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**БИЗНЕС ЦИКЪЛ В ЗЕМЕДЕЛИЕТО В КОНТЕКСТА НА ИКОНОМИЧЕСКИЯ
БИЗНЕС ЦИКЪЛ НА ПОЛША
AGRICULTURE BUSINESS CYCLE ON THE BACKGROUND OF
ALL-ECONOMY CYCLE FROM THE PERSPECTIVE OF POLAND**

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Abstract

The key purpose of the article is to define the similarities and differences between agriculture business cycles and all-economy cycles in Poland in the years 2000-2011. One has used data of the Research Institute for Economic Development (IRG) at the Warsaw School of Economics in Warsaw (SGH) - business cycle indicators, which were used in the descriptive analyzes. It has been concluded that the agriculture cycles in Poland have synchronized with economic cycles. It means that economic cycles have an increasing effect on the development processes in this sector. Integration with the EU has substantially modified economic situation in agriculture. It is mostly about business stabilizers in the form of direct payments which constitute the main instrument supporting the sector. The differences between the agriculture business cycles and economic cycles expressed by means of indicators manifested themselves in lower values, less symmetric cycles.

Key words: business cycle, agriculture, economy, Poland

INTRODUCTION

Economists have long attempted to explain the mechanisms of periodical cycles in economy which has produced many economic cycle theories. It should be noted that initially, given the crucial role which agriculture played in economy, the economic cycles were primarily linked to its environment (the so called agricultural cycle theories), i.e. weather conditions. With time, as the role of the sector in shaping the development of the economy was diminishing, changes in the cycle were increasingly determined by non-agricultural factors.

Agriculture as an economic sector is subject to economic cycle fluctuations which are triggered both by macroeconomic conditions and more specific factors related to the macroeconomics of the land factor [Czyżewski, 2007]. It is primarily

about the dependence of economic effects on weather conditions and about low flexibility of agri production. The last one leads to bigger volatility of prices rather than production. As a consequence, volatility of prices is bigger than volatility of goods' and services' prices in economy, while reactions of the sector to economic cycle changes are manifested mainly in price relations between products sold and bought by farmers. The price scissors widen (price relations deteriorate) usually in economic slowdown and close when economy rallies which confirms the rule of supply disequilibrium asymmetry which indicates that disequilibrium in the agriculture sectors is bigger. There are currently no conclusive views on relations between fluctuations in economy and agriculture. The theories developed so far as regards business cycles in agriculture can be divided into a few streams: ones which stress inner development mechanisms of agriculture, external shocks, the role of the inducted development including innovation [Stępień, 2011] and concentration in the agri-food sector [Kufel, 2012]. Thus, a question may arise: what are the differences and similarities between business cycles in agriculture and economic cycles? The answer to this question represents the focal point and the main purpose of this article. One has formulated also hypothesis: the agriculture business cycles have synchronized with all-economy cycles. Consideration of this issue is not only a theoretical-scientific speculation but does have its practical implications. Its purpose is also to learn the dynamics of economic activity in agriculture and, above all, to better adjust agricultural and economic policy instruments as economic cycle stabilizers. The author has focused on assessing different business cycle changes and their impact on agriculture as a whole sector within which one can also identify specific cycles related to selected markets, e.g. pork cycle [Stępień 2011], cattle cycle.

RESEARCH METHODS

The research period covers the years 2000-2011. This is dictated on the one hand by the will to use the longest possible time series and on the other hand by the limited uniformity and comparability of the data¹. Among the key methods of economic cycle analysis are economic cycle tests. The author of the article has used data of the Research Institute for Economic Development (IRG) at the Warsaw School of Economics in Warsaw (SGH). It focuses on agriculture business cycle indicators [Gorzelać, 2010] and the so-called business cycle indicators of IRG SGH.

The business cycles in agriculture are studied by IRG SGH on the population of ca. 1600 farms in a quarterly cycle. Quarter 1 (January), Quarter 2 (April), Quarter 3 (July), Quarter 4 (October). It is a not a group representative for the whole Polish agriculture given the dominant presence of farms relatively stronger economy-wise², yet they are reliable for farms which play a crucial role in the commodities market. The base of the research is a survey addressed to farmers with questions which the respondents answer by way of subjective evaluations, i.e.

¹ Data referring to the business cycle indicator have been comparable since 1999.

² For example, in 2011 70 % of the farms included in the study were units with area of over 15 hectares.

more, less, worse or above/below standard. The business sentiment indicator in agriculture is measured based on: adjusted income indicator (it concerns farmers' subjective assessment of changes in the farm's money revenues) and farmers' confidence (it assesses the sentiment among farmers about the economic situation and development outlook of their farms) [Gorzelał, Zimny, 2010]. More weight in the construction of the agriculture business sentiment indicator has been attached to the adjusted money revenues indicator. It has been weighted 2, while the confidence indicator carries the weight of 1. The very interpretation of the indicator makes sense in studies which last many years and comparative studies (with respect to business cycle studies in other sectors of IRR SGH). It is worth pointing out here to the issue of identifying respondents with the evaluation of policymakers' actions, especially with regard to the agricultural policy as well as creating the "image" of the economic situation by media [Płonka, Musiał, 2011]. These phenomena affect the indicators studied causing their possible overestimation or underestimation. It can be assumed, however, that these opposite phenomena are mutually offset.

IRG SGH business cycle indicator has been used in evaluation of the economic cycle (business sentiment). It constitutes a counterpart of the GDP in the group of qualitative data. It has been built based on the average weight of 7 economic indices of: banking sector, auto transportation, construction sector, agriculture, households, trade and industry. For industry and households weights 2/9 were adopted and 1/9 for the other sectors. In general, all the economic indices which are included in the IRG SGH business cycle indicator rely on a similar method of qualitative studies which enables their comparability. At the same time, notwithstanding the fact that answers to the questions are subjective in nature, usually the same entities participate in studies which limits this subjectivity, especially in a dynamic approach [Klimkowska, Stolorz, 2008]. Hence, the comparison of these two indicators and their performance can be viewed as empowered.

Simple filter has been used in studying the course of fluctuations: it is a weighted moving average (4-periods) indicators which enables for seasonal flattening. Individual cycles were defined based on graphic assessment of the volatility of selected indicators and Chow Test for Structural Breaks. The cycle was defined from "bottom" to "bottom" as a full cycle assuming that the cycle phase (upward or downward) lasts at least 4 quarters (1 year) and that the cycle peak point takes the positive value of the economic cycle indicator (or a value close to it). To assess the similarity of the cycles, the key morphological features of the cycles were used. That is why both the first and the last of the identified cycles did not have a complete course [Grzelał, 2013].

RESULTS AND DISCUSSION

In the years 2000-2011, negative business cycle indicators were identified to dominate in agriculture which usually meant slowdown in this sector. Only in three quarters at the turn of 2007 were positive indicators of the studied parameter recorded (fig.1). It is worth emphasizing, however, that in the years 2005-2008, the

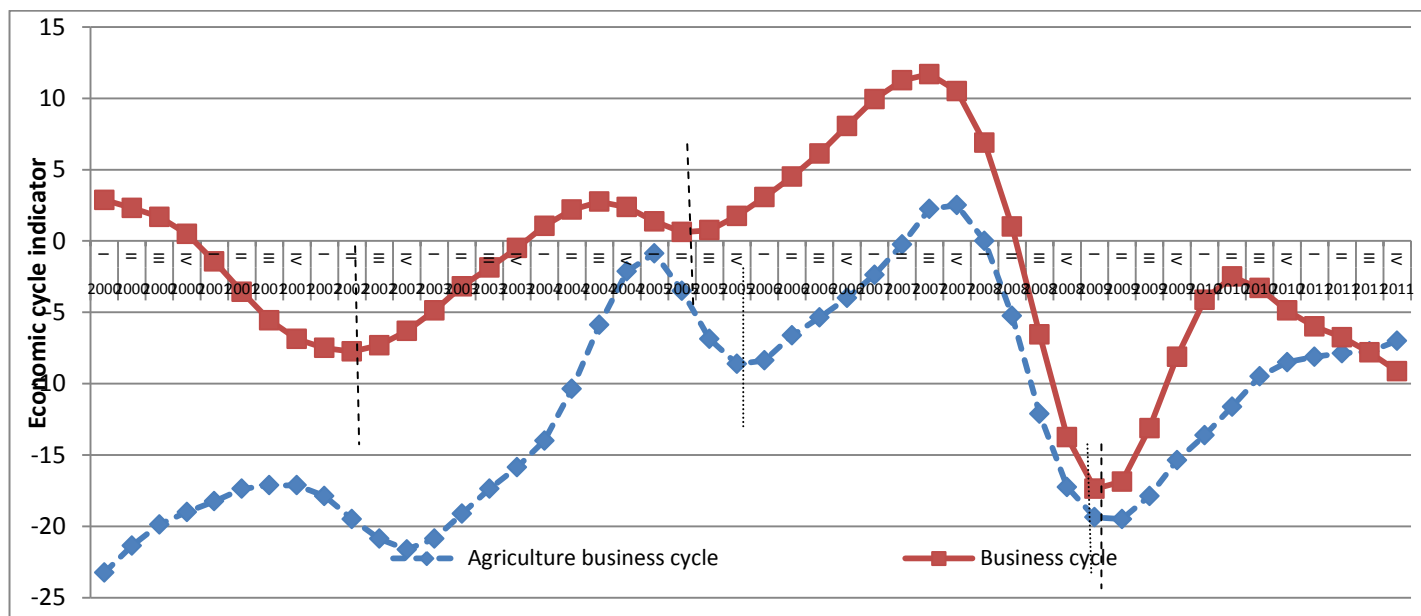


Figure 1. Total (seasonally flattened) agriculture business cycle and business cycle indicator (seasonally flattened) for the economy in Poland in the years 2000-2011

Note: vertical lines mark the borderlines between cycles

Source: Own material based on: Reports [Gorzalak, Zimny, 2000-2012] and [Adamowicz, Klimkowska 2000-2012]

agriculture business cycle indicator was driven down by the adjusted income indicator which weighs more in the algorithm than the farmers' confidence indicator (see the previous chapter). This is because the last specific agriculture business cycle indicator took positive values and after the integration with the EU stayed at higher levels than the adjusted income indicator. This may be indicative of growing optimism among farmers and the growth of confidence about their future development. This was driven by the growing support for the sector and a relatively favorable situation in the consumption area.

Relative to Poland-wide trends expressed by the business cycle indicator, the agriculture compared much less favorably. However, a significant improvement should be noted in this respect after the EU accession as the agriculture received support in the form of the EU Common Agricultural Policy instruments. In the end of the 2008 and in early 2009, economic indices deteriorated which was coupled by the crisis across the whole economy. It was also noted that after the EU accession convergence between agriculture business sentiment indicator and the business cycle indicator increased. Much as for the entire studied period (2000-2011) the ratio of correlation between the two parameters was 0.63, in the period after the integration it increased to 0.89. It may be indicative of the tightening relations between the agriculture and economy as a whole. The one quarter delay of the agriculture business cycle indicator relative to the business cycle indicator has increased the correlation quotient to 0.67 (fig. 2). This may be symptomatic of the

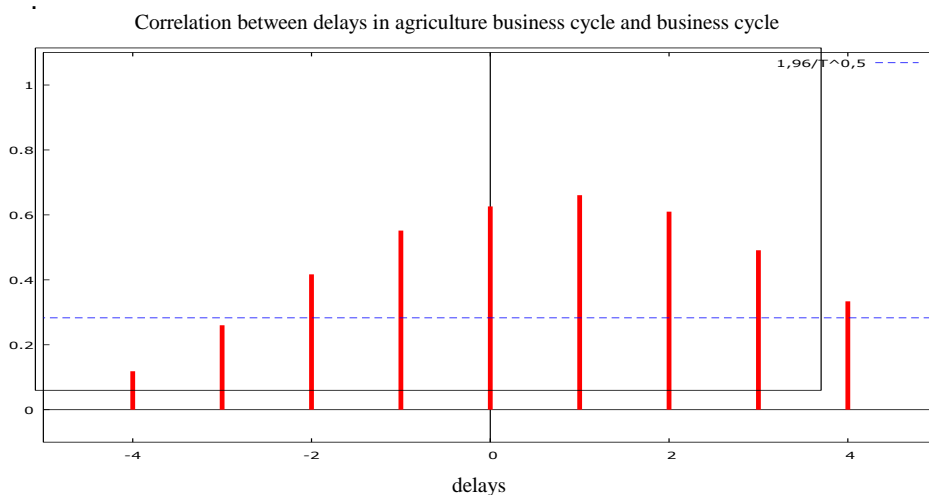


Figure 2. Correlation between delays in agriculture business cycle indicator and the business cycle indicator in Poland for years 2000-2011
 Source: Own material based on: Reports [Gorzela, Zimny 2000-2012] and [Adamowicz, Klimkowska 2000-2012]

inertia in the process agriculture assimilate with overall economic business cycle as well as the leading nature of the business cycle indicator fluctuations relative to the situation in agriculture. This is due to relatively small flexibility of agricultural

production as well as the sector being distanced from the end customer in the food chain [Grzelak, 2013].

In the studied period three business cycles were identified in agriculture (fig 3). The first one falls in years 2000-2005 (quarter 4), the second in 2006-2009 and finally the third which has not ended yet covers the period after Q1 2009. Each of them has a different course. The first of the aforementioned cycles was definitely the longest. Its peak occurs shortly after the integration with the UE. Particularly noteworthy is the length of the upward phase with local fluctuations. These fluctuations are primarily driven by high volatility of economic conditions in agriculture. The lengthy recovery (despite its low level) coincided, on the one hand, with a very difficult situation in agriculture towards the end of the 90s of the 20th century and consequently with the low level of the analyzed indicator. On the other hand, it was accompanied by the upcoming integration with the EU, introduction of the EU CAP tools supporting agriculture and development of the agriculture-related institutions and a change in price relations for the benefit of the agriculture. In the initial phase of the cycle, the livestock population declined and investments subsided significantly. The second cycle in agriculture was in examined period definitely shorter (fig. 3), while the economic cycle was most favorable then in view of the increase in prices for agricultural production and improvement in the balance of foreign trade in agri and food products. This cycle was more convergent with the general economic trends. Its peak falls in the second half of 2007 after which downward trend was recorded due to the widening of price scissors to the detriment of agriculture as well as in view of the global crisis. The prices of cereals, milk and pig livestock went down. Noteworthy is a relatively quick transition into the upward phase (beginning of the next cycle which is still continuing) which was possible thanks to the stabilizing impact of direct payments (in particular) and price increase of agricultural production. The psychological aspect cannot be neglected in this case either. One has noticed that the cycles in agriculture were found to synchronize with the overall macroeconomic cycles. Moreover, the cycles in agriculture demonstrated, a relatively evident asymmetry. It consisted in the upward phase being longer than downward phase [Grzelak 2013]. On the other hand, the downward trend was more dynamic. It means that the recovery of good economic conditions in agriculture requires long-term efforts in the area of investments. On the other hand, reactions to deteriorating conditions are more immediate [Woś 2000]. It was also noted that the location of turning points in the economic index is wider spread than that of turning points in the business cycle indicator [Adamowicz and others 2011].

CONCLUSIONS

The considerations in this article can be concluded as follows:

1. The agriculture business cycles have synchronized with all-economy cycles. This was reflected in increasing harmonization of economic cycle fluctuations, decreasing asymmetry of agricultural cycles and amplitude. It means that economic signals have an increasing effect on the development processes in this sector.

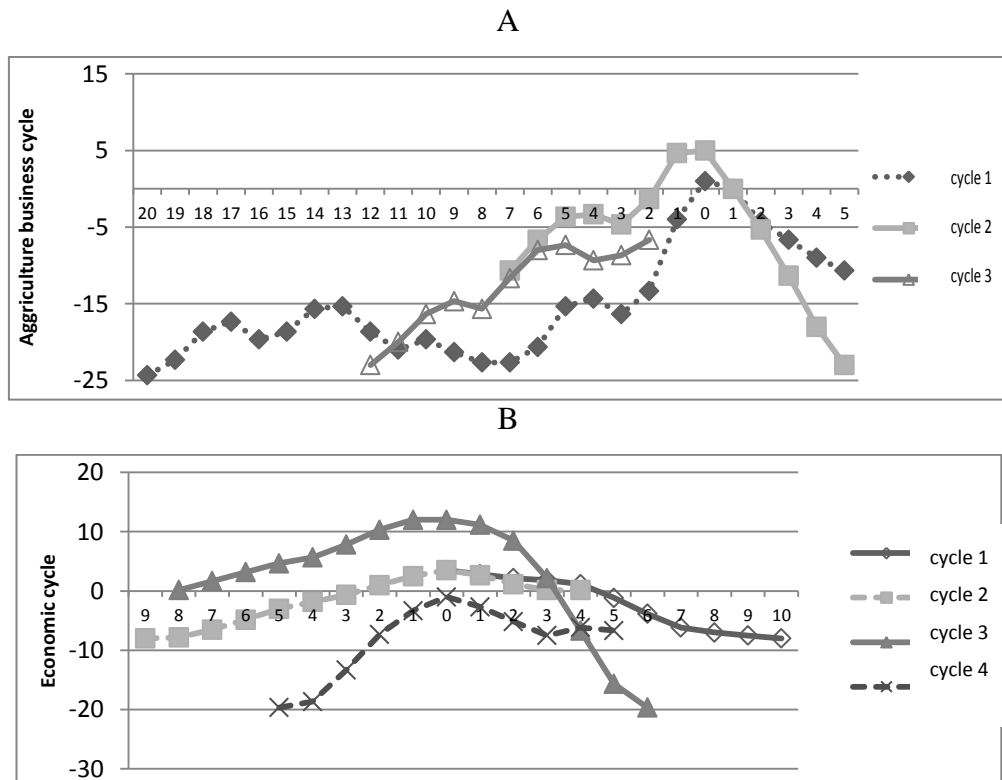


Figure 3. Delimitation of cyclical changes in the value of the agriculture business cycle indicator (A) and economic cycle indicator (B) in Poland the years 2000-2011
 Note: Marked on axis X are quarters. Quarter 0 represents max. for a given cycle. Values on the left from 0 represent quarterly distances from max in the upward phase while values on the right are quarterly distances from max in the downward phase

Source: Own material based on: Reports: [Gorzelał, Zimny 2000-2012]

2. Integration with the EU has substantially modified the business sentiment in agriculture. It is mostly about business sentiment stabilizers in agriculture in the form of direct payments which constitute the main instrument supporting the sector. As a consequence the deteriorated economic cycle in 2008 was not a deep recession as was the case towards the end of the 90s of the 20th century [Grzelak 2013].
3. The differences between the course of the business cycle in agriculture and economic cycle, expressed by means of indicators, manifested themselves in lower values, less symmetric cycles (in terms of the relation between the length of the upward phase and the downward phase), a relatively shorter period of a favorable cycle as well as 1 quarter delays of agriculture cycles.

4. It is highly probable that in the future the agriculture business cycle will integrate further with macroeconomic situation which will necessitate a growing demand for: innovations, new means of production, investments.

LITERATURE

Adamowicz, E., Klimkowska J. 2000-2012. Business cycle indicator. Instytut Rozwoju Regionalnego. SGH, Warszawa.

Adamowicz, E., Klimkowska J., Walczyk K. 2011. Cyclical fluctuations in Poland, http://www.sgh.waw.pl/instytuty/irg/publikacje/pimirg/pim87/pim87_1.pdf. [dostęp luty 2012]

Gorzela, E., Zimny Z. 2010. Economic situation in agriculture. Instytut Rozwoju Gospodarczego. SGH, Warszawa.

Grzelak, A., 2013. Business cycle in agriculture on all-economy background in Poland. Roczniki SERiA, Tom XV z.2.

Klimkowska, J., Stolorz S. 2008. Prognostic property of business cycle indicator SGH and its components based on the reference indicator of cyclical fluctuations in the Polish economy. Prace i materiały Instytutu Rozwoju Gospodarczego SGH, nr 80.

Kufel, J. 2012. The economic situation and market processes in the agri-food sector. IERiGŻ, Warszawa.

Milewski, R. 1999. Elementary economics issues. PWN, Warszawa.

Płonka, A., Musiał W. 2011. The situation in Polish agriculture – evaluation of selected indicators. Roczniki SERiA, T. XIII, z.1.

Stępień, S. 2011. Relationships of cyclical fluctuations in agriculture to economic conditions. Roczniki Nauk Rolniczych seria G, nr 98/3.

Woś, A. 2000. Investment and accumulation in peasant agriculture in the years 1988-1998. IERiGŻ, Warszawa.

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