost uninfluenced. In the case of debt securities in issue, however, the quantity of money only remains uninfluenced if the original duration of the securities exceeds two years.

2.2. A Graphical Representation of Income Statements

In order to identify business trends, we analysed income statements submitted by the 50 largest European banks. The focus of our analysis was on their net interest income (interest income minus interest expenses) and their net commission income (commission income minus commission expenses). All data were normalised by the volume of assets indicated in the balance sheets.

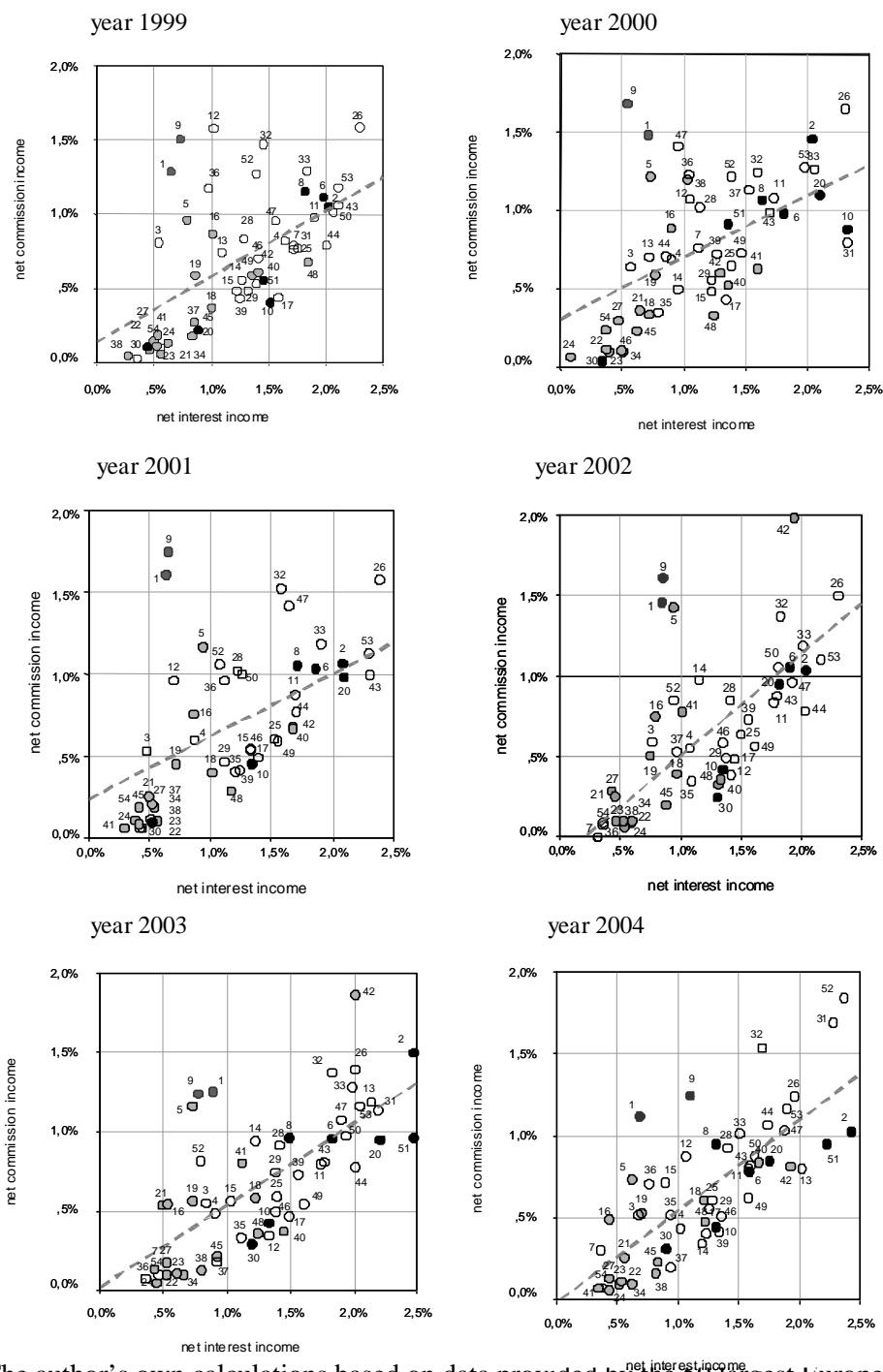
The relevant numbers for the *period 1999 until 2004* are plotted in Figure 6, in which the broken lines represent an adjustment-line for the observed banks. Our analysis shows that at present, as far as banking profits are concerned, net interest income remains of greater significance.

Additionally, Figure 6 reveal a slight, but noticeable change in favour of net commission income compared with net interest income during the time period of 1999 until 2004, with an outlier already in 2002. And almost all German banks are grouped in the lower left hand corners of the graphs in Figure 6.

The two types of income are the components of banks' credit terms, i.e. (1) net interest obtained during the refinancing process, and (2) revenues from consulting and from providing assistance to customers wishing to raise funds in the capital markets (i.e. profits derived from the securitisation process). Competition will force the banks to offer a wider range of off-balance sheet services in order to boost commission earnings.

Figure 6: Business trends according to income statements for the years 2002 and 2003

Note: All figures are percentages of total assets



Source: The author's own calculations based on data provided by the 50 largest European banks

Summary: When Western European banks want to refinance their credit supply, they resort increasingly to disintermediation. Consequently, even if - as a theoretical example - the

assets in the banks' balance sheets were in line with minimum reserve requirements, the central bank's ability to exercise monetary control would be severely limited.¹⁹ As time progresses, attempts to control the quantity of money will become increasingly ineffectual.

3. Consequences for monetary policy

There is little doubt that small banks with a local market will survive within the European banking market, and central banks will continue to focus their efforts on them as an object of monetary targeting. Nonetheless, small banks will have no choice but to adapt to the activities of larger banks.

In Europe, these large banks are working towards three objectives: (1) cost-cutting²⁰, (2) diversifying their services, and (3) increasing equity capital. On the one hand, the activities in question pose a threat to banks by inducing them to accept a higher level of risk²¹. On the other hand, they offer certain advantages, since increased diversification makes bankruptcy less likely²².

When banks diversify, they seek to achieve two goals: (a) increased refinancing (of their credits) by means of assets and (b) shifting the burden of financing onto the capital market. Consequently, a very broadly defined money supply (M3), consisting of the credit institutions' liabilities, becomes less efficient as an instrument of monetary policy.

The mainstays of ECB monetary policy used to be the monetary target²³ and the Eurosystem's internal inflation forecast²⁴. In May 2003, however, the ECB adopted a new two-phase policy. The first phase is an economic analysis designed to identify short-term to medium-term risks to price stability, while the second phase is a monetary analysis which takes account of variations in a wide range of monetary indicators, including M3, its components and

¹⁹ Cf. Borchert 2002: 57-59.

²⁰ This is especially true of small credit institutions.

²¹ They imagine they are too big to fail.

²² Cf. Mishkin 1999: 680 and 686.

²³ The monetary target was considered as an indicator, not an intermediate target.

²⁴ Cf. Rudebusch/Svensson 1999: 17.

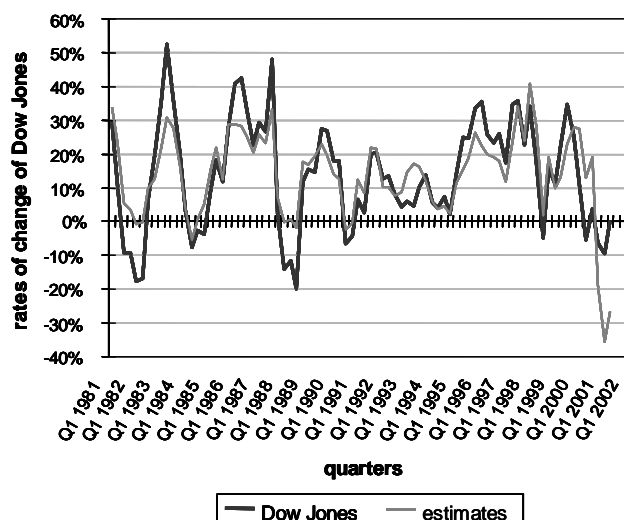
counterparts, notably credit, and various measures of excess liquidity²⁵. This was a fundamental change in monetary strategy!

It should, however, be emphasised that “monetary policy works not just through its direct effects on interest rates, but also through its effects on other asset prices.”²⁶ A rise in asset prices tends to be accompanied by monetary and credit growth.²⁷ For example, an expansionary monetary policy reduces stock prices by raising the expected equity premium.²⁸ In a country like the U.S.A., movements in the Dow Jones index (DJ) can therefore be assessed with some degree of accuracy by the amount of liquidity within the banking sector (M3-M1) and beyond it (FA-(M3-M1)), with FA = total financial assets:

$$(3) \text{ DJ} = f((\text{M3-M1}), (\text{FA}-(\text{M3-M1}))) \quad \text{with} \quad r^2 = 0,66.$$

The development of the Dow Jones Index during the last 25 years is represented in Figure 7 together with its estimates according to equation (3).

Figure 7: Variability of Dow Jones-Index



Source: The author's own calculations based on data from Datastream

²⁵ Cf. ECB 2003: 8.

²⁶ Mishkin 2001: 9. According to an empirical investigation conducted by the Deutsche Bundesbank (2002: 49), the same seems to be true for Germany.

²⁷ Cf. Jaeger 2003: 28.

²⁸ Cf. Bernanke/Kuttner 2004: 33.

Up to the present, there is no clear evidence to suggest that a similar connection exists between EuroSTOXX and liquid assets inside and outside the banking sector in Western Europe.

Monetary policy, therefore, ought to react not so much to changes in the quantity of money, but must consider additional factors influencing price stability, especially stock-prices as well as private-sector expectations of the future paths of inflation, output, and the interest rate²⁹.

If commercial banks continue to refinance loans via assets and to provide assistance to customers wishing to raise funds in the capital markets, the appropriate way for the ECB to influence investment financing, securitisation via monetary policy will be to resort to some sort of inflation targeting³⁰, which might be best described as »constraint discretion«.³¹ However, central banks should not rely on only one strategy. It is possible that different measures might be implemented depending on the ultimate source of inflation,³² which might be exhibited by an inflation forecast. Be that as it may, “the uncertainty associated with the introduction of the new currency should provide an argument for relying less, rather than more, on monetary aggregates as indicators.”³³

²⁹ Cf. Svensson 2005: 2.

³⁰ Cabos et al. conducted a regression analysis for Germany which shows that inflation targeting yielded more reliable results than monetary targeting for the period 1970-1997. Cf. Cabos/Funke/Siegfried 2001: 231.

³¹ Cf. Mishkin 2004: 121.

³² Cf. Issing 2001: 284.

³³ Svensson/Woodford 2003: 2.

Appendix I: The Principles of Factor Analysis

Factor analysis is a statistical technique designed to reduce a set of observable variables to a small(er) number of latent factors. The underlying assumption is that there are a number of unobserved variables (so-called *factors*) that account for correlations among observed variables. If this assumption is correct, each observed variable (y) can be expressed as a weighted composite of a set of latent factors (f).

This concept is formalised in the following system of equations:

$$y_1 = a_{11} f_{11} + a_{12} f_{12} + \dots + a_{1n} f_{1n} + e_1$$

$$y_2 = a_{21} f_{21} + a_{22} f_{22} + \dots + a_{2n} f_{2n} + e_2$$

...

$$y_m = a_{m1} f_{m1} + a_{m2} f_{m2} + \dots + a_{mn} f_{mn} + e_m.$$

Assuming that the residuals (e) are uncorrelated with any of the observed variables, the correlations among the observed variables are accounted for by the factors (f). Since the main purpose of factor analysis is data reduction, a precondition is $n < m$.

In order to obtain significant results, it is advisable to implement the factor analysis as follows:

(1) Selecting a factor model: In the present case, the most useful technique is *principal component analysis*. The purpose of this procedure is not to ascertain causes, but to reduce variables to a common denominator. The communality estimate³⁴ for a variable is therefore assumed to be 1.

(2) Determining the number of factors: The decision is ultimately subjective. From the economic perspective, there is one important requirement. It is necessary to be able to interpret the factors. If one wishes to verify a theory which suggests a certain number of factors, a factor analysis should be carried out with the prespecified number of factors. These factors should have an eigenvalue greater than 1 (*Kaiser-Guttman rule*).

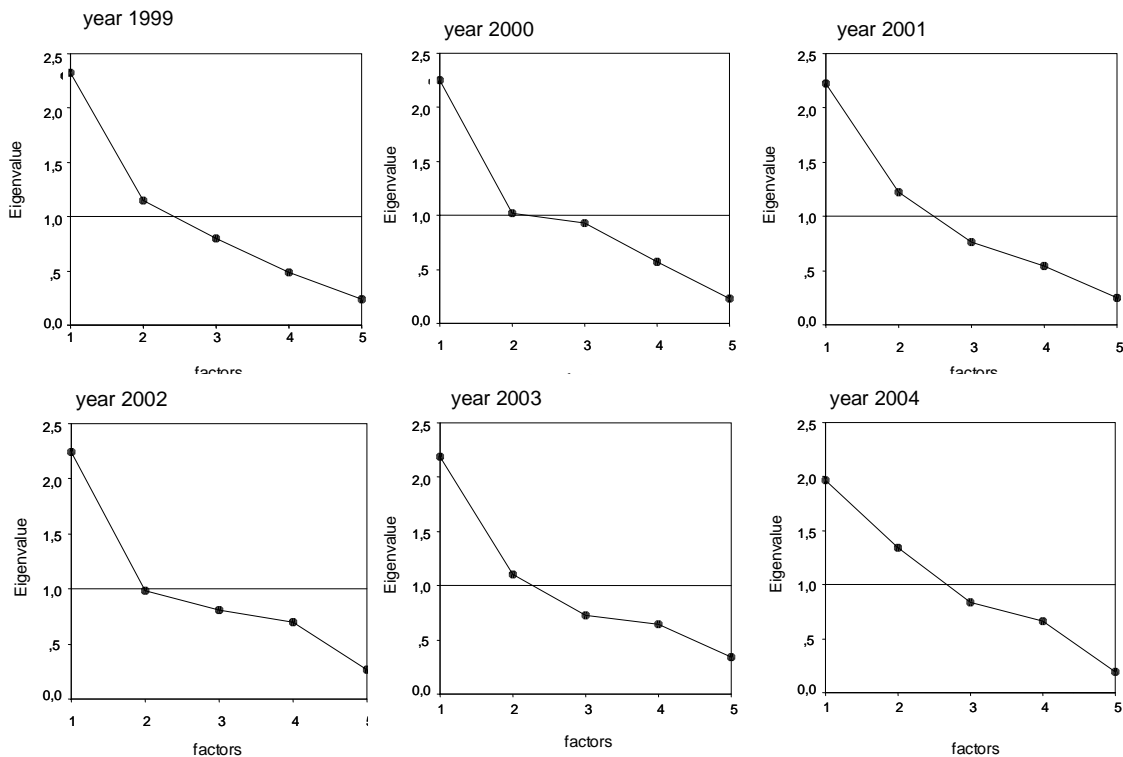
³⁴ By *communality estimate* we mean the approximate calculation of the proportion of the variable's variance which is free of error and which is shared with other variables in the matrix.

(3) Factor rotation: The concept of data reduction provides the most common basis for rotation. The aim is to rotate the factors simultaneously in order to obtain the greatest possible number of zero loadings on each factor. The rotation method used in the present study is the simplest one, namely an orthogonal rotation in which the angle between the reference axes of factors is maintained at 90 degrees (*Varimax rotation*). The *factor loadings* of the rotated area emerge at the end of this process.

(4) At the final stage of the operation, the factor matrix shows how the variables are related to the factors.

A factor analysis was carried out as a *principal component analysis* in which the key figures of the major Western European banks were reduced to certain factors. The scree plots in Figure 8 suggest that two factors should always be extracted.

Figure 8: Scree plots



According to the Kaiser-Guttman-rule, the factors should have an eigenvalue greater than 1.

This applies to two factors in all graphs of Figure 8. The correlation between these factors and the original variables gives us the *factor loadings* represented in the Varimax rotated factor matrix in Table 1.

Table 1 Rotated factor matrix ^{a)} <i>balance sheet items</i>	1999		2000		2001		2002		2003		2004	
	factor		factor		factor		factor		factor		factor	
	1	2	1	2	1	2	1	2	1	2	1	2
equity capital <i>c</i>	.666	-.056	.838	.053	.620	-.556	.470	-.565	.400	-.646	.585	.325
non-bank deposits <i>d_{nb}</i>	.789	-.440	.684	-.576	.882	-.246	.796	-.398	.743	-.425	.900	.117
cash & central bank deposits <i>B</i>	.818	.221	.576	-.143	.568	.419	.648	.108	.723	.206	-.157	.779
debt securities in issue <i>s_l</i>	-.588	.676	-.266	.825	-.830	-.111	-.812	.114	-.808	.183	-.838	.301
securities <i>s_g</i>	.083	.900	.044	.814	.019	.846	.073	.886	.115	.844	-.255	-.741

Extraction method: analysis of main components

Rotation method: Varimax with Kaiser-normalisation

^{a)} the rotation converges after 3 iterations

The absolute values of the factor loadings assign the various variables to factors 1 and 2 (bold figures). These factors, of course, still have to be interpreted in economic terms. The correlation between these factors and the objects (banks) yield the *factor values* in Figures 2, 3, 4 and 5. The zero lines in these figures represent the mean values of the two factors in question.

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