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Business Cycle in Agriculture: The Austrian School Theory

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Abstract:

Purpose: *The study aimed to present the possibility of explaining fluctuations in agriculture using the theory of the business cycle of the Austrian School. The basis of this school's cycle theory is the theory of the structure of production (capital). It means that the production stages are arranged consistently with the technical and temporal process of producing and selling a consumer good. These stages in which capital goods are used are, to a different extent, distant from the final goods. Agriculture is a sector that is more distant from final goods than most of the other economic sectors. According to the Austrian School, the main reason for the cycle is the central bank's monetary expansion, leading to an increase in lending activities.*
Design/Methodology/Approach: *In the analysis the causes and course of cyclical fluctuations in agriculture, the subject literature analysis, deduction, and verbal logic were primarily used.*
Findings: *Credits go mainly to manufacturers producing in the early stages of the production structure. In consequence, it widens and lengthens. The result is a more dynamic than in other sectors growth in production, income, and prices, and thus also in agriculture. On the other hand, the narrowing and shortening of the production structure in the decline phase mean large drops in production, income, and agricultural prices.*
Practical Implications: *The knowledge about dynamic changes in production and prices in agriculture enables farms to function better in the economy. While, in agricultural policy, it allows for a better selection of instruments and the appropriate time of their application.*
Originality/Value: *The research broadens the knowledge of the possibilities of using the theory of the business cycle of the Austrian School to explain the characteristics of the cycle in agriculture.*

Keywords*: Business cycle, agriculture, production, prices, structure of production, Austrian school theory.*

JEL Codes: *E14, E32, Q13, Q19.*

Research type: *Research Paper.*

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1. Introduction

The economic fluctuations refer to the entire economy and its sectors. There is not much research on cyclical fluctuations in agriculture other than analyzing other aspects of this sector. Research on the cyclical nature of agriculture focuses primarily on empirical analyzes. They relate, among others, to the determination and description of the phases of recovery and downturn in agriculture (Jędruchniewicz, 2020), relations of the agricultural prosperity and the entire economy (Da-Rocha and Restuccia, 2006), changes in efficiency and productivity of production factors in agriculture in particular phases of the business cycle (Ball, San-Juan-Mesonada, and Ulloa 2014; Czyżewski and Majchrzak, 2017) and the impact of globalization on the synchronization of cycles in general and in agriculture (Kose, Prasad, and Terrones, 2003).

On the other hand, theoretical research on explaining the causes and course of fluctuations in the entire agriculture is significantly limited. Economists focus more on Ezekiel's The Cobweb Theory (1938) that concerns changes in specific agricultural markets. However, agricultural markets often have their characteristics.

From the early theories of cyclical changes throughout the entire agriculture, the most recognized is the sunspots theory by Jevons (1878). He searched for exogenous reasons which caused repeated on quite a regular basis crisis in agriculture. Conducting correlation studies, he concluded that outbursts in the Sun are the cause of changes in agricultural production. The further development of thought focused firstly on finding exogenous but substantive causes of fluctuations in agricultural production. Secondly, finding the internal mechanism causing relatively regular fluctuations in agricultural activity (Hansen, 1932).

Today, the dominant view is that changes in the entire economy determine changes in agriculture. Therefore, it is difficult to speak about a different theory describing cyclical fluctuations in agriculture. Instead, a theory that well explains changes in the economy should be used. An example of using such a cycle theory is the work of Kułyk and Grzelak (2018). It is based on Kalecki's theory of the business cycle. This theory indicates the contradictions between the demand and supply effects of investments. It considers changes in the production capacity of entities and the possibility of financing investments.

The article is theoretical. It aims to present the possibility of explaining fluctuations in agriculture using the theory of the business cycle of the Austrian School. The ability of this theory to explain changes in production and agricultural prices will be analyzed.

2. Methodology

In the conducted study, which explains the causes and course of cyclical fluctuations in agriculture, the subject literature analysis, de-duction, and verbal logic were

primarily used. In deliberations on the theory of capital, the method of comparing theoretical views was also used.

3. Results and Discussion

3.1 Features of the Agricultural Cycle

Economists point out that the business cycle in agriculture often shows significant differences from the general economic cycle. Changes in this sector result partially from more complex processes that are taking place there. They depend on economic, natural, and biological factors. The analysis of the features of the agricultural cycle focuses mainly on the length of phases and the dynamics of the most important categories, such as production, prices, and in-come.

Changes in agricultural production are most often characterized by the asymmetry of the length of cycle phases. The growth phase lasts longer than the downturn phase. Research carried out in Polish agriculture shows that the growth phases of the agricultural cycle lasted from 2 to 4 years, and the periods of recession always lasted two years. All cycles lasted 4-6 years (Jędruchniewicz, 2020). The phase length asymmetry in agriculture is like that of the entire economy. In terms of this feature, the agricultural cycle coincides with the current business cycle. The frequency of this cycle is greater than that of the classical cycle, which is because the current cycle is shorter than the classical cycle (Stock and Watson, 1999).

The feature distinguishes the agricultural cycle from general economic fluctuations in the dynamics of production, prices, and income. In the growth phase, the increase of these categories related to agricultural holdings is higher than changes in the production and prices of consumer goods and incomes generated by non-agricultural households (Tomek and Robinson, 2003). The amplitude of production, prices, and agricultural income is also more significant than the amplitude of aggregated or average values of these categories calculated for the entire economy and most industries producing outside of agriculture.

The processes in the downward phase of the cycle are reversed. "The basic feature of the business cycle in agriculture, which distinguishes it from other industries, is a significant reduction in prices of agricultural products and farmers' income during crisis conditions" (Stępień, 2015). In traditional terms, during this period, agricultural production, prices, and income drop faster than in most non-agricultural sectors and, on average, in the entire economy. Nowadays, however, there are often no decreases in many categories during a downturn, e.g., deflation or annual drops in GDP are rare.

Therefore, it seems that a feature of the new agricultural business cycle is the decline in production and prices in agriculture and, at the same time, an increase in these categories relating to the entire economy. In general, changes in agriculture during the downward phase are more unfavorable than in most areas of the economy.

Agricultural prices are changing particularly dynamically. It is related, among others, to the presence of the King effect (Gardner,1990). Due to the low-price elasticity of the demand for food, changes in the supply of agricultural products result in significant changes in their prices.

Cyclical fluctuations in agriculture are characterized by double asymmetry. Firstly, it concerns the proportion of the growth and downward phases; secondly, the relative differences in the variability of production, prices, and incomes in agriculture and non-agricultural sectors in different phases of the cycle.

3.2 The Theory of the Production Structure of the Austrian School

The basis for understanding the Austrian School business cycle theory is the theory of the structure of production (capital) of that school. The theory of production structure was created by Böhm-Bawerk and developed by Mises, Hayek, Rothbard, and other school representatives. In creating this theory, Böhm-Bawerk used the distribution of goods established by Menger (1981 (1871)). According to this division, there are a consumer (final) and capital (intermediate) goods in the economy used to produce consumer goods. Capital goods are divided according to their distance from the final good. Thus, there are capital goods more distant (machines) and less distant (semi-finished goods) from the final goods (e.g., food products).

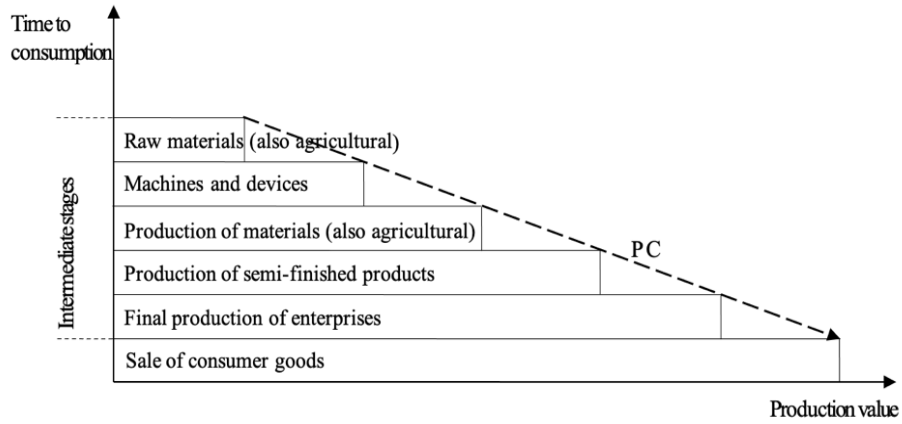
Austrian economists distinguish capital from capital goods. Capital goods are material resources which through subjective actions, will materialize during a specific production process. This is in line with the tradition of the classical school. Capital, on the other hand, is the market value of capital goods. It results from the subjective valuation that entrepreneurial entities assign to capital goods (Salerno, 2012). Capital is an abstract concept or a tool of economic calculation. It is expressed in money. The analysis of cyclical fluctuations is based on consideration of both categories. Thanks to this approach, the Austrian School integrates the material and monetary processes in the economy. Emphasizing the importance of money in entrepreneurs' decisions is one element that brings the theory of capital and its structure closer to actual management processes.

The Austrian School emphasizes that the production process of consumer goods always takes place in time and must be analyzed in the context of time. Before consumers purchase the final goods, they must go through the entire production process. It starts with the extraction of raw materials and goes through the further stages. At each of these stages, various capital goods are used, and enterprises conduct economic calculations. The production structure (capital) consists of production stages arranged in an order consistent with the technical and time process of producing and selling the final good. A simplified diagram of the production structure, which in the real economy is complicated, is presented in Figure 1.

According to the approach of the Austrian School, capital goods are, first, heterogeneous. They can be specific secondly, they are to a different extent distant from

consumer goods, thirdly, they are a resource that can be reduced. This is the opposite of the mainstream school approach. "Rival theories either had no capital theory at all or had a capital theory that did not integrate well with monetary theory" (Garrison, 1989). Mainstream schools are based on Knight's neoclassical capital theory (1934). From this perspective, the analysis based on capital goods is of less importance, and capital is, firstly, homogeneous; secondly, time plays no role in the analysis of its usage; thirdly, it is a value fund that reproduces itself. This means that the mainstream schools completely reject the theory of the capital structure of the Austrian School.

Figure 1. *Structure of production*



Source: *Own elaboration based on M. Skousen (1990): The Structure of Production. New York University Press, New York.*

The production process of the final goods begins with the acquisition of raw materials (Figure 1). They are partially used to create machines and devices that serve to extract and process raw materials and to produce other machines. Machines make machines. There is a feedback loop in the real economy. This phenomenon does not, however, negate the theory of capital structure. The other part of raw materials is used for the further direct production of consumer goods. The following stages are processed into materials, semi-finished products, and ultimately final goods purchased by consumers in the end. In each of these stages, capital is used as a secondary factor, and labor and natural resources are used as primary factors. Each of them receives their re-numeration. The rectangles in Figure 1 represent the value of the production transferred to the next stage of the production structure. These values form the macroeconomic production curve (PC).

"*The fact that circular methods of production lead to greater effects than direct methods is one of the most important and fundamental theorems in the entire theory of production"* (Böhm-Bawerk, 1891). The production structure can be simplified or more complex. A more complex structure consists of a more significant number of stages. This means that more capital goods must be used, which in turn need to be produced. It is possible only when entrepreneurs can finance this more significant amount. The Austrian School indicates that new funds come from the voluntary

savings of entities (Mises 1998 (1949)). An extensive production structure is more capital intensive. This has two primary consequences.

Firstly, the use of more capital for the same amount of labor and land increases the quantity and quality of consumer goods. Secondly, the production time is extended, and so is the waiting time for higher consumption. The economists of the Austrian School claim that the necessary condition for a more significant number of final goods is to adopt more complicated methods of production, thus extending the production time. The temporal structure of production created by enterprises is not an independent existence but results from its adjustment to the temporal structure of consumption.

The critical issue in the context of this article's title and purpose is defining the place of agricultural production in the production structure of the entire economy. The approach of the Austrian School is not based on aggregated quantities as mainstream school theories. For a long time, economists have analyzed particular departments and industries in such a structure and the experimental processes at particular stages. Earlier (Holzman, 1953) and nowadays (Maśniak, 2013; Skousen, 1990) place agricultural production and the extraction of industrial raw materials at the very beginning of the production structure. It is, therefore, the production that is the most distant from the final goods.

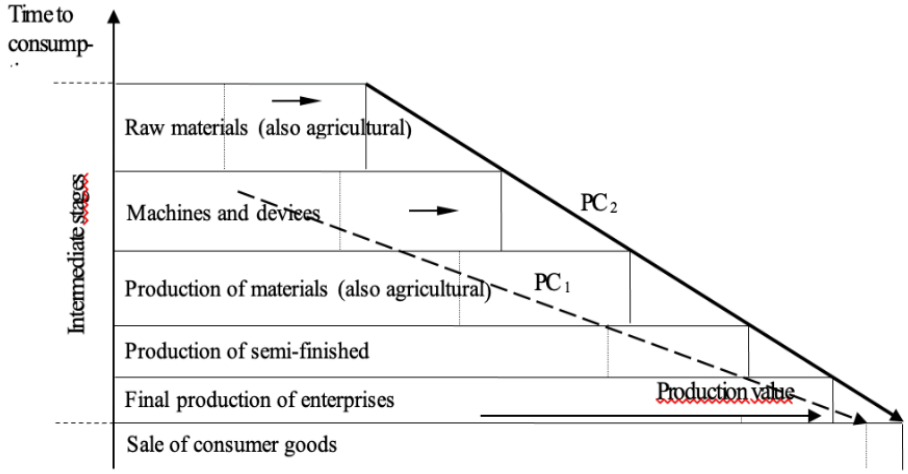
A different approach is based on the structure of agribusiness (Jędruchniewicz, 2013). It consists of three main divisions arranged following the technological process of producing the final food product: 1) agri-cultural supply industry in production and services; 2) agriculture; 3) food industry. Here, agricultural production is conditioned by the development of the industry as means of production for agriculture. In this approach, it is a little closer to the consumer. Figure 1 shows two places of agricultural production in the temporal structure of production. It seems to be in line with reality. There are many groups of agricultural raw materials in the economy and various methods of their production and usage. In general, it can be assumed that agriculture is a sector that is more distant from final goods than most of the other sectors of the economy.

3.3 Agriculture in the Business Cycle of the Austrian School

The theory of the business cycle of the Austrian School belongs to the group of monetary theories. According to this school, the expansionary monetary policy of the central bank begins the growth phase of the cycle. The traditional approach emphasizes the critical importance of the interest rate decrease (Hayek, 1931; Garrison, 2001; Huerta de Soto, 2006). However, today it is more and more criticized. It is indicated that the determining factor is the increase in money supply (Fillieule, 2007; Hülsmann, 2011). The increase in the money supply may be due to the reduction of interest rate but is not limited. The focus on the quantity of money keeps this theory valid in the current zero interest rate environment.

In a banking system based on fiat money and fractional-reserve banking that is the existing one, credit growth is not considered a problem. New money goes first to enterprises as well as partially to consumers. According to the Austrian School, the loans granted are not distributed evenly in the economy. This is the so-called Cantillon effect. It is the amount of new money that is important and, above all, the place where it enters the economy. Most loans, which do not result from voluntary savings, are made to producers who produce in the early stages of the production structure to purchase capital goods and to consumers for the purchase of durable goods that are treated as capital goods. Loans for the purchase of fast-consuming consumer goods are not increasing much (Machaj, 2017). This is because entrepreneurs expand and extend the production structure.

Figure 2. *Development of the production structure*



Source: *Own elaboration.*

The effects of the credit increase are shown in Figure 2. The production curve PC1 has shifted to the right and changed the tilt angle. It took the form of a PC2 curve. A shift to the right means an increase in production at the current stages (expansion of the production structure) while stiffening means creating new stages (extension of the production structure). Higher rectangles represent the emergence of new stages within the adopted names of types of production. However, new investments are made without voluntary savings. Entrepreneurs expand their activities based on false information, meaning an artificially increased amount of money. This gives rise to wrong calculations as well as decisions. It is inducing entrepreneurs to make massive errors in economic calculation or estimate the results of various possible actions (Huerta de Soto, 2006).

The most significant changes in production occur at the stages that are the most distant from consumer goods and the smallest in the direct production and sale of these

goods. According to the discussed theory of the production structure, agriculture is at the initial stages of the structure, far from the final goods.

Dynamically growing production at the initial stages, and thus also agricultural production, results from the fact that according to the entire technical process of producing a final good, the raw materials and machinery industries must first be developed as they provide capital goods subsequent stages. The creation of new stages of production is a technical process. Therefore, thanks to the availability of loans, the widely understood innovative activities are also launched in agriculture. This takes the form of purchase of more advanced equipment and machines, modernization of the existing ones, expansion of buildings and warehouses, increased expenses for more efficient varieties of plants and animal breeds, improvements in the organization of production, new methods, techniques, and sales channels, as well as training and retraining of employees. "A longer production process allows for the development of better, more intricate, complex and specialized technical methods" (Shackle, 1972).

Secondly, increasing the production of capital goods creates a greater demand for raw materials. The limited amount of these resources and the high competition between enterprises producing most distant from consumption causes an increase in wages and raw materials prices (Garrison, 2001). The prices of commodities, including agricultural ones, increase the most rapidly in the first phase of the business cycle. Prices of consumer goods are rising the least. Thirdly, the increase in demand and prices improves the profitability of production and income in agriculture. A growing optimism also improves farmers' expectations, which results in an increase in investment and a further and more significant increase in production.

Monetary expansion extended the temporal structure of production. However, it does not change the temporal structure of consumption. Therefore, in the final part of the growth phase in the boom period, the structure of the increase in prices of goods and services produced at various stages of the production structure is reversed. Prices of consumer goods are rising the fastest. It is caused by the increase in demand for these goods, which results from the simultaneous influence of the following factors: 1) increase in income of owners of labor and land; 2) a temporary reduction in the production rate of new consumer goods; 3) an increase in the accounting profits of enterprises at the initial stages of production, part of which is spent on consumption (Huerta de Soto, 2006).

Higher dynamics of prices of consumer goods than of capital goods also results in higher profitability of companies producing at stages closest to the consumer than at much more distant stages. This triggers a reaction from entrepreneurs. Some of them withdraw capital goods from the initial stages and transfer them to the final stages. However, most enterprises, including farms, increase the demand for new loans to initiate investments quickly. The interest rate is rising, and the financing of companies by commercial banks is becoming limited. In such a situation, the demand for products manufactured at the earlier stages is falling. This is happening at a time when enterprises and farms produce and invest on a large scale.

A significant decline in demand for capital goods initiates the downward phase of the cycle. Its primary cause is the artificial extension of the production structure in isolation from the consumption structure in the growth phase (Salerno, 2012). The inability to finance capital-intensive production processes forces enterprises to change them. In the economy, the structure of production is shortened. It involves the elimination of some of the stages of producing the final goods. This process is most intensive at the initial stages, also in agriculture. In the economy, the narrowing of the production structure also occurs, which means a decrease in production at the stages that remain and create a new structure. In the downturn phase, production and prices change oppositely than in the growth phase. Relatively (in agriculture, most often absolutely), about consumer goods, the production, and prices of goods at initial stages decline the most. Income drops the most at these stages as well. On the other hand, the dynamics of production and prices of final goods are the lowest.

The period of the economic downturn is when entrepreneurs, including agricultural ones, give up and admit that they made investment mistakes. At the level of the entire economy, a production structure that is in line with the voluntary decisions of consumers must be restored. Enterprises and farms go bankrupt while others are restructuring. The crisis causes the waste of many capital goods irrevocably. Bankruptcies and troubles also worsen people's psyche. To sort out the structure of the economy, a particular time is always needed. "The depression period, therefore, is the necessary recovery period." (Rothbard, 2009).

4. Conclusion

The theory of the Austrian School does not use such aggregated categories as the theory of mainstream economics to explain cyclical fluctuations. The theory of the production structure allows the distinction of sectors of the economy and the analysis of their behavior during the cycle. It considers the demand and supply factors influencing manufacturers' decisions. Therefore, the Austrian School approach can be an excellent alternative to explaining cyclical fluctuations in agriculture. This approach is consistent with the characteristics of the agricultural cycle regarding changes in production, prices, and income.

Monetary expansion is a key but not the only factor influencing changes in agriculture in a particular country. Natural factors can significantly affect changes in production and prices. They can strengthen the main factor or act in the opposite direction. Agricultural policy is also critical. The use of specific instruments encourages farms to increase investment and production.

On the other hand, in times of crisis, purchases reduce drops in prices and production through minimum prices and intervention. In an open economy, the impact of world agricultural markets also needs to be considered. These factors may cause that fundamental changes will deviate from the theory of the Austrian school. This will also be the case with all the other theories.

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