

ANALYSIS OF BANKS' INTEREST MARGINS

Agata Gemzik-Salwach¹

Abstract

The article concerns the possibilities to assess the effectiveness of bank services basing on an analysis of their interest margins, and its aim is to show the informational capacity of those measures. The first part of the article discusses theoretical issues related to setting various types of interest margins and on their basis specifying interest margin discrepancies. Then results of empirical research are presented which were conducted basing on the data from quarterly financial reports of selected WSE listed banks in 1998-2009. The analysis covered the shaping of all the discussed values in time, both for the bank sector as a whole and in relation to particular banks.

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Introduction

Effectiveness of bank interest services is undoubtedly of fundamental significance in assessing the bank's functioning, for it answers the question of the economic sense of the undertaken business activity in the given segment of the market. One of the ways to assess it is by analysing the values of interest margins obtained by the entity. If we adopt the conception of the bank as a financial agent, which conception seems to be more valid than the "production" one, it must be stated that the bank buys a right to temporarily administer surplus entity means only in order to sell them back to deficit entities. The bank behaves then in the same manner as any other subject offering agent services, for whom the basic source of income is the margin, i.e. the difference between (higher) sales price and (lower) purchase price of the goods. This income has to cover all costs of the agent's activity, suffice to cover expected losses (reserve for expected risk) and finally needs to be large enough to allow after the above some profit, for which the business activity is undertaken. Thus all the mentioned components compose the value of the interest margin, which reflects the effectiveness of the conducted activity.

This article attempts to assess the effectiveness of bank interest services basing on an analysis of interest margin values obtained by banks. "Interest services" are understood here as any financial instruments which serve the banks to obtain foreign funds and any products used to locate financial means. The aim is to show the informational capacity of interest margin in relation to that area of analysis. In research, data from financial reports of selected WSE listed banks in 1998-2009 were used.

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Research on interest services effectiveness

The main source of income for most banks is the income from interest rate difference, defined as income from interest diminished by interest cost². It is the main indicator of commercial bank interest services effectiveness (Kulińska-Sadłocha, 2003, p. 218; Marcinkowska, 2001, p. 19). Financing sources of low or even zero interest rate, e.g. demand deposits or capital, have an incommensurate influence on this category's value. They ensure means at a zero interest rate or even at a rate lower than the market rate, and thus increase the interest margin. Interest rate difference changes accordingly to the change of interest rates and so a bank which finances assets of variable interest rate basing on such a source is susceptible to profit amount fluctuations. If the assets and liabilities are administered reasonably in the process of their management they may contribute to considerably increasing profit. However, their recovery is often connected with non-interest costs, e.g. expenses connected with running bank branches. In a similar way, net interest income may considerably reduce unprofitable assets, like loans from which interest is not counted or not deducted (Baltrop & McNaughton, 1995, p. 17).

Net interest income is sometimes identified with the interest margin and is then defined as "difference between interest income gained from profitable assets and interest cost incurred on liabilities, expressed in money" (Grabczan, 1996, p. 21).³ Net profit from interest rate difference divided by the mean value of assets in total at the time of obtaining the profit gives the net interest margin:

$$\text{total interest margin} = \frac{\text{interest income} - \text{interest cost}}{\text{mean state of assets in total}} \cdot 100 \quad (1)$$

It is a direct effect of the bank's policy of calculating prices of the products, so the method of setting interest margin may be used to assess the effectiveness of such services. Alternatively, when calculating the interest margin of a bank, sometimes instead of assets in total the denominator of this index will have profitable assets, i.e. those which bring profit from interest or fees. These are mainly loans and bank's investments in securities.⁴ A thus defined value is the indicator of "pure" profit from the portfolio of profitable assets. A different type of interest margin is calculated when the bank's net interest income is expressed in percentage of interest income:

² Another important source of the bank's profits is net non-interest income, which is a difference between non-interest income and cost. Non-interest income usually covers various commissions and charges for using bank services, and non-interest expense mainly includes staff remuneration and other personnel expenses. In the recent years a tendency may be observed of increasing net non-interest income share in the bank's total net income.

³ It is also worth considering the difference between a thus understood interest margin and an interest spread. The latter category is defined as the difference between the interest rate obtained from the assets and the interest rate paid for the liabilities.

⁴ It is justified by the fact that net interest income should be related not to all assets of the bank but rather to those which actually generate it.

$$\text{total interest margin} = \frac{\text{interest income} - \text{interest cost}}{\text{interest income}} \cdot 100 \quad (2)$$

Presenting the net interest income in percentage of assets or interest income has the additional benefit of allowing – besides the monitoring of changes of the values’ trends in time – also to make comparisons of various banks. Interest margins undoubtedly form a source of the bank’s ability to generate surplus. They function as a factor strengthening the competitive position of the Polish bank sector (Wilkowicz, 1999).

The described methods refer to the effectiveness of bank interest services as a whole, and to examine benefits from the bank’s engagement in offering particular services and the effectiveness of particular bank units it is necessary to also perform an analysis specifying the financial result from particular transactions. The sum of those results makes the financial result for a service or a group of services, then the result for a customer or group of customers and the result for organisational units (branches and regions) (Iwanicz-Drozowska, 2005, p. 95).

A change of interest margin value may be caused by changes of interest rate levels, volume and structure of assets and liabilities of the bank (Dzida, 2001, p. 30). Analysis of bank interest margins may serve to define the banks’ scope of interest rate risk by specifying the rate discrepancy. To do that, we need to analyse the consequences of interest rate changes, assuming that the other two factors which may have an impact here remain unchanged. Thus while examining the degree to which the change of the net interest margin was caused by market rates fluctuations it first needs to be examined what the interest income would be if with the current structure and volume of the balance-sheet items the interest rates did not change and remained at a level from the previous period, and then compare it to the net interest income actually recorded at that time:

$$W_t = r_{At} \cdot V_{At} - r_{Pt} \cdot V_{Pt}, \quad (3)$$

$$W_{t'} = r_{At-1} \cdot V_{At} - r_{Pt-1} \cdot V_{Pt}, \quad (4)$$

where

- W_t = net interest income obtained in time t
- r_{At} = interest rate of profitable assets in time t
- V_{At} = volume of profitable assets in time t,
- r_{Pt} = interest rate of cost liabilities in time t,
- V_{Pt} = volume of cost liabilities in time t,
- $W_{t'}$ = net interest income which would occur in time t if interest rates remained unchanged,
- r_{At-1} = interest rate of profitable assets in the previous period,
- r_{Pt-1} = interest rate of cost liabilities from the previous period.

The measure of interest rate risk is rate discrepancy, understood as the difference between the real and the hypothetical net interest income:

$$R = W_t - W_{t'} \quad (5)$$

where R = interest rate discrepancy.

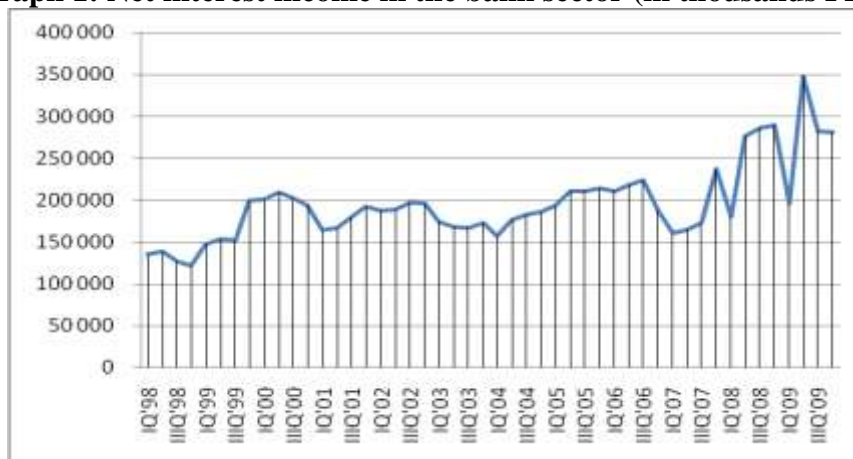
If the result is a positive value, it shows that the bank has recorded interest margin increase due to interest rate changes in the given time, and if the value is negative it means that the current interest margin is lower than the one which would occur if rates remained at the previous level. Thus understood rate discrepancy may be calculated as a total for the whole net interest income and it then defines the impact of the changes in the rates on the total margin of the bank or separately for each source and way of using the financial resources.

Research results for the Polish bank sector

The methods for assessing profit effectiveness presented above were used for an analysis of financial results of selected commercial banks in Poland. The results were first used to assess current interest services effectiveness allowing for risk of the bank sector as a whole and to compare particular banks, then to see how those dependencies shaped in time.

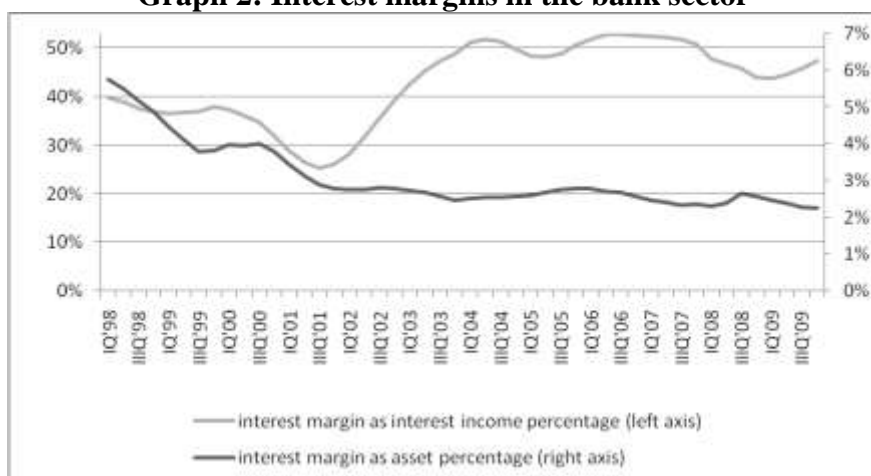
Already the first calculation results allow to pose first conclusions as to the profit effectiveness of interest services. Graphs 1 and 2 present how the interest margins describing it were shaping.

Graph 1: Net interest income in the bank sector (in thousands PLN)



Source: Own study

Graph 2: Interest margins in the bank sector



Source: Own study

In the analysed period the effectiveness of bank interest services measured with the net interest income and with the margin indices was changing. The mean net interest income in the bank sector was recorded at 195 532 thousand PLN, and the mean margin in relation to assets at the value of 3.08%, and 42.72% in relation to interest income. From the beginning of the analysis period to the end of 2001 interest margins in the examined commercial banks could be observed to narrow down practically for the entire period. An exception in that period was the turn of the year 1999/2000, when the interest margins slightly rose. This narrowing down of the interest margin, together with lack of cost reduction, became then the main cause for the bank sector profitability to fall. Since 2002 in Poland, like in many other EU countries, an increase of the net interest margin could be observed, calculated both in relation to the level of assets and of interest income. 2003 saw interest margins calculated in relation to the assets decrease, which was caused by a decrease of interest rates. At the same time interest margins calculated in relation to interest income successively grew.

From 2004 to 2005 better results could be observed as to the value of the net interest income and margin level calculated in relation to the level of assets, and a fall of the margin expressed in interest income percentage. The reason for net interest income increase was the increase of net interest rates in operations with the financial and budget sectors. Higher net interest income from the non-financial sector was to a large extent a consequence of stronger increase of interest income than cost. It was a result of changes in bank balance-sheets; there occurred then an increase of the amounts of loans on households, increase of corporate deposits and unsymmetrical adjustment of bank product prices to NBP and market rates. Interest rates grew, but loan interest grew more than deposit interest. In 2005 there was a high increase of credit value, particularly of housing and consumer loans. In 2006 net income from operations with non-financial entities grew due to loan value increase and changes of the term structure of deposits. In that year there occurred a higher rise of current deposits of lower interest and slower increase of time deposits of higher interest. In 2007 net interest income grew as compared to the previous periods. This was the year when interest margin expressed as interest income percentage had the highest values. Net interest income grew slower at that

time than the total assets because interest income grew slower than cost. In effect, the interest margin for assets considerably lowered as compared to the previous year. In 2008 interest income calculated as an amount grew more than costs, and calculated as percentage – more than assets. This was partially a result of increased interest income from securities. In 2009 net interest income remained the main source of bank activity income, yet its share decreased. Lower net interest income was a consequence of the net interest income from operations with the non-financial sector decreasing.

Currently the main factors of the lowering of banks' financial results certainly include higher credit risk costs, higher financing costs and lower dynamics of the loan activity. On the one hand this is a result of deposits growing quicker than loans and of the "deposit war", and on the other a consequence of low margins on loans granted during the credit boom and an increase of debts of companies at risk, which did not generate income.

The shares of particular banks in creating those results are presented in table 1.

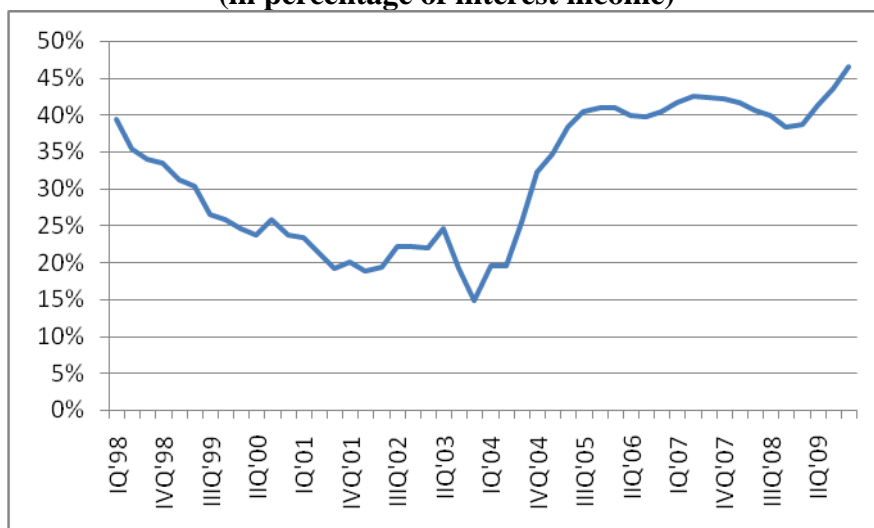
Table 1: Mean net interest income and interest margins in selected banks

	Bank Handlowy w Warszawie	Bank Ochrony Środowiska	Bank Polska Kasa Opieki	Bank Przemysłowo-Handlowy	Bank Zachodni WBK	BRE Bank	DZ Bank Polska	FORTIS Bank Polska	ING Bank Śląski	Kredyt Bank
Net interest income (in thousands PLN)	231832	21025	631830	288241	241553	135927	10256	47063	217139	164714
Interest margin I (as percentage of assets)	3.08	3.34	3.37	3.26	3.17	1.93	2.46	3.39	3.12	3.11
Interest margin II (as percentage of interest income)	48.66	41.90	47.95	48.01	47.84	31.55	38.99	44.78	39.66	39.54

Source: Own calculations

The lowest level of the interest margin as asset percentage (1.93%) and as interest income percentage (31.58%) was recorded for BRE Bank, yet the mean net interest income of this bank was not the lowest of all, for it amounted to 135 927 thousand PLN, which places it at the 8th position among the 11 examined banks. To compare, the margins of DZ Bank Polska were 2.46% and 38.99% respectively, with net interest income lower by as much as 125 671 thousand PLN. It is, however, worth noting that 2009 brought the highest net interest income in BRE Bank's history. Graph 3 presents how the interest margin of BRE Bank was shaped in the analysed period.

**Graph 3: Interest margin in BRE Bank
(in percentage of interest income)**



Source: Own study

Looking at how the net interest income and interest margins shaped in time, one cannot but consider issues connected with the financial crisis which significantly changed the functioning of banks. Considering bank services effectiveness, it needs to be noted that in the pre-crisis years banks paid less for deposits than NBP interest rates and money cost on the interbank market, then the situation changed somewhat. Banks were decreasing deposit interests but interest rates were falling at a quicker pace, together with profits from the loan portfolio, because loan interest usually depends on WIBOR. This caused considerable decrease of interest margins.

Banks reacted variously to this situation. Many of them got involved in the “deposit war” aiming to help liquidity. The above mentioned BRE Bank obtained good results at that time as it did not abandon competing against other banks through low deposit rates and this was what greatly helped it to improve the net interest income. On the other end of the scale there is Bank BPH, which obtained the lowest interest margins from among the examined banks at that time.

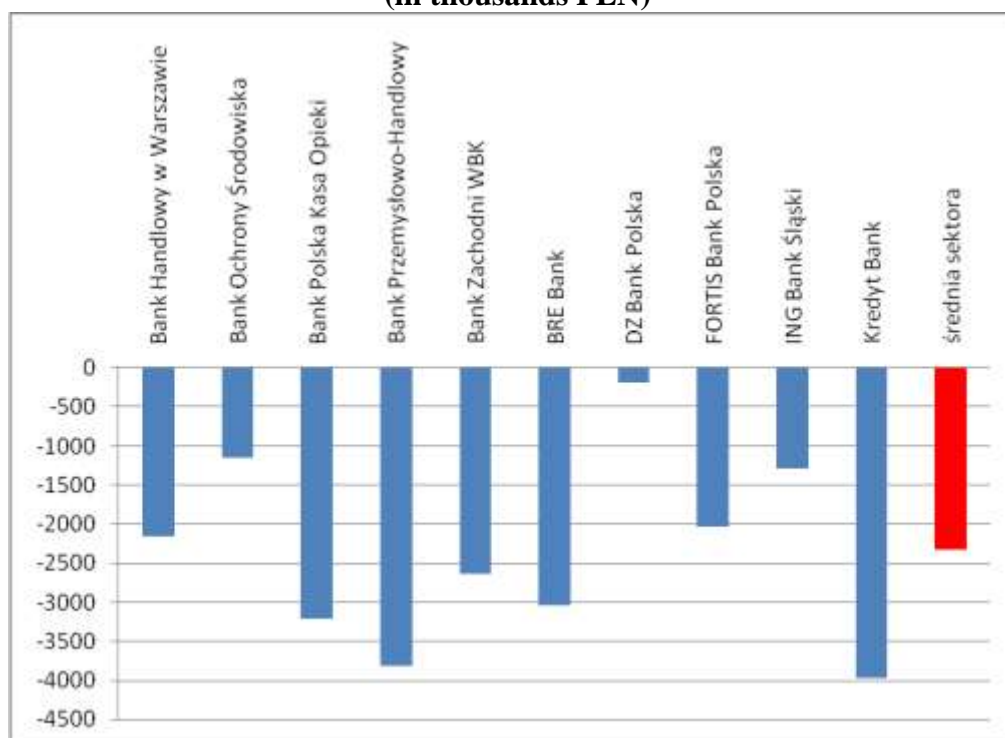
More information on the situation in the bank sector can be obtained by referring to the concept of rate discrepancy, based on setting such bank interest margin values as would occur if interest rates were maintained at an unchanged level. Hypothetical values were obtained for the net interest income and for interest margins expressed in percentage of the mean asset state and in interest income percentage. The differences between those values and their real counterparts allow among others to draw the first conclusions concerning interest rate risk in a given period of time.

Analysis of interest rate discrepancy for the traditional net interest income showed that in the examined time banks more often lost than gained due to changes of market interest rates. It is proven by a large number of negative results – out of 370 calculated discrepancies for all examined banks per quarter, in 157 cases the rate discrepancy for the net interest income was less than zero. Mean discrepancies from the whole spectrum of analysis for all examined

banks were lower than zero. Mean rate discrepancy was – 4 521 thousand PLN, which may be interpreted as loss of the banks as compared to the hypothetical values which would occur if there was no interest rate risk. On this basis it can be stated that banks could not foresee changes of interest rates well or were not able to secure themselves properly against those changes. Banks for which the analysis showed the greatest interest rate discrepancies were Kredyt Bank and BPH, and the lowest loss in this set was experienced by DZ Bank Polska.

The shaping of the discrepancies may be explained with interest rate change trends which occurred at that time. Negative discrepancy occurred mostly when official interest rates of the central bank were lowered, resulting in changes of market rates. An environment of falling interest rates impedes the functioning of banks whose main source of income is the difference between income from asset interest and cost of gaining the capital, because then there appear problems with maintaining high margins. In the face of that banks should have been expected to potentially lose in comparison with the situation from before the unfavourable changes. Graph 4 shows calculation results of mean interest rate discrepancy in interest margins for particular banks.

Graph 4: Mean interest rate discrepancy for the net interest income in selected banks (in thousands PLN)



Source: Own study

Assessing interest rate discrepancy, it needs to be remembered that it is based on a comparison of actually recorded net interest income and other types of interest margin with hypothetical values which would occur if interest rates remained unchanged. So if this discrepancy takes a negative value, it is not necessarily a sign that at the given time net interest income in the banks has actually fallen. It may also be a sign that interest margin grew

at the time, but if not for the change of interest rates that growth would have been greater. It is similar with positive discrepancy – it shows that banks benefitted from the change of interest rates and it may be reflected either in net interest income growth or in lessening its decrease.

Conclusions

Obtained results lead to the conclusion that the measures of interest margins are useful to evaluate the effectiveness of the bank's activity in the area of interest services. It may be completed with interest rate discrepancy analysis, which gives preliminary information as to whether or not the direction of interest rate change was profitable for the bank. It is worth emphasising that the presented measures can be used both to assess the effectiveness of the bank's activity in particular years, to assess development tendencies within the bank, and to compare it with other banks. This is immensely important for bank management, as it gives a more complete image of the effectiveness of their interest rate policy.

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