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FACTORS AFFECTING THE ECONOMIC MANAGEMENT EFFICIENCY OF AGRICULTURAL ENTERPRISES IN UKRAINE

Abstract

The paper analyzes the basic mechanisms of forming the system of global production and sale of vegetables. Factors of the impact of international economic integration on the effectiveness of national agrarian sector's functioning have been listed. Its importance and necessity for a stable economic development of agricultural enterprises have been determined. The paper examines the cooperation between national economies of different countries with the elimination of trade barriers, the convergence of every country's markets for the purpose of creating a common market. It generalizes and substantiates the relevant directions of regulating the national vegetable market and integrating agricultural enterprises of vegetable growing branch into world vegetable trade turnover.

Keywords globalization, integration processes, international trade, foreign experience, export, economic growth, vegetable products

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INTRODUCTION

The agroindustry complex is a crucial part of many countries' economies around the world. These include almost all of the European Union countries, namely Australia, Brazil, India, China, Japan, United Kingdom and the USA. All of these countries pay great attention to the development of agricultural sector. Control in this field is mostly directed towards reaching the ultimate goals that are determined beforehand and are related to reaching the planned targets. It is typical for many foreign enterprises to strengthen the integration relations between farms, processing enterprises and trade.

That allows producers not only to reach high performance, but also to reduce the prime cost of production, while optimal placement allows to reduce traffic and energy costs, to minimize losses and to maintain the quality of production. Today, the situation in Ukraine's agriculture is characterized by changes in approaches to developing integration processes and an urgent need to consider current actual economic conditions in the agricultural sector. Foreign economic activity and interregional relations are developing, joint ventures, holding companies, unions are being created, agricultural producers enter other countries' wholesale markets. The consistent development of the agricultural sector of the economy is a major factor of successful social and economic development of the country. Earlier, the determination of the direction of agricultural enter-

prises' strategic development was considered a prerogative of government authorities. In conditions of the European integration of Ukraine, the development of the agricultural sector is impossible without implementing innovative technologies, creating friendly legal and organizational environment for developing various innovations. However, in conditions of increasing market globalization, it is necessary to specify theoretical and methodological support for the implementation of the development management of the agricultural sector of the national economy.

The key issues of the sector are defining the direction of development and forming the optimal business strategy of agricultural enterprises. These issues can be successfully solved only in a complex of measures that provide for a stable, effective and competitive development of agricultural enterprises in conditions of existing competitive economic environment. Ensuring the sustainability of entities in agrarian sector is done primarily through creating organizational and economic implementation mechanisms of a development strategy that allows adapting the enterprises to changes in business environment. The main instrument for implementing such strategy is concentrating efforts on integration of native enterprises into the world market. This takes place within the concept of strategic control over formation and development of production and resource potential of agricultural enterprises. In current conditions, the impact of international trade on the development of the agricultural sector of the economy is increasing significantly. However, the mechanism of such an impact is influenced greatly by the level of globalization of international trade. This increases the importance of researching the connection between the level of development of agricultural production and trade volumes, and consequences of increasing export volumes for economic growth of this sector.

The state of agricultural production in Ukraine requires new approaches to the organization of foreign economic activity, as well as defining the direction of integration development in the agrarian sector. On a practical level, it is also necessary to develop the strategy of development and integration of agricultural sector of the national economy. The need for a theoretical, methodological and practical solution of these problems proves the relevance of the work, its importance and practical significance.

1. LITERATURE REVIEW

A substantial contribution to the research of problems related to the development and state of the agricultural sector was made by such scientists as V. Ya. Ambrosov (2013), O. H. Shpykuliak (2016) and others. The problem of foreign experience has been highlighted in papers by P. Muzyka (2011).

A. Smith formulated the basics of international trade theory and derived the theory of absolute advantages. The point of the theory of absolute advantages is that countries export those goods which they produce with least expenses, and import those goods which other countries produce with least expenses (Smith, 2009).

The modern agricultural market is characterized by the underdevelopment of market infrastructure, the organization of production harvesting and sale, as well as by the imperfect system of control over quality and safety of food (Lupenko & Mesel-Veselyak, 2012).

Every enterprise, including agricultural ones, has to know what production, what quantity of it, where, when and at what price it will sell before planning production volume and forming a production capacity.

It is especially important in conditions of globalization of the economy, with competition between both local and foreign producers. To do this, it is necessary to investigate the demand for production, its sales markets, their capacity, actual and potential rivals, potential customers, the possibility of organizing production with a competitive price, the availability of required material resources, the presence of qualified stuff, etc. (Shtal, Savytska & Dobroskok, 2015).

But, regardless of a large number of works on the matter, the possibility of adapting foreign experience of forming a model of global vegetable production is not explored enough, and that is the reason for the relevance of chosen direction of the research.

2. AIM OF THE STUDY

Examining the foreign experience of forming a model of global production and vegetable trade, as well as in developing proposals on the possibility of its implementing into national practice.

3. RESULTS

The trade is a major factor of integrating national economy into the global economy. The international trade rise level, export, in particular, is the driving force of the country's economic growth.

The rapid development of economic relations creates a need for an interstate regulation aimed at free movement of goods, services, capital and labor between the countries within the region, at harmonization and pursuing a common economic, research and development, financial and monetary, social, foreign and defence policy. As a result, there appear integral regional economic complexes with single monetary infrastructure, common economic proportions, common financial funds, supranational or interstate authorities (Komarnytskyi, 2003).

The export development allows for a more efficient reallocation of available resources. It leads to the acceleration of research and technology development of agricultural production and increase in output. Besides, the reduced exports have an unfavorable effect on the industry economics in the form of excess production of individual products and unstable economic situation of agricultural enterprises. It slows down the introduction of innovative technologies resulting in a decrease in competitiveness of domestic products in the world market. Again, it causes reduced exports. After the transition to market economy, the main problem for the agricultural enterprises lies in the undeveloped system of agricultural products distribution and procurement having a negative impact on the stable cost situation in the food market and profitability of agricultural enterprises. In our opinion, the lack of integration of domestic agricultural producers into the global vegetable sales is the major factor hindering the implementation of foreign trade policy of Ukraine.

The international economic integration is a process of business and political integration of countries based on the development of a strong and stable relationship and division of labor between national economies, the interaction of their production structures at different levels and in different forms. On the microscale, this process takes place by means of interaction of the capital of economic entities (enterprises, companies) of individual countries and formation of the system of economic agreements between them. On the global scale, the integration is based on the economic groupings of countries and harmonization of national policies.

In confirmation of our opinion, E. Minaeva states that the integration is primarily due to the need for the expansion of productive forces beyond the national frontiers, it leads to the constant intensification of the division of labor and increase of interdependence of national economies (Minaieva, 2014).

Thus, the international economic integration means cooperation between the national economies of different countries with a partial or total unification of economies, elimination of barriers to the international trade, the rapprochement of markets of all countries to create one large market, i.e., common market.

The factors which determine the global integration processes are the intensification of the international division of labor, development of productive forces under the influence of scientific and technological progress of global nature, a rapid development of communications, objective need for the joint solution of global problems of survival of mankind, etc. (Komarnytskyi, 2003).

The process of economic integration is objective by nature and implies spontaneity, the absence of control from national and supranational authorities. The regional integration relationship is always formed on the contractual basis. Two countries or groups of countries merge into regional international complexes based on the mutual agreement and pursue a common regional policy, in particular in the sphere of foreign trade. The economic integration is currently developing not only by means of expansion,

attracting new countries, but also by expanding into other spheres of interaction and further merging of the economies of different countries into a single entity. Thus, regardless of all difficulties and misunderstandings between the states of the European Union, a high level of rapprochement of national economies has been achieved in general, as well as coordination of economic policy and generation of a program of joint actions.

The challenging environment in which domestic agricultural producers work is a driver for the integration of agricultural enterprises into the international competitive environment. The Decree of the President of Ukraine "On Measures of Formation and Functioning of Agricultural Market" provides for making national wholesale and retail markets. It is stated there, in particular, that a network of enterprises that will exercise wholesale trade of agricultural products must be created in cities with the population of over 100 thousand people (The President of Ukraine, 2000). The purpose of market making is the formation of an efficient market mechanism of the sale of agricultural products and products of its processing by the goods producers of all forms of ownership; having a positive effect on the quality of products, their final price and satisfaction of consumer needs; enhancement of competition in the consumer market.

To promote vegetable growing, the decree of the Cabinet of Ministers of Ukraine the "Concept of Development of Vegetable Growing and Processing Industry" was adopted, aimed at the growth in production of vegetable growing and processing industry by means of encouraging investments and providing the legal support (The Cabinet of Ministers of Ukraine, 2011).

However, the implementation of this regulation is often far from being optimal; the lack of consistency and uniformity in Ukrainian laws and their selective execution has a negative influence on the vegetable production and processing requiring the improvement of mechanisms of legal regulation of the vegetable market. All of it is impossible without the analysis of economic activities of agricultural producers.

We commenced the regression analysis of interrelations between export, import and vegetable production per capita in the leading countries of the world from 2010 to 2015 based on the statistical data (www.fao.org/faostat/ru/ #compare). To verify the interrelation between the rate of vegetable production, export and import, we suggest hypotheses:

H0: $r_{xy} = 0$, *in the economy of analyzed country, there is no linear relationship between the volume of export (import) and level of gross output;*

H1: $r_{xy} \neq 0$, *in the economy of analyzed country, there is a linear relationship between the volume of export (import) and level of gross output. To check the null hypothesis that the general index of correlation of normal two-dimensional random variable is zero with the significance level equal to* α *and the competing hypothesis* $\mathrm{H1} \neq 0$, *it is necessary to calculate the observed value of criterion (random error value) by using rearrangement (Ferster & Renz, 1983):*

$$t = \frac{r}{\sqrt{1-r^2}} \cdot \sqrt{n-2} \; t_{n-2}, \qquad (1)$$

and find the critical point t_{tab} of a two-sided critical region for a given significance level α and a number of degrees of freedom $k = n-2$. If $|t_{obs}| < t_{tab}$, then, we have no reason to reject the null hypothesis. If $|t_{obs}| > t_{tab}$, then the null hypothesis is rejected.

Linear regression equation has the form

$$Y(x) = bx + a. \qquad (2)$$

The coefficients of linear regression equation may have an economic meaning. In our study, the regression coefficient b shows the average change $Y(x)$ in the rate of vegetable production per capita when the value of factor x is increased or decreased by a unit of its measurement.

Formally, the coefficient a shows the predicted level $Y(x)$, but only if $x = 0$ is close to sample values.

If $x = 0$ is far from sample values, the literal interpretation may give wrong results; even if the regression line describes the observed sample values rather accurately, there is no guarantee that it will remain accurate when extrapolated to the left or to the right.

By substituting the relevant values x in the regression equation it is possible to determine the aligned (predicted) values of result index $Y(x)$ for each observance.

Estimated regression equation (built on sample data) will take the form

$$Y(x)_i = a + bx_i + \varepsilon_i, \ i = 1, \ \ldots N, \qquad (3)$$

where ε is a random error (deviation, perturbation), a and b are estimations ofsought regression parameters α and β, .

The causes of random error: failure to include an explanatory value variables in the regression model; aggregation of variables; incorrect description of a model structure; incorrect functional specification; measurement errors.

As deviations for each observation are random and their sample values are not known, observations x_i and y_i can give only estimated parameters α and β; values a and b being random, because they correspond to the random sampling are the estimated parameters of regression model α and β.

To estimate parameters α and β, the ordinary least squares (OLS) method is used. The least squares method gives the best (consistent, efficient, unbiased) estimate of regression equation parameters, but only if certain prerequisites related to a random member (ε) and independent variable (x) are fulfilled.

$$\sum_i \varepsilon_i^2 = \sum_{i=1}^{N} (Y_i - b_0 - b_1 x_i)^2 \to \min. \qquad (4)$$

The empirical regression coefficients a and b are just estimates of theoretical coefficients α and β, the equation itself reflects only the general tendency in the behavior of analyzed variables.

For each regression model, the following coefficients have been calculated.

The coefficient of determination is R^2. *R-squared* is a statistical measure of how close the data are to the fitted regression line. It is also known as the coefficient of determination, or the coefficient of multiple determination for multiple regression. Correlation coefficients whose magnitude is between 0.9 and 1.0 indicate variables, which can be considered very highly correlated. Correlation coefficients whose magnitude is between 0.7 and 0.9 indicate variables, which can be considered highly correlated. Correlation coefficients whose magnitude is between 0.5 and 0.7 indicate variables, which can be considered moderately correlated. Correlation coefficients whose magnitude is between 0.3 and 0.5 indicate variables, which have a low correlation.

F-statistic. The F-statistic calculation is used in a test of the hypothesis that the ratio of a pair of mean squares is at least unity (i.e., the mean squares are identical). In most analyses, a p-value of 0.05 or less is considered sufficient to reject the hypothesis that the coefficients are zero. Tabular criterion value with degrees of freedom $k_1 = 1$ and $k_2 = 4$ is $F_{tab} = 7.71$.

T-statistic. The *T-statistic* is the coefficient divided by its standard error. The standard error is an estimate of the standard deviation of the coefficient, the amount it varies across cases. It can be thought of as a measure of the precision with which the regression coefficient is measured. If a coefficient is large compared to its standard error, then, it is probably different from 0. In our calculations, t_{tab}

$$\left(n - m - 1; \frac{\alpha}{2}\right) = (4; 0.025) = 2.776.$$

Durbin-Watson model is a probability, which allows to determine the conditions of statistical independence of deviations from each other. The neighbors are also checked for not being correlated. The critical values d_1 and d_2 are determined based on special tables for the required significance level α, the number of observances $n = 6$ and the number of explanatory variables $m = 1$. There is no autocorrelation if the following condition is fulfilled: $d_1 < DW$ and $d_2 < DW < 4 - d_2$, critical values according to Durbin-Watson table for $n = 6$ and $k = 1$ (5% significance level): $d_1 = 1.08; \ d_2 = 1.36$.

The equations of linear dependence between the volume of import and rate of vegetable produc-

Table 1. Communications import and gross vegetable production for the years 2010–2016*

Country	Linear Regression Equation $Y_i \cdot (X_{imp})$	F-statistic	T-statistic		R-squared	DW-statistic
			T_b	T_a		
China	$Y_i = 8.3263 \cdot X_{imp} - 1.4124$	17.67	4.20	1.92	0.82	1.38
India	$Y_i = 43.6245 \cdot X_{imp} - 2.155$	27.04	5.20	2.74	0.87	2.69
USA	$Y_i = -763.386 \cdot X_{imp} + 109.5826$	5.55	2.26	2.97	0.56	1.73
Turkey	$Y_i = 55.1689 \cdot X_{imp} - 13.1552$	31.53	5.62	4.09	0.89	2.59
Russia	$Y_i = 42.6667 \cdot X_{imp} + 13.7283$	0.87	0.29	0.94	0.02	2.01
Italy	$Y_i = 119.1649 \cdot X_{imp} + 2.7467$	6.17	2.59	0.84	0.61	2.23
Ukraine	$Y_i = 22.5672 \cdot X_{imp} - 1.4215$	0.95	0.97	0.31	0.19	1.54

Note: * compiled by the author's according to Food and Agriculture Organization of the United Nations

tion, significance of Fischer factor, Student's *T-test*, Durbin-Watson model and model determination factor in the economies of analyzed countries are represented in Table 1.

Table 1 shows that hypothesis H1 is not validated for all countries. There is a significant dependence between the volume of import and rate of vegetable production in China, India and Turkey. In the rest of the countries, the hypothesis is disproved, hence there is no direct linear dependence between the volume of import and growth of gross output of vegetables, other factors being equal. In other words, most changes in the values of the gross output of vegetables are influenced by other factors, not taken into consideration in this model.

The equations of linear dependence between the volume of export and rate of vegetable production, the significance of Fischer factor, Student's *T-test*, Durbin-Watson model and model determination factor in the economies of analyzed countries are represented in Table 2.

Table 2. Communications export and gross vegetable production for the years 2010–2016*

Country	Linear Regression Equation $Y_i \cdot (X_{exp})$	F-statistic	T-statistic		R-squared	DW-statistic
			T_b	T_a		
China	$Y_i = 16.6296 \cdot X_{exp} - 0.4521$	8.34	2.87	0.20	0.67	2.57
India	$Y_i = 8.1265 \cdot X_{exp} + 0.1304$	8.08	2.84	0.51	0.67	2.60
USA	$Y_i = -207.5496 \cdot X_{exp} + 35.8917$	2.63	1.62	2.57	0.40	1.70
Turkey	$Y_i = 60.4817 \cdot X_{exp} - 5.4593$	27.95	5.29	1.49	0.87	3.02
Russia	$Y_i = 76.3404 \cdot X_{exp} - 5.9514$	14.44	3.81	2.91	0.78	2.19
Italy	$Y_i = 182.3859 \cdot X_{exp} - 12.4788$	8.63	2.94	0.90	0.68	1.94
Ukraine	$Y_i = 3.7813 \cdot X_{exp} + 2.0519$	0.21	0.46	1.20	0.05	2.09

Note: *compiled by the author's according to Food and Agriculture Organization of the United Nations

Table 2 shows that in almost all countries that are largest vegetable producers in the world, hypothesis H1 is validated. In the USA and Ukraine, hypothesis H1 is disproved, hence, ceteris paribus, there is no direct linear dependence between the volume of export and growth of vegetable production. It can be explained by the fact that the production rate in Ukraine is more influenced by political factors than economic ones. In the developed economy of the USA, there is another type of dependence between export and vegetable production.

The classical and neo-classical schools, which dominate in the sphere of economic theory, consider the trade as a factor having a positive impact on the development of national economy. So there is an urgent need for the development and implementation of the strategy of development of domestic agricultural enterprises, which will comply with the conditions in the modern high-risk market. It is necessary to organize events and attract a wide range of potential investors to the creation of wholesale food markets and their integration in the system of world vegetable trade.

As the international experience shows, the wholesale market is not just a place to buy and sell agricultural products, but it is one of the crucial elements of agricultural infrastructure, thanks to which there is a transparent setting of prices for the agricultural products, distribution of food product flow. It is also an important mechanism for ensuring the country's food security, development of competition, increase of efficiency of activities of agricultural producers, reduction of the level of shadowness of the economy (or a "shadow" turnover in the economy).

For further development of domestic vegetable growing, it is necessary to further improve the vegetable market infrastructure and efficient mechanism of its legal regulation.

CONCLUSIONS

Economic theory presumes a positive impact of an increase in international trade volume on economic growth of the sector inside the country. Based on the analysis of foreign vegetable trade volume in countries that are leaders in vegetable trade, the following conclusion can be made. Import has a major influence on economic growth in vegetable growing sector in countries with transition economies, such as India and Turkey. In China, import volume influences economic growth in current period moderately. In the USA, Russia, Italy, as in Ukraine, there is no relation between import volume and economic growth. At the same time, according to the research, it can be argued that export has a significant positive impact on economic growth both in the developed countries and ones with a developing economy. In Ukraine, there is a weak connection between export and economic growth. In Russia, there is, ceteris paribus, no direct linear relationship between economic growth and export volume.

For a successful development of vegetable processing sector in Ukraine, it is necessary to adopt a program of development of the sector similarly to the leading countries, especially because Ukraine has necessary production and natural resources for producing qualitative and, hence, competitive production. It is necessary during the realization of this program to consider the factors of creating wholesale markets of agricultural production on a national level, therefore, it is necessary to develop and adopt a strategy of stable economic development and perfection of economic relations between producers and processors of vegetables. The development of mechanisms for integrating native vegetable growing enterprises into global vegetable trade system will allow for providing food security for the country and increasing competitiveness of native agricultural production on the world market.

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