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## Price parity in the agricultural sector as a guarantee of the national food security

**Abstract. Introduction.** The article deals with the problem of price parity in the agricultural sector at the global level. Pricing policies used by various countries are different due to the historically formed system of agriculture, specialisation of production and productivity of agricultural lands. *The purpose* of the article is to conduct a comparative analysis of price parity in the agricultural sector of countries, such as the USA, Belarus and Ukraine in the period of 2005-2016. *Methods.* The research is based on selective, index, graphical, monographic and comparative methods. The results of the conducted research showed how the mechanisms (programs) of government price controls are used by developed countries and how the price parity index is calculated in the context of food security. *Conclusions.* The calculations are different for each of the analysed countries. The article proves the importance of moderate government control and the benefits of state the implementation of price parity in the agricultural sector by the state.

**Keywords:** Agricultural Sector; Price Scissors; Food Security; Consumption; Price Parity

**JEL Classification:** E20; O13; Q11; Q14

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**Ціновий паритет в АПК як гарант продовольчої безпеки держави**

**Анотація.** У науковій статті розглянуто основні механізми (програми), що застосовуються урядами окремих держав для забезпечення паритету цін на продукцію АПК. Проведений компаративний аналіз зарубіжного досвіду моніторингу паритету цін в АПК свідчить про поширену практику застосування індексного методу розрахунку цінового паритету в контексті забезпечення державного регулювання цінової політики в АПК та продовольчої безпеки держави.

**Ключові слова:** АПК; ножиці цін; продовольча безпека; споживання; ціновий паритет.

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**Ценовой паритет в АПК как гарант продовольственной безопасности государства**

**Аннотация.** В статье рассмотрены основные механизмы (программы), которые применяются правительствами отдельных государств с целью обеспечения паритета цен на продукцию АПК. Выполненный компаративный анализ зарубежного опыта мониторинга паритета цен в АПК свидетельствует о распространенной практике применения индексного метода расчета ценового паритета в контексте обеспечения государственного регулирования ценовой политики в АПК и продовольственной безопасности государства.

**Ключевые слова:** АПК; ножицы цен; продовольственная безопасность; потребление; ценовой паритет.

## 1. Introduction

The problem of price parity in the agricultural sector arises in all countries. Even in developed countries, it is impossible to ensure a balance between different fields of the agricultural sector without implementing state intervention in the regulation of prices. However, the methods of state pricing policies in the agricultural sector, which are used by different countries are different and due to the historically formed system of agriculture, specialisation of production and the fertility of agricultural lands. In Ukraine, except for the stable supply of population with quality, safe and affordable food, the agricultural industry can significantly contribute to addressing hunger and food insecurity despite the low pace of technical and technological renovation of agricultural production through the price disparity in the agricultural sector.

The price disparity destabilises the equivalence of exchange between the fields in the agricultural sector, which determines the relevance of this study.

## 2. Brief Literature Review

There is a widespread idea in Ukrainian economic literature about the phenomenon of price disparity in the agricultural sector, which is the sectoral distortion of the price parity (Y. A. Ulianchenko [1], I. B. Iatsiv [2] et al) as a result of the insufficient level of innovation and investment development of the national economy (E. V. Baula, T. L. Nikiyuk [3]). Problems of food security have been considered by K. P. Golikova [4], L. R. Voliak [5], V. Ye. Ivchenko [6], L. V. Moldovan, B. Paskhaver, A. V. Shubravska [7] and others. We should also mention the achievements of Ukrainian scientists who studied foreign economy policy in the agricultural sector under the conditions of the global economy relations, among whom are S. I. Belei, O. V. Zybarena [8]; T. M. Melnyk, O. S. Golovachova [9]; V. F. Petrychenko [10]; O. L. Popova [11-12] and others.

Also there are foreign scholars who researched the relevant issues, such as M. V. Avdeyev (Avdeyev, 2015) who calculated the losses of agricultural enterprises in connection with the price disparity in the agricultural sector [13]; M. Fabus (Fabus, 2014) who studied the direct impact of foreign investments on the cutdown of such a disparity [14]. The investment aspect of the price parity in the agricultural sector was studied by M. I. Kuznetsov (Kuznetsov, 2016); V. A. Shibaykin (Shibaykin, 2016) and M. S. Iurkova (Iurkova, 2016) [15], while L. V. Lagodich (Lagodich, 2014) explored the volatility of prices in the Belarusian food market [16]. N. Bajramovich (Bajramovich, 2016), T. Volk (Volk, 2016), E. Erjavec (Erjavec, 2016) and others conducted a comparative analysis of the agriculture of the Western Balkans (Albania, Bosnia and Herzegovina, the Former Yugoslav Republic of Macedonia, Montenegro, Serbia and Kosovo) in the context of the national regulatory policies in the agricultural sector in order to give recommendations basing on the European experience [17]. In addition, Z. G. Novruzova (Novruzova, 2011) examined the possibility of improving the competitiveness of agricultural products on the basis of implementation of foreign experience [18].

However, while considering Ukraine's European economic integration in the context of ensuring the country's food security, scientists did not pay sufficient attention to the international experience on the effectiveness of the stabilisation agricultural prices and income in the agricultural sector if compared with the prices and incomes relevant to the national economy.

**3. The purpose** of the article is to conduct a comparative analysis of price parity in the agricultural sector of countries such as the USA, Belarus and Ukraine.

## 4. Results

The food security of any state is determined by the efficiency of the whole national economy. At the same time, food resources are formed in the agricultural sector. The food security of the state should be understood as «the level of food security of the population, which guarantees social and political stability in society, the survival and development of the nation, individuals, families, as well as the sustainable economic development of the state» [4, 411].

It is possible to provide the required level of food security due to achieving a balance between the prices for agricultural products and industrial products or services consumed in the agriculture, under which the purchasing power of agricultural prices if compared to the relative industrial products and services remains at the level of the base period [19; 21]. It should be noted that under the growth of consumer spending in agriculture, the marketing cost of agricultural products rises. Therefore, the policy of price and income control in the global agriculture provides for the monitoring of production costs by groups of specialised farms (EU countries), by type of industry (the USA), by the parity of prices for industrial and agricultural products (former Soviet republics), as well as by the profitability of farms and industries [18, 93].

The regulation of prices for agricultural products, as well as farmers' incomes, involves the monitoring and evaluation of changes in economic indicators such as: the price parity of the means of production in the agricultural sector and agricultural products, costs of production, the profitability of business entities and private industries in the agricultural sector, etc.

We have noted that various mechanisms (or the so-called programs) of state regulation of prices are used in order to maintain price parity (as the main indicator) and a parallel influence on the costs of production and to ensure the profitability of farms and the agricultural sector in developed countries. In particular, they are:

- 1) the creation of buffer stocks, which provides the procurement of agricultural products under the condition of extremely low prices with further sale of the reserves when prices for the agricultural products purchased by the government rise;
- 2) the procurement done to maintain prices for agricultural products, which aims to provide long-term high prices for the products of economic entities by suspending or minimising the sale of some agricultural products on the domestic market;
- 3) the export subsidies of certain products or raw materials of the agricultural sector and import restrictions to ensure higher prices in the local market;
- 4) compensatory payments used by the state to support an appropriate level of profitability of agricultural production by providing direct compensation payments in conditions of a significant drop in market prices for agri-food products [1, 5-6].

The analysis and assessment of the nature and dynamics of price parity in the agricultural sector of the United States, Belarus and Ukraine showed the following. The focus of public policy aimed to support the industry in the USA is manifested in the regulation of production processes in agriculture, as well as in the implementation of its financial support, in particular for the vector maintaining price parity between the resource industries which produce fixed and current assets for the agricultural sector and its products. This explains why the intensive development of agriculture in the USA contributes to the achievement of the following three strategic objectives: to ensure food security of the state, to expand economic and trade opportunities for agricultural producers and to ensure the possibility of the rational use of natural resources [20, 134; 21, 423-426].

In the process of public regulation of agriculture, the United States government introduced various programs aimed at stabilising the farming incomes and payments; stimulating the growth of production efficiency and protecting agricultural resources, as well as encouraging foreign trade at different periods and with different purposes. According to the concept of the price parity in the agricultural sector of the U.S., there is a need to ensure a constant ratio between the prices for farming products and the prices for the relevant goods and services consumed by farmers. The point of this calculation is to determine the price level which allows purchasing some material and technical resources of industrial origin for a certain amount of agricultural products in the length of the period used as a basis for such a calculation (Figure 1).

The periods of 2005-2016, 1990-1993, as well as the year 2011, are considered to be the periods when the ratio of prices in the United States was equivalent to almost 100% and favourable for the development of the agricultural sector [23].

During the analysed period, the price scissors in the agricultural sector of the United States, which characterise the gap in the price parity in the agricultural sector, expanded in the period of 2005-2008, and only in the period of 2009-2012 they narrowed to the level of base year in accordance with the terms of the government price support to the income of farmers, despite the increasing efficiency in agriculture due to the active implementation of innovations. However, the US law «On Agriculture» as of 2014 abolished the guaranteed direct subsidies to farmers in the absence of facts of cultivation or livestock feeding [24], which influenced the price parity in the agricultural sector of the United States of America during the period of 2014-2016.

The method of calculating parity prices in the US was emulated by the post-Soviet republics. Belarus also has statistical institutions which calculate the index of parity prices for industrial and agricultural products to analyse the terms of trade and adjustments in the government price policy in the agricultural sector (Figure 2).

The index is calculated on the basis of statistical reporting data obtained from 850 agricultural producers which are the leaders in the local market representing more than 9,600 types of agricultural products [25]. The unstable value of the index of parity prices and its decrease to its minimum in 2008 and 2011, suggests that the prices for sold agricultural products grew faster than for industrial products consumed by agricultural producers. However, the situation has changed since the year 2012 and the price parity has been altered in favour of industrial products (with the exception of 2014) [16, 121].

The cumulative index of costs on agricultural production in Ukraine is calculated on the basis of costs for the facilities of industrial and agricultural origin, tariffs and surcharges for services and expenses for labour payment of the staff of agricultural enterprises (Figure 3).

In Ukraine, the method of calculating parity prices is similar to the one applied in the USA. However, similar to Belarus, the method of chain substitutions is also applied, i.e. the indicators of the reporting and previous periods are taken into account while assessing of the changes in the price parity. The volatility of the price parity in the agricultural sector of Ukraine during the analysed period points to the inflation processes in the national economy and the limited opportunities of agricultural producers in relation to technical and technological renovation in the agricultural sector. In addition, the phenomenon of the price lag for agricultural products of the studied countries in terms of the facilities of industrial origin is substantiated by the inelastic demand for food products of agricultural origin [27, 125], which is why the incomes obtained from the sales of agricultural products in the United States, the Republic of Belarus and Ukraine are growing more slowly when compared with the cost of agricultural products.

It should be noted that in order to achieve price parity in the agricultural sector the government regulation is necessary, which is explained by the peculiarities of some regions (the unstable market due to seasonal fluctuations; the variable yields through the influence of climatic conditions, the cyclical nature of the farming and seasonality in production and procurement of agricultural products, etc.). However, state intervention in the sector should be appropriate and

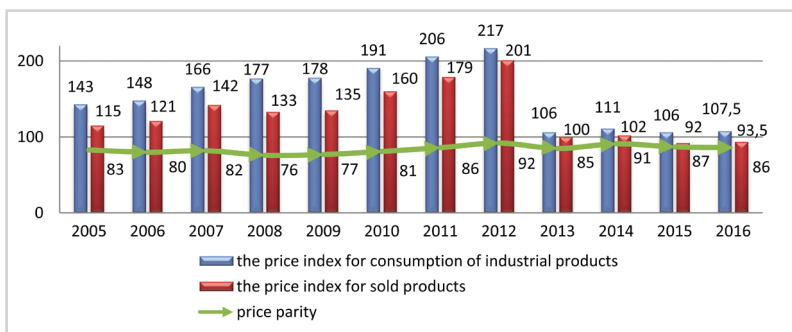


Fig. 1: Dynamics of the price parity in the agricultural sector of the United States of America in the period between the end of 2005 and the 6 months of 2016, % of base year

Source: Compiled by the authors based on [22]

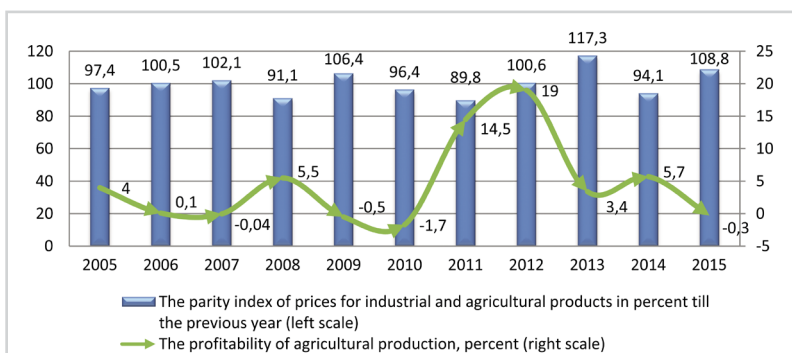


Fig. 2: Dynamics of financial indicators and prices in the agricultural sector of the Republic of Belarus in the period of 2005-2015

Source: Compiled by the authors based on [25]

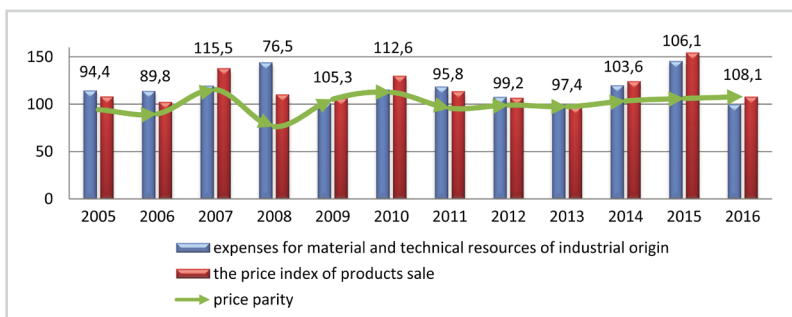


Fig. 3: Dynamics of the price parity in the agricultural sector of Ukraine in the period between the end of 2005 and the 6 months of 2016, % of base year

Source: Compiled by the authors based on [26]

moderate as it will have a negative impact on market processes. This will be the case both in conditions of non-interference from the part of the state (under these conditions there would be a decrease in the profitability of agricultural production, a reduction of farmers' incomes, etc.), and in conditions of over-intervention. While considering the latter, we noted that the so-called discrimination on the policies of some local authorities may lead to the opposite effect, despite the desired positive expectations. Thus, instead of developing a competitive market environment and the market-based instruments related to price reduction, local authorities may provoke the reverse process through their over-intervention in the agricultural sector [28, 119].

### 5. Conclusions

The comparative analysis of foreign experience of parity prices monitoring in the agricultural sector has shown the common approaches to the application of the index method of calculating the price parity in the context of ensuring the state regulation related to the pricing policy in the agricultural sector and food security of the state. The maximum possible effect



from the state regulation of price parity in the agricultural sector can be achieved due to the following:

1. The necessity of changing the priorities relevant to the implementation of the state policy in the agricultural sector through both direct and indirect impacts. Such measures should be complex and include:

- a) the improvement of the legislative regulation of prices in the agricultural sector, according to the requirements and peculiarities of the industry, time, and globalisation trends;
- b) a multi-level system of prices for the main types of agricultural products in order to provide producers with adequate incomes;
- c) the use of anti-monopoly measures as one of the vectors of the state policy;
- g) integration and cooperation for the formation of food complexes with a full (closed) production cycle and therefore

the possibility to maximise profits from consumption of the relevant products;

- d) the favourable investment environment and openness for innovations which have already been offered or widely used by the leading developed countries.

2. The regulation of the limit of both mediators and trade allowances for agricultural products in terms of their wholesale prices, which will make it possible to protect the final consumer against unreasonable overestimate of retail prices.

Further researches in this area may include: information support to the monitoring of price parity in the agricultural sector on the basis of specification of its components taking into account the non-state financial forms of incentives and the development of the agricultural sector in Ukraine.

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