

COMPETITIVENESS OF AGRICULTURE IN UKRAINE UNDER GLOBALIZATION CONDITIONS

Prokopenko Kateryna,

PhD in economics, Senior Research Fellow

Institute for Economics and Forecasting,

Ukrainian National Academy of Sciences, Kyiv, Ukraine

e-mail: k_prokopenko@ukr.net

Abstract: *The paper is devoted to research of place and role of agriculture in the system of the world and national economy. Assessment of effect of agriculture on general economic indices has been made. The article shows the influence of agriculture on the foreign trade balance of Ukraine. The problems of the impact of world and domestic prices on the competitiveness of Ukrainian agricultural producers are disclosed in the work. The article demonstrates the interrelation of world and national prices by the example of prices for corn, as well as the tendency of their volatility. The system of indices based on the data of Input-Output table has been introduced for assessment the place of agriculture in national economy. The indices reflect interrelations of agriculture with other sectors of national economy. Agriculture influences considerably on production activity of row of contiguous branches and is responsive on the changes in an economy. Thus, growth of output and final consumption of its products provides the rapid positive reaction in other branches, and the positive changes in an economy at once tell on industry.*

Keywords: *competitiveness, foreign trade, prices, volatility, Input-Output table.*

JEL Classification: Q11

UDC 338.43(477)

Introduction. In the conditions of the integration into the system of the modern world economy, the competitiveness of the national economy becomes especially relevant. Ukraine has a significant agricultural potential, thus it is fully related to agricultural products and food. In recent years, the country has taken a leading position in the world grain and technical crops market, and last year it became one of the three leading grain exporters. Throughout the period of independence, Ukraine has consistently been among the top ten countries - the world's producers of barley, buckwheat, sunflower, potatoes, sugar beet and is now among the top ten producers of wheat, corn, and milk. Particularly fast in recent years, Ukraine has been increasing the production of corn, rapeseed, soya, which has been reflected in its place among world producers.

The main body of the academic paper. In 2018 exports of agro-food products increased by 4.8% (Table 1). Such a reduction in the value of exports is due primarily to increase in export prices. In recent years, there has been a steady increase in the share of foreign exchange earnings from the export of domestic agricultural products. Last year, the agrarian sector provided 39% of all foreign trade revenues of the state (in 2009-2012, on average 22%, in 2014 - 31%, and in 2016 - 42%). The volume of the agrarian imports is almost four times lower, which stably generates a positive balance of the foreign trade balance of agri-food products. Thus, ensuring the competitiveness of the domestic agricultural sector is an important component of the country's economic policy.

The share of agricultural products in total exports of the state has now stabilized along with a steady increase in agri-food exports. It should be noted that this was achieved at the expense of the growth of export prices (the agricultural prices index of agricultural exports was 107%). The index of physical volume of exports was 97.9%, which indicates a decrease in physical exports in 2018. This indicates a cessation of the long-running trend (six consecutive years) of the fall in world food prices. Therefore, in the past year domestic farmers only thanks to a favorable price situation, it was possible to obtain additional 1.2 billion USD of export earnings.

Table 1. Dynamics of commodity structure of foreign agro-food trade of Ukraine*

Indicator	2005	2010	2013	2015	2017	2018
Exports, mln. USD	4307	9935	17024,3	14564,2	17758,4	18611,8
Imports, mln. USD	2684	5762	8184,0	3478,9	4299,4	5055,5
Balance, mln. USD	1623	4173	8840,3	11085,3	13459,0	13556,4
Share of food products and raw materials in total exports, %	12,3	19,0	26,8	38,2	41,0	39,3
Share of food products and raw materials in total imports, %	7,4	9,5	10,7	9,3	8,7	8,8

*Source: calculated according to the State Statistics Service of Ukraine.

Generally, competitiveness is defined as an indicator of the ability to deliver goods and services wherever it is possible to find buyers at prices that are lower than those of competitors, while earning at least the same returns as alternative income that could be obtained for alternative use of the resources involved. Thus, the competitiveness determines that producer has:

- the ability to satisfy the demands of the buyers of products regarding the timeliness of deliveries and the expected quality of products;
- the ability to satisfy the consumer's demands both in the domestic and in the foreign market regarding the price of the product;
- the ability to effectively use resources.

Ukrainian agriculture proved to be one of some branches of the national economy, which made a positive result in the formation of the national GDP. Compared to 2017, in 2018 the GDP grew by 3.3%, with agriculture becoming the branch of material production, which showed the maximum growth of gross value added (7.8%), correspondingly, its share in GDP increased to 10.1%. Thus, in comparison with other sectors of the Ukrainian economy, it is more resistant to the impact of the economic crisis.

In general, domestic agricultural products were competitive both on the domestic and international markets.

Prices as a component of the competitiveness of Ukrainian agricultural products on the world market. Ukrainian agriculture is an important part of ensuring world food security. Given this it should be recognized that in order to meet the demand for food from a growing world population, which is estimated to reach 9.2 billion people in 2050, agricultural production is projected to grow by around 70%. An important component of achieving this goal is to maintain profitability for agricultural producers. High prices of agricultural products would not only benefit countries that are efficient producers and exporters, but also becomes an incentive for countries which currently act as net importers of food, with a high potential in agricultural production (the development of which is constrained by the high level of subsidies to production of developed countries), to further the political goals of food self-sufficiency.

Measures to ensure food security should be taken at the micro and macro levels. Factors that contribute to the formation of food security at the macro level, include actions aimed at stabilization of agricultural production and reducing the likelihood of natural disasters which affect food security; reducing the dependence on energy resources; decrease the dependence of national food security from foreign sources in the conditions of instability in world markets

and foreign exchange earnings from imports, price stability; reduce trade barriers and elimination of trade embargo.

Changes in the price level contribute to volatility in the market when these changes are the significant and risks of these changes cannot be predicted in advance. Thus, the fluctuations cause a high level of uncertainty, which increases the risks for agricultural producers, including those related to the change in commodity prices, consumers and governments, and promote the non-optimal decisions of investors on the allocation of investment in agriculture. Over the past fifty years barriers to agricultural trade were formed, which caused a slowdown in growth in agricultural trade, and reducing the rate of development of the poorest countries, increased growth and adverse effects of volatility in global food prices.

Market is the center of economic activity and the most important economic issues related to the functioning of the market. The mechanism is based on the functioning of the market supply and demand, with the central element of the market mechanism in favor price. Pricing in the agricultural sector differs significantly from other sectors of the economy. First, this is due to the specific agricultural production. The main features of pricing for agricultural commodities include: rental pricing principle; objectivity seasonal fluctuations; the possibility of active regulation; instability and high amplitude.

The main features of the formation of agricultural commodities prices include: rental pricing principle; objectivity of seasonal fluctuations; the possibility of active regulation; instability and high amplitude.

Prices formation on the agricultural market is determined by the dynamics of supply and demand. The proposal depends on the following factors:

- weather conditions
- prices of inputs,
- fuel prices,
- level of coverage,
- State trade policy,
- level of agricultural support.

Fluctuations in prices - a common feature inherent even to established agricultural markets. But when these trends become large-scale and unpredictable, they can have a negative impact on food security of consumers, farmers, and countries.

The rapid increase in food prices and their fluctuations from 2008 troubled the world and forced it to actively discuss and explore the problem of price changes in agricultural markets. Since 1960, a significant increase in food prices was observed twice. Since 1982 the world market was quite stable for over 20 years and prices were lower than the baseline of 2000.

Today food prices in the world are consistently high, although there is a gradual trend to their reduction. Therefore, we can say that the second wave of growth ended and prices have stabilized (Fig. 1). According to the latest forecasts of economists Food and Agriculture Organization of the United Nations (FAO) food market will be more stable and less volatile as compared to the last few years, due to improved supply and the recovery of world grain stocks.

Macroeconomic effects of commodity prices for the country are important because they affect the level of income per capita, which is the key determinant of living standards. In general, high world food prices benefit countries that export these products, while low prices benefit importing countries. Abstracting from the moment of volatility, it can be argued that in the short to medium term price fluctuations are generally changes with a zero-sum:

exporters are benefiting at the expense of importers, and vice versa. However, in the long term, high food prices may force some importing countries to increase investment in agriculture and reduce imports, or even become exporters. Such investments are crucial for the development of the agricultural sector, sustainable poverty reduction and prevention of food safety risks.

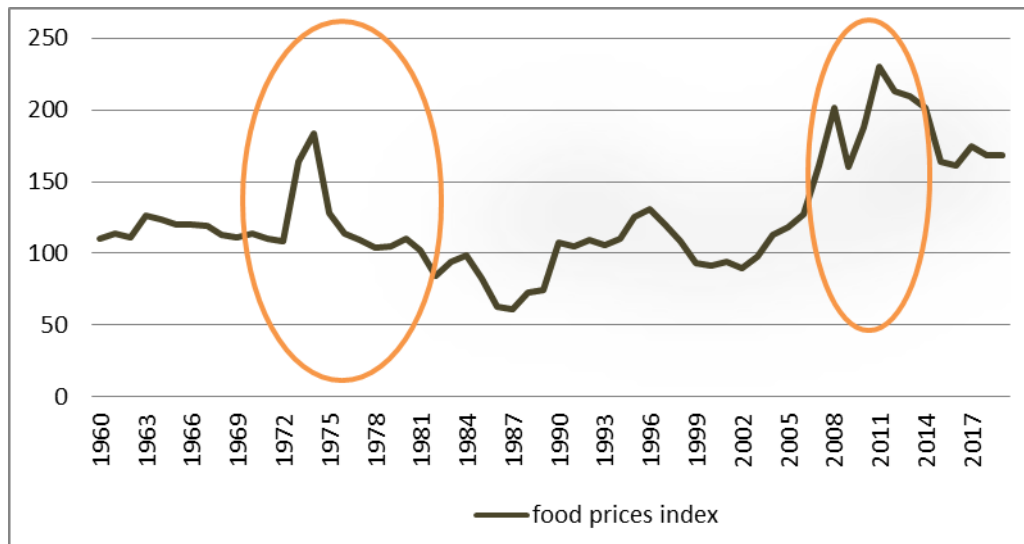


Figure 1. The dynamics of the food prices index, % (2002-2004 year = 100%)

Source: Created by author based on the data of World Bank [1]

The impact on the balance of payments and the exchange rate would be the most significant in those countries where the food sale is part of export or import. Countries, which export much of their production, receive the greatest benefit at high prices. Countries that import a significant portion of food for consumption, are affected at high prices the most. However, consequences generated by the "terms of trade" are important too. For example, a country that exports oil or metals, may not need to increase their production to compensate for rising food prices if the price of its exported products increased more than prices for imported food.

In the short term benefits of high prices are realized primarily by farmers with high commodity surpluses, and it should be noted that these producers do not relate to the poorest. In addition, the poorest tend to buy more food than sell. Thus, high food prices tend to lead to increase poverty, food insecurity and malnutrition.

In the long run the best way to reduce food prices is the investment in agriculture. It will lead to a sustainable yields increase, lower production costs, increased productivity and reduced loss and waste of food. These investments can make food more affordable for consumers and more profitable for manufacturers and act as an important mechanism to influence food prices for everybody to receive the benefit. In this sense high prices may be the safeguard against high prices, provided that high prices encourage the introduction of improved technologies in agriculture and encourage the government and international donors to increase the amount of financial resources for investment in agriculture. So while high prices intensify the problem of food security and poverty in the short term, they also empower investment and economic growth that reduce these negative risks in the long term.

Nevertheless, high prices can encourage long-term investment in agriculture that will contribute to sustainable food security in the long term.

Export-oriented agricultural products prices on the domestic market of Ukraine depend on the prices prevailing on the world market. In the last few years one of the main export crops was corn. Therefore, Fig. 2 compares the dynamics of moving average values (for occasional fluctuations smoothing) and average monthly selling price of corn on domestic and global markets.

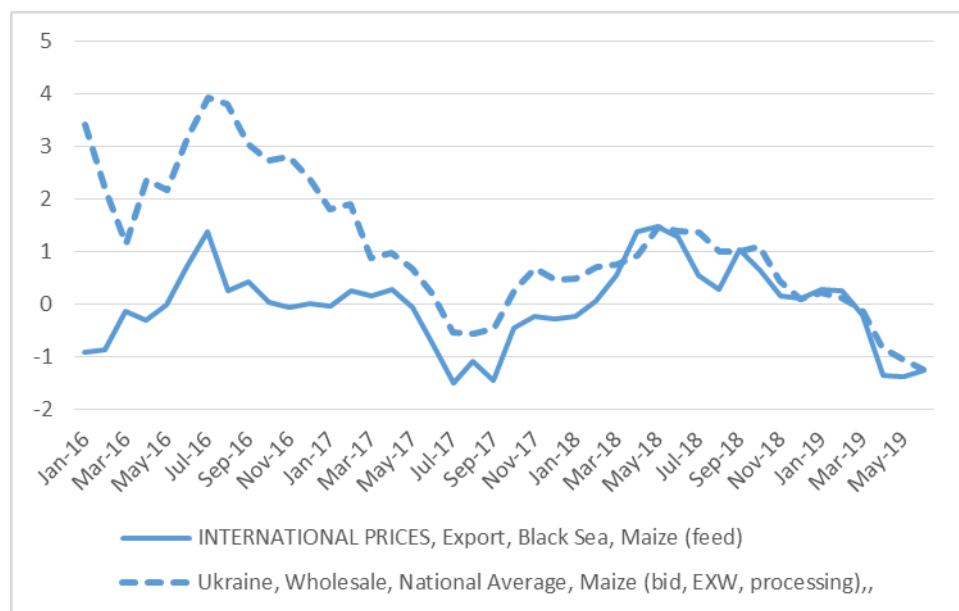


Figure 2. Dynamics of 12 months moving average of monthly corn selling prices, %

Source: Created by author based on the data of GIEWS FPMA Tool [2].

For farmers volatility of commodity products prices (either their increase or decrease) leads to uncertainty. It affects decisions on investment in agriculture and, thus, has the long-term affect on World Food Security.

The dynamics shows that the trend of prices on the domestic market with a small time lag almost completely repeats the one on the world market.

Comparing levels of volatility of corn global and domestic prices indicates that domestic corn prices trend in Ukraine (except for the marketing year 2012/2013) was characterized by higher volatility compared to world prices (Fig. 3). It should be noted that the last six months of 2019 the volatility of world and domestic corn prices were rather close, but it tends to rise and this situation creates additional risks for domestic producers and requires certain measures to mitigate the impact of volatility on their activities.

Profitability of Ukrainian producers is very dependent on the world prices, which is particularly clear on the corn market [3, c. 82].

Over the past 15 years, the major discussed issues of the policy on food prices were management tools to prevent this risk, thus, volatility is a risk that must be managed. Overall it is expected that prices will rise because of growing population and economic growth that will put upward pressure on demand, as expected increased use of biofuels (depending on biofuel policies and the price of oil). As for the proposal, if oil prices continue to rise, agricultural production costs will increase, which will cause increasing food prices. Restrictions related to natural resources, particularly climate change and the lack of fertile land and water in some regions, create serious problems for the food production at reasonable prices. On the other hand, it is optimistical that there is still significant potential for increasing

crop yields through new technologies, and reducing losses throughout the chain of production and marketing. However, this potential will not be realized without increased investment.

The tools to address price volatility and provide income to farmers could include private initiatives, government policies, or a combination of both.

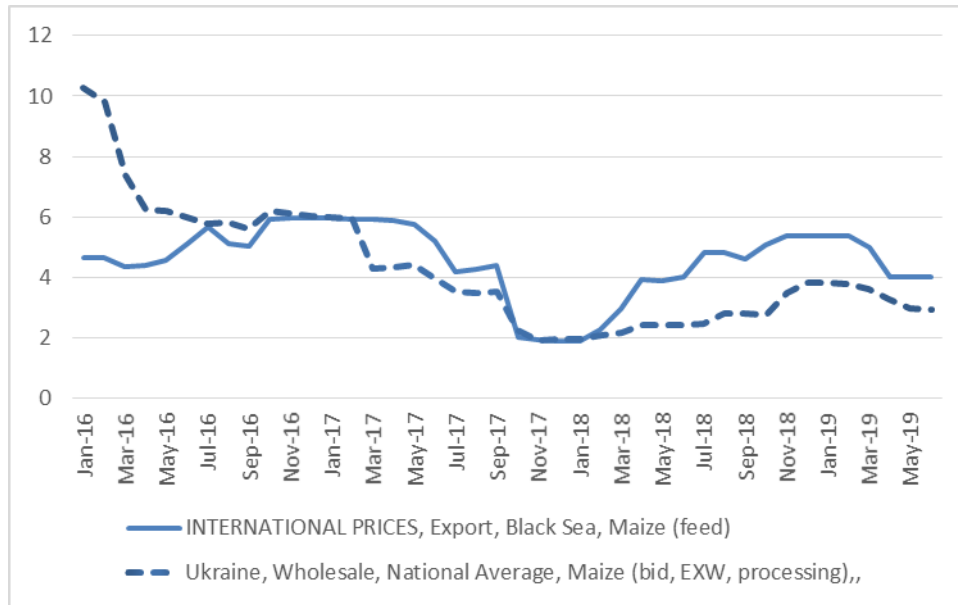


Figure 3. The dynamics of corn selling prices volatility, %

Source: Created by author based on the data [2].

First of all, there are several methods for individual farmers to address these issues in particular, they can try to reduce the likelihood of these risks. For example, the use of appropriate production technology (through the introduction of drought-resistant crop varieties or irrigation investment), farmers can reduce the risk of crop losses due to weather conditions.

The risks associated with fluctuations in prices also can be reduced through the use of insurance. However, these tools are quite expensive. So farmers, in order to protect against these risks, mainly apply simple financial approaches, such as saving money during periods when they obtain high income, using these reserves when income decreases [4, c. 21].

In addition, there are tools of protection against price fluctuations such as diversifying crop rotations, membership in farmer cooperatives and the construction and use of facilities for their production.

Governments can empower farmers by creating a political and legal framework that will expand their ability to manage these risks [5, c.12]. Such measures include training farmers to provide accurate information about the market situation, support the social security system during natural disasters or serious disturbances on the market.

For example Common Agricultural Policy (CAP), of EU is composed of several policy tools to help farmers to deal with price volatility and income. These tools have developed over a long period.

CAP uses the following three tools for the period 2014-2020:

- financial support for farmers in the form of insurance premiums for crops and livestock from losses caused by adverse climatic events and disease;

- financial support of mutual funds to compensate farmers for production losses associated with climatic and environmental events;
- financial support to farmers who experience a serious loss of income (over 30% of the average annual income) [6, p.68].

US farm policy uses a completely different set of tools and instruments to deal with the volatility of prices and incomes for farmers than those used by CAP. While EU provides direct payments to support farmers' incomes by marketing their products, the USA stopped direct payments and focused on the market income, reducing risk by encouraging farmers to use insurance. These differences are reflected in the balance of various tools in the US and EU, while the agricultural policy of the USA comprises at least 60% of insurance tools and no direct payments, CAP comprises less than 1% of insurance instruments and around 60% of income support through direct payments [4, p. 13-14].

The main aim of measures of preventing and reduction of the prices volatility is to reduce food insecurity and promote productivity, particularly among small producers in developing countries. Doing so increases the degree of stability in relation to external shocks, and increases the supply in local markets at affordable rates. Measures to deal with the price volatility should ensure the volatility reduction in the short and long run and reduce the impact of price volatility on food production, income and nutrition in the poorest developing countries. Tools to achieve these goals include: demand regulation, trade policy, providing investments for financing agricultural markets, ensuring transparency and predictability and the prevention of speculation on agricultural commodity markets, forecasting the information on agricultural output.

Intercommunications of agriculture in a national economy. Exploring proportions and correlations of national economy, we go out from two directions of analysis: at first, investigate the structure of economy of a particular branch, secondly, intercommunications of economic elements of production recreation overall or separate its constituents.

Agriculture is related to all industries practically. All economy of country can be represented in Input-Output table. The more branches and subbranches are represented by Input-Output table, the completer there will be represented the state of economy, its underlying structure, intercommunications and proportions.

Now Ukrainian statistics make balance with 42 basic types of activity. If we take into account that Input-Output table in Ukraine are built annually, for the aims of operative analysis and research of dynamics relations, the such combined chart into larger units on the whole is sufficient.

There is the system of analytical indexes of built on the basis of Input-Output table, which allow to explore the correlative functioning of industries of economy. Among them there are the coefficient of the gross value added, coefficient of influencing, coefficient of review, coefficient of import, matrix of the price influencing and so one [7].

Input-Output table gives the most complete picture of structure of economy and actual intercommunications between the types of activity, about the streams of raw material, products and others. They are the source of another type of important data, namely on their basis it is possible to count up the coefficients of direct and complete maintenances, on the basis of which the analysis is also conducted and the row of indexes is built.

The interdependence of industries in the process of production is expressed by the system of direct, mediated and complete maintenance of goods and services. Every coefficient of complete charges is the sum of direct and mediated maintenances and expresses charges, which are needed for the increase of products of two correlative industries, but taking into

account charges, which it is necessary to produce for achievement of this purpose in compatible branches.

The analysis of matrix of full cost shows that agriculture most in the process of production uses production of hydrocarbons – 13.4 cop. per 1 UAH of the produced products, food industry – 1 cop., Petroleum refinement – 8.8 cop., manufacture of chemicals – 20.9 cop., Manufacture of machinery and equipment – 5 cop., Electric power industry – 7 cop., trade – 15.3 cop., transport – 5.9 cop.

The elements of the first line characterize the charges of products of agriculture by each of types of activity calculated per 1 UAH of their issue. Consequently, the products of agriculture are most used in the process of production by such types of activity as a the own – 130.8 cop. per 1 UAH of products of this industry, food industry – 34.8 cop., Textile and leather industry – 3.3 cop., hotels and restaurants – 10.8 cop., education – 2 cop. Exactly these industries rely on the source of raw materials most that is created in agriculture.

Elements of main diagonal $b_{1,1}$; $b_{2,2}$... $b_{38,38}$ – describe own input of industries. To agriculture inherent extraordinarily large own input, as a coefficient of complete charges makes 1,59. Considerable part of products, which consumes agriculture in the process of production is created by industry. Foremost this is feed and seed, organic fertilizers.

The degree of influencing of branches between themselves is determined by means the coefficients of influencing and response, which are calculated based on coefficients of complete charges. These coefficients allow analyzing the structure of issue of industry and pattern of eventual consumption of products of branches.

In particular, the coefficient of influencing shows changing gross production of branches at the change of final consumption of products of j -i branch. A coefficient is determined by a formula:

$$C_{infl} = \frac{\sum_i b_{ij}}{\frac{1}{n} \sum_i \sum_j b_{ij}}, \quad (1)$$

b_{ij} – coefficients of full costs.

The coefficients of influencing were calculated by all types of activity from 2016 to 2017. We can analyze the degree of influencing of elements of final consumption on the output of products based on the conducted calculations in 2016. Maximum coefficient of influencing was had by such types of activity, as Manufacture of coke products ($C_{infl}= 1,523$) and Metallurgy and metal processing ($C_{infl}= 1,4$).

The considerable influencing is also observed in such branches as Food-processing industries ($C_{infl}= 1,219$), to Textile and leather industry ($C_{infl}= 1,204$), Petroleum refinement ($C_{infl}= 1,236$), to Manufacture of chemicals ($C_{infl}= 1,228$). Agriculture also is characterized by coefficient of influencing more then 1 ($C_{infl}= 1,055$). It means that the change of final consumption of this branch by unit leads the output will increase by 1,055.

The minimum influencing was observed in such types of activity, as Social activities ($C_{infl}= 0,692$), education ($C_{infl}= 0,716$), Services to legal entities ($C_{infl}=0,732$), Financial intermediation ($C_{infl}=0,764$), Post and telecommunications ($C_{infl}=0,705$). Consequently, the minimum influencing characterizes mainly such types of activity as services.

For the observed aggregate the coefficient of influencing is nearby unit that testifies to stable position of separate branch in relation to other and even level of influencing of final consumption to the output of every branch.

The coefficient of response characterizes the change of output of products of j-i branch at the change by unit of final consumption of products of all other branches. It estimates the state of branch relatively to other branches, but by a criterion different from a previous coefficient and settles accounts after a formula

$$C_{resp} = \frac{\sum_j b_{ij}}{\frac{1}{n} \sum_i \sum_j b_{ij}} . \quad (2)$$

The higher value of coefficient of response corresponds to the greater reaction of output of branch to the changes of final consumption in other branches.

Maximum coefficient of response in 2002 was observed in Productions of hydrocarbons ($C_{resp}=2,938$), trade ($C_{resp}=2,868$), transport ($C_{resp}=1,8$), Mining of coal and peat ($C_{resp}=1,631$), Manufacture of machinery and equipment ($C_{resp}=1,675$), Electric energy ($C_{resp}=1,749$), Petroleum refinement ($C_{resp}=1,539$). Minimum coefficient was observed in Construction ($C_{resp}=0,499$), Gas supply ($C_{resp}=0,589$), Heat supply ($C_{resp}=0,609$) and Water supply ($C_{resp}=0,551$), Renting ($C_{resp}=0,492$), Education ($C_{resp}=0,526$), Health care and social assistance ($C_{resp}=0,516$), Fishery ($C_{resp}=0,483$), Forestry ($C_{resp}=0,525$).

Value of coefficient in agriculture made 1,163, so the increase of final consumption of all branches by unit leads that output of agriculture will be multiplied by 1,163 times.

Thus, agriculture has a perceptible influence to production of other branches and it is enough sensible to the changes in other branches, that is increase of output and final consumption of this branch will give the rapid positive reaction in other branches of economy, and the positive changes of economy will affect exactly agriculture.

Conclusions. Coming from tendencies taking place in the modern economy of Ukraine, it is possible to assert that during a certain period the output of agricultural production by households will remain considerable, and this producer will remain important for the agrarian market of Ukraine. However only agricultural enterprises can accumulate basic and circulating facilities necessary for the intensive production with a prospect of providing competitive agricultural production. According to the forecasts of the agrarian market development, which indicate the presence of Ukraine in key positions in virtually all segments of production and export of grain and oilseeds, in the medium term, Ukraine's export agro-food potential will be in full demand.

Ukraine is part of the global market and depends on the trends that take place there. The Ukrainian producers are most affected by fluctuations in prices for raw materials (corn, wheat, oilseeds, etc.). Ukrainian producers need to increase processing and increase exports not only sunflower oil, for processing which our country still holds the leading position, but also exports of cereal crop processing products in general. It should be noted that it is precisely products with deep processing that have a stable demand in the world market, generates high prices, and can provide a significant increase in export earnings. Prospects for the development of domestic agricultural production will be determined by the possibilities of increasing the share of commodity groups with high added value.

Research of intercommunications between the branches of economy on the basis of the system of the analytical indexes built after Input-Output table lead to conclusion that agriculture has a perceptible influence on production activity of other branches and is enough sensitive to changes in other branches, that is increase of output and final consumption of

products of this branch will provide the rapid positive reaction in other branches of economy, and the positive changes of economy will positively affect agriculture right away.

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