ALEKSANDER GRZELAK
Economic University in Poznan
JADWIGA SEREMAK-BULGE
Institute of Agricultural and Food Economics
– National Research Institute
Warsaw

COMPARISON OF SELECTED METHODS OF SURVEY OF THE ECONOMIC CONDITIONS IN AGRICULTURE IN POLAND*

Abstract

The paper aims at comparison of the survey methods of the economic conditions in Poland and their usability to evaluate the development trends in agriculture. The paper compares three methods: the one used by the Institute of Agricultural and Food Economics (Synthetic Indicator of Economic Conditions in Agriculture, SIECA), the Economic Development Institute of SGH (Total Indicator of Economic Conditions in Agriculture, TIECA) and to a marginal degree that of the Central Statistical Office (survey of economic conditions in agricultural holdings).

The conducted research shows that Synthetic Indicator of Economic Conditions in Agriculture may be a barometer (benchmark indicator) to the Total Indicator of Economic Conditions in Agriculture. This follows from phase cycle advancement for the SIECA to the TIECA by approx. 1 quarter. There was a relatively clear synchronization of these cycles (upon clearing away the trend as well as seasonal and incidental fluctuations). The length of the separated economic cycles in agriculture in the researched period was on average 12-13 quarters. At the same time, they were asymmetrical. The growth phase was more gentle and long-lasting, while the downward phase was rapid and lasted shorter.

Keywords: economic conditions, agriculture, research method, indicator, economic cycle.

Preface

The economic conditions may be defined as the total conditions affecting the climate for operation of business entities. Behavioural issues also play an essential role here, as they affect the projects undertaken by the developers and assessment of the future by business management. The economic conditions most often concern the whole economy, but it may also include its components, e.g. agriculture (Adamowicz E., Klimkowska J., Walczyk K. 2011).

The relationships between the general economic conditions and the economic conditions in agriculture are complex. On the one hand, the economic conditions in agriculture are vulnerable to the influence of the general economic conditions, on the other – they are their component. The flow of incentives from the economic conditions to agriculture takes place mainly through the sale of the agri-food products and purchase of the means of production. At the same time, economic conditions in agriculture contribute to the general economic conditions primarily through the food price impact on the general inflation indicator and the level of consumption as well as the impact on the development of food industry production and agri-food exports, which is an essential part of the Polish trade with foreign countries[1].

The economic conditions are closely associated with the phenomenon of ciclicity of fluctuations (situation cycles), and surveys of fluctuations of economic conditions are an extensive part of the science of economic conditions. These surveys usually concern the general economic conditions, relatively rarely they concern agriculture. Poland is among those few countries where such surveys are being carried out since the early nineties of the 20th century (Seremak-Bulge J. 2000-2014; Gorzelak E., Zimny Z. 2010-2014; Woś A. 1998). Interest in the market mechanisms and their impact on the conditions of the functioning of agriculture grew in view of their introduction in the early nineties of the 20th century. On the other hand, the share of agriculture in the GDP is decreasing and the economic conditions in agriculture are increasingly coincident with the trends occurring in the economy and in the global environs (Grzelak A. 2013), also due to the integration of the world food markets (Rembeza J., Seremak-Bulge J. 2009). However, the economic conditions in agriculture are still influenced, though to a smaller degree, by specific factors such as, e.g. dependence of production on the agri-meteo conditions, atomization of agricultural producers, relatively low flexibility of demand for agricultural raw materials in terms of prices, combination of the producer and consumer functions (Czyżewski A. 2007). The agricultural economists believe that the following have the greatest impact on fluctuations of the economic conditions in agriculture: profitability of agricultural production expressed by the price scissors indicator, changing vol-

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[1] The share of agri-food products in the Polish exports fluctuated in the past years around 11.5-13.5% and in imports it was 9.5-10%. The more important fact is that the steadily growing positive balance in foreign trade in these goods has an essential impact on reduction of the deficit in the total Polish foreign trade balance.

ume of agricultural production and the level of support to agricultural producers or the terms of access to credits.

The objective of this paper consists in a comparison of the methods of survey of the economic conditions in agriculture in Poland and their usability to evaluate the development trends in agriculture. The article compares three methods: the one used at the Institute of Agricultural and Food Economics (Synthetic Indicator of Economic Conditions in Agriculture, SIECA), by the Economic Development Institute SGH (Total Indicator of Economic Conditions in Agriculture, TIECA) and by the Central Statistical Office (survey of economic conditions in agricultural holdings). In view of the fact that the third of the specified methods was only used since 2012 it is only considered in a marginal scope.

The authors focused on evaluation of the changes in economic conditions in agriculture as a whole sector. The key research hypothesis states that the Synthetic Indicator of Economic Conditions in Agriculture (SIECA) is a reference indicator vs the Total Indicator of Economic Conditions (TIEC). The analyses concern the 1998-2014 period because of the comparability of the existing empirical data.

Methodology of research

The dramatic changes in the economic conditions of functioning of agriculture, caused by the change in the economic system in Poland at the end of the 1980s and the beginning of the 1990s and its exposure to the market mechanism, gave rise to interest in the economic conditions research in agriculture. These surveys were first started at the beginning of the nineties by A. Woś with the use of the quantitative method. The author used a synthetic indicator of economic conditions to assess the general economic conditions affecting the status and development of agriculture, based on the following indicators: change in agricultural GDP, price scissors, income parity, agricultural investment rate, terms of trade for agri-food products (Woś A. 1998). The weak point of the indicator used by A. Woś was a time lag of the statistical survey and limited access to information, which hampered or even made impossible the efficient use of agricultural policy tools to counteract the effects of change in these conditions. However, it was an inspiration to develop a method which allows monitoring the changes which take place in the market environs of agriculture and their monthly presentation with the use of one indicator – the Synthetic Indicator of Economic Conditions in Agriculture (SIECA).

1. Calculated in the Market Survey Facility of the Institute of Agricultural and Food Economics – NRI, the Synthetic Indicator of Economic Conditions in Agriculture (SIECA) is a quantitative indicator, which synthetically illustrates the changes of the market conditions in agricultural production. It is calculated as an arithmetical average of the price scissors and the potential demand indicator. This indicator includes the complex demand-supply and price conditions of the agricultural market, equalized with the use of a 6-month moving average (Table 1).

Table 1

SIECA and partial indicators used by the Institute for evaluating the changes on the market derived limitations of production in agriculture in Poland during 06.2013-06.20

Partial meters	06.2013	01.2014	02.2014	03.2014	04.2014	05.2014	06.2014
Price scissors	100.0	100.5	100.1	100.2	100.1	100.1	99.7
Purchase price change indicator	100.1	100.4	99.9	100.1	99.9	100	99.6
Means of production price change indicator	100.1	99.9	99.8	99.8	99.8	99.8	99.9
Potential demand indicator	99.5	101	99.7	99.6	100.3	99.8	99.6
Inflation and food price change indicator	99.6	100.2	99.8	99.7	99.8	99.8	99.9
Changes in remuneration and food price change indicator	99.3	101.9	99.9	100.2	100.9	100.5	99.9
Change in food industry production indicator	99.8	100.3	98.9	98.4	99.9	99.4	99.4
Change in agri-food product exports and imports indicator	98.6	102.8	101.1	101.3	101.4	98.8	98.1
Synthetic Indicator of Economic Conditions in Agriculture (SIECA)	99.7	100.8	99.9	99.9	100.2	99.9	99.7

[a] 6-month moving averages.
Source: (Seremak-Bulge J. 2000-2014).

Apart from the synthetic indicator, the monthly evaluation also includes the partial indicators comprised therein, namely the price scissors, and its equalized indicators of changes in the prices of the purchase basket and retail prices of the means of production, as well as the indicator of potential demand with its equalized indicators of changes in the food retail prices vs the inflation and remuneration, changes in the value of food industry sales and changes in the foreign trade in agri-food products turnover.

The price scissors indicator is calculated as the relation of the equalized indicator of changes in the basket of purchase of basic agricultural products quoted and published monthly by GIS in statistical bulletins (in 1993 these included: total cereals, wheat, rye, potatoes, beef meat, pig meat, poultry and milk[2]) and the equalized indicator of changes in retail prices of the basic means of production purchased by the farmers and monitored by GUS (mineral fertilizers, pesticides, immediate energy carriers, including fuels, agricultural machines, building materials). The monthly indicators of changes in the purchasing basket prices are weighted with the use of the value of purchase. Moreover, in consecutive months of each year analyses include the changes in the cumulated price scissors indicator, which occurred during the period between December of the previous year and the studied month.

[2] After 2000, GUS increased the number of cereals species and animal products monitored monthly, but due to the comparability of the results of surveys the number of products was not changed and their share in commercial agricultural production in the recent years is 62-65%.

The equalized indicator of potential demand is the product of indicators of changes in food prices with regard to the general indicator of changes in prices and consumption goods and the indicator of changes in remunerations in the business sector, the indicator of changes in the agri-food product foreign trade turnover, according to the formula:

$$\text{Potential demand} = (a \quad 1.2 + b \quad 1.2 + c \quad 1.2 + d \quad 0.4) / 4$$

where:
a – equalized indicator of changes in food retail prices with regard to inflation,
b – equalized indicator of changes in food retail prices with regard to remunerations,
c – equalized index of changes in the value of food industry sales,
d – equalized indicator of changes in the value of agri-food exports and imports.

2. The method of the economic condition test was first used to survey the economic conditions in Polish agriculture by E. Gorzelak in 1993[3]. The method was developed for agriculture in April 1992 in response to the growing interest in surveying the economic conditions in conjunction with the transformations in the economic system and development of open market economy in Poland. Evaluation of the economic conditions is based on an analysis of positive and negative responses from respondents who assess the revenue status of the farms they are running and their development prospects The Total Indicator of Economic Conditions (TIEC) is calculated as the arithmetical average of the indicator of changes in cash revenues and the indicator of trust (Table 2). The indicator of cash revenues is calculated as the arithmetical average from balances of questions on the achieved and anticipated cash revenues in agricultural holdings, separately from the two recent surveys. The share of the partial indicator in TIEC is twice that of the share of the trust indicator.

Farmer responses to the question on prospects of further farming were the basis for calculating the indicator of trust. Three variants of response were proposed: "with trust", "with anxiety" and "with fear", with assigned +1, -0.1 and -1 point, respectively. During surveys also detailed results are studied as they allow clarification of the reasons for change of the Total Indicator of Economic Conditions (TIEC), but which are not one of its components. The following changes

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[3] The economic conditions test is usually carried out with respect to the survey of general economic conditions. In Poland, apart from the general economic conditions, these surveys were extended onto the processing industry, civil works, transport, commerce, banking, agriculture and households. Surveys of economic conditions in agriculture are carried out rather less often due to the diminishing share of agriculture in the GDP in developed countries and the growing dependence of the situation in agriculture on the level of economic growth and support under agricultural policies. Apart from Poland, the economic conditions test in agriculture is carried out only in two countries (Dudek S., Zając T. 2012).

are included: amounts of savings and debts, purchase of the means of production (mineral fertilizers, concentrated feed, plant protection agents), investments (in machines and equipment, buildings and structures), accessibility of credits, plans for the use of credits on market terms and the possibility to contract preferential credits, as well as allocation of aid funds. Survey of TIEC since October 1998 are carried out every quarter of a year (from July 1993 till July 1998 they were carried out every two months) by the Economic Development Institute SGH, with the assistance from Agricultural Advisory Centres, on several thousand farms (over the 20 years the number of farms fell from over a dozen thousand to about 2 thousand farms)[4]. The relatively large population allows analysis of the results of surveys depending on the size of the farm (7-15 ha, 15-50 ha, > 50 ha), its location (the northern, western, central-western and southern macro-regions) and age (up to 30, 31-45, 46-60 and over 60 years) and the education of the manager of the farm (primary, secondary, university).

Table 2

Indicators for economic conditions in agriculture calculated by IRG SGH in 04.2013-04.2014

Description	04.2013	07.2013	10.2013	01.2014	04.2014
General econ. condit. indicator (TIEC)	-6.5	-1.2	-1.9	-4.7	-4.5
Cash revenue indicator	-13.0	-1.9	-2.5	-9.4	-8.3
Indicator of trust	6.4	0.4	-0.8	4.5	3.3

Source: (Gorzelak E., Zimny Z. 2010-2014).

3. Since 2013 GUS surveys the economic conditions (in half-year periods: the 1st half-year in June and the 2nd one in December) in agricultural holdings using the economic condition test. The survey includes all agricultural holdings of legal persons and organisational units which do not have legal personality and a random sample of individual farms (25.5 thousand), with economic size of over EUR 2 thousand (for 2012) or 4 thousand (for 2013) of the value of standard production (GUS 2012, 2013). It is therefore a sample including commercial holdings[5]. The economic conditions are defined as the difference in percentage balances of positive and negative responses. In this case survey concerns the status and evaluation of changes in the general situation of the agricultural holding, profitability of agricultural production and the demand for agricultural products as well as the foreseen changes in the situation in the coming 6 months. Partial economy meters are used, but there is no synthetic measure. These meters are of both a dynamic nature due to the fact that they concern the changes

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[4] Since 2013, the surveys are carried out with the participation of IERiGŻ-PIB.

[5] The mean area of surveyed units was 13.7 ha. Among these 35.8% of surveyed farms used up to 5 ha of agricultural land, and 20.1% at least 15 ha of agricultural land.

(general situation, profitability, demand for agricultural products), and statistical (e.g. evaluation of the current situation of the agricultural holding).

Table 3

Selected meters for economic conditions used for evaluation of economic conditions on agricultural holdings by GUS in 2012[a] and 2013

Description	Change in general situation of a farm	Change in profitability of agric. production	Change in demand for agric. products	Evaluation of current situation of a farm	Evaluation of profitability of agric. production	Demand for agric. products
2012-I	-20.9	-34.7	-2.7	-1.5	-14.8	-19
2012-II	-20.7	-28.9	-4.3	-2.5	-11.4	-20.5
2013-I	-17.3	-35.7	-9.9	-3.1	-9.5	-38.8
2013-II	-16.4	-29.8	-6.7	0.6	-4.3	-31.4

[a] Survey commenced in the 1st half of 2012.

Source: (GUS 2014).

Economic conditions on agricultural holdings are determined by a number of partial meters, also taking into account the general focus of production on the holding, the nine area groups, the age of the farm manager (six groups). Evaluation also concerns the structure of agricultural holdings in terms of their current and anticipated objectives, expenditure, diagnosis and forecast as to the implementation of investment projects, fostering factors and those hampering the development of the holdings and their plans. Additionally, the detailed elements were predetermined for the evaluation of the economic conditions in terms of the general situation of the agricultural holding, profitability of production and demand for agricultural products.

Despite the relatively short time of publishing the GUS meters of economic conditions (Table 3) in agriculture and lower frequency of surveys (half-year cycle), in general they correspond with the trends disclosed by the SIECA and TIEC indicators (Tables 2-3, Fig. 1).

The time range of empirical analyses in this article was limited to 1998 (3rd quarter) – 2014 (1st quarter) to ensure comparability of data and homogeneity of analyses. Comparisons were based on the economic condition indicators for the same months for the studied series, i.e. January, April, July and October, as representatives of each quarter. Records of the TIEC indicator (quarterly) refer to those very months.

The surveys of changes in the economic conditions were based on the method of decomposition of time series Census-II for an additive model. This method has an advantage in that it is possible to estimate seasonal fluctuations separately for each year, thus allowing isolation of changes in the seasonal nature matrix in longer periods of surveys and application of corrections of estimators in terms of departing observations. It was assumed that the status of the economic conditions in time is the function of: trend, cyclic, seasonal and incidental fluctuations. Decomposition of

time series and focus on cyclic fluctuations of the indicators of economic conditions allowed learning the nature of the studied issues. Moreover, graphic analysis and spectral analysis[6] were used, including evaluation of the coefficient of coherence[7] and phase displacements[8] of cycles. This facilitated evaluation of synchronization and the run of economic cycles in the selected methods of its determination. The above analyses were carried out with the use of the Statistica and Gretl software.

Survey results

During the surveys on the economic conditions in agriculture with the use of the SIECA and TIEC indicators for selected months (representing quarters) of 1998-2014. It was found that insofar as the first of the above usually adopted values which were advantageous to agriculture i.e. above 100. The value of the second one was usually negative (below 0) (Fig.1). It should be noted that the TIEC indicator is of endogenic nature i.e. it describes the economic conditions in agriculture from the subjective perspective of agricultural holding managers. These assessments may sometimes by excessively pessimistic. On the other hand the optimistic results for SIECA may come from the fact that the partial meter namely the potential demand takes into account elements which usually increase its value, e.g. change in the value of the food industry sales, the buying force of remuneration with regard to the changing food prices or relations in the agri-food exports-imports (Grzelak A. 2014).

After the EU integration a noticeable improvement in the economic conditions occurred, measured by the TIEC indicator. While its value before integration was -21.5 on average, after integration it grew to -7.3. The improvement in the economic conditions resulted from the inclusion of agriculture into the EU CAO and primarily from the direct payments which have the role of stabilizing revenues at the time of economy slumps. When measured with the SIECA indicator, the improvement in economic condition was not equally pronounced (Fig. 1).

At the same time, the data concerning the decomposition of series (Table 4) for the SIECA indicator show that the share of long-term changes in annual scale is about 59.3 percent on the average of general variability, while incidental changes in the studied period amounted to 23.4% on average and seasonal – 17.2%. With respect to the TIEC indicator these values were: 51.7, 5.5 and 42.8%, respectively. The greater importance of incidental changes in the case of the SIECA indicator may result from the variability of the agricultural product prices which depend on numerous factors, most often of exogenous nature.

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[6] Analysis of time series in terms of frequency, which is a component of Fourier spectral analysis (Skrzypczyński P. 2010).

[7] Coefficient of coherence is a measure of regression match between the time series (SIECA and SGH indicators) for a defined frequency. Its interpretation is similar to the coefficient of determination and adopts values within the range of <0-1>.

[8] The phase displacement informs about the mutual lead or delay of the studied series within a defined range of fluctuations (Dudek S., Zając T. 2012).

The relatively great importance of the seasonal factor in the case of the TIEC indicator, particularly in the first half-years, results from the fact that this period is usually associated with commencement of field work as well as intensified investments and expenditure. In the second half of the year when it comes to enjoying the effects of actions in the earlier period and revenues grow, the seasonal factors are not so clearly distinguished due to price variability and crop level. It should be added that in the case of the SIECA indicator the impact of seasonality was attenuated by the application of 6-month moving averages. The greatest impact on the economic conditions level is exerted by long-term fluctuations and – it is worth noting – they are similar for both the studied indicators. This may be explained with the fact that economic conditions in agriculture are determined by long-term regularities associated with the modelling e.g. of price trends or general trends in the economy.
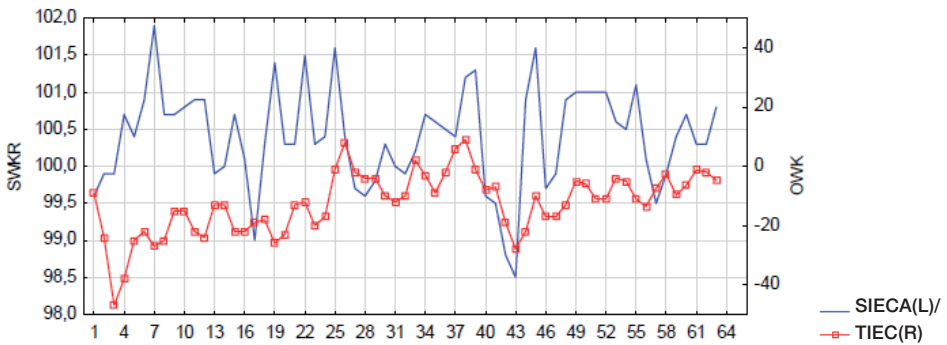
1– 3rd quarter (July 1998) ... 64–1st quarter (January 2014); vertical line – integration with the EU.

Fig. 1. The economic condition in agriculture indicators SIECA and TIEC.
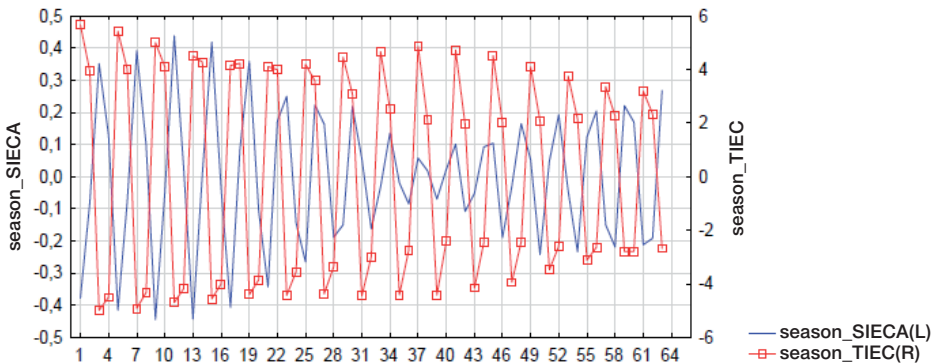Source: own study based on: (Gorzelak E.. Zimny Z. 2010-2014; Seremak-Bulge J. 2000-2014).

Fig. 2. Seasonal component for the SIECA and TIEC indicators.
Source: as in Fig. 1.

Relative share of components of time series of the SIECA and TIEC indicators
*in full variability (1998-III - 2014-I) (%)*

Quarters	Incidental changes	Trend-cycle changes	Seasonal changes
		SIECA	
I	43.4	29.4	27.2
II	21.5	50.4	28.1
III	9.0	78.3	12.7
IV	19.9	79.4	0.7
Average	23.3	59.3	17.2
		TIEC	
I	10.9	21.7	67.3
II	2.8	25.6	71.6
III	2.9	64.7	32.4
IV	4.9	95.0	0.08
Average	5.5	51.7	42.8

Source: own study based on: (Gorzelak E.. Zimny Z. 2010-2014; Seremak-Bulge J. 2000-2014).

Analysis of the seasonal component (Fig. 2) for the studied series shows that the seasonality matrix changed. It is visible mainly in the case of the SIECA indicator where the amplitude of seasonality fell till 2008 to grow again. Perhaps this should be linked with the considerable change in economic conditions on the world agri-food markets at that time. It should also be noted that in the two first quarters of the year, the TIEC indicators of economic conditions usually had lower values which grew in the second half-year, particularly in the 3rd quarter. In the case of the SIECA indicator, the situation was the opposite, as this indicator of an exogenous nature reflected the conditions of the economic situation in agriculture in advance, only some time later the changes were discounted by the agricultural producers in form of moods and evaluation of the current and future situation of the agricultural holdings.

After decomposition of the SIECA and TIEC indicators of economic conditions and identification of the cyclic fluctuations (Fig. 3), we may observe that the run of these cycles is relatively convergent. The more detailed spectral analysis additionally allows determination of the length of these cycles (Fig. 4). The presented period schemes show that for both the cycles associated with the SIECA and TIEC indicators of economic conditions 5 cycles should be distinguished with an average length of about 12-13 quarters (3-year). They correspond with relatively the highest value of the period scheme i.e. greater importance of the given frequency in explaining the variability of these series (Hamulczuk M. 2013). The coefficient of coherence between these studied indicators for 12-13 quarter cycles was

0.71. Harmonization of these cycles is, therefore, clear and it is also noticeable in graphical evaluation (Figs. 1). A displacement (lead) of cycle SIECA with regard to cycle TIEC may be seen. The SIECA turning points usually were by 1-2 quarters ahead of analogous points for the TIEC indicator. In the case of the top turning points the displacement was a little larger. This may show that discounting the more advantageous conditions in agriculture by the farmers themselves ran with relatively greater inertia and the response to a crisis was quicker. At the same time, the coefficient of displacement shows that the cyclic fluctuations of the TIEC indicator were on the average about 1 quarter delayed with regard to the cyclic fluctuations of the SIECA indicator of economic conditions. It may be, therefore, stated that the SIECA indicator is a barometer of sorts for the TIEC cycle, signalling the change in the economic conditions beforehand (Grzelak A. 2014).
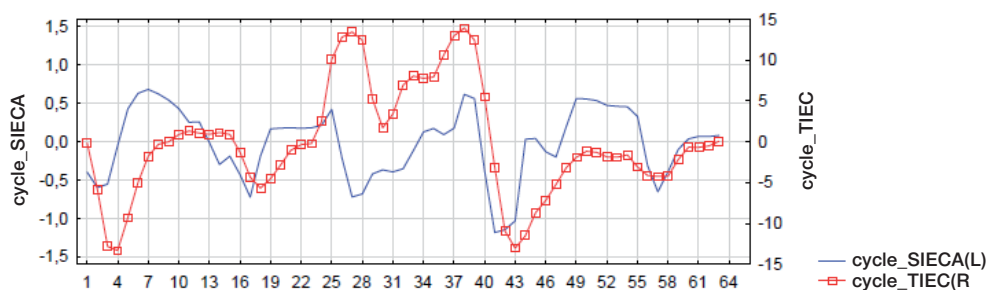
·1-3rd quarter (July 1998) ... 64 – 1st quarter (January 20124); vertical line – integration with the EU

Fig. 3. Distinguished cyclic fluctuations (Census 2 method) in agriculture in Poland for the SIECA and TIEC indicators of economic conditions in agriculture.

Source: as for Fig. 1.

Between 1998(III)-2014(I) it is possible to distinguish basically 5 economic cycles in agriculture. The first appears in 1998(III)-2002(III), the second in 2002(III)-2005(I), the third in 2005(I)-2008(III), the fourth in 2008(III)-2012(III), the fifth is from 2012(III). Their asymmetry is evident: the growth phase was longer whereas the fall phase was more violent and lasted relatively shorter (Grzelak A. 2014). Each of the distinguished cycles has a different run. The first cycle (1998(III)-2002(III)) falls in the pre-accession period. Economic conditions in agriculture, at that time, were not advantageous both from the TIEC and SIECA indicator perspective (Fig. 1).

The price scissors then opened unfavourably for agriculture particularly so in 2002 because of the limitation of domestic demand and the possibility of locating agri-food exports on foreign markets. Small possibilities of supporting agriculture were also important due to budgetary limitations and the disadvantageous situation on the labour market which limited the migration of those employed in agriculture.
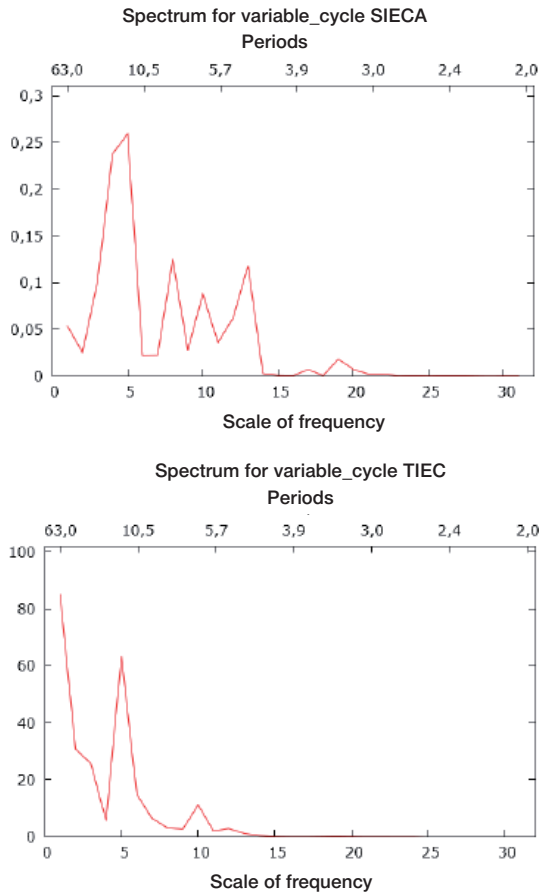
Fig. 4. The period schemes for distinguished cycles of the economic conditions in agriculture
for the SIECA and TIEC indicators of economic conditions in agriculture.

Source: as for Fig. 1.

The next cycle (2002(III)-2005(I)) was affected mainly by the processes of integration of the economy with the EU. The prospect of integration with the EU development of the institutionary environs in agriculture change in price relations in favour of agriculture and reduction of tax duties in agri-food exports, fostered improvement of economic conditions in agriculture. Considerable underinvestment in this sector was also of importance. We could observe a near-integration boom. Breakdown of this cycle was associated with a significant growth in the prices of the means of production for agriculture.

During the subsequent cycle (2005(I)-2008(III)) advantageous conditions particularly with respect to prices (in view of the dynamically growing development of agri-food exports and considerable rise in agri-food products on the

world market) as well as the growing support for farmers made development of agricultural holdings possible enhancement of their investing activities and income (Grzelak A. 2013). On the other hand, the breakdown in this cycle commenced in the second half of 2007 was much more violent due to the opening of the price scissors unfavourable to agriculture. Due to the change in prices on the world markets the prices of agricultural products fell with simultaneous rising prices of the means of production. This caused further opening of the price scissors and deterioration of the economic situation in agriculture.

It is noticeable that the situation changed relatively quickly into a growing phase and commencement of a consecutive cycle (2008(III)-2012(III)) which was possible in view of the rising prices of agricultural products and improvement of economic condition on the world markets and the stabilizing effect of direct payments. The psychological aspect could also have played a role. The thing is that the actual slump in economy in agriculture was much smaller than expected hence the quick improvement of the agricultural producers' moods (Grzelak A. 2014). Deterioration of the economic conditions towards the end of this cycle was rather of a slightly corrective nature concerning mainly the price scissors unfavourable to agriculture. Since 2012(III) a new cycle commenced.

Summary

The above considerations lead to the following conclusions:
- Both the qualitative TIEC and GUS qualitative indicators of the economic conditions and the qualitative indicator SIECA illustrate the changes in economic conditions in agriculture fairly well. They can thus be used by institutions responsible for the effectiveness of agricultural policy to evaluate and counteract the effects of change in the economic conditions of functioning of agriculture. Although the studied indicators did not always allow unambiguous determination whether at the specific time the economic conditions in agriculture was advantageous or not, determination of development trends did not arouse any doubts.
- The SIECA indicator of economic conditions in agriculture can be deemed a barometer (reference indicator) regarding the TIEC indicator of economic conditions in agriculture. This results from the time-ahead phase cycle for those indicators by about 1 quarter. At the same time clear synch of these cycles may be observed (after clearing away the trend as well as seasonal and incidental fluctuations).
- Each of the economic conditions indicators used has specific advantages: SIECA and TIEC – relatively long period of analysis synthetic nature additionally monthly (SIECA) or quarterly (TIEC) nature of data (Grzelak A. 2014). The GUS indicator in turn – due to the large survey sample and the broad range of partial meters – allows in-depth analysis of the changes in the economic conditions from the agricultural producer point of view.
- Long-term fluctuations are the most effective in terms of the level of economic conditions and it should be noted that they are relatively similar for

both the studied indicators. The general indicator of economic conditions in agriculture TIEC is modelled to a relatively higher degree as compared with the synthetic indicator of economic conditions in agriculture SIECA by seasonal factors and to a lower degree by incidental ones.

- The length of distinguished economic condition cycles in agriculture in the studied period was 12-13 quarters on average. At the same time, they were of asymmetrical nature. The growth phase was more attenuated and long lasting and the down phase was more violent and lasted shorter.

- Upon integration with the EU improvement of the economic conditions in agriculture was observed more pronounced in the case of the TIEC indicator. This was primarily caused by improvement of price terms and the inclusion of agriculture into the EU CAP instruments. Price variability and the demand-supply conditions did not change. It is, therefore, difficult to say whether fluctuations in the economic conditions in agriculture diminished after integration.

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