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The Influence of the Military and Political Shocks on the Economic Potential of Agribusiness in Ukraine

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Keywords

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Introduction

The current political and economic situation is characterized by destabilizing processes that lead to significant complications of market conditions of enterprises performance, including ukrainian agribusiness enterprises. Recently, business activity of agribusiness enterprises in Ukraine is characterized by greater price uncertainty, not only while the purchasing of raw materials but also at selling their products. Such uncertainty affect numerous factors, reflecting the acceleration of markets redistribution, changes in pricing and fiscal policy, inflation, reducing the consumers purchasing power, but the most important among them are-the military and political factor. Under these conditions, the operating results of agribusiness enterprises are unpredictable; many of them teeter on the brink of zero return or are in zone of unprofitability and threatening of breakdown; so the scientists' attention is increasingly attracted to problem of solving the complex of issues to ensure stable operation of enterprises in difficult conditions of hybrid war in the country. There are currently several regions in the world, the economics of which are developing specifically and separately from the country to which they are included.

This is Prydnistrovia, the territory of Moldova occupied by Russian troops in 1991, Abkhazia occupied the territory of Georgia with Russian troops in 2008 and Donbas, Crimea, the territory of Ukraine occupied by Russia in 2014.

The Analysis of Recent Research and Publications

Theoretical and practical issues of formation and effective functioning of the agribusiness companies are the subject of research of Ukrainian scientists such as (Andrijchuk, 2005; Dem'ianenko, 2011; Il'chuk, 2002; Zbars'ky, 2010; Nelep, 2004; Olson, 2013; Sargan, 1958; Miller, 1985; Blair, 1985; Lenzen, 2001). In their works these scientists have disclosed the organizational and economic features of agribusiness enterprise functioning, assessed trends in their development, but the issue of agribusiness enterprises' activity during political, military and economic crises have not been considered in-depth.

Theoretical and methodological and practical aspects of constructing models of inter-industry balance of the economies of the region have devoted their works to (Leontiev, 1997; Neumann, 1944). However, the scientific works of these scientists did not reflect the issue related to the assessment of modern economic systems in the region, using models of interregional balance in the concept of reintegration and development of agribusiness in the context of military conflicts in a separate region and the construction of such models at the regional level.

Problem Definition

The purpose of the article is to analyse the current state and the operation of agribusiness enterprises and define prerequisites for their further development to overcome the economic destruction caused by military operations in the Donetsk & Lugansk regions and the annexation of the Crimea.

Presentetion of Basic Material of the Research

The negative effects of internal political disruption and perturbations in the economy of Ukraine during 2014-2016, the annexation of Crimea and military actions in the Donbas has spread to most sectors of the domestic economy. As a consequence, the existing imbalances have deepen, there was a fall in GDP, the range of industrial production, works and foreign trade has reduced, volume of development of capital investments has also decreased.

The reduction in industrial production deepened in 2014 which was caused by stopping the industrial facilities of Lugansk & Donetsk regions and the loss of the Russian trading areas. The fall of industrial production in these two regions was the highest among the regions of Ukraine and negatively affected the performance of industrial production about Ukraine. According to the State Statistics Service in Donetsk region industrial production fell by 58.7%, in Luhansk-85%. To evaluate the importance of the contribution of Donetsk & Lugansk regions into the Ukrainian economy will help the following information: Donetsk & Lugansk regions occupied 9% of Ukraine. In these areas was created 16% of the gross domestic product of Ukraine, 25% of industrial output, 25% of domestic exports.

Agricultural sector is a part of Ukraine's economy, producing vital to a society products and where an enormous economic potential is concentrated. The development of agriculture in critical degree determines the state of the national economy, the level of food security and socio-economic situation in society. Unstable political situation in Ukraine covers all areas of economy. Since Ukraine is one of the leading agricultural countries in the world and has all the conditions for reaching a new level of transformation of the economy, ensuring high competitiveness on the European market, it is important to research and evaluate the state og agricultural enterprises. Due to the fact that some regions of Ukraine temporarily occupied by Russian troops, let us consider the impact of this situation on the development of Ukrainian agribusiness as a whole.

As it is known, over the past 10 years the export of grain from Ukraine increased by 77%. It gives us title to believe that the most important agricultural industry comparable with metallurgic, which was dominant in the Ukrainian economy last 80 years (Sargan, 1958). In particular, Ukraine is among the three largest world grain exporters, exporting 32.3 million tons of grain over the 2013-2014 marketing year. To identify whether military and political factors in the country have influenced the production of major crops we should analyze their dynamics in 2010-2016 years. The dynamics of production of major agricultural products during the years 2010-2016, excluding the Autonomous Republic of Crimea (ARC) is shown in **Table 1**.

Table 1
Basic Crops Productio in Years 2010-2016 (Without Including the Autonomous Republic of Crimea [9-13])

	Whitestrwandpalsecrops (in initially received weight)		White beet (industrial)		Sunflower seeds (in initially received weight)		Potatoes		Field vegetables	
	'000 t	in % to prior year	'000 t	in % to prior year	'000 t	in % to prior year	'000 t	in % to prior year	'000 t	in % to prior year
2010	37867.1	85.4	13749.2	136.6	6735.3	106.1	18338.3	95.2	7723.7	97.2
2011	54816.0	144.8	18740.5	136.3	8614.1	127.9	23780.6	129.7	9400.4	121.7
2012	45307.9	82.7	18438.9	98.4	8313.4	96.5	22906.4	96.3	9625.4	102.4
2013	62285.3	137.5	10789.4	58.5	10941.2	131.6	21851.5	95.4	9396.2	97.6
2014	63859.3	102.5	15734.1	145.8	10133.8	92.6	23693.4	108.4	9637.5	102.6
2015	60125.8	94.2	10330.8	65.7	11181.1	110.3	20839.3	88.0	9214.0	95.6
2016	56106.7	100.1	8968.3	127.7	13190.6	119.0	21716.9	104.3	8641.8	103.0

For reliable determination the effect of share of agroindustrial complex, which was located in the territory, occupied by the Russian army of ARC, on the production of agricultural products throughout Ukraine it is necessary to analyze the dynamics of their production during previous years considering the ARC **Table 2**.

Table 2
Production of Goods in 2010-2016 with Practional Consideration the Autonomous Republic of Crimea [9-13]

	Year	Whitestrwand palsecrops		White beet		Sunflower seeds		Potatoes		Field vegetables	
		'000 t	%	'000 t	%	'000 t	%	'000 t	%	'000 t	%
With consider ARC	2011	39270.9	85.3	13749.2	136.6	6771.5	106.4	18704.8	95.1	8122.4	97.4
	2012	56746.8	144.5	18740.5	136.3	8670.5	128.0	24247.7	129.6	9832.9	121.1
	2013	46216.2	81.4	18438.9	98.4	8387.1	96.7	23250.2	95.9	10016.7	101.9
	2014	63051.3	136.4	10789.4	58.5	11050.5	131.8	22258.6	95.7	9872.6	98.6
Without consider ARC	2015	63859.3	102.5	15734.1	145.8	10133.8	92.6	23693.4	108.4	9637.5	102.6
	2016	60125.8	94.2	10330.8	65.7	11181.1	110.3	20839.3	88.0	9214.0	95.6
	2011	56106.7	100.1	8968.3	127.7	13190.6	119.0	21716.9	104.3	8641.8	103.0

However, for a full analysis we have not got enough data, because the area is currently uncontrolled. Therefore, the analysis will use the data for Crimea only until 2013, because in previous period from 2014 to 2016 statistical information is not available.

Graphic representation of basic agricultural products production in 2010-2016 is shown in **Figure 1**.

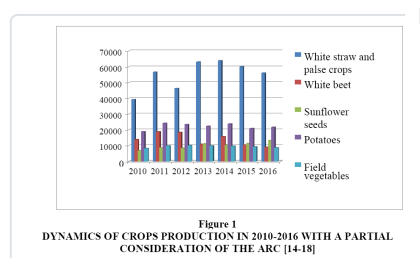


Figure 1: Dynamics of Crops Production in 2010-2016 with a Partial Consideration of the Arc [14-18]

So, as we can see from **Figure 1**, the military and political turmoil did not have a significant effect on major crops production in the country. For white straw and pulse crops, 2014 was the most growing season, it accounts for 63,859.3 ths tons, despite the absence of temporarily occupied territory of the Autonomous Republic of Crimea. The least fruitful for cereals is 2010, it counts 39,270.9 ths tons and includes Crimea and is characterized by stable military-political situation in Ukraine. The volume of sunflower seeds is gaining at runtime and in 2016 is 13,190.9 ths tons, that is bigger of all previous years indices. Potatoes are characterized by low fluctuations of indices. But sugar beet and vegetables dynamics are reduced, indicating their dependence on the military-political turmoil.

It should be mentioned that among the Ukrainian regions in the context of agrio industrial sphere, Donetsk and Luhansk did not have any priority, as they are industrial regions and the share of the agricultural sector among other regions accounted for Donetsk region-3% in the Luhansk region-2% (Agricultural bulletin).

It should be noted that according to the agreecultural producers' survey, carried out by experts of IA "APK-Inform", germination ability of winter wheat in Donetsk region in 2014 were in 90-95% of planting acreage and were in good and satisfactory condition (Lenzen, 2001). It is noted that wheat entered the wintering by 65%. According to Minagroprod of Ukraine, winter crops in the Donetsk region in 2014 were sown 407.9 thousand ha, that is 90% of the established plan (The official website of the Ministry of Agrarian Policy and Food of Ukraine).

In particular, taking into account the events in the East of the country, the spring sowing campaign took place in difficult conditions. As a result of military actions in Donetsk region in 2014, the sowings of agricultural plants on the area of 3.3 thousand hectares was destroyed, agricultural enterprises incurred losses more than on 16.6 million UAH. It have been established that on the territory of Donetsk and Lugansk regions in 2014-2016 crops was gathered only from 67% of the area, corn- from 35% (Agricultural bulletin).

External risks of developing the economic potential of agribusiness enterprises of Donbass are connected mainly with:

1. Military operations in the Donbass, which lead to a reduction in production in the region, worsening terms of external financing and increase of budget expenditures to finance the security forces and rebuild infrastructure;
2. Rising debt burden on the budget on account of the need to increase funding for the Army and the National Guard;
3. Depletion of foreign exchange reserves, that complicates the use of the National Bank of Ukraine's interventions as tools to curb the growth in demand for foreign exchange arising from panic and speculative attacks and lead, respectively, to the depreciation of the currency.

Taking into account all the above mentioned facts, it can be said that in 2014 (The year the active phase of military operations with the Russian army in the east of Ukraine) will go down in history as the year of a number of achievements in growing food products. Despite the loss of more than 10% of the country's area, occupation the Crimea by Russian troops and military actions in the Luhansk and Donetsk regions. Ukraine has received one of the highest harvest in its history.

According to the yield capacity, Ukrainian agricultural enterprises only in 40% stand behind the European agrarian enterprises and in 50% from the United States. That is, potentially, Ukraine can produce more than 100 million tons of grain per year (The official site of Ukraine's agricultural sector). Nevertheless, despite the positive results of the period from 2014 to 2016, it is important to note that the war gives its own negative effect. Occupied Crimea, before the annexation, used to give Ukraine 5 million tons of grain.

In addition, during the whole period of the antiterrorist operation in Ukraine it have been lost nearly 1.5 mln tonnes of grain production in the occupied territories of Crimea and Eastern Ukraine.

To identify whether the military and political situation in Ukraine influenced the production of major livestock products, we should analyze their dynamics for 2010-2016. The dynamics of production of major livestock products in 2010-2016, excluding the ARC, is shown in **Table 3**.

Products	Meat		Milk		Eggs	
	'000 t	in % to prior year	'000 t	in % to prior year	'000 t	in % to prior year
2010	2724.2	107.0	10895.6	96.9	16241.6	107.2
2011	2829.9	103.9	10750.8	98.7	17896.9	110.2
2012	2921.9	103.3	11067.4	102.9	18364.2	102.6
2013	3203.3	109.6	11190.6	101.1	19094.1	104.0
2014	3323.5	103.8	11132.8	99.5	19587.3	102.6
2015	3270.4	98.4	10615.4	95.4	16782.9	85.7
2016	2572.1	100.7	9026.1	97.7	13047.6	89.5

To determine the effect of agricultural production share on the territory of the Autonomous Republic of Crimea on the output of major livestock products throughout Ukraine we have to analyze the dynamics of their production taking into account the Crimea. However, for a full analysis of missing data, so while the analysis we will use the data on Crimea only until 2013, because for the following periods statistics is not available which is given in **Table 4**.

	Year	Meat		Milk		Eggs	
		'000 t	in % to prior year	'000 t	in % to prior year	'000 t	in % to prior year
With Crimea	2010	2925.4	106.8	11248.5	96.9	17052.3	107.2
	2011	3031.8	103.6	11086.0	98.6	18689.8	109.6
	2012	3120.9	102.9	11377.6	102.6	19110.5	102.3
	2013	3379.6	108.3	11488.2	101.0	19614.8	102.6
Without Crimea	2014	3323.5	103.8	11132.8	99.5	19587.3	102.6
	2015	3270.4	98.4	10615.4	95.4	16782.9	85.7
	2016	2572.1	100.7	9026.1	97.7	13047.6	89.5

Graphical representation of production of major livestock products over a period of years 2010-2016 with a partial consideration of the Autonomous Republic of Crimea is shown in **Figure 2**.

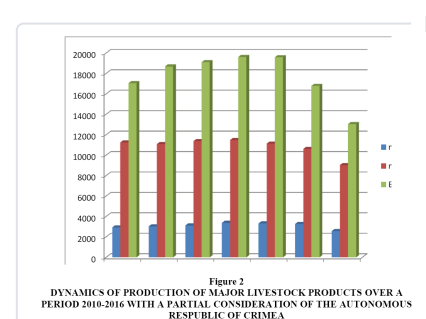


Figure 2: Dynamics of Production of Major Livestock Products over a Period 2010-2016 with a Partial Consideration of the Autonomous Republic of Crimea

According to **Figure 2**, the output of major livestock products has the same trend of growth in the dynamics of indicators up to 2013 and from 2013 we observe a decline. To a greater extent it concerns eggs production in 2010, the figure reached 17,052.3 ths tons, but in 2013-19,614.8 ths tons and in 2016-13,047.6 ths tons. As for the amount of meat, in 2010 it volume kept up at 2,925.4 ths tons, in 2013-3379.6 ths tons and in 2016-2,572.1 ths tons.

The same trend is observed in the volume of milk. The Index of 2010 is 11,248.5 ths tons, in 2013 it equals 9026.1 ths tons and in 2016-9,026.1 ths tons. This downward trend indicates that military-political turmoil had a significant negative impact on the output of major livestock products.

The closest relationships of agricultural enterprises can be observed with processing enterprises and food industry. The process of interaction of agricultural industry with processing industries are based on technological, organizational and economic unity of production, storage and processing of crops and livestock.

Ukrainian food industry is strategically important, as enterprises of this industry form the food security of the country, provide population with necessary food products, the consumption expenditures of which make over 60% of population cash expenditures (Sargan, 1958).

Positive changes in the activities of processing agricultural enterprises in recent years due to the expansion of their productive capacity by increasing the existing facilities and construction of new plants, including acquisitions transactions.

A striking example of the latter one took place a few years ago it was the acquisition of Holding companies "Grain Trade Company Olsidz-Ukraine". by a group of companies (GC) "Kernel".

As a result of the assets acquisition of holdings "Kirovogradoliya" and "EcoTrans", GC "Kernel" has increased the share of its market presence to 22%, taking control of almost a quarter in the structure of sunflower oil in Ukraine.

Noting the production of sunflower oil, it is worth mentioning that in 2014 Ukraine produced 4.88 mln tons of crude oil, which is 36.3% more than the year before. Export of sunflower oil in 2014 rose by 35.4% and makes 4.35 mln tons. However, for the last four months of 2016 it was produced 1.7 mln tons of crude oil, which is 11.5% higher figure for the same period last season. Export of sunflower oil for September-December 2014 according to preliminary data is 1.39 mln tons, it is 13% more than in September-December 2013 (**Figure 3**) (Miller & Blair, 1985).

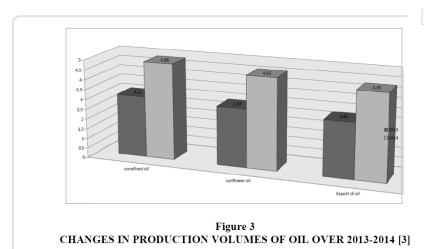


Figure 3: Changes in Production Volumes of Oil Over 2013-2014 [3]

In order to analyze the state of agroindustrial complex more clearly, let us consider the activities of trusted leader in its sphere of the consumer market of Ukraine, namely PHC "APKINVEST". The main brand of the company is TM "Miasna Vesna". It should be noted that the company, despite the changing business environment in the country and military actions, has managed to maintain the growth dynamics. On condition at the end of 2016, it is the leader in the industrial production of pork in Ukraine with a share of 18% in volume terms. Enterprise fulfills all obligations to partners and customers. During the 2016 "APK-INVEST" demonstrated the stability of its position, showing a growth of key performance indicators compared to the same period last year. Thus, despite the fact that the company had to suspend its business in a war zone, net income from sales increased by 35% compared to 2013, which amounted to 967 mln USD without VAT. However, the production of pork in live weight increased by 21% and amounted to 40 ths tons.

Due to this, in reference year, the country produced 29.5 ths tons of finished products. While pork production increased by 21% and amounted 25 ths tons. The volume of meat and sausage products in the reporting period amounted to 3.5 ths tons (Lenzen, 2001). Analyzing the state of agroindustrial complex, it should be noted that the considerable importance for it has the signing of the Agreement for association with the EU and, consequently, the unilateral removal of export duties on Ukrainian products, including food products. In this way, this industry has not lost from a massive reduction of trade with Russia and Russia was the first who lost its status as the main trading partner of Ukraine. The country managed to increase supplies to Europe and other regions, primarily in the Middle East and North Africa. We also note that over 30% of Ukrainian exports is accounted for by agroindustrial complex, which allows to maintain first place in the world in the export of sunflower oil and supplying the world market of grain the country confidently takes the second place (Agricultural bulletin).

The war in eastern Ukraine had adverse effects on agribusiness, particularly in the financial and credit sector. Thus, in recent years, in terms of legislation, the VAT refund for export grain has been adopted. These funds are returned automatically and accumulated in special accounts and can be used for the payment of "input" VAT. However, in the budget for 2015-2016, the Government has increased funding for the Army by reducing the agribusiness VAT refund by 1.8 bln. UAH (The official website of the Ministry of Agrarian Policy and Food of Ukraine). While preserving the fixed agricultural tax and the accumulation value added tax helps Ukrainian agribusiness to remain competitive in domestic and foreign markets, especially in the present conditions of currency fluctuations.

State of agroindustrial complex loans in 2016 by region is shown in **Table 5**.

Region	Number of agribusiness enterprises which attracted credits in 2016 (according to NBU)	Volume of attracted credits in 2014 (according to NBU)				Volume of attracted credits in 2013	Interest rate on attracted credits in 2016, %	
		Total	Short-term	Medium-term	Long-term		In national currency	In foreign currency
Vinnytsya	67	291.4	204.0	87.4	0.0	862.6	16.2-24	x
Volynsk	7	9.8	7.2	0.0	2.6	22.1	22-25	x
Dnipro	79	343.2	288.4	10.2	44.6	452.7	18-25	x
Donetsk	14	75.0	19.0	29.3	26.7	303.2	23-24	9
Zhytomyr	182	211.9	179.0	18.4	14.5	174.6	20.3	10.8
Zakarpatty	3	2.5	2.5	0.0	0.0	22.1	16-23	16
Zaporizhzhia	99	499.5	438.2	56.5	4.8	786.3	20-30	7,9
Ivano-Frankivsk	10	15.1	14.6	0.5	0.0	29.3	19-21.5	X
Kyiv	49	585.1	75.6	455.5	54.0	522.5	18-26	X
Kirovohrad	217	453.3	202.9	227.0	23.4	234.4	19-24	X
Lviv	20	449.7	449.7	0.0	0.0	383.8	17-27	X
Mykolaiv	288	615.4	508.5	29.6	77.3	1685.8	22,3	X
Odesa	225	965.4	680.5	198.5	86.4	907.2	17-25	10-13
Poltava	105	581.7	456.5	25.1	100.1	1322.2	17-25	X
Rivne	38	146.3	115.4	30.5	0.4	256.2	19-26	X
Sumy	35	544.2	392.6	0.0	151.6	352.1	21.5	X
Ternopil	75	1105.9	947.1	0.0	158.8	1845.1	15-29.9	X
Kharkiv	215	615.4	390.5	190.9	34.0	932.7	18-26	11-15
Kherson	309	1258.7	1071.5	178.6	8.6	647.7	19.5	9.2
Khmelnyskyi	43	286.2	286.2	0.0	0.0	233.9	18-22	X
Cherkasy	125	1577.8	774.8	468.6	334.4	1726.7	18.5-25	X
Chernivtsi	5	22.4	22.4	0.0	0.0	39.5	19-25	x
Chernihiv	57	361.9	346.9	0.0	15.0	421.3	16.5-24.5	7,8
Total	2267	11017.8	7874.0	2006.6	1137.2	14164.0	15-30	7.8-16

Note: Without consideration the temporarily occupied territory of the Crimea and the Donetsk and Luhansk regions.

Thus, despite the conducting warfare in the Donetsk region, regional enterprises used the borrowing funds at the same level as the other regions of the country and in comparison with the same date of the previous reporting period.

On the territory of Lugansk region for the period of 2014-2016, according to the NBU, agribusiness entrepreneurs did not attract credit funds for the development of agriculture in their region that could not be displayed on the results of financial and economic activity of agricultural enterprises in the region.

Background for reconstruction of demolished potential by the war is the most probable just in agribusiness, although there are many obstacles from side of the state. The functioning of Ukraine's economy in general and the business as its structural unit, should provide the effective recovery strategy development and implementation of the economic potential of processing enterprises in the devastated area of Donbass. This is not possible without the research of availability, the part of enterprise economic potential, the weight of each component and the determination of the relationship between them.

Economic potential of agribusiness is a complex, dynamic and stochastic hierarchical system of financial, production, employment interacting components. Creating the optimal structure of enterprise potential allows for a minimum number of components to fully implement a set production and economic functions.

Against the background of low probability of attracting by Donbass agribusiness enterprises an additional credit and investment resources and rapid recovery of industrial processing enterprises in the short-term prospects should not be expected even with some improvement of the business environment and the political and military situation. Therefore, the restoration of the destroyed potential of agribusiness in the first stage lies entirely in the enterprise resource capabilities.

Agribusiness development in modern conditions should provide a balanced and interconnected restructuring of all its branches, the maximum critical manufacturing application of scientific and technological progress, international experience, the most advanced forms of economy and organization of production based on the priority of solving contemporary problems.

The recovery of demolished potential capacity of agribusiness enterprises by means of effective ways to use them in the future is an important and urgent issue for any company that has experienced the destruction from the side of Russian army in local terrorists in Donbas.

Ensuring the priorities of agribusiness development, especially its leading sectors makes it possible to provide the population with food products, industry with raw materials and foreign trade with export goods.

The issue of Donbas's reintegration into the economic area of Ukraine is crucial and of high priority for the economy of Ukraine. The term "reintegration" refers to a process that means repeated renewal and recovery, renovation and reproduction. At present, however, a number of obstacles hinder the end of fighting in the East, as well as the restoration and reintegration of Donbas. The task is complicated by the fact that a part of the Donetsk region has been emancipated from the occupation, while a part of the region is still occupied by the Russian troops and all economic ties have been lost between these territories for 3 years.

The reintegration development links reflect the progress mechanism of formation processes in dynamics and the reintegration connections of functioning reflect the functioning of the processes of cooperation and integration in the current time and are characterized by the capability of operative change (Dem'ianenko, 2011).

A characteristic feature of the reintegration links of development is that they proceed from the development and differentiation of productive forces and their influence on industrial relations. These include resource exchange links that reflect the development of the specialization process, as well as product exchange in the part where they show the organizational development of intereconomic cooperation and integration. Reintegration relations of functioning arise from industrial relations and their impact on productive forces. These include product exchange links in the part in which they reflect the economic functioning of the processes of cooperation and integration (Il'chuk, 2002).

Reintegration relations show a general pattern of development and interaction of productive forces and industrial relations, as well as territorial and sectoral peculiarities of their exposure (Zbars'kyj, Matsybora & Chalyj, 2010).

Creation of an effective mechanism of the reintegration balance on the territory of Donbas will enable the government:

To eliminate the price disproportions of a speculative nature that arose as a result of the presence of a large number of intermediaries in the conditions of insufficient development of market relations;

1. To respond flexibly to changes in supply and demand by optimization of interactions between participants and the clear functioning of the economic mechanism;
2. To pool the existing resources and direct them towards development of the industry that is in desperate need of them at this time;
3. To solve the most acute social problems including employment.

In symbolic formalization, the principles of creating reintegration interconnections on the territory of Donbas can be represented by mathematical dependence (U) showing the intersection of the interests of each stakeholder participating in the process:

$$\sum_{j=1}^u T_i(2,3,4)C_i(1,2,6,7)P_j(2,6)Z_j(3,6)R_j(1,8)U_i(5,7,8)N_i(9) \quad (1)$$

where T_i -agricultural enterprises which produce meat and dairy products; C_i -agricultural enterprises which supply raw materials for the production of forage; P_j - industrial and processing enterprises providing raw materials for the production of meat and dairy products; Z_j -transport enterprises; R_j -procurement companies; U_i - enterprises for processing meat and dairy products; N_i -scientific institutions.

Figures in brackets show the combination of interests of stakeholders participating in the process of creating the optimal balance: 1-enterprises for the production of mixed fodder; 2-suppliers of means of production; 3-provision of the cattle-breeding industry with forage; 4- delivery of veterinary medicines to the young cattle; 5- transportation of products; 6-storage of products; 7-sales of products; 8-scientific substantiation.

The coefficients i and j at N , C , P , Z , R , M and N indicate that the production of the j -th industry is consumed to produce the products of the i -th industry.

The functioning of the mechanism of reintegration relationship existence will enable the government to ensure:

1. Development of economic integration and specialization taking into account the economic conditions of Donbas;
2. Creation of the effective forms of integration which can include the contract one, agro-industrial formations, associations and others;

3. Improvement of the economic mechanism of the relationship between the participants of the integration process including tied credit, joint investment, forage support, forage production under give and take conditions;

4. Introduction of a more perfect system of economic management of production development at the regional and general level of the state.

The system of indicators for assessing the effectiveness of the established integrated economic system should reflect the most important qualitative characteristics of the development of products at the agricultural enterprises and ensure the competitiveness and innovation of production.

In contrast to the known approaches (Leontiev, 1997) used to determine the integral index of a set of several tens of input and output indicators, in the proposed approach based on the model of interbranch balance offered by Leontief, only the output parameters reflecting the qualitative characteristics are used in the formation of the integral interaction index. Thus, it significantly reduces the number of parameters and simplifies the calculations. Considering Leontief's model, it is necessary to study the specifics of reintegration balance as a balance method and to analyze the tables of reintegration balance. In this case a difficult task arises: how to match the volume of production to meet all the needs of the region's product. This task requires the involvement of a matrix algebra apparatus (Samuelson Leontief, 1991; Galbraith, 1999). In the 1930s, Leontiev applied a method for analyzing interbranch relations with the involvement of a linear algebra apparatus for the study of the US economy. The method became known as input-output. During the Second World War the input-output matrix developed by Leontief was used for the economy of Germany.

Actually, the real equilibrium in the commodity market is possible only in case of coincidence of expectations of producers and consumers, because in practice the equilibrium is achieved quite rarely, because inefficient use of resources is inevitable in real life. Therefore, it can be argued that the need for a balance method is apparent (Von Neumann, John & Oskar Morgenstern, 1944). Constituents of the reintegration balance model of production are presented in **Table 6**.

Branches in the integrated structure	Branches-consumers					Final product (c)	Gross product (Y)
	Production of grain-crops (X_{i1})	Production of forage (X_{i2})	Dairy production (X_{i3})	Livestock growth (X_{i4})	Production of organic food (X_{i5})		
Production of grain-crops (X_{i1})	180.6	144.3	134.5	89.6	76.0	2282.3	2907.3
Production of forage (X_{i2})	112.3	76.5	99.3	59.5	126.2	9.3	483.1
Dairy production (X_{i3})	0	0	33.5	19.9	4.9	106.2	164.5
Livestock growth (X_{i4})	0	0	2.2	0.6	0.3	3.4	6.3
Production of organic food (X_{i5})	19.8	16.3	33.5	25.6	7.1	11.5	113.8

Source: Statistical journals of the State Statistics Service of Ukraine.

The main frequently used indicator in this table is the cross-sectoral product flows x_{ij} - the total volume of products consumption of industry i at production branch j (the source of this information is the statistical reporting form "Survey of consumption of products and services in the production of products (works, services)"). The specified production flows form the matrix of intermediate consumption

$$X = |x_{ij}|$$

Specified:

X_i -Volume of issue in i branch;

x_{ij} -volume of production of i branch, consumed in j branch;

c_i -The final product, that is, the volume of consumption of products in i branch in the non-productive sector;

$$a_{ij} = \frac{x_{ij}}{x_j} \text{ - quantity of products in } i \text{ branch, spent on production of one unit of production in } i \text{ branch.}$$

Numbers a_{ij} are called coefficients of direct costs of j branch and characterize the technology of this industry.

Consequently, the reintegration balance is the equalization of the volume of production of each branch of industry, the total volume of its products consumed by the industrial branches and the sector of final demand, that is:

$$X_i = \sum_{j=1}^n x_{ij} + c_i, \quad (2)$$

Assume $X = \{x_i\}$ - the vector of production volumes in the branches, then AX - the consumed volumes of resources, thus, outside the production sphere - only $X - AX$ is consumed. We call the economy of the region highly effective, if $AX \leq C$, that is, in the production sphere consumes less than the sphere of consumption.

One of the main tasks of the reintegration balance is to find, at a given structural matrix of the economic system in conditions of the aggregate output balance, the joint production, required to meet the specified demand. That is, you need to enter a production vector that satisfies the balance of equation. Taking into account the economic interpretation, this vector of production should be negative.

This requirement means that each industry is able to produce any volume of its products, provided that it will be provided with resources in the required quantity. In fact, this is not the case, because the production capacity of each industry is limited by the amount of information, finance, labor and capital.

The matrix A, which is included in this expression, characterizes the region's production economy and the natural requirement is that it requires the development of at least one set of final products. For the existence of a problem solution, it is sufficient to fulfill the so-called Hawkins-Simon condition, that is, the non-negative quadratic matrix A is a productive one (Von Neumann, John & Oskar, 1944).

Let us investigate the matrix of direct costs for productiveness:

$$(E - A) = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix} - \begin{pmatrix} 1 & 0.80 & 0.74 & 0.50 & 0.42 \\ 0.68 & 1 & 1.3 & 0.78 & 1.65 \\ 0 & 0 & 1 & 0.59 & 0.15 \\ 0 & 0 & 0.28 & 1 & 0.17 \\ 2.79 & 2.3 & 4.72 & 3.6 & 1 \end{pmatrix} = \begin{pmatrix} 0 & -0.80 & -0.74 & -0.50 & -0.42 \\ -0.68 & 0 & -1.30 & -0.78 & -1.62 \\ 0 & 0 & 0 & -0.59 & -0.15 \\ 0 & 0 & -0.28 & 0 & -0.17 \\ -2.79 & -2.30 & -4.72 & -3.6 & 0 \end{pmatrix}$$

$$(E - A) = \begin{vmatrix} 0 & -0.80 & -0.74 & -0.50 & -0.42 \\ -0.68 & 0 & -1.30 & -0.78 & -1.62 \\ 0 & 0 & 0 & -0.59 & -0.15 \\ 0 & 0 & -0.28 & 0 & -0.17 \\ -2.79 & -2.30 & -4.72 & -3.6 & 0 \end{vmatrix} = 0.543628$$

According to the performance criteria, we have obtained, that the model has a solution because the value of the matrix is less than 1 (the sum of elements $\sum a_{ij} \leq 1$). To ensure a positive indicator of the output of the finished product in the Donetsk region which is shown in **Table 7**, it is necessary that the condition is fulfilled: the determinant of the matrix (E-A) should have a positive value, that is, the matrix (E-A) will have an inverse matrix $(E - A)^{-1} = D$, which is a matrix of total costs.

Manufacturing industries	Consumer industries					Final product	Gross product
	1	2	3	...	n		
1	180.6	144.3	134.5	...	X_{1n}	C_1	Y_1
2	112.3	76.5	99.3	...	X_{2n}	C_2	Y_2
3	0	0	33.5	...	X_{3n}	C_3	Y_3
4	0	0	2.2	...			
5	19.8	16.3	33.5	...	X_{nn}		
Net profit	2594.6	246	-138.5	...	M_n	$\sum_i X_i = \sum_j X_j$	
Gross product	2907.3	483.1	164.5	...	X_n		

But if even $X_{ij}=0$, that is the branch j does not use products directly to the branch i, the same at the indeterminate matrix from this branch to any other one can find a chain of industries that use products from one branch to produce products in another. For irreducible matrices, the condition of performance looks like this: if the sum of the elements of each line is not more than one and at least one line is strictly smaller than one, then Leontiev's model with this matrix is productive.

There are some real reasons for productivity: the production of each industry is sufficient for the needs of the production itself, moreover, there is an industry whose products even remain for final consumption. In this case, the interconnection of all branches is traced, which, in turn, allows us to hope that this balance may turn into residues for consumption as well as products from other industries.

The reintegration balance consists of four quadrants. The first reflects cross-sectoral product flows, the second-the sectoral material structure of national income.

The quadrant components $M_i X_n$ are calculated as the difference between gross output and the sum of the elements of the corresponding columns found in the first quadrant: $Z_j = X_j - \sum x_{ij}$

$$2907.3 - (180.6 + 112.3 + 0 + 0 + 19.8) = 2594.6$$

$$483.1 - (144.3 + 76.5 + 0 + 0 + 16.3) = 246$$

$$164 - (134.5 + 99.3 + 33.5 + 2.2 + 33.5) = -138.5$$

$$6.3 - (89.6 + 59.5 + 19.9 + 0.6 + 25.1) = -188.4$$

$$113.3 - (76 + 126.2 + 4.9 + 0.1 + 7.1) = -101$$

The last quadrant shows the final distribution and use of national income.

Let's check the basic balance equation according to the formula of the basic balance of the ratio $\sum y_i = \sum Z_j = 24 \text{ i } 2,7$

If the elements of the matrix D are denoted by d_{ij} , C-the final product in the industry, then for any i branch is a fair relation:

$$X_i = \sum_{j=i}^n d_{ij} C_j \quad (3)$$

From this relation it follows that gross output acts as a weighted sum of the quantities of final products and weights are the coefficients d_{ij} , that show how much everything is needed for products manufacturing in branch I for the release into the sphere of final use of the unit of production in the branch j . Unlike the direct cost factors a_{ij} coefficients d_{ij} are called coefficients of full material costs and include both direct and indirect costs of all orders. If direct costs show the amount of means of production spent directly on the production of this product, then they are indirect to the previous stages of production and are part of the production of the product not directly, but through other (intermediate) means of production.

$$D=(E - A)^{-1}=\begin{pmatrix} 0 & 1,25 & 1,35 & 2 & 2,38 \\ 1,47 & 0 & 0,47 & 1,28 & 0,60 \\ 0 & 0 & 0 & 1,69 & 6,67 \\ 0 & 0 & 3,57 & 0 & 3,88 \\ 0,36 & 0,43 & 0,21 & 0,28 & 0 \end{pmatrix}$$

The calculated coefficients of total expenditure $d_{ij} \in D$ indicate how much money increases the production X_i of the industry with the increase of C_j the amount of goods j , consumed by households and other sectors of the final demand sphere, per monetary unit. This increase will have an effect on branch directly if $i=j$ and indirectly if $i \neq j$.

While carrying out calculations on the distribution of costs in the products production in agricultural enterprises of the Donetsk region, it was assumed that the sub-sector that is forming the final production sector needs the most cash investments, since it is the most capital-intensive and compared to the crop sub-sectors (in this case the intermediate ones are grain growing and fodder production) have a multiplicity of times the turnover of capital. Thus, all the phenomena and processes occurring in modern agricultural production, with their constant change, are increasingly attracting attention to the issues of balance and equilibrium of the economic systems of the region with the aim of their constant development. Since any branch of agriculture is characterized by a certain proportionality and interdependence of the main elements at the input of which there is raw material and other productive resources and at the output-the end product, suitable for consumption, it is expedient to consider the method of interbranch balance. We can conclude that the Leontiev's method distinguishes clarity and clarity of calculation, universality and globalization, in other words, the suitability for the economy of regions and industries. In our opinion, reintegration analysis should become the main tool of strategic planning in conditions of regions' reintegration and military-political shocks.

Conclusion

According to the results of the undertaken study we can confirm that Ukraine has a high economic potential of agribusiness enterprises, but its actual condition can be characterized by a high performance, because it is affected by a number of external and internal factors. First, it is a warfare from the side of Russian Federation and the small size of investments in this sector, outdated technology, insufficient financial and economic support of agribusiness economic activity of the state.

Despite the difficult socio-political and economic situation in Ukraine, on the whole it appeared to be possible to ensure food security and stable situation in the food market. However the vital issue of choosing the further steps in implementation the state agrarian policy taking into account the best European and international experience and external threats from Russia. The priorities of capital investments into agribusiness should be: the development of market infrastructure, storage and marketing of agricultural products (as agricultural raw materials and disintegrated its infrastructure and existing facilities do not meet modern requirements); agribusiness potential development of the region, the reconstruction of processing enterprises to focus on the competitive products production; agricultural production development.

State efforts in the agricultural sector should be aimed at creating conditions for dynamic development of all sectors of agricultural production, attracting social organizations and business associations in state agricultural policy formation and implementation, ensuring the stability of domestic food market, expanding the exports geography and increasing the presence of agricultural products on world markets and support the development of small agricultural producers.

The proposed methodology of integrated estimation of production efficiency, based on changing qualitative characteristics of the economic system of the Donetsk region, allows:

1. To evaluate the final result of the production process's efficiency.
2. Calculate the integral index using indicators to assess the components of the production process.
3. Determine the directions of increasing the efficiency of production due to the impact on structural elements.

The use of the reintegration balance method enables not only to study the interdependence between different sectors of the economy of the Donetsk region, which manifests itself in mutually influential prices, volumes of production and incomes, but also to solve the following tasks:

1. Forecast of the main indicators (output of gross and final products, net production, material costs, industrial consumption of products in terms of branches of material production), depending on changes in both external and internal factors;
2. Forecast of wholesale prices of products of branches of material production;
3. Effectiveness assessment of territorial economic ties, etc.

The proposed methodology is quite universal and can be applied at the level of the country, regions and main types of economic activity. The dynamics of components of the integral index can be judged on current shortcomings and develop measures to eliminate them.

Obviously, in the face of economic devastation and social decline, the failure of reforms in all directions, it is Donbass capable of providing an institutional basis for the revival of the Ukrainian economy on a new technological basis. In this regard, in Ukraine, at the first stage, it is necessary to conduct nationwide tax and budget decentralization, to provide post-war and border areas with maximum economic freedom. Proceeding from the international practice, it is necessary to legally consolidate the territory of Donbass as a free economic zone and a platform for outdated development. Within the framework of the reintegration of Donbass, the issue of providing trade and economic preferences on the part of the European Commission and the Eurasian Economic Commission and the introduction of two free trade zones that will operate unilaterally and restore the damaged co-operative ties in the priority sectors of the economy is extremely important.

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