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DIAGNOSING THE CHANGES IN THE POLISH BANKING SECTOR. USING THE BUSINESS TENDENCY SURVEYS

The political transformation that took place in Poland after 1989, the change from centrally planned economy to market economy significantly increased the importance of the financial sector, especially the banking sector. Banks found the right place for their function, becoming one of the most important stimulators, both for companies and households activities. The rising competition among financial institutions operating in Poland gives priority to the knowledge of current evaluations and forecasts of the economic situation in the banking sector. The information about business conditions in the financial sector became necessary, both for the state decision-making centres and all economic entities. The increasing demand for information about financial business conditions, with limited statistical data resources at the same time, gave rise to starting research in the Polish banking services market using a business tendency survey.

1. Methodology of business conditions research in the Polish financial market

Business tendency surveys in the financial market were originated for the first time in Poland, or maybe in Europe, by Department of Marketing Research of Poznań University of Economics and "Infomarkt" Marketing Research Ltd. The research covered the banking and insurance sector. The surveys have been conducted quarterly since 1992 for banks and 1993 for insurance companies. The surveyed population are head offices and branches of banks and insurance companies. The research is held on a nation-wide scale.

The questionnaire consists of four parts. The first part of the questionnaire contains questions with respect to general variables describing the economic situation

of the bank. The questions deal with the following issues: financial situation, the number of offered services, the number of served clients, the value of obtained financial means and granted loans, the value of doubtful and loss loans the eligible capital, pre tax earnings, risk based capital ratio and profitability.

The second part comprises detailed questions regarding particular banking services. The evaluated categories are the following: the number of provided services, the value of provided services, supply (demand), interest rate (fee). These evaluations refer to banking services divided into four groups: zloty deposits, foreign currency deposits, loans and other banking services[1].

In the course of processing the collected data, single and composite business performance indicators are estimated. Single indicators (balances) refer to particular categories and kinds of banking services, whereas the composite indicator – Poznan Index of Banking Economic Performance – PIKBANK is estimated on the basis of business survey balances. PIKBANK provides the synthetic evaluation of business conditions in the banking sector. It is a weighted average of five business survey balances calculated using the following formula:

$$\text{PIKBANK} = \frac{\text{OPS} + \text{OWK} + (-\text{OKN}) + \text{OSF} + \text{PSB}}{5},$$

where:

OPS – balance of obtained financial means in i period (assessment),
OWK – balance of given loans in i period (assessment),
OKN – balance of doubtful and loss loans in i period (assessment),
OSF – balance of financial situation in i period (assessment),
PSB – balance of pre tax earnings in i+1 period (prediction).

The synthetic PIKBANK indicator is estimated for the whole banking sector and bank segments selected with regard to ownership forms and location.

2. The development of banking services market in Poland and the analysis of business fluctuations

The background for the transformation of the Polish banking system was created by political reforms introduced after 1989. The reinforcement of the banking sector led to the separation of nine branches from the National Bank of Poland and

[1] Totally twenty kinds of services were considered: current deposits, three months' deposits, four-to-twelve months' deposits, over one year deposits (classification of zloty and foreign currency of loans), consumer loans, current activity loans, investment loans, foreign currency, current accounts for persons, current accounts for corporates, leasing, bank guarantees, discount bills of exchange, foreign operations, issue of own securities, turnover of external securities.

their transformation into universal commercial banks. In the 1990's the banking sector underwent the biggest changes in the whole Polish economy, which were brought about by the economic needs and changing environment.

Liberal license policy carried out up to the end of 1991 influenced the process of rapid establishment of new banks. In 1989 there were 40 commercial banks and at the end of 1991 there were already 72. At the end of 1993 74 commercial banks and 1653 cooperative banks operated in Poland. Nevertheless, as a result of mergers, takeovers and bankruptcies the number of banks systematically decreased reaching the number of 70 commercial and 684 cooperative banks by the end of 2001.

Along with the rising number of commercial banks in the years 1993-2000 there was a systematic growth of non-financial sector deposits. Within this period a six-time rise of the value of collected deposits was observed in the Polish banking sector. Moreover, Polish zloty deposits (over seven-time growth) grew more rapidly than foreign currency deposits (two point five-time growth). In the 1990's, banking deposits being the dominant form of household savings showed a nominal ten-time increase, although the real growth only doubled (which gave about 9,5% of real growth rate annually. Despite the high growth rate of deposits in the 1990's, the tendency to save money systematically declined. While in 1991 the saving's rate was 16.3%, in 2000 it was only 9.3%. At present, the tendency in Poland is similar to the average tendency in developed European countries, however, the average Polish income is four times lower.

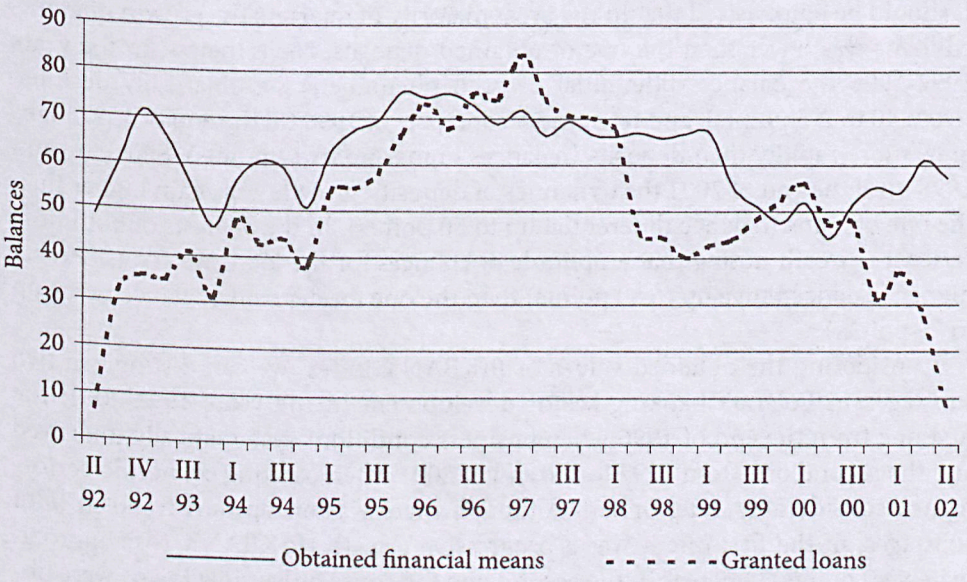


Figure 1. Growth dynamics of the obtained financial means and granted loans (business survey data)

In 1993-2000 a high dynamics of banking loan activity was also observed. Due from the non-financial sector increased almost six or seven times. The growth of granted loans in commercial banks (eight or nine-time growth) was significantly higher than in cooperative banks (four to five times growth). Additionally, the share of commercial banks in the overall loan market for the non-financial sector was dominant (94.6%). The majority of loans granted by commercial banks were corporate loans (74.3%) and the rest were personal loans (25%). Consumer loans were prevailing among all kinds of loans (19.8%).

In the 1990's we could observe a systematic rise of loans granted by banks with a variable growth dynamics. Generally at that time two substages emerged: the first one were the years 1992-1996 – when the increasing growth was observed (the balance increased by 77 points!) and the second stage including the years 1996-2001, characterised by strong, but irregular decreasing growth (balance went up 75 points). Totally, the upward tendency occurred in 21 quarters and the downward one in 16 quarters.

The dynamic development of banking sector in Poland is confirmed by the results of quarterly business test survey conducted in Polish banking sector by Poznan University of Economics. In the years 1992-2001 there was a high increase of financial means obtained by banks, accompanied by a high fluctuation amplitude. The business survey balances varied from +36 to +76. In the whole analysed period we can differentiate seven phases: three with increasing growth (together 19 quarters), three with decreasing (13 quarters) and one stability phase (7 quarters).

PIKBANK provides a synthetic evaluation of banking economic performance. It should be emphasised that in the great majority of quarters the growth of granted loans was lower than the one of obtained deposits. Nevertheless, in the years 1992-1996 the balance differential of both phenomena systematically declined (from 40 to 2-5 points), and from the second part of 1996 till the end of 1997 loans grew more rapidly than deposits (balances higher up to 12 points). Starting from 1998 until the end of 2001 the dynamics of deposits' growth was again higher than the one of loans (balance differential up to 50 points). In the analysis of both time series it is worth noting that amplitude of changes for the loans was considerably higher (balance range up to 80 points) than the one for deposits (balance range up to 39 points).

Considering the obtained values of PIKBANK index, we can distinguish two substages in Poland's banking sector development in the years 1992-2001: the first one from the end of 1996 when business conditions systematically improved and the second one from 1997 to the end of 2001 when banking economic performance considerably deteriorated. Although there was an upward trend in both substages, in the first one it was a progressive growth (PIKBANK rose approximately 40 points), whereas in the second one the consecutive slowdowns were observed (PIKBANK went down 37 points).

In the whole analysed period we can discriminate six phases: three phases of expansion and three phases of slowdown. Altogether the upward trend, that is the banking economic conditions revival, occurred in 19 quarters, while the downward trend denoting the decline was observed in 18 quarters.

The results presented in figure 2 clearly indicate that there was a slowdown in the banking sector development. The reasons for such a situation were certainly complex and varied, but undoubtedly an obstacle for a more dynamic expansion was insufficient capital invested in the Polish banking sector and a growing recession of the country's economy.

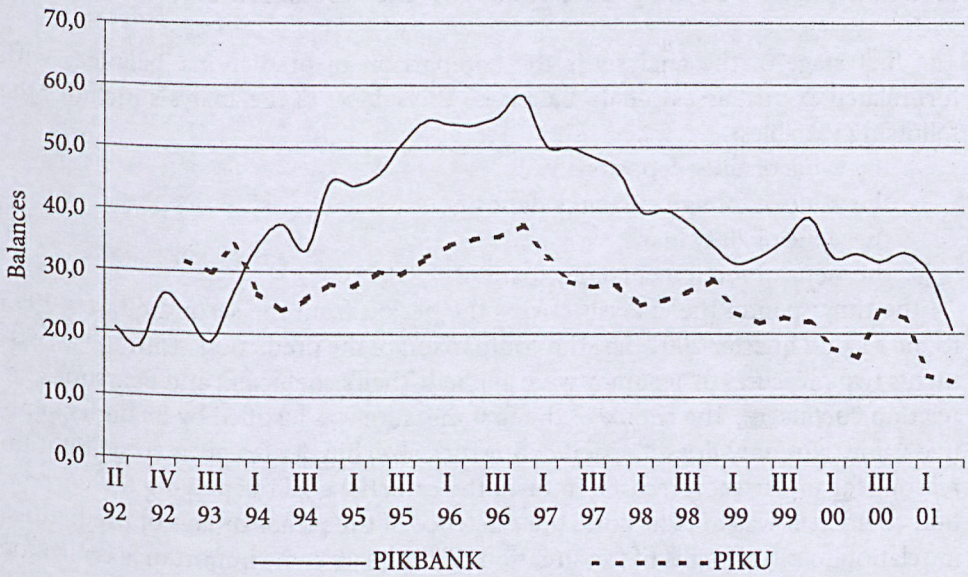


Figure 2. Economic performance in the Polish financial sector (business survey data)

The comparison of the PIKBANK value (banking sector) with the PIKU[2] value (insurance sector) allows us to presume that the growth rate of the Polish banking sector in the last ten years was substantially higher than the one of the insurance sector (balance differential was up to 20 points). At the same time our attention is drawn by a high synchronisation of cyclical movements in both sectors, which confirms the assumption about their functioning as "communicating vessels".

[2] PIKU is a composite index providing a synthetic evaluation of business conditions in Poland's insurance sector. It is estimated on the basis of the BTS results conducted by Department of Marketing Research of The Poznań University of Economics.

3. Accuracy evaluation of the BTS results for the Polish banking sector

In this part of the article, we will examine whether the BTS data for the Polish banking sector reflects the actual changes of the surveyed economic variables and accordingly, whether it can be regarded as a reliable source of diagnostic and prognostic information about banking sector performance.

3.1. Comparison of the predictions with the assessments

The first stage of the analysis is the comparison of predictions' balances with formulated ex post assessments' balances. The subject of the analysis includes the following variables:

- the value of zloty deposits,
- the value of foreign currency deposits,
- the value of zloty loans,
- the value of foreign currency loans.

The time span of the analysis covers the period from the second quarter 1993 to the second quarter 2001. For the comparison of the predictions with the assessments two measures of accuracy were applied: Theil's coefficient and Pearson's correlation coefficient. The choice of the first measure was justified by its high cognitive value. Not only does it specify an error's size, buy it also gives some light on reasons for imperfect forecasts. In turn, the essential goal of applying the correlation coefficient was to determine the existence of time leads or lags of predictions in relation to assessments of the situation. What bears some importance is also the fact that the correlation coefficient is essentially the only statistical measure to be applied in the next stage of the analysis: accuracy evaluation of the BTS results and corresponding statistical data. Therefore, only this method allows us to compare three kinds of data, which are the subject of the accuracy analysis: expectations – assessments, assessments – statistics, predictions – statistics.

Comparison of the predictions with the assessments on the basis of Theil's coefficient

The achieved results show a rather slight conformity of both kinds of data. The average error for all four variables was 0.267 (table 1). A reasonable result was obtained only in the case of zloty loans for which Theil's coefficient was below 0.15. Clearly, the least accurate were the predictions for both kinds of deposits, for which Theil's coefficient exceeds 0.3. The analysis of Theil's coefficient components indicates that the main reason for the forecasting error was inadequate prediction

of central tendency – the proportion of this coefficient is about 0.75 on the average. Definitely it has the greatest impact on the forecasting errors concerning zloty deposits – as much as 0.94 and it has the smallest influence on foreign currency deposits – 0.56. However, U_M coefficient for both kinds of loans takes the value similar to the average error estimated for all four categories. The impact of other factors on the forecast quality is smaller and slightly exceeds 10%.

Table 1

Theil's coefficients for the predictions and assessments

Measures	Zloty deposits	Foreign currency deposits	Zloty loans	Foreign currency loans	Total
Theil's coefficient U²	0.336	0.341	0.146	0.243	0.267
Theil's coefficient components:					
U_M	0.940	0.559	0.728	0.765	0.748
U_S	0.002	0.254	0.132	0.083	0.118
U_C	0.028	0.177	0.088	0.152	0.111
Percentage of predictions:					
underestimated (At ≥ Pt)	100.0	87.9	93.9	100.0	95.5
overestimated (At < Pt)	0.0	12.1	6.1	0.0	4.5

The error resulting from imperfect variation has a relatively big influence on the predictions of foreign currency deposits ($U_S = 0.25$). In the case of the first kind of error (U_M coefficient) it has been noted that it results from a substantially lower value of expectations' balances in relation to assessments' balances. The percentage of the underestimated forecasts ranges from 88% for foreign currency deposits to 100% f or zloty deposits (figure 1) and foreign currency loans (figure 2), which means that the assessments were higher than the predictions in each quarter.

Taking account of the obtained results we can draw a conclusion that the underestimation of forecasts is characteristic of the BTS results in the banking sector. Bank managers are too cautious about formulating their judgements on forthcoming changes. It is a specific quality of management from this sector. The comparative analyses of the assessments and predictions carried out, for example, for industrial companies demonstrate a reverse phenomenon – too optimistic approach of entrepreneurs[3].

[3] See e.g. M. Dędys, *Jakość prognoz przedsiębiorstw przemysłowych*, [in:] E. Adamowicz (ed.), *Statystyczne i ekonometryczne metody badania krótkookresowych zmian stanu gospodarki*, IRG SGH, Warszawa 1998.

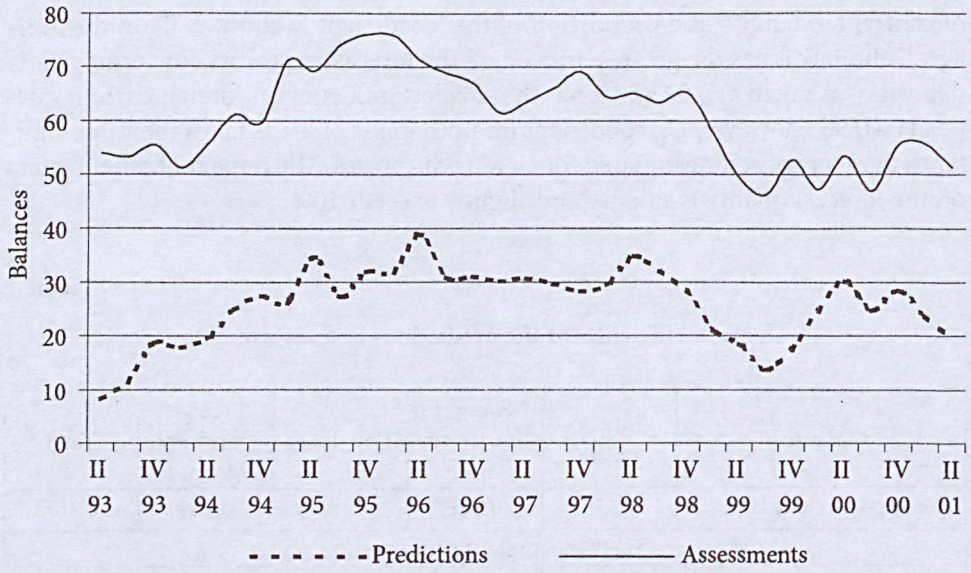


Figure 3. Zloty deposits – the assessments and predictions on the basis of the business survey

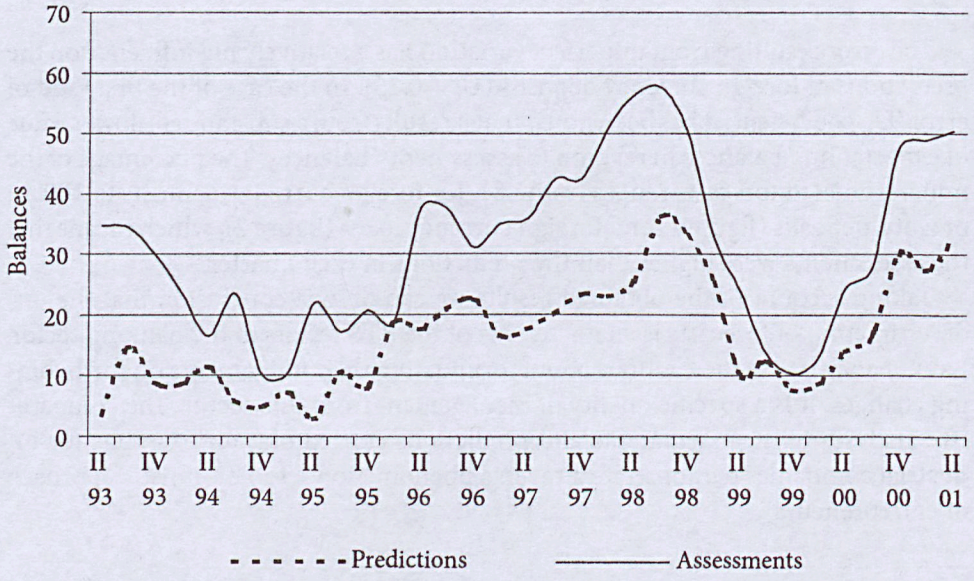


Figure 4. Foreign currency loans – the assessments and predictions on the basis of the business survey

The distribution of Theil's inequality proportions obtained for the analysed variables is satisfactory considering a possibility of forecasts' correction. If underestimation is a regularity, and simultaneously this error clearly dominates the other two, its systematic elimination can considerably increase the degree of correctness of the expectations and evaluations. Obviously the problem of forecast correction should be the subject of analyses in further studies on the usefulness of business survey for forecasting the situation in the banking sector.

Correlation analysis of the predictions and assessments

The other measure used in the comparison of the BTS predictions and assessments is Pearson's correlation coefficient. In the case of all analysed variables we obtained a high, statistically significant correlation between the predictions and assessments (table 2). Taking into consideration three of four categories, the highest correlation appears in the most desirable combination of the predictions and evaluations

Table 2

Correlation between the predictions and assessments – including leads and lags[4]

Correlation	Zloty deposits	Foreign currency deposits	Zloty loans	Foreign currency loans
$r(A_t ; P_{t-4})$	0.181	0.005	0.382	0.011
$r(A_t ; P_{t-3})$	0.395	0.190	0.407	0.195
$r(A_t ; P_{t-2})$	0.540	0.392	0.628	0.450
$r(A_t ; P_{t-1})$	0.627	0.591	0.760	0.705
$r(A_t ; P_t)$	0.703	0.785	0.847	0.828
$r(A_t ; P_{t+1})$	0.612	0.895	0.647	0.771
$r(A_t ; P_{t+2})$	0.478	0.766	0.558	0.539
$r(A_t ; P_{t+3})$	0.367	0.603	0.475	0.206
$r(A_t ; P_{t+4})$	0.235	0.462	0.355	-0.013

[4] The meaning of particular symbols included in the table is the following: r – Pearson's correlation coefficient, A_t – assessment of the situation in t period, P_t – predictions of the situations in t period. Consequently the pair: $r(A_t ; P_t)$ denotes correlation of diagnostic time series (A_t) with predictions formulated a quarter earlier (P_t). The t symbol at the prediction stands for the period for which the prediction was formulated and not the period from which it comes. The most desirable as well as the most logical is the situation, in which the highest correlation coefficients are obtained by comparing At times series with Pt time series. The high value of correlation coefficient in this case signifies that we can successfully forecast the direction of changes of a particular variable at one quarter lead.

Correlation coefficient for $n = 33$ (the sample size) and $\alpha = 0.05$ are statistically significant when $r = 0.344$ and for $\alpha = 0.01$when $r \geq 0.4426$.

(A_t ; P_t). Only the predictions of foreign currency deposits present the highest correlation with the evaluations at one quarter lag.

The predictions of zloty loans and foreign currency loans display the highest interdependence with the evaluations. The correlation value for these categories is respectively 0.85 and 0.83, whereas the correlation between the corresponding time series for foreign currency deposits does not exceed 0.8. In the case of this variable the correlation rises closely to 0.9 when the predictions are lagged by one quarter. The relatively lowest correlation was found between the expectations and evaluations for zloty deposits (r coefficient = 0.7).

To sum up the presented results of the accuracy analysis obtained on the basis of Theil's coefficient and Pearson's correlation coefficient we could point out the following regularities:

- imperfect central tendency is the crucial reason for the forecasting errors,
- the predictions of bank managers are too cautious in relation to actual phenomena development,
- it is possible to reduce the forecasting error for most variables,
- a statistically significant correlation between the balances of predictions and the balances of assessments was observed for all surveyed variables.

3.2. Comparison of the BTS results and statistical data

The analysis conducted in the previous subchapter had a preliminary nature. It showed a reasonably high conformity of the predictions and assessments, yet it did not answer our question about usefulness of the business survey for a short-term diagnosis and prognosis of economic performance in the banking sector. To reach this purpose it is necessary to compare both the assessments and predictions with the statistical data. It might turn out that both kinds of qualitative data incorrectly determine the actual fluctuations of the surveyed variables. It is probable that the balances of assessments display a high conformity with the statistics whereas the predictions fail to do so.

Before starting the analysis the quantitative data should be properly transformed in order to ensure their higher comparability with the results of the business survey. The nominal values were converted to indexes by dividing phenomena's values in a given quarter by its value in the respective quarter from the previous year.

Correlation analysis of the BTS results and statistical data

The first method to be applied for the comparison of business survey results with the statistics is the correlation analysis. Potential lags or leads of the qualitative data have been taken into account just as in the case of comparing the assessments and predictions. The results of correlation between the assessments and statisti-

cal data turned out satisfactory. A statistically significant interdependence was observed between both kinds of data. Moreover, the assessments of the situation are no lagged in the case of all variables. For three categories the assessments are parallel with the statistics (the highest correlation between I_t and A_t time series). In the case of two variables: zloty deposits and foreign currency deposits the correlation coefficient exceeds 0.8, while it is over 0.9 for zloty loans.

Table 3

Correlation between the BTS assessments and statistical data – including leads and lags[5]

Correlation	Zloty deposits	Foreign currency deposits	Zloty loans	Foreign currency loans
$r(I_t ; A_{t-4})$	0.376	0.073	0.303	0.138
$r(I_t ; A_{t-3})$	0.583	0.280	0.479	0.373
$r(I_t ; A_{t-2})$	0.712	0.499	0.619	0.541
$r(I_t ; A_{t-1})$	0.796	0.705	0.790	0.608
$r(I_t ; A_t)$	0.805	0.857	0.918	0.551
$r(I_t ; A_{t+1})$	0.703	0.842	0.734	0.443
$r(I_t ; A_{t+2})$	0.603	0.755	0.516	0.256
$r(I_t ; A_{t+3})$	0.452	0.598	0.318	0.108
$r(I_t ; A_{t+4})$	0.348	0.406	0.139	0.040

I – denotes index of quantitative data, A – assessments of the situation (BTS data)

The assessments of foreign currency loans demonstrate the lowest correlation. With respect to this category the assessments are the most coincident with the statistics from the next quarter. Thus, the business survey data display one quarter lead in relation to the actual development of the variable.

Less satisfactory correlation results were obtained while testing the relation between the business survey predictions and statistics (table 4). A very good correlation was observed only for zloty deposits. (r higher than 0,75). A positive phenomenon regarding this variable was the lack of lags – the highest correlation occurred between the predictions and statistical data for parallel time series. An even more desirable interdependence was found for the predictions of zloty deposits and foreign currency loans. The forecasts of these categories reveal the highest correlation with the statistics at one quarter lead. It means that the predictions can constitute

[5] It denotes index of qualitative data, other symbols have the same meaning as in a previous table.

an interesting material and find application in the construction of composite leading indicators. Another data showing a high correlation with the statistics at one quarter lead, slightly lower than for parallel time series, were predictions of zloty loans.

Table 4

Correlation between the BTS predictions and statistical data – including leads and lags

Correlation	Zloty deposits	Foreign currency deposits	Zloty loans	Foreign currency loans
$r(I_t ; P_{t-4})$	0.151	-0.105	0.407	0.062
$r(I_t ; P_{t-3})$	0.336	0.003	0.518	0.308
$r(I_t ; P_{t-2})$	0.391	0.218	0.657	0.440
$r(I_t ; P_{t-1})$	0.400	0.416	0.706	0.526
$r(I_t ; P_t)$	0.337	0.593	0.755	0.450
$r(I_t ; P_{t+1})$	0.284	0.755	0.653	0.353
$r(I_t ; P_{t+2})$	0.277	0.790	0.531	0.190
$r(I_t ; P_{t+3})$	0.253	0.739	0.367	0.035
$r(I_t ; P_{t+4})$	0.269	0.604	0.219	-0.008

I – denotes index of quantitative data, P – predictions of the situation (BTS data)

The only prognostic category with a lagging character in relation to the statistics are foreign currency deposits. With regard to these deposits predictions show the highest correspondence not with parallel data, but with data appearing in statistics of banking system as many as two quarters earlier. It implies that qualitative forecasts of foreign currency deposits are not a reliable source of information on future changes.

The conducted analysis of correlation between the business survey results and statistics show a high correspondence of both kinds of data. This finding particularly concerns questions of diagnostic nature. For some variables the correlation results are very promising taking into account leads of the qualitative data. The business survey results for one diagnostic question and two prognostic questions turned out to present one quarter lead in relation to the actual changes.

Accuracy analysis on the basis of business cycle morphology

After the synthetic comparison of business survey data with quantitative data more analytical approach to accuracy analysis will be developed.

An analysis of business cycles reflected by time series of the qualitative and quantitative data will be carried out. It will allow us to compare the morphology of cyclical movements identified with regard to both kinds of data, especially business cycle phases and turning points. The morphological analysis will concern two kinds of banking services: zloty deposits and zloty loans, which constitute the main area of banking activity in Poland.

Before starting the analysis of the cyclical fluctuations a further transformation of data is required. It consists in time series decomposition by trend elimination and this time it also regards the business survey results. Due to a relatively short time horizon of analysis the simplest, linear trend model was estimated for all time series. After trend estimation the empirical data were divided by the values of the trend obtaining percentage deviations of cyclical movements from development tendency. Thus, a multiplicative model of time series was used. Both kinds of time series were not adjusted for seasonal and irregular movements as the construction of the analysed data eliminates these components to a large extend. In the statistical data only irregular fluctuations might appear, while in the case of business survey data both kinds of above movements may emerge. Those, however, should not significantly affect time series structure owing to a proper way of asking questions (see chapter 1).

Analysis of deviations from trend for the qualitative and statistical data showed considerable differences in their size. Trend deviations both for assessments and predictions are much larger than those for the statistics. Statistical data presented trend deviations from –12 to +44 percentage points, whereas business survey results did so even from –73 to +55 percentage points. It is one of the consequences of comparing qualitative data with quantitative data. As a result, a comprehensive comparison of cyclical movements revealed by both kinds of data is not feasible since we cannot compare their amplitudes. However, we are able to analyse thoroughly conformity of business cycle phases, their direction and length, and turning points.

The arising differences in the amplitude of fluctuations presented by the statistics and business survey data confuse the graphic analysis of changes. Hence, we decided to normalise both kinds of data on the basis of the following procedure[6]:

$$(x-\bar{x}):\frac{\sum|x-\bar{x}|}{n}.$$

[6] See e.g. Z. Matkowski, *Syntetyczne wskaźniki koniunktury dla gospodarki polskiej oparte na wynikach badań ankietowych* GUS, [in:] Z. Matkowski (ed.), *Barometry koniunktury dla gospodarki polskiej*, IRG SGH, Warszawa 1999.

Analysis of business cycle morphology for zloty deposits

In the cyclical movements based on the statistical data two full business cycles were identified. The first started in the first quarter of 1994. From that time we observed an expansion which lasted for eight quarters.

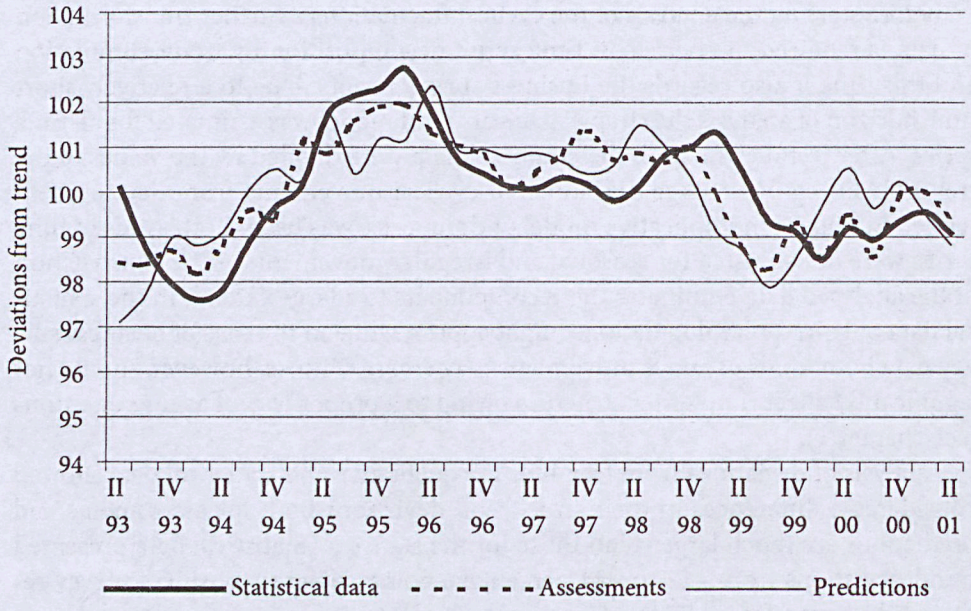


Figure 5. Zloty deposits – cyclical movements selected on the basis of the statistics and BTS results (assessments and predictions)

However, in the second quarter of 1996 there was a turning point originated a decline phase lasting for four quarters. The consecutive cycle began in the second quarter of 1998. This time the growth phase was much shorter – only one year.

In the first quarter of 1999 a business cycle peak occurs and the decline phase starts and continues as long as the previous phase. From the second quarter the fluctuations are rather irregular – ups and downs alternate, therefore they can be defined neither as a further decline nor as the beginning of a new cycle. As regards the first cycle we deal with longer period of upturn than downturn and positive amplitude. The second cycle is considerably shorter (only two years) and both phases have the same length, yet the amplitude of the whole cycle is negative.

Cyclical movements selected on the basis of the assessments display a large conformity with the statistics (figure 5). Qualitative data show the beginning of the first cycle, as well as the occurrence of the peak at the same time as the statistics. By contrast, the decline phase following this peak was twice as short. Hence, the

trough appeared four quarters earlier. Since the second quarter of 1997 started a short, nine-month expansion followed by a five-quarter period of stabilisation. Compared with the statistics, the second cycle began one year earlier, while the stabilization period started at a quarter's lead in relation to the second phase of increase. The stabilisation ended in the fourth quarter of 1999 originating the decline phase. This time the business survey assessments signalled the peak at a quarter's lead as well. The decline phase lasted until the third quarter of 1999 and terminated two quarters earlier with respect to the statistics. However, it is not possible to define the direction of changes in a clear-cut way for further periods (totally as many as seven quarters).

Clearly, besides the first expansion, which is identical to the quantitative fluctuations, the consecutive phases show up at leads, however, their length is irregular. The second upturn emerges at one-year lead, whereas the downturn and the stabilisation at one quarter and half-year lead, respectively. A characteristic quality observed in the cyclical changes based on the assessments are longer periods of expansion and stabilisation and shorter decline phases in comparison with the quantitative data. We should pay attention to the fact that the two distinguished cycles, similarly to the statistical data, have respectively positive and negative amplitude.

A slightly different behaviour is exhibited by cyclical changes based on the business survey predictions. The growth phase begins at the same time, but lasts three months longer than in the two previous time series. After this time, there comes a very l ong decline phase (as many as 13 quarters). At the start it presents a slight, then rapid movements and is separated by a short revival in the first half of 1998.

However, the revival continues too short to consider it a growth phase. The end of the decline phase occurs at the same time as in the case of assessments. Therefore, also in the prognostic time series the trough turns up at a half-year lead. After this period we can observe a short, three-quarter expansion. By contrast, from the second quarter of 2000 it is difficult to identify an evident upward or downward direction of changes.

According to the above analysis, we can draw a conclusion that the predictions reflect the actual cyclical fluctuations with less accuracy than the assessments. First of all, they do not identify two but one business cycle, however, with a very long downturn. On the other hand, it is worth noting that if we were to interpret the actual cyclical changes in somewhat different way, the period between the beginning and the end of both decline phases creates a long-term downturn disturbed by a short upturn with small amplitude. The predictive time series also announces this growth phase, even at an appropriate lead, yet it is shorter than in reality (table 5).

Table 5

Business cycles based on the business survey and statistical data

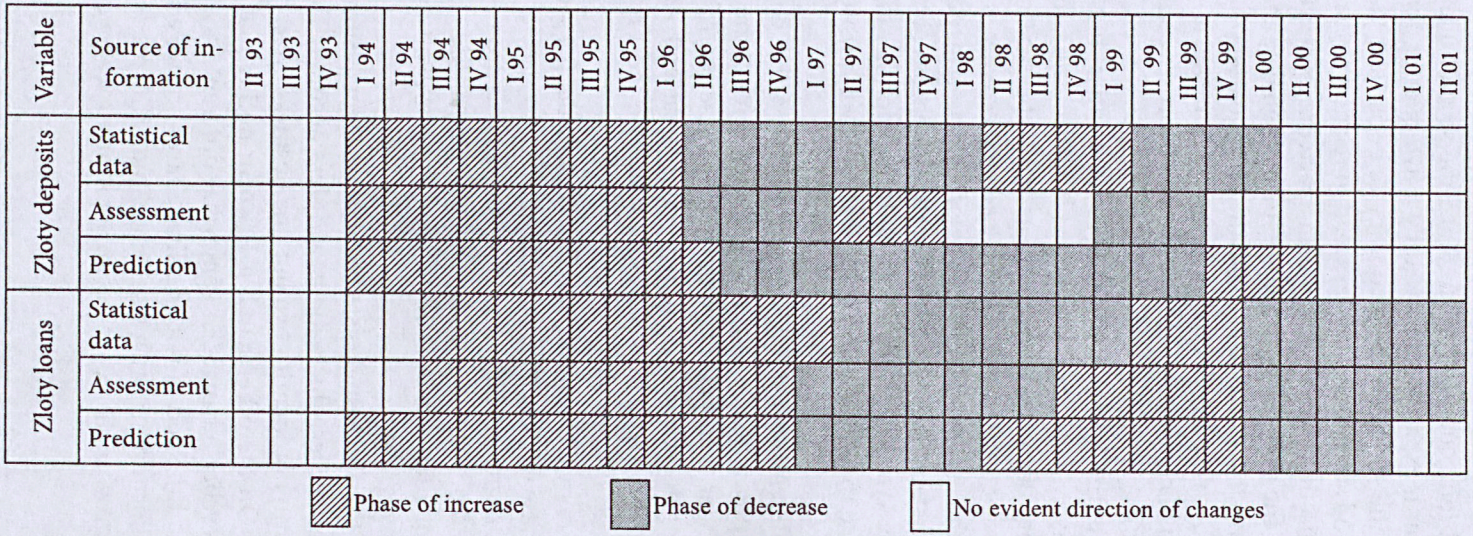


Table 6

Zloty deposits – correlation between the BTS results and statistical data after trend elimination – including leads and lags[7]

Correlation	Assessments	Predictions
$r(I_t; BTS_{t-4})$	0.308	0.428
$r(I_t; BTS_{t-3})$	0.544	0.645
$r(I_t; BTS_{t-2})$	0.752	0.734
$r(I_t; BTS_{t-1})$	0.857	0.707
$r(I_t; BTS_t)$	0.804	0.565
$r(I_t; BTS_{t+1})$	0.626	0.369
$r(I_t; BTS_{t+2})$	0.443	0.242
$r(I_t; BTS_{t+3})$	0.198	0.132
$r(I_t; BTS_{t+4})$	0.011	0.084

The analysis of correlation between the business survey results and the statistics after trend elimination provided very interesting results. Not only did the correlation for all compared time series increased, but also it reached the highest value not for parallel time series, but for those in which the qualitative data show one quarter lead over the quantitative data. These results might confirm the assumption about the leading nature of analysed qualitative data.

Analysis of business cycle morphology for zloty loans

Business cycle examination of zloty loans based on the qualitative and quantitative data allows us to distinguish two cycles, however, the second one is of incomplete character. The beginning of the first cycle was detected in the third quarter of 1994. The expansion lasted almost three years finishing in the first quarter of 1997. From the second quarter of 1997 we could observe a long-term downturn continuing for two years. Despite its shorter time span in relation to the growth phase the amplitude of the whole cycle was close to zero. Between the second and the third quarter the second growth phase occurred, however, it had a smaller amplitude and shorter length than the first one. In the first quarter of 2000 a downturn started and carried on until the end of analysed time span, while the amplitude of this incomplete cycle had a negative value.

A very similar behaviour is presented by the cyclical changes estimated with regard to the business survey assessments (table 5). The start of the growth phase is synchronised with the statistics, however, the peak occurs at one quarter lead and the trough originating the second growth phase is identified half a year earlier. By

[7] BTS denotes business survey data, other symbols have the same meaning as in previous tables.

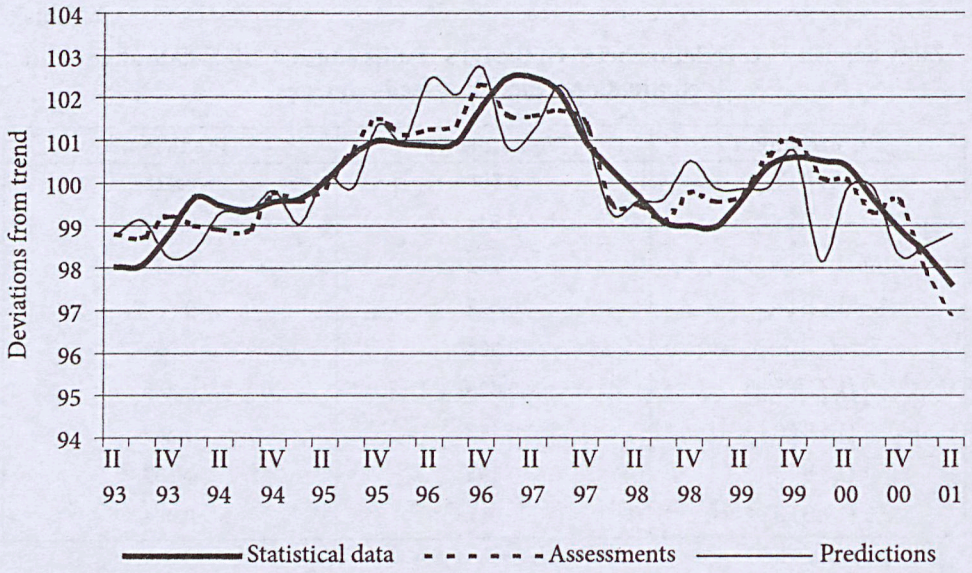


Figure 6. Zloty loans – cyclical movements selected on the basis of the statistics and BTS results (assessments and predictions)

contrast, the second peak is identical with the one presented by the statistical data. The fluctuations based on the assessments display conformity with the movements based on the statistics in terms of amplitude. The amplitude of the first cycle is close to zero while the amplitude of the second one is negative. Thus, the cyclical performance of the assessments is rather accurate, moreover two turning points are detected earlier than the real changes.

Furthermore, the cyclical movements obtained from the predictions are characterised by half a year earlier start of the upturn and similarly to the assessments - one quarter lead of the peak. Next, the downturn of the first cycle ends at one year lead. The second quarter of 1998 initiates the growth phase which, in the light of the predictive data, continues for five quarters. However, the second trough appears at the time indicated by the statistics. The prognostic time series shows longer, more frequent and more irregular leads of turning points when compared with the assessments. In relation to the quantitative data it is characterized by longer upturns and shorter downturns.

The analysis of the business cycle performance conducted for zloty deposits and zloty loans gave satisfactory results taking into account the implementation of the business survey results for predicting turning points. The cyclical movements estimated, in principle, on the basis of all business survey data have leads over the fluctuations reflected by the statistics. Nevertheless, to draw final conclusions it is necessary to extend the analysis to other variables as well as develop similar studies using various concepts of business cycle measurement.

Table 7

Zloty loans – correlation between the BTS results and statistical data after trend elimination – including leads and lags

Correlation	Assessments	Predictions
$r(I_t; BTS_{t-4})$	0.233	0.394
$r(I_t; BTS_{t-3})$	0.417	0.519
$r(I_t; BTS_{t-2})$	0.628	0.591
$r(I_t; BTS_{t-1})$	0.773	0.662
$r(I_t; BTS_t)$	0.904	0.735
$r(I_t; BTS_{t+1})$	0.735	0.641
$r(I_t; BTS_{t+2})$	0.500	0.517
$r(I_t; BTS_{t+3})$	0.295	0.341
$r(I_t; BTS_{t+4})$	0.115	0.183

In addition, it is essential to collect longer time series that would enable us to make more confident judgements. The study conducted for the adopted time span proved that eight-to-ten years' time series might be sufficient for various statistical analyses, yet they are not long enough to formulate conclusions on accuracy of business cycles based on statistics and business surveys.

Concluding remarks

The results of the analysis presented in this article show a relatively high quality of the business survey data and, consequently, their usefulness for a short-term evaluation and forecast of the situation in the Polish banking sector. The obtained results are of a preliminary nature, nevertheless, they prove that business survey results could be a valuable source of information on the economic performance of the banking sector. Hence, they might serve as useful input for making short-term decisions not only in banks, but also in other institutions operating in the financial sector. However, it is necessary to continue the presented methodological studies and extend them to other crucial variables describing economic activity in the banking sector.

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