

Central European Economic Journal

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Cyclical Fluctuations in the Banking Services Market and the Changes in the Situation of Entities from the Financial Services Sector

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Abstract: Section K of the services sector includes entities conducting financial and insurance activities and, among others, banks. Fluctuations in the whole economy and its individual sectors' situation are interrelated; hence, one may also expect similarities of cyclical fluctuations in the banking sector and in the entire financial sector. The analyses in the article concern the connections between the cyclical fluctuations on the banking services market and in the entire K section of the services sector, grouping entities conducting financial and insurance activities in Poland. The analyses proved that changes in the economic situation appear earlier in the banking sector than in section K of the services sector. The time range of analyses covered the period from the first quarter of 2003 to the first quarter of 2018. Conclusions on relationships were formulated on the basis of cross-correlation analysis and the analysis of the turning points in the time series of variables describing the cyclical fluctuations in the banking market and in the K section of the services sector.

Keywords: banking situation, economic situation in the financial sector, cyclical fluctuations

JEL Codes: E32, G20

Acknowledgement

The article dedicated to prof. Krzysztof Opolski on the occasion of the 70th birthday anniversary.

1 Introduction

The role of financial development on economic growth was assessed in many studies across countries. Many of these studies confirmed that financial development positively influences economic growth (Shan, Morris 2002, Levine, Zervos 1998, Rousseau, Wachtel 1998, Wang 2000, Christopoulos, Tsionas 2004, Osborn, Sensier 2002). The dependencies between the situation in the whole economy and the situation in the financial markets are complex, often bilateral (Pietrucha 2013, Opolski, Dwórzniak 2014). In some studies, bi-directional causal relationship between financial development and economic growth was found (Demetriades, Hussein 1996, Luintel, Mosahid 1999, Al-Yousif 2002, Hassan, Sanchez, Yu 2011). Demetriades and Hussein (1996) argue that there is little support to the view that finance is a leading sector in the process of economic development. Al-Yousif (2002) underlines that economic policies are country specific and indicates the importance of the efficiency of the institutions implementing them. That is the main reason why the relationship between financial development and economic growth cannot be generalized across countries.

Cyclical fluctuations spread in the economy and are transferred between various sectors. The scope of connections between particular sectors determines the transfer of cyclical fluctuations. Due to the multi-faceted nature of the relationship between the sectors of the economy, a full explanation of the mechanisms of cyclical fluctuations formation in the various sectors is not easy. In the theory of strategic complementarity between economic operators, it is assumed that firms increase their economic activity, when they consider that other companies with which they cooperate will also increase economic activity. The dominant optimistic or pessimistic about the future expectations of entrepreneurs, therefore, translate into the condition of not only one industry, but also affect the health of other industries. It should be noted that an important causative factor constitutes positive or negative economic growth forecasts, which translate into decisions in companies in the implementation of development strategies and the timing of initiation of other important projects. This causes the effect of herd behaviour (Banerjee 1992).

The research on concurrency of cyclical fluctuations formation in the economy requires earlier specification of the variables that measure the economic activity in the various sectors and to indicate how the cyclical component will be extracted from the data (Barczyk,

Lubiński, Konopczak, Marczewski 2010). In the literature, there are examples of studies presenting the results of empirical researches on the synchronisation of cyclical fluctuations of sectors (Christiano, Fitzgerald 1998, Kijek 2013). Analyses conducted by Christiano and Fitzgerald (1998), based on the indicator of cyclical fluctuation for the number of hours worked, which was extracted for different sectors of the US economy, have shown that there is a high degree of concurrency of cyclical fluctuations. The economic situation in most sectors of the economy improved almost simultaneously. The same was with the deterioration of the economic situation, which happened in most sectors around the same time. Almost the same conclusion about a high similarity of cyclical fluctuations in branches of industry sector was made on the basis of an analysis conducted for the Polish economy. Moreover it is worth to notice, that the fluctuations in the cyclical component showing the condition of the food industry and light industry possess leading properties to the other industries (Kijek 2013).

Afonso and Furceri (2007) analysed the sectoral business cycle synchronisation in the European Union countries and found high business cycle synchronisation in industry and building and construction and low business cycle synchronisation in services sector. According to the study conducted by Meller, Metiu (2017), the higher the synchronisation of business cycles, the higher is the synchronisation of credit cycles. Samarina, Zhang and Bezemer (2017) conducted a study for 16 EMU economies over 1990–2015 and found that the effect of euro introduction was the increase of coherence of business credit cycles and decrease of coherence of total credit and mortgage credit cycles. Synchronicity of cycle movements and similarity of their amplitudes were adopted as measures of credit cycle coherence.

The financial market acts as the bloodstream of the economy and provides the necessary funds for its functioning. Banks are one of the key groups of entities that make up the financial system, whose activities are classified in section K of the services sector. In section K of the services sector, there are included entities conducting the financial and insurance activities. Section K can be divided into three divisions: division 64, covering entities providing financial service activities, excluding insurance and pension funds, division 65, which covers entities whose subject of activity is insurance, reinsurance and pension funds, excluding compulsory social security and division 66, covering entities whose subject

of activity is supporting financial services and insurance and pension funds. Through the development of interest rates, the monetary authorities affect the development of bank lending. Thus affecting the functioning of economic entities, their interest in loans and dynamics of the economic situation in the various sectors of the economy (Lubiński 2013, Pietrzak, Polański, Woźniak 2017).

In many studies, a very important role in the analysis of cyclical fluctuations in the economy and its individual sectors perform the data from business tendency surveys. The business tendency survey indicators are used in composite leading indicators due to their leading relationship against main macroeconomic indicators (Adamowicz, Dudek, Pachucki, Walczyk 2012; Garczarczyk, Mocek, Olejnik, Skikiewicz, 2006). Financial variable are also important as components of composite leading indicators constructed for the whole economy and the main sectors of the economy (Nilsson, Gyomai 2007, Garczarczyk, Skikiewicz, 2009).

The abovementioned results of different studies indicate the great significance of financial sector for economy and raise a question about the relationship between the banking sector and the whole financial sector (section K of the services sector). It is important to verify if the banking sector indicators are leading in relation to the whole financial sector indicators (similarly, as in the case of their relationship to the main macroeconomic variables). On the other hand, according to other studies and theories, there may exist synchronisation of cyclical fluctuations in the banking market and the whole financial sector. Business tendency survey indicators have been used in the article to verify the relationship between cyclical fluctuations in the banking sector and the whole financial sector.

The aim of the article is to compare the data of two different business tendency surveys conducted in Poland – the first survey was concerning the banking sector and the second survey was concerning the section K of the services sector. The aim will be realised by the assessment of the relationship between the cyclical fluctuations in the banking market and in section K of the services sector in Poland. It is important to verify if the cyclical fluctuation in the banking market are leading or coincident in relation to the cyclical fluctuations in the whole section K of the services sector. The assessment of the economic situation on the banking market will be made on the basis of the business tendency surveys conducted quarterly by the Department of Market Research and Services of the Poznań Univer-

sity of Economics and Business. The point of reference in the analyses will be the situation in the entire section K, covering the entities conducting financial and insurance activities, in which the business tendency survey has been conducted by the Central Statistical Office on a monthly basis. In addition, the cyclical fluctuations in the banking sector will be compared to the cyclical fluctuations in section K division 64, covering the entities providing financial services activities, excluding insurance and pension funds, and section K division 65, which covers the entities whose subject of activity is insurance, reinsurance and pension funds, excluding compulsory social security.

The time range of analyses will cover the period from the first quarter of 2003 to the first quarter of 2018. Comparative analyses will concern synthetic indicators, obtained on the basis of the business tendency surveys conducted by the Department of Market Research and Services of the Poznań University of Economics and Business and the Central Statistical Office. These will be PIKBANK indicator and the general business climate indicator. In addition, an indicator regarding the current assessment of the financial situation will be included in the analyses. Due to the uniform set of questions used by the Central Statistical Office in the business tendency survey in the services sector and the lack of additional questions regarding the shaping of economic key values for the banking sector (such as the value of loans and the value of deposits) that appear in the business tendency survey in the banking sector, conducted by the Department of Market and Services Research at the Poznań University of Economics and Business, the scope of comparative analyses in the article has been limited to the above-mentioned indicators.

2 Research methodology

Business tendency survey is conducted by the Central Statistical Office on a monthly basis. Department of Market Research and Services of the Poznań University of Economics and Business conducts a survey on a quarterly basis. This requires the data to be converted to a comparable form. For this reason, Central Statistical Office data was transformed into quarterly terms. Two formulas were used. According to the first formula, quarterly values were calculated as the average for each quarter from the monthly data for this quarter. In the second variant of the formula, the quarterly value

was determined as the value from the last month of each quarter.¹

Analyses were performed in the 'growth cycle' approach. Due to the development of the economic situation balance of the services sector in the range of -100 to +100 points, a trend-free time series is created, which means that there is no need to eliminate the long-term trend, for example, with the use of Hodrick-Prescott filter (Dudek and Walczyk 2013, p. 26). In studies on cyclical fluctuations, which are based on statistical data, there is a choice between the 'classical cycle' approach and the 'growth cycle' approach. The 'classical cycle' approach which focuses on fluctuations in the absolute level of economic activity. The 'growth cycle' approach focuses on fluctuations identified with the deviations of economic activity from its long-term trend. It is argued that the main disadvantage of the 'growth cycle' approach is the act of removing a stochastic trend, which eliminates one of the major driving forces of the business cycle (Harding, Pagan 2002). Although that 'growth cycle' approach was adopted in many studies and this approach is used by OECD in composite leading indicators system (Nilsson, Gyomai 2007).

In order to make the assessment of leading relationship of business tendency survey indicators, the time series have been seasonally adjusted with the use of ARIMA X12 procedure in the Gretl program. The new variables with the cyclical component of the time series have been marked with the symbol '_c'. The banking business tendency survey indicators leading relationship with the indicators of business tendency survey in section K and its two divisions was verified on the basis of the analysis of cross-correlations, in which four quarters were adopted as the maximum length of lags and leads (Nilsson, Gyomai 2007, Matkowski, 2005).

In addition, there were identified turning points in time series containing a cyclical component of the analysed variables. To this end, the Bry-Boschan procedure implemented in the BUSY program

(BUSY Program ... 2003) was applied. It was assumed that the minimum cycle length is 6 quarters, and the minimum length of the phase is 3 quarters.

Due to enhancement in the aim of the article on the verification of leading relationship of the banking business tendency survey indicators with reference series, the measures used in other studies of cycles synchronisation were not adopted. In the studies concerning the cycles synchronisation among the others, the following measures were used: concordance statistic, measure of synchronicity and measure of similarity of cycles (Camacho, Perez-Quiros 2006, Artis, Marcellino, Proietti 2003).

3 Characteristics of the situation in the banking sector in the light of the results of the business tendency survey in the period 2003 Q1–2018 Q1

The business tendency survey in the banking sector has been conducted by the Department of Market Research and Services of the Poznań University of Economics and Business since the second quarter of 1992. This survey is carried out in the headquarters and branches of commercial banks and cooperative banks. The main indicator showing the economic situation in the banking sector is the PIKBANK index, calculated on the basis of five simple indicators (Garczarczyk, Mocek, Olejnik, Skikiewicz, 2006).

$$PIKBANK = \frac{BOPS + BOWK + (-BOWN) + BOSF + BPSB}{5} \quad (1)$$

BOPS - assessment of obtained financial means

BOWK - assessment of given loans

BOWN - assessment of doubtful and loss loans

BOSF - assessment of financial situation

BPSB - forecast of balance sheet sum.

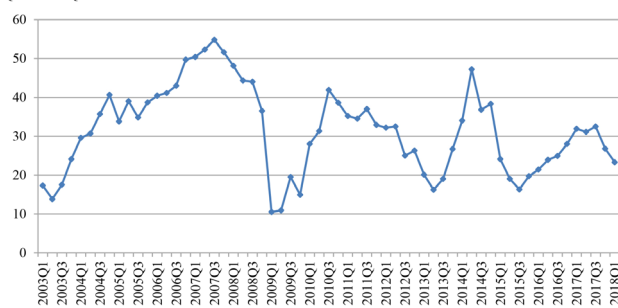
The questions regarding the banking situation were constructed with the use of five-point scales, allowing to assess the direction and intensity of changes of basic economic values, crucial for the banking sector. Simple

¹ The following abbreviations of variables has been used in the article: WOK - general business climate indicator, OSF - indicator of current financial situation of the enterprise. The sections of the economy has been marked with symbols - K (section K), 64 (section K division 64), 65 (section K division 65). The variables based on the first calculation formula has been marked with the number 1, the variant of variables based on the second calculation formula has been marked with the number 2. According to the above convention, the symbol WOK_65_2 means the general business climate indicator for section K division 65 calculated on the basis of the second formula – as the value from the last month of a given quarter.

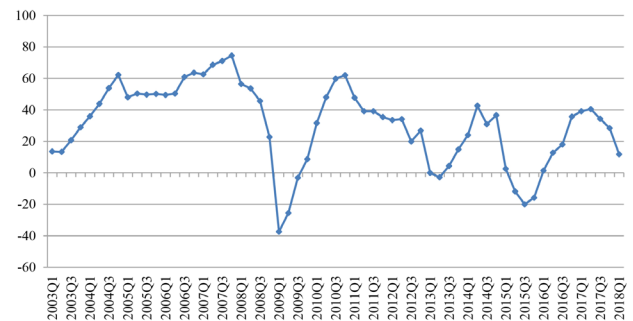
Tab. 1. Descriptive statistics for banking business tendency survey indicators in the period 2003 Q1–2018 Q1

Descriptive statistics	BOSF - assessment of the financial situation (diagnostic balance)	PIKBANK
Mean average	31.1	31.5
Quartile 1	13.6	23.9
Median	35.4	32.2
Quartile 3	49.7	38.7
Standard deviation	25.2	11.0
Coefficient of variation	80.9%	34.7%
Minimum	-37.4	10.5
Maximum	74.5	54.8

Source: Own calculations based on the data from the Department of Market Research and Services of the Poznań University of Economics and Business.

**Fig. 1.** Synthetic banking business tendency survey indicator PIKBANK in the period 2003 Q1–2018 Q1

Source: Own calculations based on the data from the Department of Market Research and Services of the Poznań University of Economics and Business.

**Fig. 2.** Banking business tendency survey indicator BOSF - assessment of the financial situation (diagnostic balance) in the period 2003 Q1–2018 Q1

Source: Own calculations based on the data from the Department of Market Research and Services of the Poznań University of Economics and Business.

indices are calculated as the economic balances for each question in accordance with the formula below:

$$SK = 1 * SP + 0,5 * NP + 0 * BZ - 0,5 * NS - 1 * SS \quad (2)$$

SP - percentage of responses indicating a strong improvement/strong increase in the phenomenon

NP - percentage of responses indicating a slight improvement/small increase in the phenomenon

BZ - percentage of responses indicating no change in the phenomenon

NS - percentage of responses indicating a slight deterioration/slight decrease in the phenomenon

SS - percentage of responses indicating a strong deterioration/strong drop in the phenomenon.

In the analysed period (Q1 2003–Q1 2018), the BOSF indicator ($V = 80.9\%$) was characterised by higher volatility than PIKBANK ($V = 34.7\%$). The values of BOSF ranged from -37.4 to 74.5 points, while in the case of PIKBANK, the values ranged from 10.5 to 54.8 points. It is worth noting that despite significant differences in the volatility of both indicators, the average values were similar and amounted to 31.5 points for PIKBANK and 31.1 points for BOSF (Tab. 1).

There is a considerable similarity in the area of cyclical fluctuations in both banking business tendency survey indicators (Chart 1 and 2). This conclusion is also confirmed by the analysis of turning points, identified in the time series containing only the cyclical component of PIKBANK and BOSF, from which seasonal and irregular fluctuations were eliminated. In the whole period

Tab. 2. Turning points in the time series of cyclical component of the banking business tendency survey indicators in the period 2003 Q1–2018 Q1

variables	upper turning point	down turning point	upper turning point	down turning point	upper turning point	down turning point	upper turning point
BOSF_c	P:2-2007	T:4-2008	P:3-2010	T:1-2013	P:1-2014	T:2-2015	P:1-2017
PIKBANK_c	P:2-2007	T:4-2008	P:3-2010	T:1-2013	P:2-2014	T:2-2015	P:1-2017

Source: Own calculations based on the data from the Department of Market Research and Services of the Poznań University of Economics and Business.

covered by the analysis, seven turning points were identified – four upper turning points and three down turning points (Tab. 2).

4 Characteristics of the situation in section K of the services sector and in divisions 64 and 65 in the light of the results of the business tendency survey in the period 2003 Q1–2018 Q1

The Central Statistical Office provides the results of business tendency survey for sections and divisions of the services sector. A business tendency survey in the services sector has been conducted since January 2003. The main indicator describing the economic situation in particular sections of the services sector is general business climate indicator (WOK), calculated as the arithmetic average of two indicators – calculated for the diagnostic question regarding the current general economic situation of the unit and the forecasting question, that measures the predictions.

The questions in the questionnaire were built with the use of three-point scales, which allow to determine the direction of changes in basic economic values, universal for entities in the services sector, regardless of the section in which their business activity was classified. The economic balances for questions contained in the questionnaire are calculated in accordance with the following formula:

$$SK = 1 * P + 0 * BZ - 1 * S \quad (3)$$

P - percentage of responses indicating improvement/increase of the phenomenon

BZ - percentage of responses indicating no change in the phenomenon

S - percentage of responses indicating deterioration/decrease of the phenomenon.

The general business climate indicator (WOK) was characterised by the lowest volatility in division 65 of section K, and the highest volatility was achieved for division 64 of section K. The WOK indicator was slightly more volatile for section K and its two divisions in option II (converted into quarterly terms as last month's value for each quarter). The largest range of values occurred in the general climate indicator for section 64 section K in option II, because its minimum value in the whole period of Q1 2003–Q1 2018 was -18.1 points, and the maximum value amounted to 65.1 points. Average values of general business climate indicator were at the lowest level in division 64 of section K, while the highest were for division 65 of section K. In both divisions and the entire section K, slightly lower mean values were assumed in the case of formula II (Tab. 3).

A simple indicator of the current financial situation of the enterprise OSF, specifying the current financial situation of entities conducting financial and insurance activities, showed much greater volatility than the synthetic indicator – general business climate indicator (WOK). It is worth noting that the relatively smallest variation of the OSF indicator occurred in the case of division 65 of section K, and almost twice as large in the case of division 64 of section K. The coefficient of variation assumed slightly higher values for OSF indicators in option II. The largest range of values was observed in the case of OSF indicator for division 64 of section K in option I – the lowest value of the business climate balance was -27.6 points, and the highest value was 65.6 points. The average values of OSF indicator for all divisions and the entire section of K were lower by approx. 10 points from the average values of the general economic climate indicator. It is worth noting that the average values of

Tab. 3. Descriptive statistics for general business climate indicator WOK in section K and divisions 64 and 65 of the services sector in the period 2003 Q1–2018 Q1

Descriptive statistics	WOK_K_1	WOK_64_1	WOK_65_1	WOK_K_2	WOK_64_2	WOK_65_2
Mean average	29.6	28.4	34.2	29.4	28.0	33.4
Quartile 1	21.4	20.8	25.3	22.2	21.3	25.6
Median	27.7	27.9	32.5	26.3	26.4	32.0
Quartile 3	33.1	33.9	39.6	32.8	34.7	38.6
Standard deviation	12.4	15.7	11.1	12.7	16.4	11.7
Coefficient of variation	42.1%	55.4%	32.3%	43.2%	58.6%	35.1%
Minimum	4.8	-4.6	12.5	1.1	-18.1	6.0
Maximum	60.3	66.4	59.7	59.8	65.1	62.2

Source: Own calculations based on the data from the Central Statistical Office.

Tab. 4. Descriptive statistics for indicator of current financial situation of the enterprise OSF in section K and divisions 64 and 65 of the services sector in the period 2003 Q1–2018 Q1

Descriptive statistics	OSF_K_1	OSF_64_1	OSF_65_1	OSF_K_2	OSF_64_2	OSF_65_2
Mean average	18.5	18.7	21.4	17.9	17.5	21.3
Quartile 1	7.8	8.3	12.3	7.2	6.9	10.1
Median	15.9	15.6	18.2	16.0	15.7	17.1
Quartile 3	25.0	25.4	28.3	24.9	24.6	29.4
Standard deviation	15.6	20.0	12.3	15.5	20.1	13.8
Coefficient of variation	84.1%	107.3%	57.6%	86.6%	114.6%	64.6%
Minimum	-9.5	-27.6	2.1	-9.4	-23.9	-0.5
Maximum	55.3	65.6	49.4	54.3	66.7	49.4

Source: Own calculations based on the data from the Central Statistical Office.

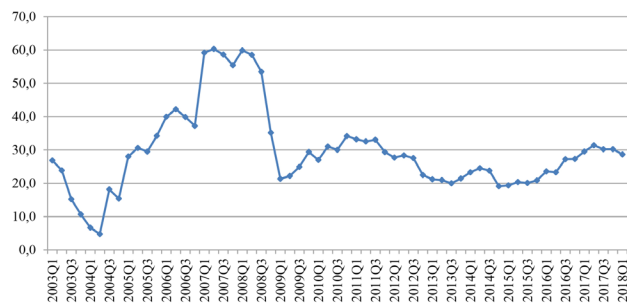


Fig. 3. General business climate indicator in section K (WOK_K_1) in the period 2003 Q1–2018 Q1

Source: Own calculations based on the data from the Central Statistical Office.

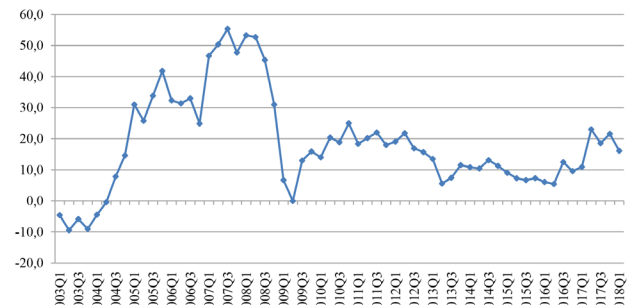


Fig. 4. Indicator of current financial situation of the enterprise in section K (OSF_K_1) in the period 2003 Q1–2018 Q1

Source: Own calculations based on the data from the Central Statistical Office.

Tab. 5. Turning points in the time series of cyclical component of the business tendency survey indicators for section K and its divisions in the period 2003 Q1–2018 Q1

variables	down turning point	upper turning point	down turning point	upper turning point	down turning point	upper turning point	down turning point	upper turning point
WOK_K_1_c	T:4-2003	P:4-2007	T:4-2008	P:4-2010	T:4-2014			
WOK_K_2_c	T:3-2003	P:2-2007	T:1-2009	P:3-2010	T:4-2014			
WOK_64_1_c	T:1-2004	P:1-2007	T:1-2009	P:4-2010	T:4-2014			
WOK_64_2_c	T:4-2003	P:1-2007	T:1-2009	P:4-2010	T:4-2014			
WOK_65_1_c	T:4-2003	P:2-2007			T:3-2013	P:2-2016		
WOK_65_2_c	T:3-2003	P:4-2007						
OSF_K_1_c		P:4-2007	T:4-2008	P:3-2010	T:1-2013	P:2-2014	T:2-2015	P:2-2017
OSF_K_2_c	T:3-2003	P:2-2007	T:4-2008	P:4-2011				
OSF_64_1_c		P:4-2007	T:4-2008	P:3-2010			T:2-2015	
OSF_64_2_c		P:2-2007	T:4-2008	P:3-2010			T:3-2015	
OSF_65_1_c	T:3-2003	P:1-2007	T:3-2010	P:3-2011				
OSF_65_2_c	T:3-2003	P:4-2004	T:3-2010	P:3-2011				

Source: Own calculations based on the data from the Central Statistical Office.

OSF indicator in the whole period of Q1.2003–Q1 2018 were at a similar level in division 64 of section K and in the entire section K. Only in division 65 section K, the average values of the indicator OSF (both in option I as in option II) were higher by a few points (Tab. 4).

Both indicators – WOK (general business climate indicator) and OSF (an indicator of the current financial situation of the enterprise) reveals a considerable similarity in terms of cyclical fluctuations (chart 3 and 4). In the case of most variables presenting the cyclical component of both business tendency survey indicators in section K and its two divisions, the turning points were identifiable in the period Q1 2003–Q4 2011 or Q1 2003–Q4 2014. In the subsequent quarters, due to the relatively low volatility, the Bry-Boschan procedure implemented in the BUSY program did not confirm the existence of further turning points (Tab. 5).

5 Comparative analysis of cyclical fluctuations in the banking market and in the K section of the services sector

The analysis of charts with time series presenting the cyclical component of synthetic business tendency survey indicators for the banking sector and K section of

the services sector allows to conclude that there is a high degree of similarity (Chart 5). A similar conclusion can be formulated in the case of indicators of the general financial situation in the banking sector, as well as the entire section K, covering all entities conducting financial and insurance activities (Chart 6).

Initial conclusions from the analysis of charts showing the development of business tendency survey indicators were confirmed by the results of the correlation analysis, which additionally allows to verify the leads or lags of banking business tendency survey indicators against the business tendency survey indicators in section K and its two divisions. Correlation analysis indicates the presence of moderate or strong relationships between variables, and also allows to consider PIKBANK_c and BOSF_c as leading indicators against business climate indicators in section K and divisions 64 and 65 (Tab. 6). The PIKBANK_c indicator shows the strongest relation with the general business climate indicator in the whole section K (WOK_K_1 and WOK_K_2). In turn, the BOSF_c indicator correlates most strongly with the OSF_65_1_c and OSF_K_2_c indicators.

When comparing the strength of correlation between banking business tendency survey indicators and both variants of business tendency survey indicators for section K and its divisions (transformed in variant I to quarterly approach as arithmetic means from three months and in the variant II obtained as values from

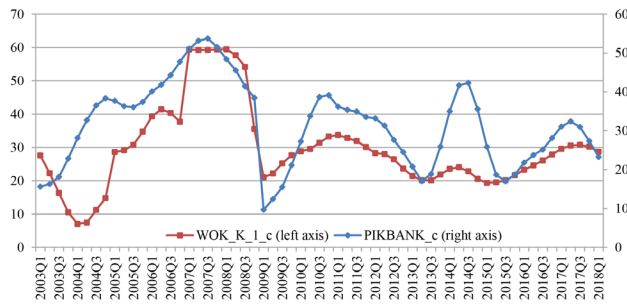


Fig. 5. Cyclical component of the synthetic banking business tendency survey indicator PIKBANK_c and general business climate indicator in section K WOK_K_1_c in the period 2003 Q1–2018 Q1

Source: Own calculations based on the data from the Department of Market Research and Services of the Poznań University of Economics and Business and the Central Statistical Office.

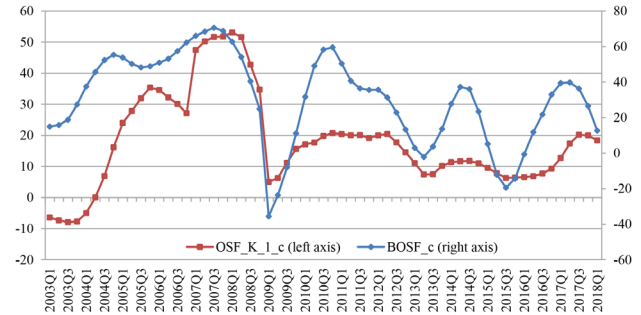


Fig. 6. Cyclical component of the banking business tendency survey indicator BOSF_c and business tendency survey indicator of current financial situation of the enterprise in section K (OSF_K_1_c) in the period 2003 Q1–2018 Q1

Source: Own calculations based on the data from the Department of Market Research and Services of the Poznań University of Economics and Business and the Central Statistical Office.

Tab. 6. Assessment of lead/lag of the banking business tendency survey indicators in relation to business tendency survey indicators of the enterprise in section K based on the cross-correlation analysis in the period 2003 Q1–2018 Q1

PIKBANK_c			BOSF_c		
variables	Pearson correlation coefficient	lag (+) / lead (-)	variables	Pearson correlation coefficient	lag (+) / lead (-)
WOK_K_1_c	0.7274	-1	OSF_K_1_c	0.6900	-1
WOK_K_2_c	0.7212	-1	OSF_K_2_c	0.7166	-1
WOK_64_1_c	0.7025	-1	OSF_64_1_c	0.6522	-1
WOK_64_2_c	0.7164	0	OSF_64_2_c	0.6303	-1
WOK_65_1_c	0.6381	-1	OSF_65_1_c	0.7362	-2
WOK_65_2_c	0.6531	-2	OSF_65_2_c	0.7002	-2

Source: Own calculations based on the data from the Department of Market Research and Services of the Poznań University of Economics and Business and the Central Statistical Office.

the last month of each quarter), it can be concluded that in half of the cases, higher Pearson correlation coefficients were obtained for variant I and in the second half of cases, for variant II.

In order to confirm the conclusions formulated on the basis of correlation analysis, an assessment of lead / lag of turning points of banking business tendency survey indicators was made against the turning points of business tendency survey indicators in section K and divisions 64 and 65 of section K of the services sector. The leading properties of the banking business tendency survey indicators were not confirmed in all the turning points due to the identification of a higher number of cycles for these variables in comparison with the variables describing the economic situation in section K and

its divisions. Taking into account the number of turning points that have been identified, it is worth to mention that in the case of the OSF_K_1_c indicator, the highest number of turning points was identified, and the BOSF_c indicator in almost all upper turning points of OSF_K_1 has leading properties, while the bottom turning points are simultaneous in both indicators. It is also worth emphasising that the turning points of the remaining variants of indicators of the current assessment of the financial situation in section K and its divisions were most often simultaneous (Tab. 7). The turning points of the PIKBANK_c indicator more often were found as leading in relation to the turning points of the general business climate indicator (WOK).

Tab. 7. Assessment of lead/lag of the banking business tendency survey indicators in relation to business tendency survey indicators of the enterprise in section K based on the turning points analysis in the period 2003 Q1–2018 Q1

variables	upper turning point	down turning point	upper turning point	down turning point	upper turning point	down turning point	upper turning point	
	BOSF_c	P:2-2007	T:4-2008	P:3-2010	T:1-2013	P:1-2014	T:2-2015	P:1-2017
OSF_K_1_c	-2	0	0	0	-1	0	-1	
OSF_K_2_c	0	0	-1					
OSF_64_1_c	-2	0	0				0	
OSF_64_2_c	0	0	0				-1	
OSF_65_1_c	1	-7	-4					
OSF_65_2_c	-2	-7	-4					

variables	upper turning point	down turning point	upper turning point	down turning point	upper turning point	down turning point	upper turning point	
	PIKBANK_c	P:2-2007	T:4-2008	P:3-2010	T:1-2013	P:2-2014	T:2-2015	P:1-2017
WOK_K_1_c	-2	0	-1	-7				
WOK_K_2_c	0	-1	0	-7				
WOK_64_1_c	1	-1	-1	-7				
WOK_64_2_c	1	-1	-1	-7				
WOK_65_1_c	0			-2	-8			
WOK_65_2_c	-2							

Source: Own calculations based on the data from the Department of Market Research and Services of the Poznań University of Economics and Business and the Central Statistical Office.

6 Conclusions

Despite the different scales used in the surveys conducted by the Central Statistical Office (three-point scales) and the Department of Market Research and Services of the Poznań University of Economics and Business (five-point scales), some similarities can be found in the development of business tendency survey indicators in the banking market and section K of the services sector, which covers the entities conducting financial and insurance activities.

Due to the different frequency of both surveys, business tendency survey indicators calculated on a monthly basis have been transformed into quarterly terms. Two formulas were used to transform them, none of them having a significant advantage in the context of assessing the similarity of cyclical fluctuations in the banking market and in the entire K section of the services sector.

The analyses allow to formulate the preliminary conclusion that changes in the economic situation appear earlier in the banking sector than in section K

of the services sector. This means that the observation of the economic situation in the banking sector makes it possible to anticipate changes that will occur with a slight delay in the entire financial sector (section K of the services sector).

The banking sector plays a very important role in the monetary policy implementation in each market economy. In Poland, the monetary policy conducted by the National Bank of Poland at first influences the banking sector and then have an impact on the whole economy. Probably, that is the main reason why the banking sector indicators can be considered as leading indicators not only for the whole economy but also for the section K and its two divisions.

The results of the analyses presented in the article encourage to conduct further research, and to verify the usefulness of the banking business tendency survey data in dynamic econometric models estimated for the main indicators describing the situation in the whole section K as well as divisions 64 and 65. The abovementioned econometric models could be used for forecast-

ing purposes. The obtained results allow to conclude that banking business tendency survey indicators will also be useful as components of leading indicators for the entire section K and its two divisions.

References

- [1] Adamowicz, Elżbieta, Sławomir Dudek, Dawid Pachucki and Konrad Walczyk. 2012. *Wahania cykliczne w Polsce i strefie euro*. Warszawa: Prace i Materiały IRG SGH.
- [2] Afonso, António and Davide Furceri. 2009. *Sectoral business cycle synchronization in the European Union*, Economics Bulletin vol. 29(4).
- [3] Al-Yousif, Yousif Khalifa. 2002. *Financial development and economic growth: another look at the evidence from developing countries*, Review of Financial Economics vol. 11.
- [4] Artis, Michael, Massimiliano Marcellino and Tommaso Proietti. 2003. *Dating business cycle: a methodological contribution with an application to the Euro Area*. Luxembourg: Office for Official Publications of the European Communities, Working Papers and Studies.
- [5] Banerjee, Abhijit V. 1992. *A Simple Model of Herd Behavior*, The Quarterly Journal of Economics no. 3.
- [6] Barczyk Ryszard, Marek Lubiński, Karolina Konopczak and Krzysztof Marczewski. 2010. *Synchronizacja wahań koniunkturalnych. Mechanizmy i konsekwencje*. Poznań: Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu.
- [7] *BUSY Program – User Manual* (2003), European Commission.
- [8] Camacho, Maximo and Gabriel Perez-Quiros. 2006. *A New Framework to Analyze Business Cycle Synchronization*, Contributions to Economic Analysis vol. 276.
- [9] Christiano, Lawrence J. and Terry J Fitzgerald. 1998. *The business cycle: It's still a puzzle*, Economic Perspectives no. 4.
- [10] Christopoulos, Dimitris K. and Efthymios G Tsionas. 2004. *Financial Development and Economic Growth: Evidence from Panel Unit Root and Cointegration Tests*, Journal of Development Economics vol. 73.
- [11] Demetriades, Panicos O. and Khaled A. Hussein. 1996. *Does financial development cause economic growth? Time-series evidence from 16 countries*, Journal of Development Economics vol. 51(2).
- [12] Drozdowicz-Bieć, Maria. 2012. *Cykle i wskaźniki koniunktury*. Warszawa: Poltext.
- [13] Dudek, Sławomir and Konrad Walczyk. 2013. *Zachowania gospodarstw domowych w warunkach zmiennej koniunktury. Polska na tle strefy euro*, Handel Wewnętrzny nr 2.
- [14] Garczarzyk, Józef, Marek Mocek, Iwona Olejnik and Robert Skikiewicz. 2006. *Wskaźniki koniunktury finansowej w diagnozowaniu i prognozowaniu rozwoju gospodarki*, Poznań: Akademia Ekonomiczna w Poznaniu.
- [15] Garczarzyk, Józef and Robert Skikiewicz. 2009. *Złożone wskaźniki wyprzedzające dla gospodarki. Zastosowania na świecie i w Polsce*, Marketing i Rynek no. 5.
- [16] Harding, Don and Adrian Pagan. 2002. *Dissecting the Cycle: A Methodological Investigation*, Journal of Monetary Economics, vol. 49(2).
- [17] Hassan, M. Kabir, Benito Sanchez and Jung-Suk Yu. 2011. *Financial Development and Economic Growth: New Evidence from Panel Data*, The Quarterly Review of Economics and Finance vol. 51.
- [18] Kijek, Arkadiusz. 2013. *Analiza cykliczności zmian sytuacji ekonomiczno-finansowej w polskim przemyśle przetwórczym*, Bank i Kredyt no. 3.
- [19] Levine, Ross and Sara Zervos. 1998. *Stock Markets, Banks, and Economic Growth*, The American Economic Review vol. 88(3).
- [20] Lubiński, Marek. 2013. *Transmisja koniunktury za pośrednictwem banków*, Prace i Materiały Instytutu Rozwoju Gospodarczego SGH nr 92, Warszawa: IRG SGH.
- [21] Luintel Kul B. and Khan Mosahid. 1999. *A quantitative reassessment of the finance-growth nexus: Evidence from a multivariate VAR*, Journal of Development Economics vol. 60.
- [22] Matkowski, Zbigniew. 2005. *Syntetyczne wskaźniki koniunktury dla gospodarki polskiej oparte na wynikach badań ankietowych*, [w:] (red.) *Z badań koniunktury gospodarczej w Polsce*. Warszawa: Materiały i Prace IRG SGH.
- [23] Meller, Barbara and Norbert Metiu. 2017. *The synchronization of credit cycles*, Journal of Banking & Finance vol. 82.
- [24] Nilsson, Ronny and Gyorgy Gyomai. 2007. *OECD System of Leading Indicators*.
- [25] Opolski, Krzysztof and Marcin Dwórzniak. 2014. *Rozwój polskiego sektora finansowego w I dekadzie XXI wieku*, Mazowsze Studia Regionalne vol. 15.
- [26] Osborn, Denise and Marianne Sensier. 2002. *The prediction of business cycle phases: financial variables and international linkages*, National Institute Economic Review no. 1.
- [27] Pietrucha, Jacek. 2013. *System finansowy a wzrost i rozwój gospodarczy w: Systemowe uwarunkowania wzrostu i rozwoju gospodarczego*. Katowice: Prace Naukowe / Uniwersytet Ekonomiczny w Katowicach.
- [28] Pietrzak, Bogusław, Zbigniew Polański and Barbara Woźniak. 2017. *System finansowy w Polsce (tom I)*. Warszawa: PWN.
- [29] Rousseau, Peter L. and Paul Wachtel. 1998. *Financial intermediation and Economic Performance: Historical Evidence from Five Industrialized Countries*. Journal of Money, Market and Banking vol. 30(4).
- [30] Samarina, Anna, Lu Zhang and Dirk Bezemer. 2017. *Credit cycle coherence in the eurozone: Was there a euro effect?* Journal of International Money and Finance vol. 77.
- [31] Shan, Jordan and Alan Morris. 2002. *Does financial development 'lead' economic growth?* International Review of Applied Economics vol. 16.
- [32] Wang, Eric C. 2000. *A dynamic two-sector model for analyzing the interrelation between financial development and industrial growth*, International Review of Economics & Finance vol. 9(3).