



Influence of External Factors on the Domestic Price of Agri-Food Products

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Abstract: *The aim of the study was to identify the influence of external factors on the price dynamics of the domestic market of agri-food products. A separate task was to evaluate the effectiveness of the policy of maintaining price stability and to develop recommendations for its improvement. The influence of external factors (world price, net export, import price) on the domestic price of agri-food products is studied. The analysis covers the period 2003-2021. The influence of external factors on the domestic price of agri-food products in the conditions of the global financial crisis of 2007-2009 and the COVID-19 pandemic is investigated and compared. The effectiveness of measures to stabilize domestic prices in the context of the COVID-19 pandemic is considered. Proposals for maintaining the price stability in the domestic market of agri-food products have been developed.*

1. INTRODUCTION

In autumn 2020, Ukraine saw a significant increase in prices for some agri-food products. This rise in prices also continued in 2021. This primarily concerned sunflower oil, sugar, flour, and eggs. Before that, the dynamics of prices for these goods was stable and even for some goods was declining. The supply of these goods to the domestic market was stable, which ruled out the possibility of a deficit. Ukraine is a major supplier to the world market of sunflower oil and grain. Exports of sugar, flour and eggs have increased over the past five years. Since these products form the basis of the consumer basket, the urgent task of identifying the causes of rising prices.

The rise in prices was caused by internal and external factors. Internal factors were related to the supply of and demand for agri-food products in the domestic market. As agri-food products were export-oriented and their production was highly developed, their supply in the domestic market was stable. Domestic demand was also stable, as real incomes remained low in 2020-2021 in the context of the COVID-19 pandemic. Thus, it is most likely that the rise in prices was caused mainly by external factors.

The study aimed to identify the influence of external factors on the price dynamics of the domestic market of agri-food products. A separate task was to evaluate the effectiveness of the policy of maintaining price stability and to develop recommendations for its improvement.

2. METHODOLOGY AND DATA

To conduct the study, all agri-food products were divided into 3 groups: 1) goods that enter the domestic market mainly through imports; 2) goods, the production of which is aimed mainly at

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exports; 3) goods that are produced mainly for domestic consumption. The first group included bananas and rice, the second group included sunflower oil and poultry, and the third group included sugar and pork. The choice of goods for each group was determined by the available statistical base.

The influence of the following external factors on domestic prices was studied: world price, net exports, import price. The analysis covered the period 2003-2021. The impact on price dynamics during the global financial crisis of 2007-2009 and the COVID-19 pandemic was compared.

The methods of seasonal smoothing of time series, regression-correlation and factor analysis were used in the study.

The information bases of the study were: 1) IndexMundi database; 2) UN Comtrade statistical base; 3) statistical data of the State Statistics Service of Ukraine; 4) statistical data of the National Bank of Ukraine.

3. RESULTS

A close correlation between the import price and the domestic price of Group A goods during 2011-2020 was revealed (Fig. 1, Fig. 2). The import price was fixed in hryvnia, taking into account the official exchange rate. For bananas, the Pearson correlation coefficient was 0.887, for rice - 0.980. The price of the import contract, taking into account the exchange rate, was decisive for the dynamics of the domestic price. However, in some years the increase in the import price did not lead to a corresponding increase in the domestic price. In these cases, the influence of internal factors was more significant.

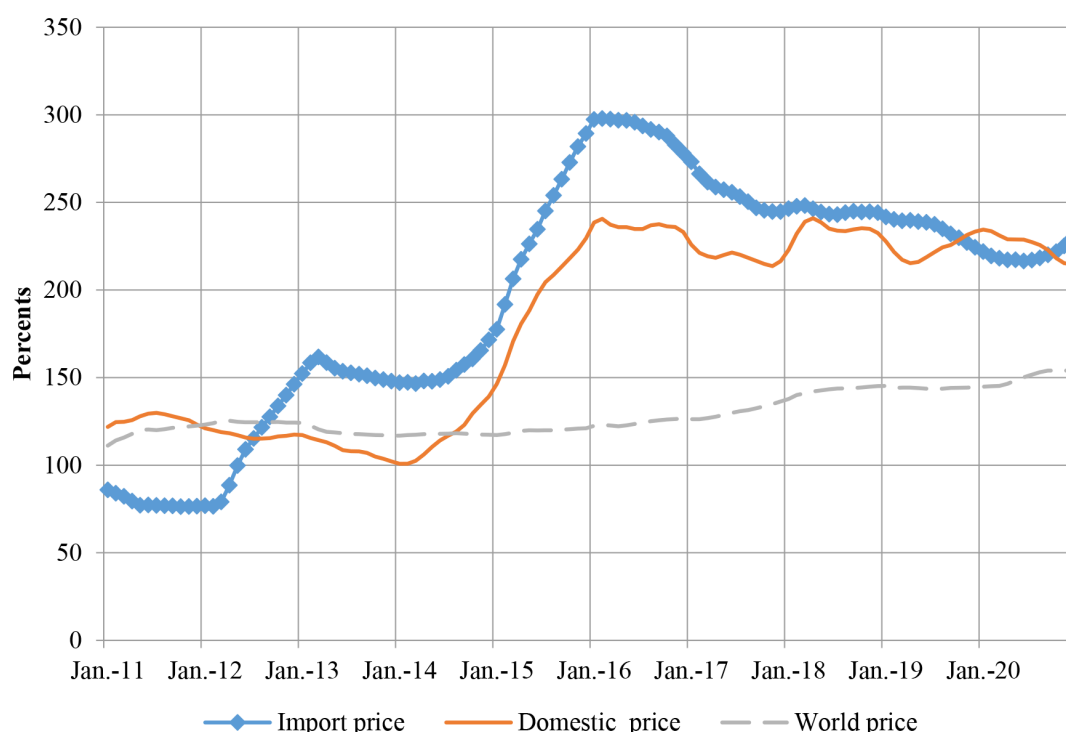


Figure 1. Monthly, seasonally adjusted banana price index, January 2010 - 100%

Source: United Nations, 2021; State statistics service of Ukraine, 2021; National Bank of Ukraine, 2021

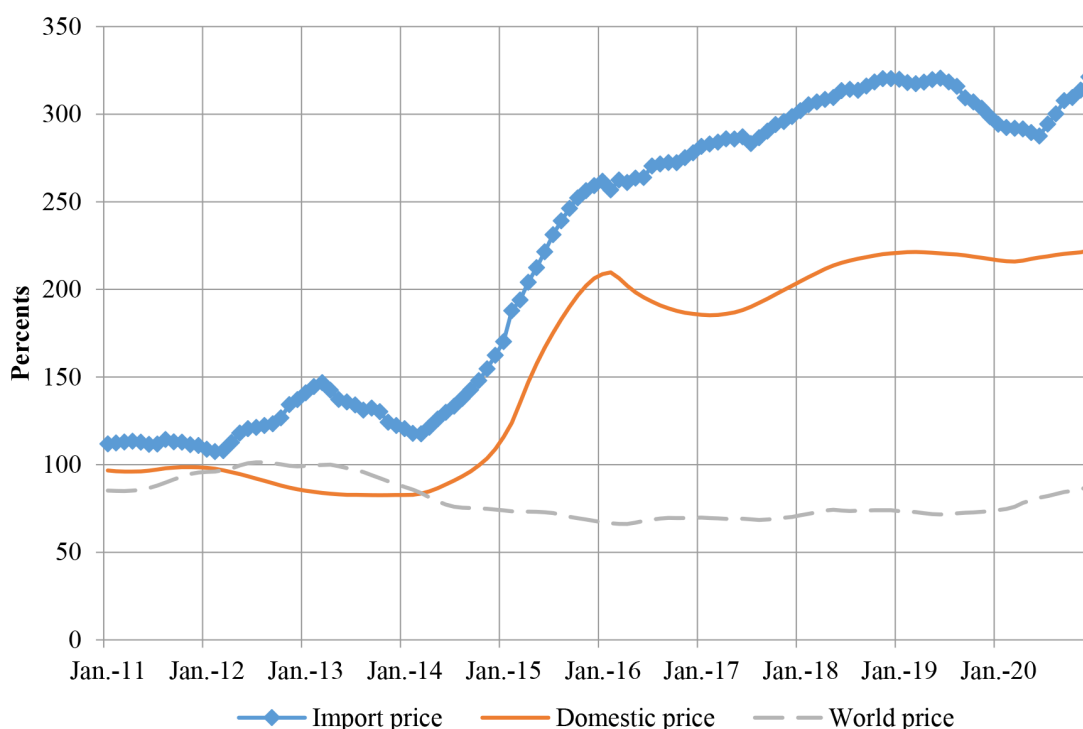


Figure 2. Monthly, seasonally adjusted rice price index, January 2010 - 100%

Source: United Nations, 2021; State statistics service of Ukraine, 2021; National Bank of Ukraine, 2021

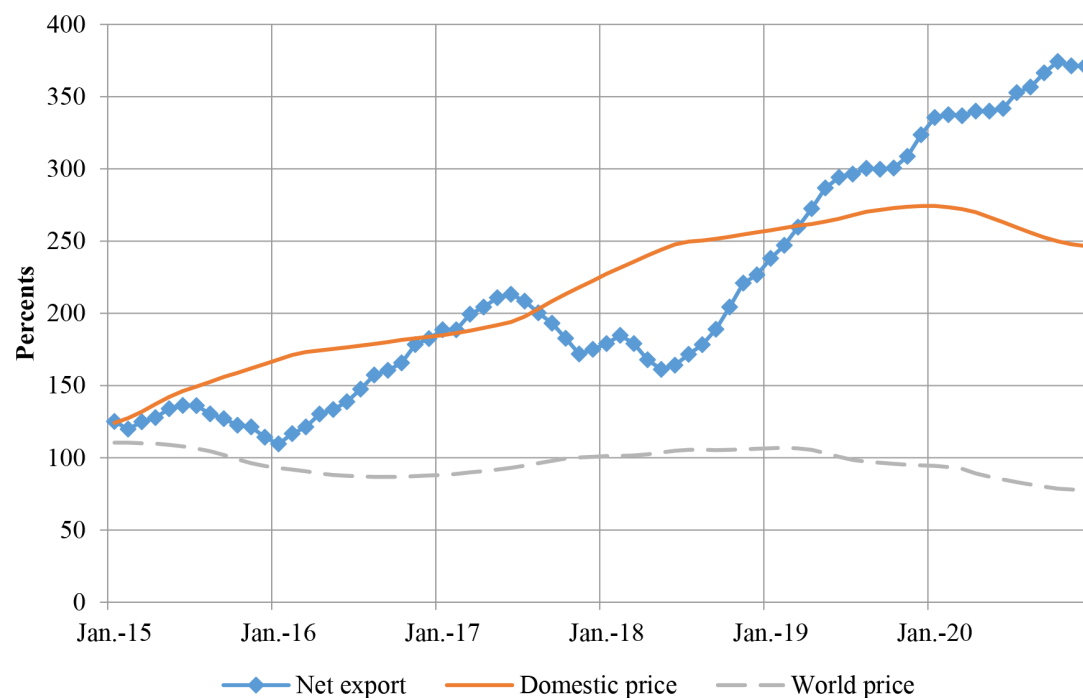


Figure 3. Monthly, seasonally adjusted poultry meat price index, January 2014 - 100%

Source: United Nations, 2021; State statistics service of Ukraine, 2021; IndexMundi, 2021

A close correlation was found between the volume of net exports and the domestic price of Group B goods during 2015-2020 (Fig. 3, Fig. 4). The Pearson correlation coefficient between net export and domestic price for poultry meat was 0.811 and for sunflower oil 0.745. The growth of net export reduced the supply in the domestic market and stimulated the growth of the do-

mestic price. For Group B goods, the effect of the net export factor on the domestic price was more significant than the effect of the world price factor. The Pearson correlation coefficient between the world and domestic prices for poultry meat was -0.127 and for sunflower oil -0.648. The negative values of the coefficient can be explained by the significant increase in prices for agri-food products in 2015 due to the internal economic crisis in Ukraine.

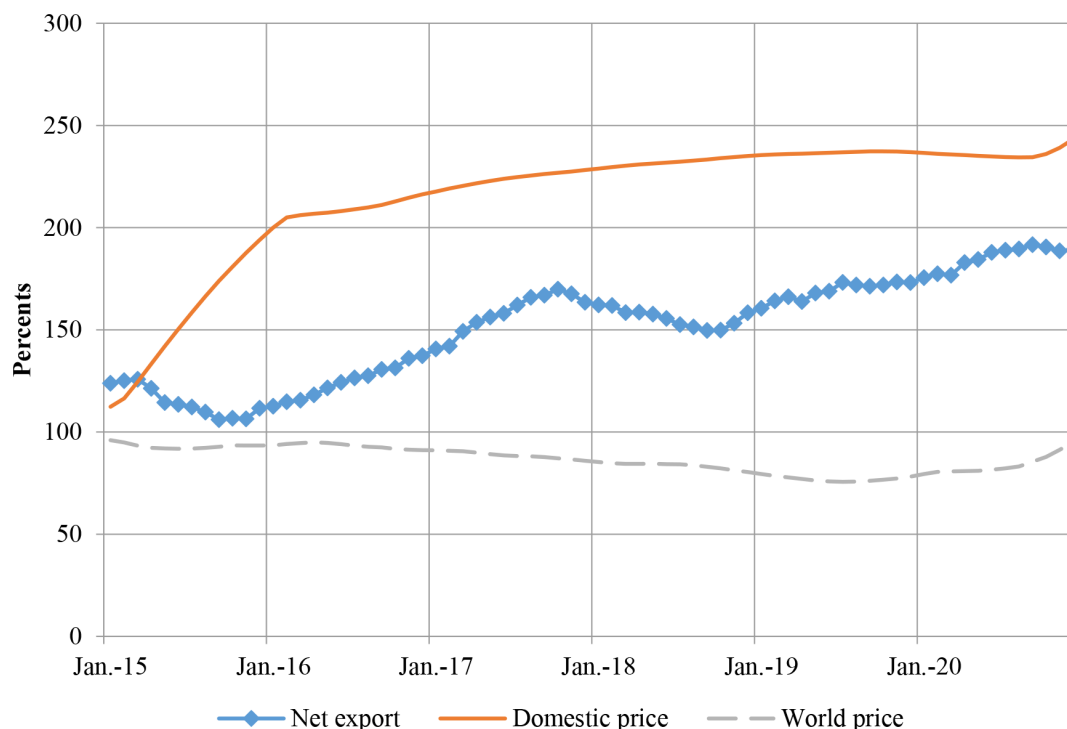


Figure 4. Monthly, seasonally adjusted sunflower oil price index, January 2014 - 100%

Source: United Nations, 2021; State statistics service of Ukraine, 2021; IndexMundi, 2021

The world price turned out to be the most important external factor for the domestic price of certain goods of group C. The effect of world prices was analyzed for sugar and pork. The analysis was performed at two-time intervals: 2004-2013 and 2016-2020. The Pearson correlation coefficient between the world and domestic price for sugar was 0.956 during 2004-2013, and 0.804 during 2016-2020. Fig. 5 clearly shows how the dynamics of the domestic price of sugar repeat the dynamics of the world price.

For pork, the relationship between world and domestic price was less close (Fig. 6). The Pearson correlation coefficient between the world and domestic pork price was 0.485 during 2004-2013, and -0.430 during 2016-2020. Production of both pork and sugar was directed mainly to the domestic market with minimal imports. This was especially true for sugar during 2004-2013 and for pork during 2016-2020. At the same time, the Pearson correlation coefficient for sugar during 2004-2013 was 0.956, and for pork during 2016-2020 was -0.430. This can be explained as follows. Sugar production is concentrated mainly in agricultural holdings. Agricultural holdings are engaged in large-scale foreign trade and monitor world prices. Pork production in Ukraine is mainly carried out by small and medium-sized enterprises that are not connected with the world market. Therefore, the domestic price of sugar repeats the dynamics of the world price, and the dynamics of the domestic price of pork does not depend on the world price.

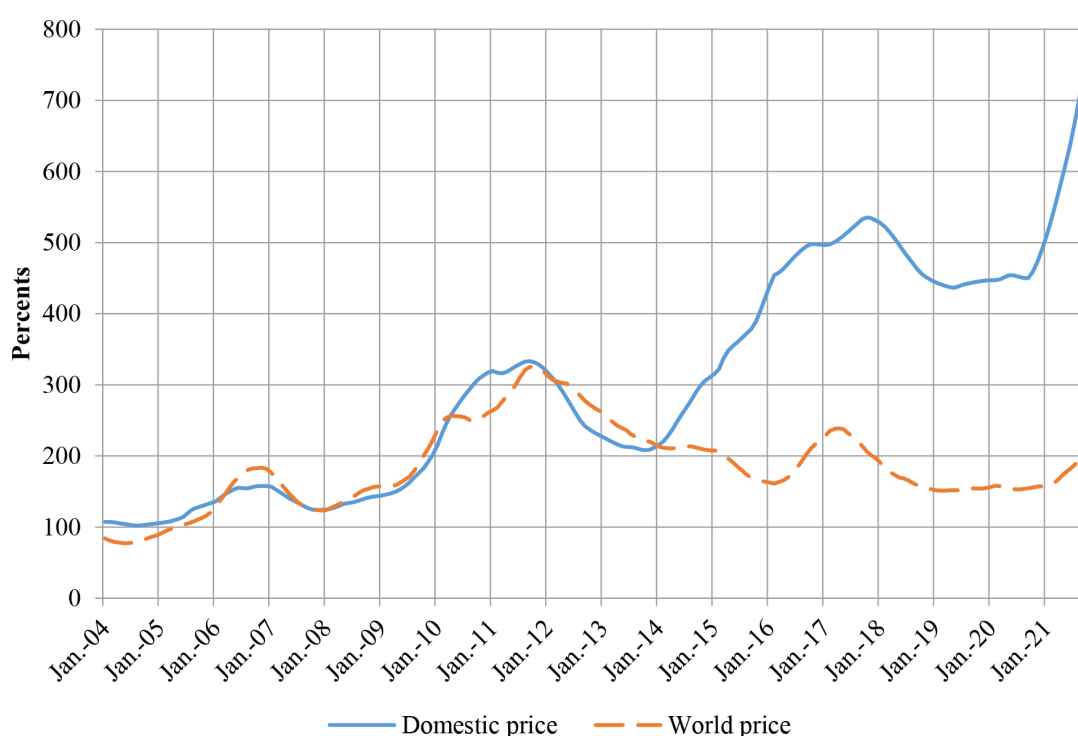


Figure 5. Monthly, seasonally adjusted sugar price index, January 2003 – 100 %

Source: State statistics service of Ukraine, 2021; IndexMundi, 2021

The world price affects the dynamics of domestic prices. The strength of this effect may be different for different product groups. However, as far as the conditions of foreign trade are concerned, they do not significantly affect this relationship. In particular, both the global financial crisis of 2007-2009 and the economic crisis caused by the COVID-19 pandemic did not change the nature of this impact. For the product groups that were studied, the nature of this impact did not change during the crisis. It remained the same as it was in the pre-crisis and post-crisis periods.

In general, both the global financial crisis of 2007-2009 and the economic crisis of 2020 caused by the COVID-19 pandemic had little effect on the agri-food market. In 2020, prices for food and non-alcoholic beverages in Ukraine increased by 3%, in 2009 - by 12%. For comparison, during the internal economic crisis of 2015, prices for food and soft drinks increased by 49%. During the COVID-19 pandemic, the service sector suffered the most. Agriculture and the food industry have suffered minimally.

During the lockdown in Ukraine in 2020, domestic food supply channels were blocked. However, the external supply channels were operating at full capacity. In 2020, compared to 2019, import of rice, bananas and pork increased, while export of sunflower oil and poultry increased too. Thus, the general economic crisis both in 2009 and in 2020 had a minimal impact on the agri-food sector. Its main negative impact was a decrease in demand for agri-food products due to lower incomes of households. The causes of crises in the agri-food sector are related to specific factors in certain commodity markets.

The main reason for the increase in sugar prices in 2020 was the reduction of sown areas and adverse weather conditions. These factors were more important than the factor of the world sugar price, which in 2020 was generally stable and a factor of the COVID-19 pandemic. In 2020, the area under sugar beets in Ukraine amounted to 209 thousand hectares, while to meet

the needs of the domestic market it is necessary to plant 228 thousand hectares. Small volumes of sugar beet sowing in 2020 were a continuation of the negative trend of reducing sown areas, which lasted for 10 years.

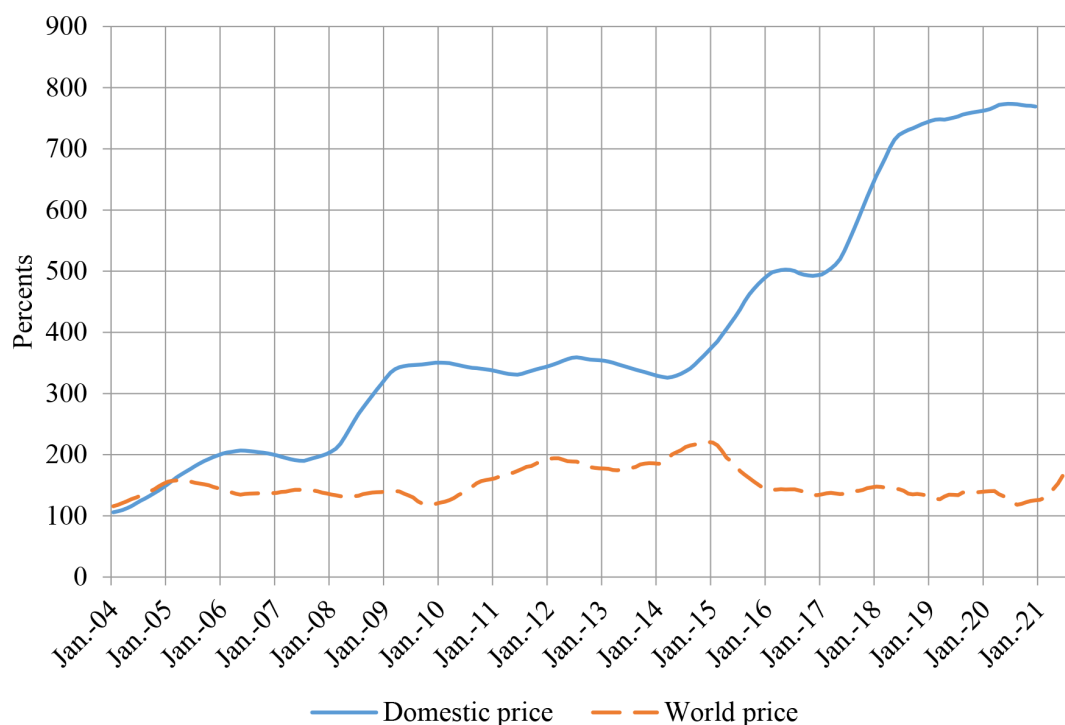


Figure 6. Monthly, seasonally adjusted pork price index, January 2003 – 100%
 Source: State statistics service of Ukraine, 2021; IndexMundi, 2021

To overcome the deficit of sugar, 163 thousand tons of sugar were imported to Ukraine for 8 months of 2021. In addition, 228 thousand hectares of sugar beet were sown in Ukraine this year. Under a normal harvest, this should provide the minimum domestic needs and stop the growth of the domestic price. As of the beginning of October 2021, 3.4 million tons of sugar beets were harvested in Ukraine (only 0.8 million tons were harvested on this date in 2020). A good harvest has stabilized the price situation. Beginning in September 2021, the domestic price of sugar stopped rising.

The situation on the sunflower oil market developed in a similar scenario. The rapid rise in domestic prices began in October 2020 at about the same time as world prices rose. In April 2021, the growth of world prices stopped. In July 2021, the domestic price of sunflower oil also stabilized.

A similar world price spike for sunflower oil has taken place before - in 2008 and 2011. Then the rise in world price also led to a rise in price in the domestic market. But it was much smaller in scale. The large increase in prices in 2020-2021 was the result of the combined action of two factors: the growth of world prices and the growth of net exports. In 2008 and 2011, exports were much lower.

Rising prices for sugar and sunflower oil have increased tensions in the consumer market. Especially since this happened in the context of the COVID-19 pandemic when household incomes declined. The rapid rise in the price of sugar did not deter the mandatory introduction by the

Government in May 2020 of producers to declare their intention to raise the retail price. This requirement did not apply to sunflower oil. The signing of a memorandum between the Government and sunflower oil producers in April 2021, which limited exports in 2021, had a positive effect on the domestic market of sunflower oil.

From the point of view of trade policy, the best way to stop the rise in prices is to ensure a balance of supply and demand in the domestic market through many measures: restricting exports, intervening inventories, increasing imports, reducing demand and more. Less effective is the administrative fixation of the price, which leads to a shortage of goods in the legal market and the growth of its supply in the illegal market at a high market price.

4. CONCLUSION

The obtained results confirmed the hypothesis of a significant influence of external factors on the domestic price of agri-food products. The domestic price of imported goods depended most on the import price, taking into account the exchange rate. The domestic price of export goods depended on net exports and world prices. The domestic price of goods that are focused on the domestic market was “tied” to the world price.

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