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True and Fair View of German Banks' Profits from the Trading Book?

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True and fair view of German banks' profits from the trading book?

A theoretical analysis of their accounting options and an empirical analysis of their reporting

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Abstract

For a number of banks, speculative trading is a relevant source of profits and risks. In order to improve the information of owners and creditors about these activities, German banks are obliged to report the net gain/loss from trading (NaF).

Firstly, we show by theoretical examples that several accounting options and rules (assignment of securities to categories with differing valuation rules, different treatment of interest income and capital gains, portfolio valuation) allow banks to shape their NaF as desired (within certain bounds).

Secondly, an empirical analysis of 102 German banks of all types reveals that little, if any, information is supplied in the annual report which would help to get a more transparent picture of the composition of the NaF and the risks involved.

Since neither the NaF as such nor the banks' reporting give a true and fair view of the trading activities, we advocate changes of the current rules.

1 Introduction

Financial distress in a number of non-negligible cases has generated considerable interest in banks' own speculative trading activities. Depositors, owners, and other investors, will often use the annual report as a natural device in order to find out about the success and the risks of a bank's trading activities.

In 1993, the German legislator has introduced "Nettoertrag/Nettoaufwand aus Finanzgeschäften" (net income/expenses from financial transactions; henceforth NaF) to increase transparency of the trading business. In the present paper, we shall examine whether this approach (together with the voluntary reporting by banks) has been successful in the sense that sources of profits and losses in trading as well as the risks taken are well visible. Our analysis will focus on bonds and interest rate derivatives because they are the most important objects of German banks' trading.

In Section 2, we will show that a number of ways exist which allow banks to shape their NaF (within certain bounds) as desired. Consequently, merely introducing the NaF as such does not suffice to reveal the actual profitability of trading.

Thus, we examine (Section 3) 102 annual reports from different segments of the banking sector in Germany. Our objective is to find out whether the banks provide additional pieces of information which together with the published figures give a true and fair view of their trading activities.

In a nutshell, we may say that the reporting in general is insufficient. Hence we conclude in Section 4 with a few remarks on changes the regulators might want to consider.

2 Ways to shape the NaF

2.1 Shifting profits between NaF and interest income

In Section 2 we will examine the most important means banks have at their disposal to shape the NaF according to their liking. We start with possibilities that arise from the existence of different income categories.

Trading activities in securities, other financial instruments (e.g. derivatives), foreign currencies, commodities etc. influence the NaF (see § 340 c HGB). In detail, the NaF is composed of the following ingredients: realized profits and losses from the trading activities, depreciations and appreciations of the securities of the trading portfolio, provisions to and reversals of the reserves for pending transactions with derivatives.

Interest income is not included in the NaF but in a separate position.¹ Interest payments from swaps, however, are included in the NaF because trading swaps with an interest rate component means that it is the interest which is traded.²

Differentiating between interest payments and changes in market prices yields a first tool to shape the NaF: buying bonds above par and holding them to maturity will inevitably yield a loss in market price if repayment is at par. Vice versa, buying bonds below par will yield a profit at the expense of lower interest income.

The following stylized example makes explicit how income can be shifted between NaF and interest income: Suppose a bank wants to invest 200.000 DM for about two years.³ It can either buy a two-year bond X with a coupon rate of 5,08 % or a portfolio Y consisting of a one-year bond Y_1 (5,04 % coupon) and a three-year bond Y_2 (5,14 % coupon). The securities can be bought at par and will be repaid at the date of maturity at par, too.

For reasons of comparability, the interest rate risk of the investment alternatives should (at the time of purchase) be the same. Hence, the shares of Y_1 and Y_2 in the portfolio Y must be such

¹ Cf. *Bundesregierung* [1990], p. 20.

² Cf. *Bundesverband deutscher Banken* [1993], p. 72.

³ Note that this time horizon is quite long for a trading activity but simplifies the presentation.

that its duration equals the duration of the bond X.⁴ The effective duration of this bond D_X is calculated as follows:⁵

$$D_X = \frac{1 \cdot 10.160 \cdot 0,95201828 + 2 \cdot 210.160 \cdot 0,90563140}{10.160 \cdot 0,95201828 + 210.160 \cdot 0,90563140} \approx 1,95.$$

To determine the shares of the bonds Y_1 and Y_2 in a portfolio with the effective duration of the bond X we solve the following linear equations:⁶

$$(1) \quad D_Y = D_{Y1} \cdot a_{Y1} + D_{Y2} \cdot a_{Y2} = D_X$$

$$(2) \quad a_{Y1} + a_{Y2} = 1.$$

Because of $D_{Y1} = 1$ and $D_{Y2} \approx 2,86$, we obtain $a_{Y1} \approx 48,72\%$ and $a_{Y2} \approx 51,28\%$.

In order to isolate the pure accounting differences of the two alternatives, we exclude effects of manifestations of interest rate risk. This is achieved by assuming that the future spot rates equal the implicit forward rates which can be derived from the initial term structure of interest rates. The resulting cash flows (always at the end of the period), interest incomes and NaFs of the two alternatives are shown in Table 1.

⁴ The duration of a bond gives that time period at the end of which the bond is immune from initial changes of interest rates. Cf. *Walz/Gramlich* [1991], p. 211.

⁵ As in our example the term structure of interest rates is non-flat (different from the assumptions of the original concept of duration), we have to calculate the so-called effective duration. Cf. *Bühler/Hies* [1995], p. 113.

⁶ For the calculation of the duration of a portfolio and the proof of linearity cf. *Kruschwitz/Schöbel* [1986], p. 607 f.

Period	0	1	2
Bond X			
Cash flow X	-200.000,00	10.160,00	210.160,00
Reinvestment		-10.160,00	10.680,40
✦ Cash flow	-200.000,00	0	220.840,40
Interest income		10.160,00	10.680,40
NaF		-80,00	80,00
✦ Income		10.080,00	10.760,40
Portfolio Y			
Cash flow Y_1	-97.429,82	102.340,28	
Cash flow Y_2	-102.570,18	5.272,11	5.272,11
Reinvestment		-107.612,39	113.124,34
Sale proceeds Y_2			102.443,95
✦ Cash flow	-200.000,00	0	220.840,40
Interest income		10.182,57	10.784,07
NaF		-102,57	-23,67
✦ Income		10.080,00	10.760,40

Table 1: Cash flows and incomes of bond X and portfolio Y

The cash flows of the securities at the end of the period 1 are reinvested for one year at 5,12 %⁷. At the end of period 2 the bond Y_2 is sold at its actual market price (the one-year interest rate being 5,27 %). Comparing the alternative investments we see that the sums of the cash flows in each period are equal, just as the sums of the incomes. But there is one important difference: The NaF and the interest income are not the same. The interest income of the portfolio Y is higher whereas the NaF is lower in each period.

Thus, we get a first noticeable result: Although the initial effective durations of two investment alternatives with same incomes and cash flows in each period are equal and even no interest rate risk is included, different interest incomes and NaFs are possible.

⁷ The interest rates in the text are rounded, whereas the entries in Table 1 are calculated without rounding.

2.2 Shifting profits between periods

We have just shown that profits can be shifted between different categories, namely NaF and interest income. Our next example demonstrates how profits can be shifted between time periods. Buying a bond at par, book values according to the German rules will never rise above par. In particular during periods with significant increases in interest rates bond portfolios will be depreciated. Those parts that belong to the trading book will then imply negative contributions to the NaF. Since bonds are commonly repaid at par, however, there then will be a capital gain at the date of maturity, i.e., a realized profit from trading.

But there is even more scope for shifting profits between periods. Suppose some security has been depreciated in the past such that its actual book value is below the purchasing price. If now the market price increases then the bank may choose whether to increase the book value to the new market price if that is below the purchasing price. Since this revaluation is not compulsory (see § 340 a HGB in conjunction with § 280 II HGB), banks may lay hidden reserves which can be used later to improve the NaF in periods where trading was not very successful. The following example shows the effects in numbers:

Let us have a closer look on the NaF of a three-year bond with a fixed interest rate⁸ of 6 % and a face value of 100.000 DM. The repayments of this bond (again at the ends of the respective periods) are shown in Table 2.

Date [t]	1	2	3
Repayment	6.000,00	6.000,00	106.000,00

Table 2: Repayments of the bond

At date 0 the interest rates $i(0,T)$ shown in Table 3 can be observed on the capital market. To analyze the influence of the future interest rates on the NaF we consider two scenarios (see Table 3). In scenario A the term structure of interest rates will be inverse on a higher level at date 1 and afterwards go back almost to the original level but becoming nearly flat. In scenario B the interest rates will rise about 1 % in period 1 and then fall again, making the term structure steeper.

⁸ Henceforth the interest rates are always coupon rates of bonds issued at par, with periodical interest payments and full repayment of the principal at the date of maturity.

Periods to maturity [T]	1	2	3
$i(0,T)$	5,00 %	5,40 %	5,80 %
Scenario A			
$i_A(1,T)$	6,00 %	5,90 %	5,70 %
$i_A(2,T)$	5,30 %	5,40 %	5,50 %
Scenario B			
$i_B(1,T)$	6,00 %	6,50 %	6,90 %
$i_B(2,T)$	5,30 %	5,90 %	6,40 %

Table 3: Interest rates at dates 0, 1 and 2

The interest rates are chosen this way for the following reason: We wanted to generate equal interest incomes in both scenarios. Therefore, we have chosen $i_A(1,1) = i_B(1,1)$ and $i_A(2,1) = i_B(2,1)$, allowing us to ignore interest income because in both scenarios the cash flows at dates 1 and 2 are reinvested at equal one-year rates. The second condition also implies that the market prices of the bond at date 2 are the same for both scenarios. Knowing the interest rates, we can namely calculate the market prices (= present values of the repayments)⁹ of the bond at dates 0, 1 and 2:

Date [t]	0	1	2
Market price _A	100.539,20	100.183,51	100.664,77
Market price _B	100.539,20	99.087,61	100.664,77

Table 4: Market prices of the bond (after interest payment)

Depending on the scenario, the NaF of period 1 will be different. For either case, however, we can also see what differences of the NaF in the periods 2 and 3 will appear depending on the (voluntary) appreciation at date 2. Furthermore, the NaF in period 2 (in the case with appreciation) respectively 3 (in the case without appreciation) will be different between the scenarios although only the market value at date 1 is different.

The bond is bought at date 0 at the market price for 100.539,20 DM. By comparing the market prices of dates 0 and 1 we get the changes in value of the bond. In the first period the market price decreases in both scenarios (see Table 4). Hence, a depreciation is necessary according to § 253 III 1 HGB. One period later, the market price has risen so much that it lies above the

purchasing price. Hence, an appreciation up to the purchasing price is possible. Subject to this appreciation the NaF is negative in period 3 because the repayment occurs at par. Without the appreciation the loss in period 3 is lower (scenario A) respectively a profit can be realized (scenario B) (see Table 5).

Period	1	2	3	Total
With appreciation				
NaF _A	-355,69	355,69	-539,20	-539,20
NaF _B	-1.451,59	1.451,59	-539,20	-539,20
Without appreciation				
NaF _A	-355,69	0	-183,51	-539,20
NaF _B	-1.451,59	0	912,39	-539,20

Table 5: NaF of the bond during the periods 1 to 3

Notice that the total NaF is in each situation -539,20 DM, just the difference between the purchasing price and the repayment of the principal (see Section 2.1). Appreciations and depreciations lead to shifts of profits between time periods. The extent of these shifts depends on two factors. The future interest rates on the capital market determine the market values. The more the interest rates change, the higher the appreciations and/or the depreciations (in principle) are. For example, in the first period the interest rates increase to a higher level in scenario B than in scenario A. For this reason the appreciation in scenario B is higher. The other relevant factor is the possibility to appreciate the bond. By using this accounting option the bank can determine at what time and how far the changes of market prices influence the NaF (see the different NaFs for periods 2 and 3 in Table 5).

If the bank decides to sell the bond before maturity (a quite realistic situation in case of trading activities) realized profits/losses instead of appreciations/depreciations will influence the NaF. The profits may exceed the appreciations because they are not limited by the purchasing price. If the bond is sold, e.g., at date 2, a profit of 481,26 DM (scenario A) respectively 1.577,16 DM (scenario B) will be realized. (The differences to the case with appreciation are exactly the differences between market prices at date 2 and purchasing price.)

⁹ For the reasons why the market price equals the present value and for the underlying assumptions cf. *Schulte* [1996], p. 33, footnote 136 and the recommended literature.

2.3 Assigning securities to different categories

So far, we have always assumed that a drop in the market price of a security will yield a reduction in its book value, i.e. a depreciation. Yet this is not true in general. Securities must be assigned on purchase to one of three categories:¹⁰

- securities classified as fixed assets,
- securities of the trading portfolio,
- securities of the liquid reserves.

Banks are basically free to choose the category according to the subjective purpose¹¹ for which the security is being bought. They can also change any assignment given they obey certain formal restrictions.¹² By changing the subjective purpose of a security they shift (future) profits and losses of this security to another position of the profit and loss account.

The implications for the NaF are twofold. Firstly, only the securities assigned to the trading portfolio are considered in determining the NaF. Secondly, for securities assigned to the fixed assets non-permanent depreciations can be avoided (see § 253 II 3 HGB). But there is a price to be paid for the latter: a remark that not all securities have been valued in strict accordance with the lower of cost or market principle has to be supplied with the financial report.

As a consequence, the possibilities to shift profits between different periods are even bigger than those shown in Table 5. The bank can change the subjective purpose of the bond and classify it as a fixed asset. Then it does not have to, but may depreciate the bond. In this case, we have got a combination of shifting profits and losses between positions of the profit and loss account and between periods.

2.4 Defining portfolios

There is yet another way how the NaF can be shaped. Securities and derivatives may either be valued separately or, under certain restrictions¹³, be valued jointly as a portfolio¹⁴. Suppose for example, the trading book contains a number of bonds, swaps, and other interest rate

¹⁰ Cf. *Bundesregierung* [1990], p. 22; *Krumnow et al.* [1994], p. 146 f.

¹¹ Cf. *Krumnow et al.* [1994], p. 138 f.

¹² Cf. *Bundesverband deutscher Banken* [1993], p. 94.

¹³ Cf. *Krumnow et al.* [1994], p. 367-377; *Walter* [1995], p. 186.

derivatives which are all denominated in the same currency. Long- and short-positions may partially offset each other, but no micro-hedge¹⁵ being involved. Interest rate changes may be such that some securities or other instruments will react with price increases, others with price decreases.

- If the single products are valued separately, then price decreases will have to be shown as a depreciation (i.e. a loss), whereas under the German law the increased market prices must not be shown. As a result, there will be a negative contribution to the NaF, even if the sum of the losses is smaller than the sum of the gains.
- If the portfolio is valued jointly, then some positive and negative price changes will cancel. As a result, there will be a smaller (if any) negative contribution to the NaF.

Up to now there has been no general agreement about the extent to which financial instruments may be jointly valued¹⁶ and whether this portfolio valuation of trading activities is optional or compulsory¹⁷ (at least for quite similar instruments).

So far, we have seen a number of ways how banks can shape the NaF (within certain bounds) according to their liking. If a reader of an annual report is interested in the performance of a bank's trading activities then this implies that the NaF alone is insufficient to supply a true and fair view. It is not only the case that our interested reader would not learn anything about the risks that were taken in order to achieve the shown NaF. It is also the case, that the NaF as such could have been "manipulated" by a clever use of the accounting options and rules given. In light of these gloomy prospects, we shall now ask whether banks voluntarily provide additional pieces of information in their annual reports which enable the readers to determine more accurately the actual trading success.

¹⁴ Cf. *Prahl/Naumann* [1991]; *Prahl/Naumann* [1992]; *Walter* [1995].

¹⁵ Cf. *Scheffler* [1994], p. 190-218.

¹⁶ Cf. *Krumnow et al.* [1994], p. 371 f. and 376 f.

¹⁷ Cf. *Happe* [1996], p. 205 f.; *Krumnow et al.* [1994], p. 366 and the recommended literature; *Walter* [1995], p. 187 f.

3 Empirical analysis of annual reports

In the summer of 1996 we contacted more than 100 German banks. Altogether 102 of them supplied their annual reports 1994 and 1995 which contained a NaF for both years (and in most cases by means of comparison also the NaF for 1993). We categorized the banks into five groups which are briefly described as follows:

GROSS: big commercial banks (Deutsche Bank, Dresdner Bank, Commerzbank, Bayerische Vereinsbank, Bayerische Hypotheken- und Wechselbank), the central giro institutions, the central institutions of credit co-operatives,

SPAR: savings banks,

GENO: co-operative banks,

PRIVAT: private bankers,

SONST: other commercial banks, instalment sales financing institutions, mortgage banks, public banks with special functions.

The distribution of the banks across these groups is depicted in Figure 1. Generally, our sample contains the biggest institutes (according to total assets) of the groups.

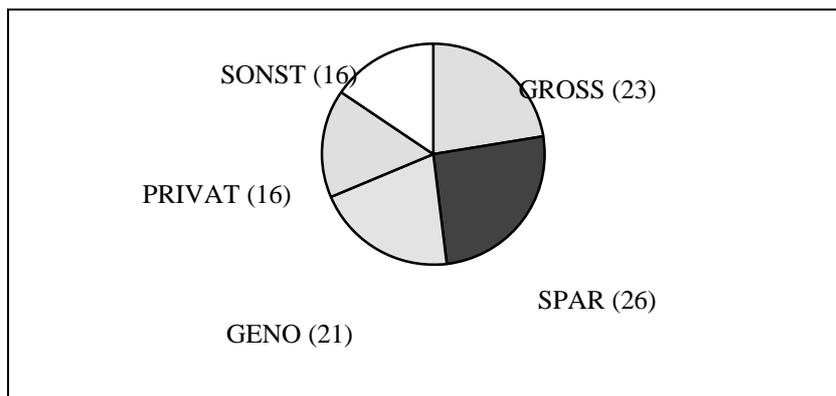


Figure 1: Composition of the sample

Using actual market data on bond yields and bond prices for different maturities,¹⁸ we have simulated the true profits and losses that would have resulted from three different trading

¹⁸ We supposed that the NaF is mainly influenced by trading activities with interest bearing financial instruments. The analysis of the annual reports showed that this assumption is quite realistic.

strategies.¹⁹ It turned out that in all cases the NaF for 1994 was negative whereas it was positive in 1995 (with a higher absolute value in 1995).

Of course, the sophisticated use of instruments other than bonds as well as good forecasts of the interest rates changes would have enabled banks to make positive profits in 1994, too. So there emerge two questions:

1. Do the reported values of the NaF have the same sign as the simulated ones?
2. Do the banks refer to the general market trend in order to explain their individual NaF?

The answer with respect to the first question is mixed. In 1994, 40 out of the 102 banks had a negative NaF, the other 62 had a positive NaF. Given the ways to shape the NaF described earlier, it is not unlikely that some institutes wanted to report a positive NaF and managed to do so by clever accounting. According to our simulation results, it was much easier to make profits in trading in 1995, and this is indeed revealed by 100 out of the 102 banks showing a positive NaF in 1995. As a side remark, the percentage of banks with a negative NaF in 1994 is very different among the groups. GROSS, SPAR, and PRIVAT range from 30 to 25 %, GENO is slightly below 50 %, and SONST is at 75 %.

Even most of the banks with a positive NaF in 1994 could not report of successful trading activities in this year because they had to accept a reduction of the NaF compared to 1993. The NaF of 91 banks decreased in 1994 whereas 89 banks achieved an increase of the NaF in 1995.

The answer with respect to the second question is mainly negative. In 1995 only little more than 50 % of the institutes explain the size or change of the NaF (see „Explanation“ in Figure 2). 8 % only mention the NaF without further explanation of its trend and about 35 % say nothing about the NaF.

¹⁹ Cf. *Homöller/Pfingsten* [1997], p. 25-27.

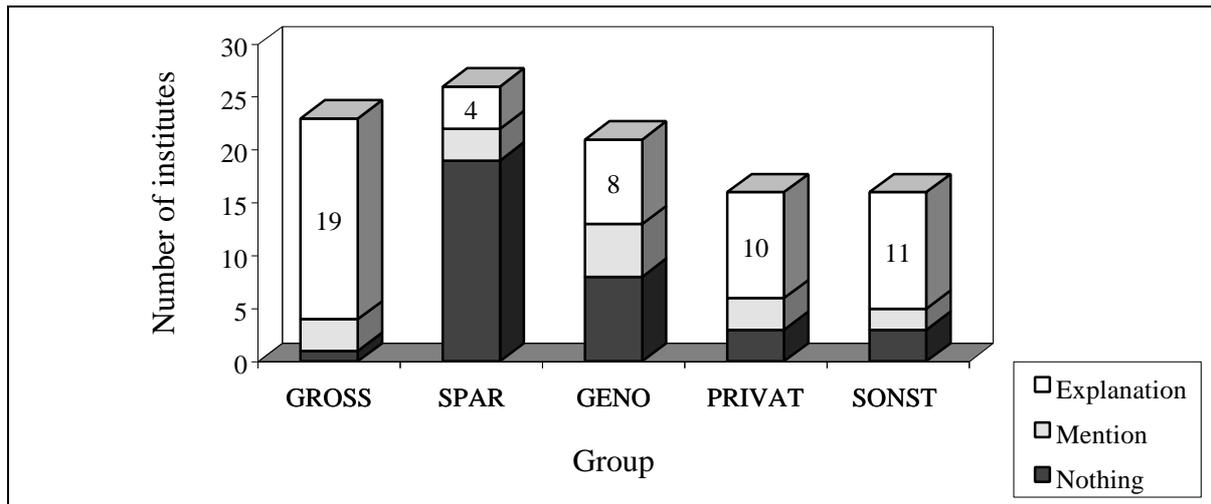


Figure 2: Explanation of the size or change of the NaF in 1995

As you can see in Figure 2 the percentage of those institutes which give the relevant information varies among the different groups. For 1994 we have got almost the same result; there are only some more banks which explain the trend of the NaF. Apparently they might feel the need to „apologize“ for the bad results.

No more than 38 institutes (out of the 52 banks with an explanation) comment on the size or the change of single components of the NaF. Some of them merely describe the change of one component.

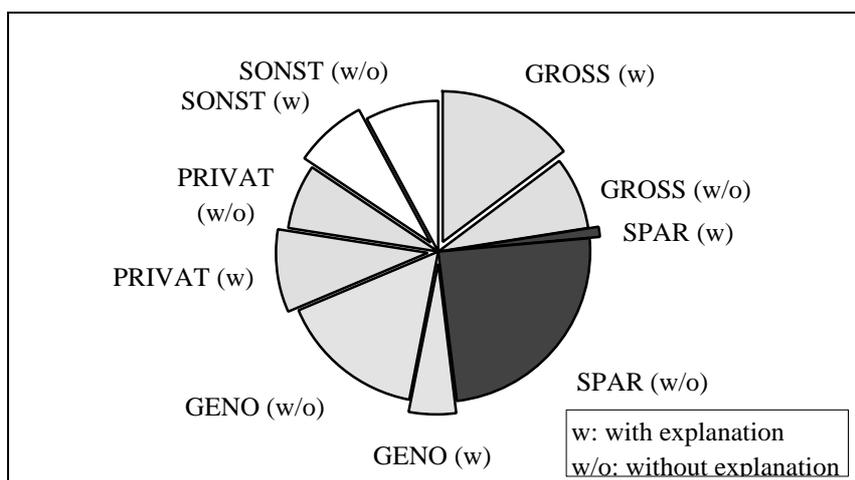


Figure 3: Explanation of the size or change of single components of the NaF in 1995

About 75 % (1994) and 50 % (1995) of the banks which give a comment on the size or the change of the NaF refer to the changes of the term structure of interest rates, the trend of the market of fixed-interest securities or the resulting depreciations and realized profits/losses.

However, less than 10 % of all banks use market data to clarify the variations in the NaF. This is very surprising since about 75 % of all banks are reporting market data (interest rates, stock prices, exchange rates etc.) somewhere in their annual report (see Figure 4).

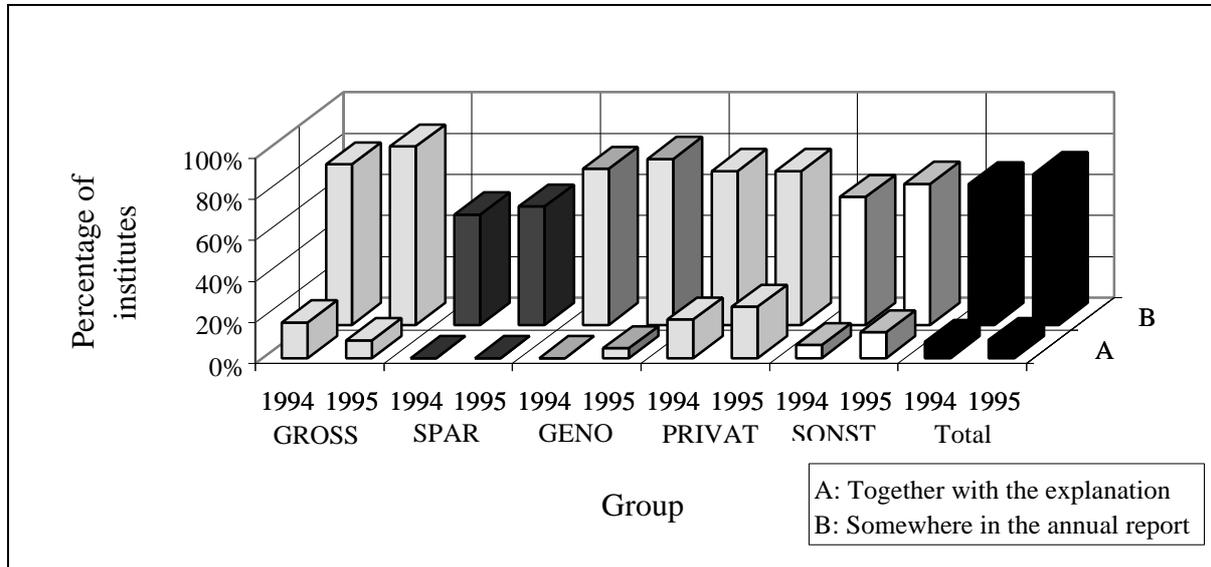


Figure 4: Reporting market data²⁰

Remarks on financial instruments used in trading as well as on types of risks encountered are also very limited. For example, in 1995 just 47 banks report a little bit about the products being used in trading. Sometimes the kind of financial instrument, e.g. bonds or shares, is only mentioned without further information about the size or the profits and losses.

Such information about the components of the NaF are supplied only to some extent in that part of the annual report (notes to the financial statements, management report) which is certified by the auditor (see Figure 5).

²⁰ Overlapping of both groups (A and B) is possible.

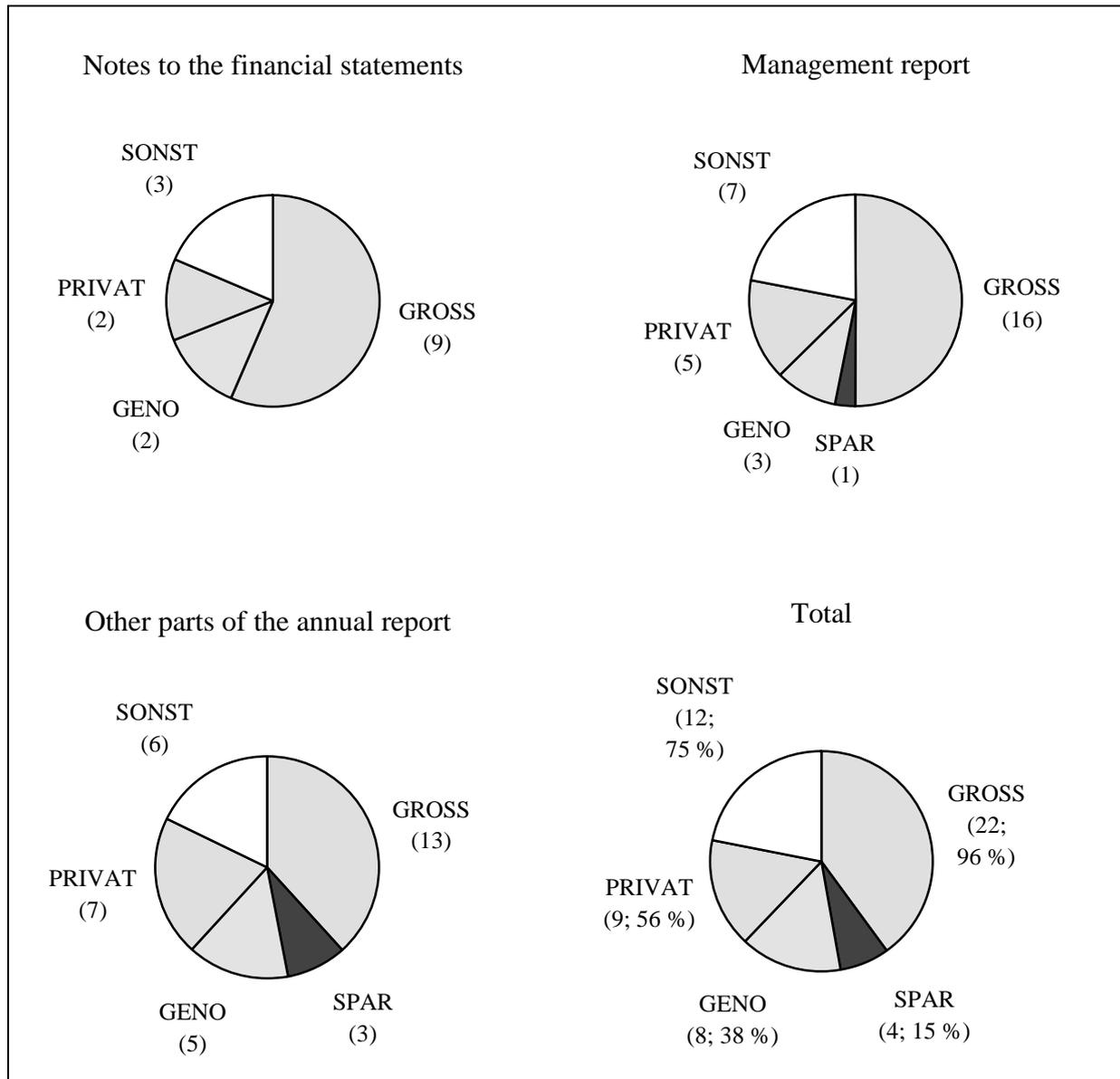


Figure 5: Parts of the annual report with remarks on the components of the NaF in 1995²¹

We have also examined the way in which these hints are given. It turns out that mostly verbal descriptions can be found, whereas numbers are only published in less than 20 % of the cases (see Figure 6).

²¹ It is possible that a bank provides some information in more than one part of the annual report.

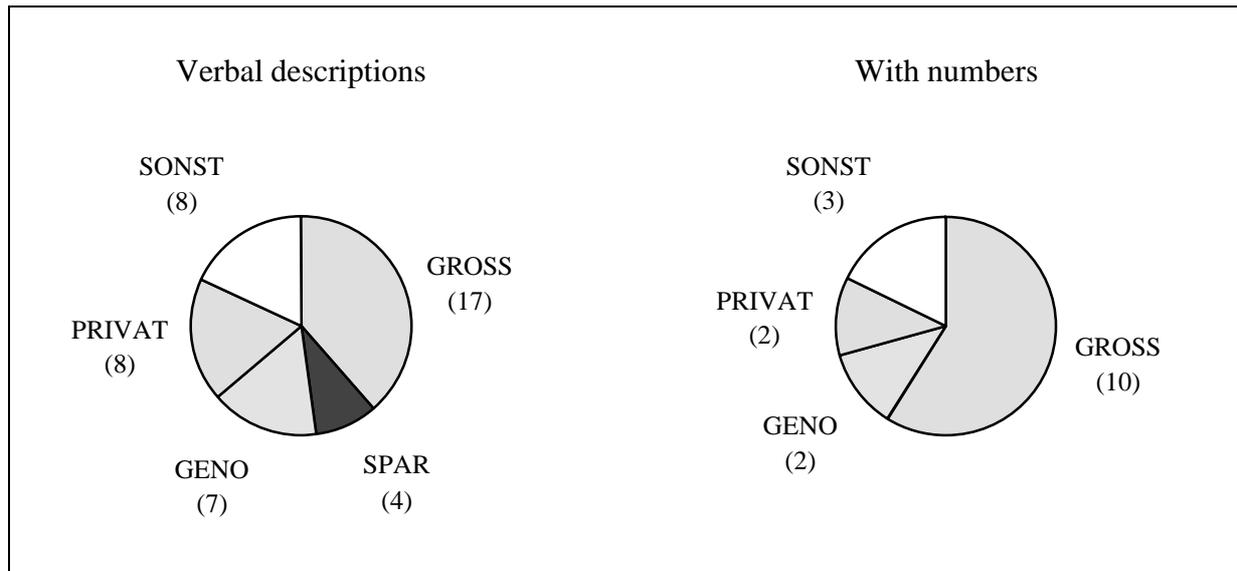


Figure 6: The kind of information about the components of the NaF in 1995²²

Success in trading cannot be determined from the NaF alone. One would also require that the size of the portfolio and its composition is revealed because the same net profit can be earned with a small portfolio with high risk or with a huge portfolio that carries relatively low risk. It is disappointing, however, how few banks inform their readers of the annual report about the size and composition of their trading portfolio. In 1994 only 4 and in 1995 only 8 out of 102 banks supplied quantitative information of the securities of the trading portfolio.

The riskiness of a trading book cannot be assessed by just comparing the size of the trading book with the net profit or loss made from it. As a measure of market risk banks tend to establish the value at risk.²³ The value at risk is the maximum amount of money which will be lost within a certain period of time (mostly ten trading days) at a certain confidence level (mostly 99 %). It turns out that 13 banks report the value at risk of their trading book by the end of 1995. One of these institutes also provides the average for the year 1995 as well as value at risks for different levels of confidence.

²² Some institutes give verbal descriptions and provide some numbers on another page of the annual report.

²³ For a critical comment cf. *Guthoff/Pfingsten/Wolf* (1997).

4 Summary

In the first part of our paper we have demonstrated how the published NaF can be shaped within certain bounds by

- shifts between interest income and profits/losses from changes in the market price,
- the use of options in the valuation rules,
- changes of the assignment of a security to one of the three categories and the clever use of the differences in the valuation rules for these categories.

Our empirical analysis of the annual reports revealed that the banks provide rather few additional, relevant pieces of information about the sources of the NaF. Mostly, the institutes do

- not include market data in the explanation of the NaF,
- not inform about the types of risks encountered,
- not reveal numbers of the size and composition of the trading portfolio.

The aim to provide more and better information by introducing the NaF could only partially be reached because of the above mentioned possibilities to shape the NaF. The limited reporting of the banks does not help to increase transparency of the success and risks of the trading activities.

The question whether more transparency should be required can be discussed controversially. In this paper we did not intend to comment on this problem. But if the legislator wants to make the trading activities of banks more distinct he should firstly modify the definition of the NaF (and of other positions of the profit and loss account). Secondly, the banks should be obliged to give a detailed and well structured analysis of the risks and the sources of the NaF. Last but not least, it could be worth to think about limiting the accounting options.

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