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STATE, COMPETITIVENESS AND PROSPECTS OF SUPPLY CHAINS DEVELOPMENT IN UKRAINE IN CONTEXT OF EUROPEAN INTEGRATION ASPIRATIONS

Iryna Popovychenko, Kira Spiridonovsa, Olesya Kirnos «State, competitiveness and prospects of supply chains development in Ukraine in context of european integration aspirations». *The state and peculiarities of the operation of supply chains in Ukraine under the conditions of martial law are considered. The fundamental impact of the Russian Federation's war in Ukraine on the current state of the domestic logistics infrastructure and on the Logistics Performance Index (LPI), the value of which is significantly related to the global competitiveness of the country, is characterized. Based on the results of the research of colleagues from the National University "Lviv Polytechnic" called "Logistics landscape-2022+", in which the authors of this article took an expert part in July-August 2022, presents the author's vision of the key factors that have affected supply chains, their modern state and development, the main characteristics of the current state of supply chains and logistics infrastructure in Ukraine and events that have radically affected their current state over the past almost three years are given. The study of the military operations impacts in Ukraine on the domestic logistics industry and, accordingly, on the competitiveness of supply chains integrated with the international space is characterized. The authors have determined their own vision of priorities in the management of supply chains in modern conditions in Ukraine, based on seven characteristics (criteria) of the supply chain proposed in the*

study "Logistics landscape-2022+". The characteristics of supply chains that according to the authors received the first three advantages are: 1) safety, 2) reliability, 3) flexibility of supply chains. It is emphasized that the mechanisms, tools, methodology, technologies, strategies for managing supply chains in conditions of disruptions / restoration of logistics should be based on digitalization of management of logistics business processes. It is proposed to pay special attention to the introduction of a procedural approach to managing the competitiveness of the logistics business. Conceptually, three interrelated blocks of indicators are proposed, their systematic assessment will allow to monitor and control the progress of operational, management and supporting business processes in supply chains. In the context of Ukraine's European integration steps, the advantages and problematic issues of including Ukrainian logistics routes in the Trans-European Transport Network TEN-T (Trans-European Transport Network) - a network of highways, railways, airports and waterways in the European Union, are considered. The authors hypothetically expressed the opinion that there is a close relationship between the position of Ukraine in the World Competitiveness Ranking and the state of its logistics infrastructure, taking into account the fact that the determining factors of competitiveness according to the results of 2021 were: level of innovations, digitalization, supportive policies and social cohesion. The authors see a retrospective analysis of the cause-and-effect relationships of the pre-war state and functioning of the Ukrainian logistics industry and forecasting its development in the perspective of European integration in post-war times as directions for further research.

Keywords: supply chains; martial law; European integration of Ukraine; factors affecting supply chains; logistics infrastructure; competitiveness.

Ірина Поповиченко, Кіра Спірідінова, Олеся Кірнос. «Стан, конкурентоспроможність та перспективи розвитку ланцюгів постачання в Україні в контексті євроінтеграційних прагнень». Розглянуто стан та особливості функціонування ланцюгів постачання в Україні в умовах воєнного стану. Охарактеризовано принципів вплив війни РФ в Україні на сучасний стан вітчизняної логістичної інфраструктури та на показник Індексу Ефективності Логістики (LPI), значення якого суттєво пов'язане із показником глобальної конкурентоспроможності країни. Спираючись на результати дослідження колег з Національного університету «Львівська політехніка» під назвою «Логістичний ландшафт-2022+», в якому автори статті брали експертну участь у липні-серпні 2022 року, представлено авторське бачення ключових чинників, які впливають на ланцюги постачання, їх сучасний стан і розвиток, наведено основні характеристики теперішнього стану ланцюгів постачання та логістичної інфраструктури в Україні й події, які радикально вплинули на їх сучасний стан за останні майже три роки. Охарактеризовано наслідки впливу воєнних дій в Україні на вітчизняну логістичну галузь та, відповідно, на конкурентоспроможність інтегрованих із міжнародним простором ланцюгів постачання. Авторами визначено власне бачення пріоритетів в управлінні ланцюгами постачання в сучасних умовах в Україні, відштовхуючись від запропонованих у дослідженні «Логістичний ландшафт-2022+» семи характеристик (критеріїв) ланцюга постачання. Характеристиками ланцюгів постачання, що отримали перші три пріоритети на думку авторів є: 1) безпека, 2) надійність, 3) гнучкість ланцюгів постачання. Підкреслено, що механізми, інструменти, методології, технології, стратегії управління ланцюгами постачання в умовах збоїв / відновлення логістики мають базуватися на цифровізації управління логістичними бізнес-процесами. Запропоновано приділяти особливу увагу впровадженню процесного підходу до управління конкурентоспроможністю логістичного бізнесу. Концептуально запропоновано три взаємопов'язаних блоки показників, системна кількісна оцінка яких дозволить моніторити та контролювати хід виконання операційних, управлінських та забезпечуючих бізнес-процесів у ланцюгах постачання. В контексті євроінтеграційних кроків України розглянуто переваги та проблемні питання включення українських логістичних маршрутів до Транс'європейської

транспортної мережі TEN-T (Trans-European Transport Network) — мережі автодоріг, залізниць, аеропортів і водних шляхів у Європейському Союзі. Авторами гіпотетично висловлено думку, що існує тісна залежність між позицією України у Світовому рейтингу конкурентоспроможності та станом її логістичної інфраструктури, зважаючи на те, що визначальними факторами конкурентоспроможності за результатами 2021 року стали: наявність інновацій, цифровізація, підтримуюча політика та соціальна згуртованість. Напрямами подальших досліджень автори бачать ретроспективний аналіз причинно-наслідкових зв'язків довоєнного стану та функціонування логістичної галузі України та прогнозування її розвитку в перспективі євроінтеграції у повоєнні часи.

Ключові слова: ланцюги постачань; воєнний стан; євроінтеграція України; чинники впливу на ланцюги постачання; логістична інфраструктура; конкурентоспроможність.

Ирина Поповиченко, Кира Спиридонова, Олеся Курнос. **«Состояние, конкурентоспособность и перспективы развития цепей поставок в Украине в контексте евроинтеграционных устремлений».** Рассмотрены состояние и особенности функционирования цепей поставок в Украине в условиях военного положения. Охарактеризовано принципиальное влияние войны РФ в Украине на современное состояние отечественной логистической инфраструктуры и на показатель Индекса эффективности логистики (LPI), значение которого существенно связано с показателем глобальной конкурентоспособности страны. Опираясь на результаты исследования коллег из Национального университета «Львовская политехника» под названием «Логистический ландшафт-2022+», в котором авторы статьи принимали экспертное участие в июле-августе 2022 года, представлено авторское видение ключевых факторов, влияющих на цепи поставок, их современное состояние и развитие, приведены основные характеристики нынешнего состояния цепей поставок и логистической инфраструктуры в Украине и события, которые радикально повлияли на их современное состояние за последние три года. Охарактеризованы последствия влияния военных действий в Украине на отечественную логистическую отрасль и, соответственно, на конкурентоспособность интегрированных с международным пространством цепей поставок. Представлено авторское видение приоритетов в управлении цепями поставок в современных условиях в Украине, отталкиваясь от предложенных в исследовании «Логистический ландшафт-2022+» семи характеристик (критериев) цепи поставок. Характеристиками цепей поставок, получившими первые три приоритета, по мнению авторов, являются: 1) безопасность, 2) надежность, 3) гибкость цепей поставок. Подчеркнуто, что механизмы, инструменты, методологии, технологии, стратегии управления цепями поставок в условиях сбоя/восстановления логистики должны базироваться на цифровизации управления логистическими бизнес-процессами. Предложено уделять особое внимание внедрению процессного подхода к управлению конкурентоспособностью логистического бизнеса. Концептуально предложены три взаимосвязанных блока показателей, системная количественная оценка которых позволит мониторить и контролировать ход выполнения операционных, управленческих и обеспечивающих бизнес-процессов в цепях поставок. В контексте евроинтеграционных шагов Украины рассмотрены преимущества и проблемные вопросы включения украинских логистических маршрутов в Транс'європейську транспортну сеть TEN-T (Trans-European Transport Network) — сеть автодорог, железных дорог, аэропортов и водных путей в Европейском Союзе. Авторы гипотетически высказали мнение, что существует тесная зависимость между позицией Украины во Всемирном рейтинге конкурентоспособности и состоянием ее логистической инфраструктуры, учитывая, что определяющими факторами конкурентоспособности по результатам 2021 года стали: наличие инноваций, цифровизация, поддерживающая политика и социальная сплоченность. Направлениями дальнейших исследований авторы видят ретроспективный анализ причинно-

слідствених зв'язей довоєнного стану та функціонування логістичної галузі України і прогнозування її розвитку в перспективі євроінтеграції в післявоєнний період.

Ключевые слова: ланцюги постачання; воєнне становище; євроінтеграція України; фактори впливу на ланцюги постачання; логістична інфраструктура; конкурентоспроможність.

Introduction. Full-scale war aggression of Russian Federation against our country that brutally started on 24 February, 2022, led to great destruction of logistics, industrial and civil infrastructure and numerous human victims.

Efficiency of logistics in any country is determined with six universal internationally accepted indices and criteria that are basis for estimation of LPI - Logistics Performance Index using the World Bank methods. Among them: efficiency of customs and border processing; quality of logistics infrastructure; simple organization of international transportation at competitive prices; quality and competence of logistics service provided by market operators; cargo tracking; promptness of delivery. LPI is assessed every two years. The last time the World bank estimated this index in 2018 due to impact of Covid-19 pandemic. Ukraine took 69th place among 167 countries, Russia took 85th place and Kazakhstan 77th [1]. It is obvious that LPI indices for Ukraine would be much worse if calculated in 2020 due to the war in our country. However more than 10 months of the full-scale war showed that Ukrainian economy and logistics branch as its important element continue functioning despite these hard conditions. Therefore, after Ukrainian victory in post-war period in order to enter to European Unity Ukraine has not only to restore, but also modernise its economy and logistics sector particularly through implementing modern business-models, organizational and management approaches, investment projects.

Analysis of recent research and publications. In research conducted by I.P. Marchuk in pre-war period (2021) based on statistical analysis he proved that logistics is a significant component of economic shift and through LPI index showed close connection of logistics efficiency with basic economic

indices (gross domestic product, export, import, direct foreign investment) and economic indices (global competitiveness, conducting business, global innovation index, index of market potential) that give foreign partners opportunity to assess conditions of conducting business in the country, its implementation in international trade and participating in global delivery chains. We agree with the author that logistics plays an important role in providing economic prosperity and can be catalyst for economic development [2].

Ukrainian scientists and researchers of logistics business and logistics sphere N. V. Chornopyska and N.V. Hayvanovych pay special attention to such criteria as "logistics competitiveness" [3]. Based on the analysis of Polish and German experience these authors concentrate on improvement of "logistics competitiveness" criteria that is significantly lower than the average European level. Thus, professionalism of companies (logistics providers) and specific logisticians is the key to successful future development of Ukrainian logistic potential.

A. Dlihach, a co-founder of Center of Economic Recovery, CEO of Advanter Group (strategic consulting and market analytics), theorist and practitioner, who participates in number of important projects connected with development of Ukrainian logistics sphere, points out that in pre-war years Ukraine slightly used its advantageous logistics location on the map of Eurasian space. He reminds the experience of countries restoring after the war: it was development of logistics infrastructure that became a driver of the country's restoring and further economic growth [4]. Assessment methodology of using logistics infrastructure potential is considered in articles of M. Hryhorak, L. Kostiuchenko, O. Harmash. The authors used integrated approach to understanding of logistics

infrastructure potential in the form of three dimensional model with the coordinate system "resources – abilities – competence". Resources allow to transform opportunities into abilities. In its turn abilities are transformed into competences through their reveal and development using education. Potential assessment is offered to make in the context of three elements providing directions of formation and using objects of logistics infrastructure: resources (assessment of material and energy consumption), organizational (effectiveness of management), and functional.

Therefore, condition and potential of logistics infrastructure, level of specialists' logistics competence, quality of management of integrated over-arching business processes in supply chains are guarantee of efficient cooperation of producers, suppliers, trade structures, consumers both within and outside the country while implementing European integration processes and full integration of Ukraine in international trade. Characteristics above are organic components of logistics business as an important element of competitiveness of the country's economy and demand constant attention of researchers and practitioners in difficult conditions of martial law.

The purpose of the research. The purpose of the article to characterize the current state of supply chains in Ukraine, problems of domestic logistics and justify ways of their solving for prospects of successful European integration of Ukraine.

The main part of the research. In summer of 2022 (July – August) research team of marketing and logistics department of Lviv Polytechnic National University conducted research "Logistics Landscape – 2022+" where the authors of this article took an expert part.

The purpose of the research was to show changes of logistics landscape under influence of the war of Russian Federation against Ukraine. Logistics landscape was considered as combination of factors

affecting supply chains, its current state and development.

The research was conducted in two stages:

1) Identifying key factors, characteristics, events, results while changing logistics landscape of Ukraine under influence of war actions;

2) Quantitative evaluation of force and significance of identified factors and events on changing Ukrainian logistics landscape in war conditions;

The author approach and opinion, considered in the results of the mentioned research, is given below.

The main factors that impact supply chains, its modern condition and development are:

1. Architecture and condition of Ukrainian logistics infrastructure before the war.

2. State of logistics processes digitalization.

3. Competence of logistics operators.

Three major characteristics of modern logistics landscape:

1. Rapid development of e-commerce using alternative, the safest in war conditions transport routs.

2. Flexibility of logistics decisions depending on theatre of war operations.

3. Response speed on war challenges along with ability to predict safe logistics corridors.

Events that have significantly affected Ukraine's modern logistics landscape for last three years:

1. Covid-19 pandemic and online transformation of logistics flows, processes, systems.

2. Full-scale war of Russian Federation against Ukraine – destruction of cities, villages, airports, railway stations, etc.

3. Economic decline due to the war (temporary occupation of our territories, fuel shortage and sharp rise in its prices, grain crises because of seaports mining for defending of regions located on the coasts of the Azov and the Black seas.

Direct consequences of war action influence on Ukraine's logistics branch and as a result competitiveness of integrated with international space supply chains are:

1. High risks for drivers' and expeditors' lives while delivering of loads to the regions of active military operations and frontline zone (risk/benefit ratio).
2. Destruction of warehouse infrastructure.
3. Destruction of airports, motorways and railroad infrastructure.
4. Shortage of drivers, lorries due to their involvement to transportation of humanitarian aid, volunteer activities, recruitment to Armed Forces of Ukraine specialists in logistics sphere.

5. Total decline of business activity and state enterprises, especially during first war months, lack of orders.

However, gradual restoring of logistics infrastructure on liberated territories and increasing of business activity is the positive trend.

As a result of the research and processing of experts' assessment priorities in management of supply chains in modern conditions were ranged (1st range – 1st priority, 2de range – 2nd priority, etc.). Data as to the results of experts' opinions processing by organisers of the research and author's assessment are presented in table 1.

Table 1 – Priorities in management of supply chains in modern Ukrainian conditions (using the results of the survey of representative expert group)

Characteristic of supply chain (SC)	Range (priority)		
	Average	Median	Author assessment
Resilience SC	3,72	4	4
Visibility&Transparency SC	5,92	6	6
Efficiency&Agility SC	3,76	4	5
Sustainability SC	5,28	6	7
Flexible&Elastic SC	3,56	3	3
Reliability SC	2,36	2	2
Security SC	2,65	2	1

As we can see, the first three places take security, reliability and flexibility of supply chains.

Mechanism, tools, methodology, techniques and strategies of supply chains management in conditions of failure / restoring of logistics should be based on implementation of distant technologies of supply chains management, i.e. digitalization of logistics processes. Computer programs of distant access to database must be placed in the cloud on reliable servers. Only highly organised Electronic data interchange (EDI) can minimize failures of logistics, including war logistics. Companies, that mastered such distant technologies in Covid pandemic (i.e. well-known platforms such as Office 365 or specialized products combining chains

"manager – warehouse – accounting – carrier".

An important role in the effective functioning of international supply chains is played by innovations in the customs clearance of goods, related to import and export operations, the procedure of customs authorities, legal regulation of the import of certain goods, etc. Ukrainian customs procedures are entering a new phase, which will be based on European rules. Currently, Ukraine has fulfilled more than 80% of its obligations to the EU in the field of customs law. From October 1, 2022, the provisions of the Convention on the Joint Transit Procedure entered into force for Ukraine, and the possibility of international movement of goods with 35 other participating countries under one transit document was opened for

business. Also, the Customs Tariff of Ukraine has been brought into line with updated international standards.

The Verkhovna Rada of Ukraine supported the government's initiative to bring the Ukrainian product nomenclature in line with the modern international one and adopted the law dated 10.19.2022 No. 2697-IX "On the Customs Tariff of Ukraine", which comes into force on January 1, 2023 [6].

Thus, the changes in the customs legislation mostly relate to the cancellation or documentary simplification of import registration when imported into Ukraine, but also the promotion of exports, in the current conditions, is a priority direction for our country.

Special attention should be paid to management of logistics business competitiveness by means of business processes optimization. Using processing approach provides transparency and efficiency of logistics functions and operations performance, optimization of product / service value chain.

Monitoring of business processes in supply chains should be performed while using adequate system of indicators, grouped into three interconnected blocks:

- The first block contains indices characterising efficiency of operation activity management, that is performing of core business processes, rationality of operational expenses in supply chain, efficiency of using fixed assets and human resources, modern technology and equipment;

- Indices of the second block may allow to determine efficiency of business processes of financial resources management by participants of supply chain, particularly working capital while assessing solvency, level of independence from external financial resources, prospects of sustainable development of logistics system in general;

- Indices of the third group characterize efficiency of business processes of sales and promotion, service, etc.

On the bases of the analysis we are going to make assumptions and forecast of Ukrainian future logistics landscape.

It is obvious that after Ukrainian victory as a candidate to European Union and seeking to become a member of European Union, strategic prospects of future "Logistics landscape 2022+" should be directed to integration of Ukrainian logistics infrastructure to European transport space, namely Trans-European Transport Network that is a network of highways, railway stations, airports and water infrastructure in European Union that is going to connect Europe from west to east and north to south.

Mechanism of integration of Ukraine to transport network TEN-T was determined by plans of investment in trans-European transport network developed by European Commission and the World Bank. However, TEN-T maps at the end of 2018 included four port projects (in Mykolaiv, Kherson, Southern, Chornomorsk), development of river navigation through dredging works in the riverbed of the Dnipro river (Kaniv, Kremenchuk, Dnipro, Zaporizhzhia, Nova Kakhovka), modernization of four airports. Unfortunately, at present these cities are attacked by Russian missiles, they are located in the frontline area or are occupied, logistics and civil infrastructure is suffering from devastating attacks.

However, we would like to hope that profitable geographical transition position of Ukraine as well as fulfilling conditions of gaining the candidate to European Union status will become a strong argument for our Western partners after finishing this devastating war. In this case plan of route development TEN-T will become actual again (it was developed until 2030). However, amount of necessary investment may increase up to level of "Marshall plan" after World War 2.

It is necessary to mention that this July after starting the "grain corridor" through Ukrainian ports European Union included Ukrainian logistics routes to trans-European transport network (TEN-T) [7]. EU's decision is

the final step in the integrational process between Ukraine and European Union favouring implementation of the initiative «Path of solidarity» as to export of Ukrainian agricultural product and delivery of humanitarian aid to Ukraine.

European Union continued North-Baltic corridor through Lviv and Kyiv to Mariupol. Baltic-Black- Aegean Sea Corridor continued through Lviv, Chernivtsi (Romania, Moldova) to Odessa. Corridors the Baltic Sea – the Adriatic Sea and the Rhine – the Danube will be through Odessa.

Including logistics routes to TEN-T network allows to solve such problems as:

- removing obstacles while fulfilling logistics operations;
- attracting European investment to modernize transport infrastructure in case of developing attractive investment projects;
- gaining access to European aid concerning development of Ukrainian part of TEN-T network;
- developing multimodal transportation
- reducing logistics expenses;
- increasing quality and reducing risks while transporting goods.

Besides, European Commission excluded Russian and Belarusian routes from TEN-T network and decreased status of routes on the territory of European Union at the junction with aggressor countries.

The steps above will become an important component of our country's competitiveness increasing measured by Global Competitiveness Report.

Conclusions. If we consider the index of global competitiveness as an integral indicator of a country's success in the world economy, according to Ukrinform data, in 2021 [8] the ranking in terms of competitiveness was led by European countries: in first place is Switzerland, the second place takes Sweden, in third place is Denmark, in fourth place - the Netherlands.

Singapore, which was first in 2019 and 2020, is ranked fifth.

The World Competitiveness Rankings-2021 (World Competitiveness Rankings-2021) presents data from 64 countries of the world, according to which Ukraine took the 54th place. For comparison, in 2017, Ukraine was in the 60th position.

The determining factors of competitiveness were: availability of innovations, digitalization, supportive policy and social cohesion. Regarding the digitization of all spheres of social and economic life in the country, we should note the significant progress of Ukraine over the past 2-3 years and a confident orientation towards the development of this direction now and in the future. Today, the improvement of supply chain management through the safe digitalization of business processes in logistics systems and the modernization of EDI (electronic data interchange) is a guarantee not only of effective maintenance of the country's economy, but also an essential component of victory in our war with the aggressor. Social cohesion has now become a natural means of survival and resistance to the aggressor for Ukrainians. The post-war reconstruction of Ukraine will require quite a few innovative solutions related to the recycling of structures of destroyed buildings and structures, the revival of regions, cities, towns, and enterprises, for which it is obvious that restoration, and in many respects the creation of a new logistics infrastructure.

Further directions of research on the topic of this article are the analysis of cause-and-effect relationships of the functioning and development of the logistics industry of Ukraine since the independence of our state and the substantiation of the conditions and factors for the restoration of the logistics potential of Ukraine in post-war times.

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