БУРКИНСЬКИЙ Б.В.

академік НАН України, д-р екон. наук, проф.

директор

Інститут проблем ринку та економіко-екологічних досліджень НАНУ

Французький бульвар, 29, м. Одеса, Україна, 65044

E-mail: oss_iprei@ukr.net

ORCID: 0000-0001-9303-0898

АНТОНЮК П.О.

кандидат економічних наук,

старший науковий співробітник

Інститут проблем ринку та економіко-екологічних досліджень НАНУ

Французький бульвар 29, м. Одеса, Україна, 65044

E-mail: paul_antonyuk@ukr.net

ORCID: 0000-0002-8100-2563

ІНТЕГРАЦІЯ ВІТЧИЗНЯНОГО РИНКУ ЦУКРУ В ГЛОБАЛЬНІ ЛАНЦЮГИ ДОДАНОЇ ВАРТОСТІ

Актуальність. Важливою умовою розвитку ринку цукру, як одного зі стратегічних ринків України, являється інтеграція в міжнародні економічні структури. Одним із напрямів вирішення проблем інтеграції являється забезпечення експортних поставок цукру шляхом створення розподільчо-логістичних центрів.

Мета та завдання. Метою статті є розробка пропозицій щодо можливих напрямів сприяння інтеграції ринку цукру України до глобальних ланцюгів створення доданої вартості, що призведе до трансформації існуючого ланцюга, та дасть можливість покращити взаємозв'язок суб'єктів різних ланок і змінити неефективний напрямок матеріальних та фінансових потоків.

Результати. Стаття містить результати досліджень, що присвячені обґрунтуванню економічних інтересів суб'єктів ЛЛРЦ та особливостей їх взаємодії. У роботі на прикладі українського ринку цукру досліджено особливості формування структур логістичних ланцюгів, їх загальні та відмінні характеристики, визначено неефективні ланки в ринковому ланцюгу. Розглянута існуюча структурна будова ЛЛРЦ та проведена діагностика ефективності його функціонування. В контексті інтеграції ЛЛРЦ України до глобального ринку цукру обґрунтовано доцільність його трансформації шляхом включення до нього нової ланки у вигляді розподільчо-логістичного центру (цукрового терміналу).

Висновки. Трансформований ЛЛРЦ дає можливість покращити взаємозв'язок суб'єктів різних ланок та змінити неефективний напрямок матеріальних та фінансових потоків для поступового переходу до руху матеріального потоку через розподільчо-логістичний центр. В ході дослідження запропоновано організаційний механізм інтеграції ЛЛРЦ з урахуванням інтересів внутрішнього і зовнішнього ланцюгів глобального ринку.

Ключові слова: трансформація, ланцюг товарного ринку, ланка, ринок цукру, розподільчо-логістичний центр, термінал

BURKYNISKYI B.V.

Academician of the National Academy of Sciences of Ukraine, Dr. Econ. Sciences, Professor

Director

Institute of Market Problems and Economic&Ecological Research of the National Academy of Sciences of Ukraine,

Frantsuzkyi boulevard, 29, Odessa, Ukraine, 65044

E-mail: oss_iprei@ukr.net

ORCID: 0000-0001-9303-0898

ANTONYUK P.O.

PhD in Economics

Senior Scientific Researcher, Department of market mechanisms and structures

Institute of market problems and economic&ecological research of the National Academy of Sciences of Ukraine,

Frantsuzskiy boulevard, 29, Odessa, Ukraine, 65044

INTEGRATION OF THE DOMESTIC SUGAR MARKET INTO GLOBAL VALUE ADDED CHAINS

Topicality. An important condition for the development of the sugar market, as one of the strategic markets of Ukraine, is integration into international economic structures. One of the ways to solve the problems of integration is to ensure the export of sugar by creating distribution and logistics centers.

Aim and tasks. The aim of the article is to develop proposals on possible ways to promote the integration of the Ukrainian sugar market into global value added chains, which will transform the existing chain and improve the relationship between different actors and change the inefficient direction of material and financial flows.

Research results. The article contains the results of the research devoted to the substantiation of economic interests of the subjects of LCSM and the peculiarities of their interaction. In the work on the example of the Ukrainian sugar market the peculiarities of the formation of structures of logistics chains, their general and different characteristics, inefficient links in the market chain have been identified. The existing structural construction of LCSM has been considered and diagnostics of efficiency of its functioning has been carried out. In the context of the integration of LCSM of Ukraine into the global sugar market, the expediency of its transformation by including a new link in the form of a distribution and logistics center (sugar terminal) has been substantiated.

Conclusion. The transformed LCSM provides an opportunity to improve the relationship between the subjects of different links and change the inefficient direction of material and financial flows for a gradual transition to the movement of material flow through the distribution and logistics center. In the course of the research the organizational mechanism of LCSM integration has been offered taking into account the interests of internal and external chains of the global market.

Keywords: transformation, commodity market chain, link, sugar market, distribution and logistics center, terminal.

Problem statement and its connection with important scientific and practical tasks. The task of ensuring the effective integration of strategic markets of Ukraine into the global economic space is one of the most significant theoretical and practical problems of modern economic development of Ukraine, which will contribute to the dynamic growth of production, export and transit potential of the national economy.

The logistics approach focused on the management of information, material and financial flows is an effective tool for improving the efficiency of logistics chains of commodity markets, but in practice these flows are not always effective, so they need detailed research to develop measures to improve them.

The urgency of the peculiarities of the formation of value added chains in the sugar market in terms of opportunities to attract individual units of the logistics chain of the sugar market (hereinafter LCSM) of Ukraine to higher levels of global value chains is extremely acute in modern conditions of strengthening the integration of the national sugar market into global chains. There is a need to change the legislation of different countries, as the free movement of goods, services and people between countries required the elimination of traditional national, transport, customs, trade and other barriers. Thus, logistics becomes a lever and a strategic tool in the competition for consumer markets [1].

For Ukraine, the actualization of the issues of expanding foreign trade relations and finding reserves to increase their efficiency is largely due to the strengthening of the export orientation of Ukrainian sugar producers to world markets. Practical confirmation of this fact is the expansion of sugar trade between Ukraine and Asia and Africa, which brings to the fore the need for their logistics services, the quality of which, in turn, is a significant factor in achieving additional competitive advantages of export products.

Analysis of recent publications on the problem. Issues of sugar market logistics as a functional component of the global economy in the works of domestic experts have been covered in a rather fragmentary and partial way. The works of many scientists, including B.V. Burkynskiy, O.V. Nikishyna, O.P. Velychko, M.L. Tarakanov, E.V. Krykavskiy, O.M. Borodina and other scientists are devoted to the research of logistics chains of commodity markets. At the same time, the current state of the logistics chain of the sugar market and its integration into global value added chains, taking into account the specifics of the industry, require additional research.

Allocation of previously unsolved parts of the general problem. For the sugar market, as well as for other food markets with significant export potential, a certain problem is the organization of export deliveries with minimal logistics costs. The emphasis on this problem is due to the lack of storage and marketing of sugar (logistics hub) in the existing export chain, which leads to significant financial losses and reduced competitiveness.

Formulation of research objectives (problem statement). The purpose of the study is to develop proposals for possible ways to promote the integration of the Ukrainian sugar market into global value added chains, which will transform the existing chain and improve the relationship between different actors and change the inefficient direction of material and financial flows.

An outline of the main results and their justification. The resource potential of Ukraine in forming the supply of high-quality sugar gives grounds for an optimistic forecast of its role in the world sugar market. Exports of this strategic commodity form a stable source of foreign exchange earnings, the scale of which can provide Ukraine with positive GDP. However, it is almost impossible to realize potential export opportunities without modern approaches to the organization of sugar exports in a highly competitive world economic space. Therefore, the export potential of the state should be considered through the prism of its ability to ensure efficient movement of product flows to potential consumers, because the price of the resource is only part of its total cost, where a significant share falls on financing logistics functions which bring material flow from the place of its origin (primary raw materials source) to the place of transfer of the rights to it (final consumer). Thus, the export sugar potential of the state is determined not only by the gross harvest of sugar beets and sugar production from them, but also by the ability to effectively enter world sugar markets with competitive prices. Gaining of market advantages due to a favorable combination of factors of production in sugar beet growing and sugar production in Ukraine is almost exhausted, thus increasing the logistics component of costs in the cost of sugar exports (currently the costs of storage, transportation and transshipment of sugar are among the highest among other agri-food products) will exacerbate the conflict between the main leading links in this market, primarily raw materials, which is actually working on the verge of profitability in conditions of significant risks of economic and climatic nature. Ignoring of these interests will in direct proportion reduce the supply of quality raw materials (sugar beets) in the domestic market and contribute to the reorientation of producers to a different structure of production in order to diversify risks.

Therefore, the relevance of using the concept of logistics in sugar exports for Ukraine is one of the main tasks of maintaining and further increasing the production and export of sugar on the basis of balanced motivation of participation in this process of all parts of the logistics chain. Globalization of the market contributes to the development of the concept of total quality management as a management approach, which aims to improve quality and participation in this process of all participants in the logistics chain for maintaining quality characteristics at all stages of production and promotion of products (services). This allows you to achieve long-term success at the expense of better meeting the needs of consumers and mutual benefit of each participant and society as a whole. There is a need to change the legislation of different countries, as the free movement of goods, services and people between countries requires the elimination of traditional national, transport, customs, trade and other barriers. Thus, logistics becomes a lever and a strategic tool in the competition for consumer markets. The growth of world sugar trade and investment flows is leading to deepening economic globalization. The global relocation of production networks by multinational companies and the inclusion in the value chain of producers of countries with different levels of development increase the importance of the research into the possibilities of integration of LCSM of Ukraine into global production networks. By embedding themselves in value added chains, sugar producers are forced to adapt to the requirements of world demand. This leads to changes in the structure of the logistics chain: in those links that are export-oriented, the growth of the number of producers is higher than in others. On the other hand, further liberalization of foreign trade leads to increased competition in the domestic sugar market due to growing imports, which is a source of additional risks. Under these conditions, changing the strategic behavior of producers and, as a consequence, the structure of LCSM and its individual parts, is one of the areas of adaptation of national production to the new challenges and opportunities posed by international trade [2].

The logistics structure of the commodity market is an ordered set of elements (links) for the movement of material and related financial and information flows on the way from the primary source of raw materials to the final consumer of finished products. We are talking about the logistics chain of the commodity market [3].

The logistics chain of the sugar market is an organizationally complex structured integrated economic entity, which consists of a number of links, interconnected in a single process of resource flow management, acting as a tool for their optimization. It is necessary to distinguish between the logistics system directly in the field of activity in which the company operates and the logistics market system. The logistics system of the sugar market can be represented as a sphere of material flows flowing between the raw materials sector (sugar beet production) and the processing sector (sugar factories) mediated by transport.

Increasing competition in the sugar market, domestic and especially foreign, increases the role of logistics in the formation of costs for the supply and procurement of material resources, support for the production of sugar beets, as well as the sale of finished products – sugar, molasses and pulp.

Vertical integration helps to control a large part of the logistics chain and obtain a larger share of value added in the production of final consumption products. The formation and rapid spread of integrated corporate entities today has become a feature of the development of many sectors of the economy, including the sugar market. In our opinion, it is possible to question the feasibility of a separate allocation of integration logistics, because market logistics, performing system-forming, integrating, regulating and productive functions, is always integrated.

The integration of these elements of the logistics system is achieved by the unity of goals, which are subject to different, but at the same time compatible links. Note that the logistics system of the sugar market acts as a subsystem of the global logistics system. There are significant connections between the elements of a logistics system that determine its integrative qualities. The basis of communication between the various links is formed by economic relations. The connections between the elements of the logistics system are organized in a certain way, the logistics system has an organization.

The structure of the logistics chain of the sugar market (LCSM) should be formed by 7 links (Fig. 1).

The basic link – supplier (pre-agricultural) – provides producers with the necessary material and technical resources and seeds of crops for growing raw materials, including imported. Breeding and seed production, as one of the important ways to increase the yield of sugar beets is to breed varieties and hybrids that provide high sugar yield from 1 ha of crops, combining high yields of roots and sugar content in them. Ukrainian producers need to completely switch to heterosis selection with extensive use of biotechnology, create high-yielding sugar beet hybrids that would meet the requirements of the best world counterparts, focusing on increasing the sugar content of roots and improving their technological qualities – increasing resistance to diseases and capable for intensive technologies. It should be noted that the development of seed farms and the success of breeding, which contributed to the involvement of domestic sugar producers in breeding and seed work based on the study of biological characteristics of crops, allowed domestic sugar producers to obtain their own seeds, which in economic and biological indicators has higher adaptogenic properties [4]. This not only frees them from the expansion of foreign varieties, but also they themselves become suppliers of seeds of their own varieties to the world market. The agricultural unit specializes in growing sugar beets. The production of sugar beets is provided by agricultural enterprises, households and peasant (farmer) farms that grow sugar root crops in the required quantity and quality to load the production capacity of enterprises. To ensure the operation of one sugar plant with a capacity of 6 thousand tons of sugar beet processing, it is necessary to consolidate the raw material zone of 34 thousand hectares of sugar beet crops, and taking into account the need to comply with crop rotation – about 120 thousand hectares. The optimal radius of raw material procurement is a 50 km zone around the sugar factory. The largest sugar producer in Ukraine, the vertically integrated «Astarta» agro-industrial holding, which includes eight sugar factories, sells two of its plants in the Kharkiv region, precisely because of the lack of its own raw material zones around these enterprises [5].

In addition to the insufficient amount of sugar beets, there is a problem of their preservation. The next link in the logistics chain (storage) is related to the uninterrupted flow of resources to sugar factories. The sugar beet processing season begins in late August and lasts 2-3 months. The enterprises supplied with raw materials work till February, others stop processing of beets in November-December. The fourth link - the distribution and sale of sugar beets - provides for three main areas of trade: (1) sales directly to processing enterprises (sugar factories); (2) implementation by intermediary structures; (3) toll processing of raw materials. In the fifth link, in the process of converting consumer value, new goods with new properties are produced. As a result of processing of sugar beets, the product of primary processing is obtained - sugar, by-products (pulp, molasses) and products of deeper processing of by-products and waste (dry granulated pulp, ethanol, betaine, pectin and fiber) depending on technology (traditional or innovative). It should be noted that Ukrainian companies to a greater extent use the simplest traditional technology of sugar beet production. Sugar production is material-, energy-, and labor-intensive, with unique technology and seasonality of production processes, which requires modern equipment and machinery, and this necessitates the proper organization of the logistics process. As for the production units of the logistics chain (agricultural and processing) of the sugar market, they are in unsatisfactory condition, except for those enterprises that operate as part of modern agricultural holdings. Not all companies in the sugar industry pay due attention to investment, there are not always the necessary credit opportunities. A large number of enterprises continue to work on the old principle – operate worn-out equipment and use simplified technologies for growing sugar

beets and their processing, which in the agricultural sector leads to crop failure, a sharp decrease in fertilizers, increased weeds, plant diseases, root crop quality. , and in the processing plant - to the wear of equipment and its failure, deterioration of sugar quality, reducing the percentage of its failure, which significantly affects the ability to export Ukrainian sugar to many countries.

Fig. 1 Logistics chain of the Ukrainian sugar market *

* author's development

Sugar factories that process sugar beets and produce sugar are large industrial enterprises that process thousands of tons of beets per day. The production and technological process of sugar production from sugar beet is divided into the following stages: acceptance, primary processing or preparation of raw materials; heat treatment; packaging and storage. When accepting roots, determine their compliance with the

requirements of DSTU for physical condition, maturity, general contamination and, depending on this part, the roots are placed in storage boxes, and the rest – immediately delivered to the sugar factory, where the separation of impurities, weighing, washing and grinding into chips take place. The next stage includes obtaining diffusion juice, its purification in several stages, thickening the juice into syrup and its purification, drying granulated sugar. In world practice, the logistical problem of product storage is solved through the introduction of alternative technologies in sugar production. During the production season, companies produce part of the sugar in the form of an intermediate product – a thick syrup, which is stored in special tanks. By producing such an intermediate product, factories can not only process more raw materials, but, by further processing the syrup into sugar, increase the production season and reduce the load on the main warehouse for storage.

The consumer link involves the movement of products for final consumption by the population (B2C Business-To-Consumer sector) and industrial consumption (for example, sugar is used in many sectors of the food industry to produce goods with new consumer value - (B2B Business to Business sector). The great part of sugar especially in recent years (the highest rate of 33,3 % of production was recorded in 2018) enters foreign markets. There is an important factor in the formation of the price of the final product, which is now much higher than world prices, the price side of competitiveness of the ukrainian production is also a problem. Molasses is also in high demand, primarily due to the rapid development of the world biofuel market, but at current export prices it is better to process molasses into ethanol on the domestic market than to export it as a raw material.

Problems of functioning of the logistics chain of the sugar market can be overcome by creating a complete logistics system or through the transformation of existing logistics chains. There are two ways to solve this problem. The first is to develop an export-oriented logistics system for sugar production. However, there are a number of problems, both internal (the existence of inefficient links in the structure of the logistics chain, low capacity of the transport system) and external. Another way is to develop and build alternative ways to develop logistics chains. For example, Brazil has the world's largest and most diversified sugar cane industry. The vast majority of its sugar factories have integrated ethanol plants, which allows them to process cane into either sugar or ethanol. In recent years, the share of industrial sucrose output from cane (known as "ATR" or Açúcar Total Recuperável) allocated to sugar production has fluctuated between 41% and 52%. A recent study by the International Sugar Organization on Brazil assessed five main drivers of its competitiveness in the global sugar / ethanol market: production costs, infrastructure and logistics development, exchange rate movements, the cost of shipping and the strength of global market positions. ethanol. In three of the five factors, Brazil has lost ground to other leading exporters. However, in the area of international export demand for sugar, as well as in the area of the sixth factor - diversification into other by-products, such as cogeneration and biochemical products based on sugar cane – Brazil has made positive progress by asserting its competitiveness in the market. Accordingly, domestic sugar factories can develop a logistics chain of production and marketing of alternative fuels made from sugar. Thus, in order to realize its bioethanol potential, Ukraine needs a significant increase in sown areas for sugar beet and the introduction of a "blend" system between the production of bioethanol and sugar (on the principle of Brazil). In Ukraine, the volume of sugar production in 2019 amounted to 1490 thousand tons, having decreased compared to 2010 by 17,5 %.

Table 1

Basic indicators of sugar market development in Ukraine, thousand tons *

Indicators	Years									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1. Production	1805	2300	2100	1262	2053	1460	2020	2043	1754	1490
2. Import	315	270	1	1,4	0,9	1,7	4,7	1,8	1,7	1,7
in % to production	17,4	11,7	0,04	0,11	0,04	0,11	0,23	0,09	0,09	0,11
3. Export	0,3	6,2	174,4	123	6,1	114,8	464,8	599,3	584,8	236,8
In % to production	0,01	0,27	8,3	9,7	0,29	7,86	23,0	29,3	33,3	15,9
4. Market capacity	2119,7	2563,8	1926,6	1140,4	2047,8	1346,9	1559,9	1445,5	1170,9	1254,9
5. SVR,%	14,86	10,53	0,05	0,12	0,04	0,12	0,3	0,12	0,14	0,13

* Concluded according to data [6,7]

The table. 1 shows the calculations of capacity and degree of openness, which are an important characteristic of the sugar market. The capacity of the domestic sugar market in 2019 amounted to 1255 thousand tons, having decreased compared to 2010 by 40,8 % due to the simultaneous reduction of sugar production and imports (by 17,4 % and 185 times, respectively). The dynamics of changes in the capacity of the sugar market is wavy: in 2011-2013 it is characterized by a small increase, in 2014-2016 – a 30 % decrease. Imports of goods are insignificant and amount to 3,1 % of production, while exports reach 33,3 % of government output.

A feature of the agricultural sector of the market chain is the dominance of the corporate sector in the production of sugar beets: in 2018 it accounted for 88,5 % of sugar beet production, the rest of the niche (11,5 %) was occupied by agricultural enterprises of the individual sector, combining farmers' and individual agricultural households. Suffice to say that instead of 6-7 thousand farms that grew sugar beets before, now about 800 entities are engaged in it. Production in households was practically suspended, it quickly decreased among farmers, while it increased in large agricultural holdings, mainly on leased, distributed lands. It should be noted that only 7 leading agricultural firms of Ukraine, which are structural units of the largest vertically integrated companies, in 2018 grew sugar beets on an area of about 200 thousand hectares, or 64 % of the total area of 311 thousand hectares. One of the largest European sugar producers, the Polish national sugar company Krajowa Spolka Cukrowa (KSC S.A.) processes 6 million tons of beets each year, which is supplied to 7 sugar factories by about 15,000 farms [8]. The degree of openness of the sugar market in the reporting period amounted to 0,13 %, having decreased 8 times due to a reduction in both imports of goods and the capacity of the domestic market. Exports of sugar, even in the unsuccessful in terms of shipped volumes 2019, was 140 times greater than its imports and amounted to 236,8 thousand tons or 15,9 % of production. The share of imports in domestic consumption is 0,13 %, which indicates the scanty power of import flows in the market chain.

Despite almost complete cessation of sugar imports (0,1 %), the degree of openness of the domestic market to international trade remains high, which makes it vulnerable to external shocks and provides for the integration of domestic production into the world and, consequently, foreign trade openness of the national sugar industry. As part of Ukraine's commitments to the WTO, the Ukrainian market can annually be supplied with 267,8 thousand tons of raw cane sugar at a preferential import duty of 2 %. The normal import duty is set at 50 % of the customs value. Also in the regime of autonomous trade preferences, the EU countries were granted a quota for duty-free supply of sugar to Ukraine in the amount of 30 thousand tons. Although the tariff quota for raw sugar has not been used since 2012, and imports from EU countries are rather insignificant, the degree of openness can also be determined by the total quota, which for Ukraine is 300 thousand tons and confirms the strengthening of Ukraine's sugar market integration into the world trade and economic space.

The conducted researches allowed to establish the following main logistic tendencies of development of the sugar market of Ukraine:

1. dominance in the agricultural chain of large-scale production;
2. presence of inefficient intermediary links in the structure of the market chain, which use schemes of toll processing of raw materials;
3. Insufficient capacity of infrastructure facilities for sugar storage with both producers and exporters;
4. biased redistribution of value added between the links of the chain;
5. critical level of imported seeds (more than 90 %) in the primary (pre-agricultural) chain of the sugar chain logistics chain;
6. high power of import flows in the agricultural chain, the share of the import component in material costs in the production of sugar beets is approaching 100 %.

The logistics chain of the sugar market, depending on the territorial (geographical) boundaries can be internal and external. In turn, the internal LCSM is divided into local (territory of a certain district, city), regional and state. It should be noted that with the expansion of commodity boundaries of the market the logistics of interlink relations changes. Thus, in local LCSM the existing conditions for coordination of cross-cutting characteristics of commodity flows are not crucial in the reproduction process (one type of transport, small volumes of supplies, limited product range, etc.). At the same time, in the state LCSM the role of the integration component in balancing interlink relations is significantly strengthened. The leading areas of coordination of flows are groupage supplies, through tariffs, mechanisms of interaction of different types of transport, the presence of common distribution centers, etc. [1].

According to the organizational and legal form of the subjects (participants), most of the logistics chains of the sugar market can be considered corporate. The integration approach focuses on the formation,

development and transformation of integration relations between the subjects of LCSM on the basis of coordination of their economic interests. Integration connections and interactions form the structure of LCSM, determine its ability to realize the reproductive function of trade in both national and global economic systems.

The sugar market of Ukraine is one of the most important in the agro-industrial complex. The Ukrainian sugar market has undergone tremendous changes over the last 10 years, ranging from reducing the number of sugar factories and abandoning the processing of raw cane sugar, to reorienting production to world quality standards and entering world markets. Taking advantage of the favorable situation, namely the growth of sugar prices in 2015/2016 MY, Ukraine began to increase supplies of products for export. The maximum volume of exports came in 2017-2018, when Ukraine entered the top 10 world exporters of beet sugar, putting on the international market 780 thousand tons. Over the past six years, domestic producers and traders began to work actively in export markets. If before this period the main supplies of sugar were to post-Soviet countries, then later the geography of supplies became very wide. It should be noted that the most promising area of domestic sugar exports is the Asian market, where there is a growing trend of sugar consumption.

Table 2

Dynamics and structure of sugar exports from Ukraine *

Export directions	2014		2015		2016		2017		2018		2019	
	thousand tons	%	thousand tons	%	thousand tons	%	thousand tons	%	thousand tons	%	thousand tons	%
Total	6,2	100,0	114,8	100,0	464,8	100,0	599,3	100,0	584,8	100,0	236,8	100,0
CIS	5,2	83,9	82,8	72,1	73,5	15,8	107,4	17,9	392,3	67,1	134,1	56,6
EU	0,6	9,7	20,4	17,8	47,9	10,3	32,0	5,3	55,0	9,4	45,8	19,3
Asia	0,3	4,8	11,3	9,8	194,6	41,9	210,9	35,2	64,6	11,1	41,6	17,6
Africa	0,1	1,6	-	-	120,3	25,9	194,5	32,5	58,0	9,9	11,8	5,0
Others	-	-	0,3	0,3	28,5	6,1	54,5	9,1	14,9	2,5	3,5	1,5

* Concluded according to data [6,7]

In 2016-2017, the main deliveries were made to Asia and Africa, where the largest importers were Georgia, Turkey, Sri Lanka, Myanmar, Egypt, Tunisia, Sudan and Libya. In the last two years, the main importers of sugar from Ukraine have again become the CIS countries – Azerbaijan, Tajikistan, Uzbekistan, Moldova. Ukraine is unable to compete in the world market with market leaders such as Brazil, India and Thailand. However, it has certain advantages in competition with sugar producers in the CIS and the EU. The efficiency of domestic sugar producers is higher than that of competitors from Europe and the CIS. It is worth noting that some countries have already exhausted their opportunities to improve sugar beet cultivation. Ukrainian manufacturers have such opportunities. The competitive advantage of Ukrainian sugar producers in comparison with such CIS countries as Belarus and the Russian Federation is based on low prices, which are in Ukraine in the range of 300-420 dollars, in Russia - 450-570 dollars, and in Belarus - 520-640 dollars. But any price advantage can be offset by logistical problems. Recently, Ukrzaliznytsia has significantly increased the transportation of sugar, if for the whole of 2017 345 thousand tons were transported, then in 2018 the transportation has already amounted to more than 500 thousand tons of we don't solve problems in the work of Ukrzaliznytsia urgently, as well as carrying capacity of port infrastructure. Ukrainian exporters will find it difficult to compete with manufacturers from Russia and the EU for promising markets in Africa and Asia. High logistics costs and rather slow speed of delivery of sugar to ports (the railway accounts for 47 % of all export shipments of sugar from Ukraine), do not allow producers to get a reasonable price when exporting their products. Over the past two years, sugar has been exported in small batches to the eastern countries of the Commonwealth of Independent States. Thus, in the 2017/18 MY season, 84 % of sugar shipments in Ukraine were exported to the CIS countries, 303 thousand tons were exported by rail, and only 15 thousand tons to the EU countries. Ukrainian sugar producers need to reduce costs and improve the quality of sugar in order to be competitive in foreign markets. The growth of competitiveness of Ukrainian sugar is facilitated by the concentration of production, and hence exports, at the enterprises of powerful vertically integrated companies of Ukraine and first of all the "big three" – "Astarta-Kyiv", "Radekhiv Sugar" and "Ukrprominvest-Agro". In 2018, these companies produced 979,3 thousand tons of sugar – 54,0 % of total production and exported 364,8 thousand tons or 62,4 % of Ukraine's exports.

Currently, Ukraine's influence on the world sugar market is insignificant. Its share in the world production does not exceed 1%, although in the production of beet sugar, this figure in different years ranged from 4-5%. In the 2019/2020 season, the world produced 194.5 million tons of sugar, with exports accounting for almost a third of total production. A very similar trend is observed in Ukraine - a third of Ukrainian sugar was exported by rail, sea and road outside Ukraine. However, it is too bold to define our state as a stable exporter of sugar, as many factors affect the predictability of consolidating this status in relation to our state. The administrative unregulation of the sugar market, the inertia of the state's actions, and the lack of effective operational solutions in most cases have long held back domestic producers. Competition trends will continue to intensify in many countries, but Ukraine still has a chance and is obliged to use it 100 % in this segment of the multifaceted world economy. Full integration of logistics systems of the sugar market of Ukraine into the world sugar market is impossible if the institutional environment and current rules are ignored.

Today, there are many trade associations in the world that are designed to promote the development of trade in raw materials. Trade associations are a kind of business platform within which experience is exchanged (through conferences, seminars, networking, etc.), standard agreements are created, disputes between companies are resolved (in arbitrations administered by associations), etc. Each of the associations is engaged in the development of trade in a particular group or type of product, which, in fact, is evident from their names. For companies engaged in the export of agricultural products, of course, the most relevant are GAFTA and FOSFA, given the large volume of production of grain and oilseeds in Ukraine. Among agri-food products, the emphasis should be not only on cereals and oilseeds, ie priority should be given not to the raw material structure of exports, but to processed products (sugar, refined oil). To protect the interests of all participants in trade, the Refined Sugar Association (RSA) was established in 1891, which defined international rules and principles of trade in white sugar, and the London Sugar Association (SAL – the Sugar Association of London) for trade of raw sugar [9]. One of the most important activities of RSA and SAL is the development of standard agreements, which are designed to take into account the specifics of a particular type of sugar (white refined or raw sugar) and delivery conditions depending on the region of the world. The main differences between the types of contracts are the bases of supply – CIF, FOB, FCA, etc., as well as the type of sugar. The developed system of standards is the basis of traders, brokers, logistics, as well as quality laboratories and other participants in the sugar market. Today, 80 % of world sugar trade takes place using standard forms of RSA/SAL contracts, and sellers and buyers spend much less time applying them to their relationships. The time-tested system of standard forms of contracts has proven its reliability, but the terms of the contracts have been adjusted in line with trends in international trade.

Regardless of the criteria of ownership of the products and the form of organization of its movement, the structure of LCSM depends on the place of production, ie the place of origin of the material flow. Just as agricultural raw materials (sugar beet) are the raw material for the production of sugar products, the processing facilities are located in the growing zone, the vast majority in the central and western regions of Ukraine. The main logistics operations for sugar exports include: accumulation, loading into vehicles, transportation to the place of unloading, unloading, accumulation of shipments, reloading on board ships (bulk carriers or container vessels), transportation of products by sea to the final consumer.

Reduction of logistics costs is achieved through the introduction of efficient logistics schemes for delivery of sugar from producers to ports, and its transshipment on board ships. Variables that affect the amount of logistics costs are: the distance between the manufacturer and the port of destination, mode of transport (road, rail), the cost of transport services or the cost of operating their own transport, the cost of logistics hub services (if any) for acceptance, accumulation and transshipment of products, the cost of ship freight and current allowances for the operation and conduct of ships in ports [10].

The structural construction of LCSM in sugar export has the following scheme: sugar production – storage in warehouses of factories – transportation to border crossings – border crossing by road or rail – transshipment on board ships (in case of border crossing by sea). The accumulation of sugar, in contrast to vegetable oils, is carried out only in the warehouses of producers, because specialized sugar terminals in ports (for example, as in the logistics chain of the oil market) are not built.

Thus, the export logistics system can be represented as a number of subsystems: subsystems of accumulation of products in places of production, transport and logistics subsystem, which ensures the movement of material flow from its point of origin to the port, subsystems of unloading and accumulation of shipments of cargo. located within the port, the transport and logistics subsystem to ensure maritime transport to the destination of cargo. Warehouses of sugar enterprises are intended for acceptance from production shops and third-party organizations of sugar, its storage and shipment. These compounds act as a

subsystem of accumulation. In Ukraine, the bulk of sugar is stored in warehouses of sugar factories and wholesale trade, the equipment of which is morally and physically obsolete. World experience shows that in developed countries up to 80 % of sugar is stored in its producers. In the world, tower storage is preferred. Sugar storage technology in tower ventilation with active ventilation is widely used in the United States and Europe. Given the modern world requirements for the quality of sugar, the implementation of projects for the construction of modern storage facilities, taking into account the latest technical, technological, operational and economic standards, becomes a priority.

The existing export LCSM of Ukraine is not efficient enough due to the lack of storage and marketing of products (logistics hub). In our opinion, the integration of an efficient link in the form of a sugar terminal (hub) in the structure of the sugar market export chain will significantly strengthen its competitiveness and allow to gradually build an effective sales channel and increase export flows.

The critically unsatisfactory state of logistics and infrastructure support of the sugar market hinders its integration into the world system of trade and economic relations. This exacerbates the destructive effects on the process of increasing the export capacity of the domestic sugar market, which is manifested in difficult access to the foreign market, especially small producers, the formation of opaque mechanisms for exporting sugar products, the development of redundant intermediaries in cross-border supply chain special attention is given to risks of deterioration of qualitative properties of sugar and its spoilage, increasing the share of transaction costs of the various links in the logistics chain, the intensification of price speculation in the market, the emergence of difficulties in monitoring the quality and safety of consumer properties of sugar. The storage capacity of production entities is limited, which increases the risks of premature spoilage of sugar, makes it difficult to guarantee ergonomic storage conditions and encourages premature sale of products to retailers in the initial periods of the marketing year at a price that is less profitable. The level of involvement in the export-oriented logistics and sales processes in the sugar market of railway and water transport infrastructure is insufficient. River freight shipping is practically underdeveloped in Ukraine. While the efficiency of port and maritime infrastructure is limited by a high level of corruption, outdated equipment for customs clearance and cargo control, low capacity of products, excessively high rates of port dues. The problematic aspect is the insufficient development of access road and railway infrastructure to seaports, which creates an additional load of freight traffic on the adjacent socio-economic infrastructure.

World practice demonstrates two main ways for the coordinated and consolidated development of complementary assets in maritime freight transport. The first way is that shipping companies through direct investment take over the organization and provision of port terminals, logistics, provide access to inland areas outside the port, establishing networking and strong cooperation with companies from different sectors of the economy. For example, the Danish company APM-Maersk and the Chinese COSCO Container, which are among the top 20 companies in the list of TOP-100 container lines, own port terminals around the world, manage highly differentiated, including production, assets [11]. Another way is that seaports interested in the efficient use of their non-mobile assets are transformed into multifunctional nodes in global supply chains, creating value-added industrial zones. Global port operators such as Hutchinson Port Holdings, Dubai Ports International, Euroports and others now manage the terminal infrastructure in almost every major port. Cost optimization, the search for economies of scale based on integrated logistics, are forcing ports to establish stronger economic, financial and transport links on land. In many cases, private terminal operators are moving in the direction of direct management of land transport infrastructure, land logistics, professional support (accounting and legal) of their business clients.

Euroports, one of the largest terminal operators in Europe, handles up to 60 million tons of general, bulk, container cargo annually, and operates a network of 26 port terminals in strategically important points in Europe and Asia. In connection with the liberalization of the European sugar market (abolition of domestic and export quotas for sugar) to justify the expected growth of sugar exports and satisfy its customers, the company has increased investment in expanding the capacity of its specialized sugar handling terminals in Antwerp (Belgium) and Le Havre (France). As for the eastern countries of the European Union, the first terminal for transshipment of sugar in the port of Gdansk was put into operation by the Polish national sugar company Krajowa Spółka Cukrowa (KSC S.A.). The modern infrastructure will allow to export to new markets in Asia and Africa by sea at least 300 thousand tons of sugar per year, as well as to refuse to rent warehouses from third-party owners, which will significantly reduce the company's costs [13].

As for cane sugar-producing countries, a significant part of exports is also made through the use of specialized terminals, despite the fact that raw cane sugar is much easier to transport. As the largest exporter of raw sugar in the world is Brazil, the largest export is shipped from the ports of this country. The largest port in Brazil and Latin America – Santos, in the city of Sao Paulo has several specialized sugar terminals,

which allows you to export both numerous container lines and dry cargo boats, its sugar transshipment - about 20 million tons [14].

A specific and interesting example is Australia's logistics infrastructure, where STL (Sugar Terminal Limited), which was established in 1960 to reform the sugar industry, plays a key role. It was then that six sugar shipment terminals were built, handling 90 % of Australia's raw sugar exports. Ownership of STL shares is limited to the main links in the logistics chain (cane manufacturers and processing plants) [15].

Thus, one of the main elements of the export logistics infrastructure of the sugar market, the most developed in the world are freight terminals, table 3.

Table 3

Modern world terminals for sugar export

№ n / a	Port (Terminal)	Characteristics	Owner
1	Antwerp Terminal, Belgium	The terminal is available for Panamax vessels, specializes in working with edible white sugar (storage, processing and packaging), has an accredited laboratory for sugar quality control Wharf length 400 m (draft 12.4 m) The capacity of the warehouse is 380 thousand tons Sugar packing lines (big bags and 50 kg bags), automated container loading station, BIBO Capacity – 635 thousand tons / year	Euroports (Manuport Logistics), private
2	Sucre Océane Le Havre Terminal, France	The terminal specializes in storage of bulk sugar, packaging in bags and loading and unloading in containers (containers, big bags, bags of 50 kg) for export and loading into silo trucks for domestic deliveries. With 4 independent silos of 15000 tonnes each, Sucre Océane is the only port terminal operator to offer complete tracking of 4 different sugar grades. 7 thousand TEU/year	Euroports, together with SHGT, is private
3	Rostock, Germany	General cargo terminal	Euroports, private
4	Gdansk, Poland	Warehouse capacity – 50 thousand tons (silo), finished goods warehouse – 8 thousand tons. Capacity – 300 thousand tons/year	Krajowa Spolka Cukrowa (KSC S.A.) state
5	STL (Sugar Terminal Limited), Cairns, Mourilyan, Lucinda, Townsville, Mackay, Bundaberg	Six terminals handle 4,6 million tonnes, or 90 %, of Australian raw sugar, of which 4 million tonnes are in bulk. The storage capacity of the terminals allows to store 2,5 million tons of raw materials at the same time, as well as 0,5 million tons of other bulk substances (granules, gypsum, sand)	STL is a public company owned by more than 5600 farmers and Queensland processing plants, a cooperative
6	Santos, Brazil	Terminals Cosan, Copersucar, Cargill, ADM, COFCO and others (20 million tons – 70 % of sugar exports)	Sugar and TNC producers

* Concluded according to data [12,13,14,15]

Freight transport sugar terminal is a set of facilities, service personnel, technical and technological devices that are organizationally connected and designed to perform logistics operations of acceptance, loading, unloading, storage, sorting, consolidation, disbandment of various consignments of sugar cargoes,

as well as commercial and information services for shippers, consignees, carriers and other logistics intermediaries in inter/multimodal transportation.

As an important part of LCSM, terminals play the role of transshipment hubs, where sugar flows are accumulated, transformed and distributed, as well as act as indicators that reflect the volume of traffic performed by different modes of transport. That is, transport terminals of different capacity and specialization are not only points of accumulation of small consignments, but also acquire the features of large freight distribution centers and supply bases and become the most important link LCSM, creating added value of products and goods moving in space and time.

The activities of sugar terminals are primarily related to freight forwarding operations, and the volume of traffic reflects the capacity of transport services of any country, which ultimately reflects the level of development of its economy. This defines their main mission - the organization of international and domestic transportation with a combination of warehousing and transshipment functions with a set of customs services and support services.

The users of the services of sugar freight transport terminals are not only shippers or consignees, but also mixed transport operators, freight forwarders and other actors in the logistics chain. Within the terminal, business partners gain access to the services of other companies with which they interact in the transportation process, as well as to the services of loading and unloading vehicles, the accumulation and short-term storage of sugar, minor repairs of transport equipment, etc.

In recent years, there have been some transformations in the geographical vector of sugar exports from Ukraine: the number of countries with which Ukraine cooperates is growing, today it is more than three dozen countries. Railway transport still occupies a leading position in terms of freight traffic per tonne-kilometers. The role of transportation, which is organized and carried out through transport terminals, is extremely growing, which is expected to integrate a large number of logistics functions. Terminals interact with carriers, freight forwarders, customers, intermediaries, customs, banks and other counterparties.

The main logistics operations of the sugar terminal can be consolidation and unbundling of sugar consignments with accompanying loading and unloading operations, which normally undergo certain technological cycles. The process cycle can be simplified to speed up the passage of goods through the terminal. Thus, the sugar can be stored for minutes and stored in the warehouse and immediately transhipped to another mode of transport for direct shipment to the consumer, or the batch of sugar can be consolidated or disaggregated in the appropriate zone without intermediate storage.

The level of competitiveness of a freight sugar terminal is ensured by a set of interrelated factors.

The first is the location on the transport network. The terminal gets advantages when located in the lane of the transport corridor, in the port or logistics center. An important condition is the availability of convenient exits to the main roads, which have a margin of traffic carrying capacity. Secondly, the location of the terminal relative to the cargo owners. It is advantageous to place in industrial zones, or in areas with high intensity of economic activity, which is associated with the profile of the terminal. Convenience of local access and moderate congestion of the road network in the area of the terminal are important. Third, the ability to process high-capacity vehicles at the terminal and the speed of the relevant operations, including waiting time.

In addition, competitiveness is ensured by the availability of regular transport services to other terminals, the ability to operate smoothly during peak periods, the availability of backup areas that allow you to increase the capacity of the terminal or create new services.

Thus, freight transport sugar terminals as logistics entities combine cargo processing operations in accordance with customer requirements, ensure the continuity of supply chains in the world market, establish a balanced flow of goods and optimize economic processes.

In these conditions, the most stable and competitive are those companies that have managed to upgrade equipment and have strong ties with enterprises that generate a cargo base. The prospect of developing sugar logistics is also the transportation of sugar for export in containers. And although this practice is already widely used, its dissemination requires additional specialized terminals using container equipment. Recently, the concept of dry port, which is directly related to the development of container traffic, has become increasingly relevant. The container terminal in the port of Chernomorsk in 2017-2018 was practically not engaged in container processing, although in 2012 it handled about 700 thousand units. [16]. Despite the active commissioning of new transshipment facilities (mainly grain and oil), there is a shortage of high-quality modern transshipment facilities, structural imbalance in terms of export cargo and territorial location. The main deficit in terms of export cargo refers to the transshipment of sugar and is estimated at 1-2 million tons. One of the main problems of Ukrainian seaports is the lack of railway

approaches, underdeveloped land transport and logistics infrastructure. Most of the sugar exports (61,6 %) are carried out by rail, and over long distances. In this regard, the development of railway infrastructure and port capacity has been urgently agreed: without the reconstruction of railway approaches, there will be no increase in port capacity.

The country's export sugar potential is determined by the internal balance between production and consumption and international positions in the world sugar market. The status of a world exporter for the country requires a constant presence of its traders in the stock and over-the-counter markets, active operations in the spot and futures markets, the use of financial derivatives in price risk management. The status of a world sugar producer is also determined by objective factors related to the geopolitical and geographical location of the country, access to the world's transport maritime and land arteries, the availability of appropriate infrastructure to serve the functional areas of logistics, and so on. For Ukraine, all the above criteria are quite real and acceptable. Occasional export deliveries do not contribute to the consolidation of world markets, so the main goal for Ukraine's integration is a constant, systematic and purposeful export policy with projected volumes of sugar supplies.

Conclusions and perspectives of further research. In conditions of economic uncertainty, the primary task of the state is to ensure the effective functioning of strategic commodity markets to increase added value and ensure national economic security. The Ukrainian sugar market has a strong natural resource, production, labor and innovation potential for reproductive development, which still remains unrealized. A characteristic feature of this market is the logistical nature of its reproductive development, ie unresolved logistics problems, systemic logistics "gaps" that deepen and produce a number of structural and price imbalances, have a profound destructive impact on the development of the market. The chain approach to sugar market research allows to identify basic logistical "gaps" and to estimate the proportions of redistribution of value added between the links of the market chain. Practice shows that the existing logistics chains of the sugar market are inefficient from the standpoint of realizing the economic interests of market participants and the state. Therefore, there is a need to restructure existing or form new market value chains on the basis of parity interactions of their participants and the active participation of the state in the formation of reproductive logistics of commodity markets.

In the course of the research it was established that the existing export LCSM of Ukraine is insufficiently effective due to the lack of an important link of storage and sale of products (sugar terminal – hub). In our opinion, the integration of an efficient link in the form of a sugar terminal (hub) into the structure of the export chain of the sugar market will significantly strengthen its competitiveness and allow to gradually build an effective sales channel and increase export flows. After analyzing foreign experience in creating sugar hubs in ports, the structural construction of such a terminal is substantiated, which in addition to traditional elements related to stevedoring operations of sugar transshipment and storage, must include representatives of other stakeholders (traders, forwarding companies, customs, quality laboratory) and distribution and logistics center within the 4-PL provider, which will perform the functions of research of the world sugar market, possible sales markets, instantaneous response to price changes in foreign and domestic markets. In addition, distribution and logistics center can take over the functions of transporting sugar from producers to the port, concentration, storage, and distribution to foreign markets. The organizational mechanism of integration of LCSM as interaction of its various links, gives the chance to improve interrelation of its subjects and to change inefficient direction of material and financial flows (deliveries and calculations) for gradual transition to movement of material (export) flow through the distribution and logistics center.

The main tools of state regulation of logistics development of the sugar market of Ukraine should be support for the establishment of logistics centers (hubs) on the basis of public-private partnership, allocation of land for their construction, information and institutional support for market infrastructure development, institutional support for sugar exports through the presence of National Association of Sugar Producers of Ukraine "Ukrsugar" among members of world trade associations (Refined Sugar Association), state support of sugar producers and exporters (in the form of subsidies) to implement the strategy of import substitution and development of foreign markets of production sales.

The scientific novelty of the study is to substantiate the scientific and applied foundations of the formation and regulation of efficient logistics chains of the sugar market based on the development of export chains with the inclusion of a new link in the form of distribution and logistics center that will improve the relationship of different links and change inefficient areas of material and financial flows.

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