Influence of economic cycles on the development of elements of the industry structure of the food market

I A Salo1, N Hr Kopytets1,*, S G Cheremisina1 and V M Voloshyn2

1 National Scientific Centre "Institute of Agrarian Economics", 03127, 10, Heroiv Oborony st., Kyiv, Ukraine
2 National Science Centre "Institute of Agriculture of the National Academy of Agrarian Sciences of Ukraine", 08162, 2-B, Mechanical Engineers st., Chabany, Ukraine

*E-mail: nataliia_kopitets@ukr.net

Abstract. The article examines the features of the development of the Ukrainian food market from the standpoint of the theory of economic cycles. As an example, we used the dynamics of indicators of production of products of perennial fruit plantations in Ukraine in retrospect and import supplies of fruits. The phases of the economic cycle in terms of the volume of industrial production were identified and characterized. Possible causes of crises have been identified. The modern phase of the development of the fruit market, as a structural element of the food market in Ukraine, has been investigated and identified as a "rise". A long wave of the development of the horticulture industry was revealed. The reasons for the emergence of the next wave in 2000 were detailed and substantiated. The optimal period for forecasting the fruit market was determined, taking into account the dynamics of the main indicators of the formation of its conjuncture – domestic production and volumes of imports.

1. Introduction

Modern national economies and the world economy as a whole cannot fully develop without well-developed markets. Markets, however, are not a structure that takes shape finally. It should be noted that they are flexible in their development, react quickly to social and economic changes, and depend on political and psychological factors. They are constantly changing, improving the institutional structure and tools for flexible response to changes in the economy. Recently, the scale of innovation processes has radically changed. Never before have, there been so many changes in such a short period of time [1].

At the present stage of socio-economic and technological development of Ukraine, cyclicity can be considered as a way of self-regulation of the market economy. In other words, it arises automatically and there are practically no organizational and economic levers for regulating this phenomenon. Cyclicity as an economic category was characterized by a spiral movement and denies movement in the opposite direction, which, in turn, transforms the definition of cyclicity into a form of progressive development of the economy in general and the food market in particular. It was known that innovative development plays a decisive role in deviating the economic system from equilibrium.

Considering the importance and priority of the food market in consumer provision of the population with food, the study of its economic cycles is very relevant and timely.
Literature review. The most famous are the fundamental developments of outstanding scientists in the theory of economic cycles. N. Kondratyev developed – the theory of large cycles or long waves (50-60), S. Kuznets – the theory of medium waves (18-25), K. Zhuglyar and J. Kitchen – short cycles (7-12 and 2-4 years, respectively), M. Tugan-Baranovskyi (study of the causes of the emergence of cycles, their impact on the development of the economy).

The cyclical development of the economy and industries has recently updated much research. It should be noted Pugachova M.V. [2], Fisher S. [3], Balyan A.V., Sychevskyi N.P., Kovalenko O.V., Yashchenko L.A., Verbitskyi S. B. [4].

We consider it expedient to study the phenomenon of the food market cyclicity using the example of the fruit market, since it is possible to use the data in retrospect – from the beginning to the end of the commercial fructing of perennial plantations in several periods.

Research of the horticulture industry and the formation of the fruit market was carried out by I.V. Kolokolchikova [5], L.V. Mykhailyshyn [6], Yu.E. Osatska, L.L. Tytova [7], A.A. Kharenko [8]. S. Kalchenko, D. Legeza and others [9] proposed models for the development of the horticultural industry as the most profitable for various types of peasant farms (commercial, natural and commercial-natural).

However, the results of their work concerned, in particular, the theoretical foundations of the development of the horticultural economy at certain historical stages. And as the formation of the fruit market and the organizational and economic mechanism of its functioning. At the same time, the cyclical development of horticulture, if considered, is extremely fragmentary and exclusively from the standpoint of the efficiency of industry production. Meanwhile, its study in the development of the Ukrainian fruit market is new and necessary. Indeed, in the economic and mathematical modeling of various parameters describing the market, one should take into account at what stage of the economic cycle it is in order to conceptually substantiate and activate the mechanisms of further development.

2. Materials and methods
In the process of preparing scientific work, a number of methods were used: monographic, comparative analysis, statistical, tabular, abstract and logical.

The theoretical and informational base of the study was the scientific works of domestic and foreign researchers on the cyclical development of the economy and agricultural sectors, the data of the State Statistics Service of Ukraine and the Food and Agricultural Organization of the United Nations (FAO).

The purpose of the article was to study the theoretical and practical aspects of economic cycles in retrospect of the evolution of the Ukrainian food market (using the example of the fruit market), to identify the causes of their emergence and to identify the current phase cyclicity.

3. Results and Discussion
The essence of economic cycles, their patterns and causes of occurrence are the object of study of economic theory. Cyclicity was understood as the form of movement of the national economy and the world economy as a whole, which implies the alternation of revolutionary and evolutionary stages of their development, economic progress [10]. Less general and more similar in nature to the economic system of the state, in our opinion, is the definition of cycles as "a constantly repeating movement from one crisis to the next" [11]. In fact, the economic cycle is a market reaction to violations of macroeconomic proportions.

Scientists consider the causes of crises in the economy from different positions. Among them stand out:

- the divergence in time of the assets of the sale of goods, services and payment for them;
- the contradiction between the social nature of production and the private appropriation of its results;
- under consumption of food by a significant number of people, caused by deficiencies in distribution;
– the ratio of optimism and pessimism in economic activity;
– technical innovations;
– excess savings and lack of investment, et. [12].

So, A. Aftalion considered the unevenness of mechanical progress to be the cause of crises, S. Sismondi – insufficient consumption, K. Marks – the specificity of the essence of production relations and the contradictions of the market system, M.I. Tugan-Baranovskyi – disproportion between industries [13].

N. D. Kondratyev at one time (late XIX – early XX centuries), having analyzed the data of several developed countries for more than 100 years. He was identified the characteristic features of economic cycles [14]: the beginning of each of them was accompanied by global changes in the economic life of society (inventions in technology, changes in foreign trade, the structure of cash turnover). During one long cycle, several short ones can be observed. With upward waves, it was found that some kind of military action was taking place, and with downward waves, a deep depression in the field of agriculture.

Cycles were manifested in periodic difficulties of the business climate, taking into account the influence of various factors (climate change, risks in agricultural production, legislative changes, etc.). That is, when the economy seeks to find equilibrium. Therefore, the identification of fluctuations in economic activity and, accordingly, changes in market conditions that arise as a reaction to the action of well-defined presumed factors of the market environment are relevant and necessary [4].

Today, scientists identify the most common causes of crises and cycles [15]:
– under consumption of products by the population provokes a collapse of production;
– lack of effective proportionality between industries and regions and unregulated activities of entrepreneurs;
– the presence of a conflict between the formation of production-sales volumes and an increase in the purchasing power of the population, and, consequently, a disproportion between demand and supply.

The food market is a sphere of interaction between market entities to ensure the production and free movement of agricultural products, food products, technologies, means of production and services for the agro-industrial complex. In turn, the formation of an effective food market remains a rather complex problem requiring the solution of a whole range of internal contradictions. The primary of which is the need to achieve and maintain a healthy competitive environment while providing opportunities for progressive economic growth and development.

The food market, in contrast from other market systems, has its own characteristics:
– the constancy of functioning (constant food consumption is due to the continuity of the reproduction of the labor force);
– the seasonality of production and consumption, which arises from the biological nature of agricultural production;
– the ability to replace other market systems (the lack of non-food goods and services can be replaced by an increase in food consumption) [16].

The food market system is a complex interweaving of horizontal and vertical, sectoral, regional, structural and functional connections. From an organizational point of view, the priority is the question of the forms and horizontal slices of the market (Figure 1).

It should be noted that the crisis may affect not the market economy of the country as a whole, but a separate industry (market), for example, gardening (fruit market) as a structural element of the food market.

Let us consider in more detail the cyclical development of the Ukrainian fruit market and the horticulture industry as one of the components of the food market. Let's characterize the market by such phases of the economic cycle: crisis, depression, recovery and recovery. Comparison of the annual dynamics of fruit production on average per person per year makes it possible to establish the period. For it which a sample of factor indicators should be carried out when predicting the current situation in order to avoid distortion of the results when constructing economic and mathematical
models. It is possible to determine the priority directions of forecasting certain indicators for each of the phases of the economic cycle. Consider the dynamics of fruit production per person per year, starting from 1990 (Ukraine's transition to a market economy) to 2020.

![Food market structure diagram](image)

**Figure 1.** Forms and horizontal structure of the production market
Source: systematized by the authors based on [16].

In accordance with the phases of the economic cycle, the level of production per person per year was conditionally divided into four groups – less 25 kg (crisis), 25-35 kg (depression), 35-55 kg (revival) and 55 kg and above (rise) (Table 1).

It should be noted that the specified sequence of phases is optional, including by year. During a certain period, there were significant fluctuations in fruit production and there were many economic micro-cycles provoked by economic instability in the country and weather conditions.

Finding out the causes of the crisis will largely reveal the main reason for the cyclical development of the Ukrainian fruit market. In addition, will also provide an opportunity more reliably to determine the factors influencing the main indicators of the conjuncture. The indicators that characterize each of the phases of the economic cycle include the level of consumption (demand), total supply and selling prices. They should be taken as a basis for further market research.

The economic cycle has a wave-like character and was marked by self-reproduction and continuity. This was well illustrated in Figure 2, where the level of fruit production per person per year was used for graphing since 1940 (Figure 2).
### Table 1. Characteristics of the phases of the economic cycle of the Ukrainian fruit market by production volumes (in market conditions 1990-2020)

| Phases of the economic cycle | Characteristics of the phases | Level of fruit production per person per year, kg |
|-----------------------------|-------------------------------|-----------------------------------------------|
| 1. Crisis                   | – decline of Ukrainian industrial production, sales difficulties;  
– significant reduction in supply, fruit export;  
– decrease in demand for investment;  
– expansion of imports of products (often of low quality);  
– lack of government support;  
– bankruptcy of some horticultural enterprises;  
– a sharp decrease in the effective demand of the population;  
– high prices, etc. | less 25 |
| 2. Depression               | – reduction in fruit production, deterioration of the assortment;  
– non-compliance with production technologies, lack of the latest storage technologies;  
– seasonal provision of Ukrainian fruits;  
– deterioration in product quality;  
– lack of investments;  
– decrease in export supplies;  
– increase in imports, etc. | 25-35 |
| 3. Revitalize                | – growth in fruit production;  
– attracting investments (including foreign ones);  
– increasing the area of fruit-bearing plantations, assortment, assortment;  
– updating old equipment, improving technologies production, product quality;  
– establishing effective sales channels, both for agricultural enterprises and households, etc. | 35-55 |
| 4. Rise                     | – full satisfaction of the demand and needs of fruit consumers throughout the year;  
– the purchasing power of the population corresponds to the level of prices in the domestic market;  
– the formation of new horticultural enterprises;  
– expansion of exports;  
– increasing competitiveness in comparison with imported products in terms of prices, quality, assortment;  
– developing commercial activities and market infrastructure in general, etc. | 55 and higher |

Source: systematized by the authors based on [17].

The presence of a long wave is obvious – from 1940 to 2000 with many microcycles. One of the global reasons for cyclicality in horticulture is the long duration of the fruit production period. It was known that non-durable consumer goods industries tend to be less cycle-responsive because they have faster cash flow. Based on the data below, you can easily determine which years belong to the above phases of the economic cycle. Note that most of the fruits in Ukraine were produced in 1977 and 1979...
about 76-80 kg, and the least in 1952 and 1999 – 13.9 and 14.3 kg, respectively. We focus on the fact that the rational rate of their consumption is 75 kg per person per year.

![Graph of fruit production per person/year](image-url)

**Figure 2.** The level of Ukrainian fruit production in 1940-2020, kg per person per year  
Source: calculated and created by the authors based on statistical data [18].

The beginning of the next wave (since 2000) was characterized by the second stage of the agrarian reform in Ukraine. In the XXI century the main impetus for the development of reform processes was the adoption of a new edition of the Land Code and the Decree of the President of Ukraine "On urgent measures to accelerate the reform of the agrarian sector of the economy" dated 12.1999, No. 529. The consequence of this was the creation until 2001 based on collective farms 15.1 thousand new agricultural formations [19]. Thanks to state financial support for horticulture, carried out by distributing funds from a special fund in accordance with the Law of Ukraine "On collection for the development of viticulture, horticulture and hop growing" dated 04.1999, No. 587-XIV, it was possible to stop the decline of the industry. Since 2012, the share of gross harvests of fruits in agricultural enterprises, formed at the expense of state support, amounted to 90.5 % (327 thousand tons).

In general, we can conclude that during 1940-2020 there were significant fluctuations in the production and consumption of fruits. And the emergence of economic microcycles was triggered by economic instability in the country and a decrease in the population – from 52.2 to 37.9 million people. The production level was 45.6 kg with a population of 41.6 million people in 2020. So, the fruit market was at the stage of revitalize, which was characterized by the attraction of additional investments, including foreign ones, an increase in the area of fruiting plantations, assortments, the introduction of new, more efficient technologies aimed at achieving high productivity and improving product quality, expanding sales channels for all categories of farms, etc.

The cyclical nature of the fruit market was also affected by changes in the dynamics of their import supplies (Figure 3).  
Over the past few years, this indicator has a special place in the formation of demand, supply and retail prices. Since 2000, imports have gradually grown and reached their maximum by 2013. Ukraine imported 907 thousand tons of fruits per year, which was 6.2 times higher than the level of 2000 and amounted to 25-30 % of the total supply of fruits. A sharp jump in imports has been recorded since 2005 – 2.5 times.
Figure 3. Dynamics of import supplies of fruits to the Ukrainian market, thousand tons
Source: calculated and created by the authors based on statistical data [20].

This was due to a decrease in import tariffs in accordance with the Law of Ukraine "On Amendments to the Customs Tariff of Ukraine" dated March 15, 2005, No. 2470-IV. In particular, tariffs for bananas decreased by 2 times (up to 3 %), citrus fruits – 7 times (up to 3 %). These fruits were accounted for 87 % (506 thousand tons) of all imports.

Reduction in fruit imports in 2014-2015 happened, first, due to a decrease in the import of citrus and bananas, which were the basis of supplies (70-80 %). This was due to a decrease in demand for them due to the depreciation of consumer income. The factor of the tariff barrier were excluded, because according to the Law of Ukraine "On Amendments to the Law of Ukraine" On the Customs Tariff of Ukraine" dated December 17, 2008, No. 676-17 import tariffs for fruits decreased after Ukraine joined the WTO. For example, zero rates were introduced for fruits of objectively necessary imports (citrus fruits and bananas).

At the end of 2020, the average monthly wage of Ukrainians was UAH 14,179. (501.7 US dollars). This in dollar terms was only 49 monetary units higher than the level of 2013. Ukraine among European countries occupies almost the last place in terms of wages, ahead of only Moldova. The income of an ordinary Ukrainian was almost fifteen times lower than that of an American. Of course, in such a situation, there was an excessive influence of income and prices on the formation of demand.

In Figure 2 clearly shows the beginning of a new wave of the cycle of import supplies of fruits from 2015. This can be explained by a significant decrease in the level of inflation in the country in 2016 compared to the previous year – by 1.3 times to 12.4 % and it was subsequent decrease – to 5.0 % in 2020. The previous wave can be designated as the average one – 12 years (from 2004 to 2015).

We believe that when forecasting the fruit market, one should take into account the economic situation in the country and changes, which may occur in the future. In particular, a significant increase in the volume of imports after Ukraine's accession to the WTO and under the conditions of the Deep and Comprehensive Free Trade Area with the EU. Therefore, the sample of factor indicators should be formed based on data for the last 8-10 years in order to avoid distortion of the results when constructing regression equations.

4. Conclusions
The results of the study lead to the conclusion that the further transition of the food market in Ukraine in general, and the fruit market, in particular, to the next phase of the economic cycle (rise) depends on the effectiveness of a new wave of innovations, which will provide a long-term stimulus for the
growth period. This will be manifested, first of all, in the development of science, focusing on the introduction of innovative technologies for growing fruit plantations, and in the transformation of horticulture into a scientific and capital-intensive industry, the development of the storage and processing of products, the effective use of logistics in the implementation of marketing strategies, the emergence of new concepts, and strategic mechanisms for the development of the Ukrainian market and foreign trade in fruits.

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