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Features of the functioning of express delivery market in Ukraine during the war

Abstract. The express delivery market is one of the most dynamic sectors of the economy, without which the effective functioning of business, e-commerce, retail, etc., is impossible. Under the influence of external factors, such as the military invasion of the territory of Ukraine by the Russian Federation in 2022, the parameters of the activity of express delivery market operators have changed, which actualises the issues of analysing the performance indicators of the express delivery market and studying changes in consumer behaviour in the field of express delivery services. The purpose of the study is to present the results of a comprehensive investigation of the features of transformation of the Ukrainian express delivery market in conditions of instability. To achieve the research goal, a set of scientific methods was used: system, statistical analysis, and index method. To identify changes in the structure of needs of consumers of express delivery services in the context of disturbances, a marketing study and an express survey of end users were conducted. The dynamics of the development of the Ukrainian express delivery market during a full-scale war is studied in terms of identifying the competitive positions of enterprises in the segment and distributing “market power” among the participants of the market under study. The enterprises that form the “core” of the market and their role in shaping the intensity of competition in the express delivery market in Ukraine are identified. The results of a marketing study on changes in consumer purchasing behaviour during the war in Ukraine are presented and the profile of the target audience of services before and during the war is established. The high adaptive capacity of enterprises providing express delivery services to conditions of instability in terms of restoring operational activities and adjusting the parameters of logistics activities in accordance with changes in the needs of consumers was noted. Consumer needs, business digitalisation, and life safety remain the determining factors for the development of the sector under study in the context of disturbances. The results can be applied in practice by the heads of the marketing and logistics department, the planning and economic department of enterprises in the express cargo transportation sector, and interested groups of stakeholders in the express cargo delivery market

Keywords: express transportation; economic environment; concentration; marketing research; end users

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INTRODUCTION

The express cargo delivery market plays an important role in the modern economy and is necessary for the efficient operation of many industries. This sector is one of the most dynamic and essential components of economic development. However, a full-scale invasion of the territory of Ukraine poses significant challenges for the postal and logistics sector. Military operations and possible threats of missile strikes impose restrictions on the work of logistics companies. The Russian invasion caused global changes around the world. One of them is the transformation of the logistics sector and the distribution of supply chains. This became the basis for increased competition in the express cargo delivery market, complication of logistics of export-import operations, decrease in the efficiency of logistics supply chains of express cargo in territorial markets close to the war zone and uncontrolled territories. Consequently, it actualises the need to investigate the severity of competition in the express cargo delivery market in Ukraine during riots. The relevance of the study of individual needs of consumers of express services through marketing research is caused by the need to adapt companies to changes in the market conditions for express cargo delivery and optimisation of business processes with prioritisation of conditions for ensuring the safety of enterprises in this market.

Study of the problems of the express cargo delivery market is the field of research interests of many researchers around the world. In particular, A. Gautam & P. Pareek (2022) indicate that the demand for express delivery of goods through e-commerce channels has increased rapidly since the 2000s, and this trend has increased significantly due to the ongoing coronavirus pandemic. Given the situation, the requirements for predicting demand for express delivery through e-commerce channels and evaluating applied logistics solutions are expanding. However, they do not consider alternative express cargo delivery routes and their specifics, which customers encounter when placing orders through e-commerce channels.

Given the relevance of applying the principles of sustainable development, and one of its main components – environmental development, for express cargo delivery companies that consider operational cycles from the moment of identifying the demand for express cargo delivery to the stage of recycling packaging waste after the consumption of services, the study by H. Duan *et al.* (2019), who investigated the outlined issues in China, is of value. Authors D. Lazarević *et al.* (2020) assessed the demand for round-the-clock courier delivery services in Belgrade, the so-called “post express nonstop”, and predicted potential demand based on the bass diffusion model, considering the environmental factor.

The topics of innovative solutions in the development of “last mile” delivery in the e-commerce market in cities from the standpoint of various stakeholders are outlined in the paper by M. Kiba-Janiak *et al.* (2021). The researchers analyse new technological and organisational solutions,

such as autonomous vehicles, crowd delivery, parcel storage rooms, and focus mainly on analysing the behaviour of electronic customers.

I. Cárdenas *et al.* (2017) analysed the spatial distribution of e-commerce supplies in Belgium. Using comparative analysis technologies, the authors compared the consumption of e-commerce services per capita in rural areas with the country’s cities.

Marketing technologies for market segmentation were used A. Griva *et al.* (2022). These researchers analysed the features and ways to improve the consumer segmentation system using e-commerce data on courier delivery in Greece. Customer segmentation was performed based on order information and geographical location to identify consumer segments with similar characteristics.

O. Fedirko *et al.* (2021) analysed the nature of socio-economic effects of e-commerce in Ukraine, Poland, and Austria using the Cobb-Douglas mathematical model and Markov chain methodology. The study showed a significant positive impact of e-commerce on employment and gross domestic product in three countries.

This allowed the authors of this paper to form the goal of the study – to present the results of a comprehensive investigation of the specifics of transforming the functioning of the Ukrainian express cargo delivery market in conditions of disturbances. The objectives of this study were:

- conduct research on the express cargo delivery market and determine the concentration levels of the express cargo delivery market based on a quantitative assessment of competition levels in the industry;
- identify changes in the behaviour of the consumer of express services under the influence of war based on a marketing study of consumer behaviour in the market of express cargo delivery in war conditions;
- develop directions for adapting the activities of express cargo delivery network operators to disturbances in order to ensure the safety of functioning and restore the operational efficiency of the defined networks.

LITERATURE REVIEW

The dynamics of the development of the logistics services market and its segment of express cargo delivery under the influence of various dominant factors (in the context of the financial crises of 2008-2009, digitalisation of the economy, the impact of the pandemic, etc.) were considered by a significant number of Ukrainian researchers.

Authors O. Shandrivska *et al.* (2014) structured express cargo delivery services in Ukraine, considering the offer of services in a highly competitive environment. Scientific contribution of O. Shandrivska *et al.* (2015) was supplemented by an analysis of the segment of express cargo delivery in Ukraine in stable operating conditions, according to which the authors focused on identifying the problems of segment development with further development of recommendations for improving the activities of enterprises, in particular, on the use of progressive forms of customer

service and proposed technical, technological, organisational, and economic areas for ensuring the improvement of the activities of express cargo delivery service providers.

I. Romanych (2018) studied such a criterion for the quality of services of a postal and logistics company as the speed of delivery of postal items in terms of assessing the attitude of consumers to it. The results were the identification of parameters of the quality of the postal and logistics company's service that are not related to the speed of delivery. Forms for calculating and accounting for the quality parameters of service provision by a postal and logistics company are constructed. Current trends and innovative technologies for the development of postal and logistics services in Ukraine are outlined. The researcher also presented a conceptual model for optimising the operational activities of a postal and logistics company, in which he provided a comparative description of socio-economic and e-commerce factors affecting the operational activities of a postal and logistics company (Romanych, 2019).

O. Prokopenko *et al.* (2016) investigated modern internet platforms for providing logistics services in Poland and Ukraine and carried out a comparative analysis of the features of e-commerce in these countries. As a result of the analysis, such advantages of the development of e-commerce as the growth of sales of goods via the internet due to increased consumer confidence in e-commerce; saving money and time by transaction participants; accelerating the exchange of information due to the logistics information system, which also allows minimising inventory, increasing capital turnover, and reducing logistics costs of producers were identified. The most popular internet platforms have been installed in Poland (Allegro) and Ukraine (Aukro). It is argued that the development of modern online trading platforms, which are a promising alternative to traditional logistics tools, is a driver for the development of the express cargo delivery sector in the analysed countries.

Substantiation of the conditions for the emergence of a synergistic effect in the supply chains of consumer goods of special dimensions was considered by L. Yakymyshyn (2017). In the paper, the researcher claims that new opportunities for the development of the logistics services market sectors are provided by IT technologies that support innovative solutions provided by technical and organisational systems, which include: electronic data interchange (EDI), electronic systems for monitoring and tracking moving stock (GPS) and supplies (tracking and control), automatic identification of goods, integrated information systems, etc. In terms of cargo handling, flowlogistics, cross-docking, and e-commerce systems are offered for use. The researcher concludes that the primary importance in the process of creating or improving an existing supply chain should be assigned to the identification of consumer needs and features of the market that serves a particular supply chain. It is recommended to expand the cooperation of consumer goods producers with major logistics operators, since the

supply chain formed in this way gains competitive advantages in establishing partnerships between supply chain participants (Yakymyshyn, 2017).

Features of logistics management of the warehouse system of an express cargo delivery enterprise were studied by N. Ptytsia & K. Kovtsur (2022). The researchers argue that the mechanism of operation of express delivery ensures uninterrupted logistics services to consumers, which in modern market conditions should be ensured by the efficient operation of the warehouse at express delivery enterprises, the working conditions of which are not fully investigated. As suggestions, the authors proposed parameters of the warehouse operation that consider the specifics of the logistics management of the express cargo delivery system.

O. Taranenko (2020) investigated trends in the development of the express delivery market in Ukraine. The subject of the study was courier and postal services that provide express delivery services. It is established that despite the negative trends in the Ukrainian economy, the e-commerce market continues to develop rapidly as an alternative to self-employment of the population in quarantine. Based on the application of the five forces competition model by M. Porter (1985), the main threats in the transportation market are analysed.

Authors L. Hlinenko & Y. Daynovskyy (2018) and Y. Petrunya & T. Pasichnyk (2018) examined e-commerce business models in Ukraine and the impact of e-commerce on changing traditional supply chains. E-commerce is seen by these authors as the driving force behind retail. Consequently, the effect of complementary development of adjacent and tangential industries is fully consistent with the concept of complementary development of the territories adjacent to the transport system developed by Y. Krykavskyy *et al.* (2020).

A. Dieke *et al.* (2021) investigated the changing needs of consumers of postal services and evaluated the provisions for improving the quality of postal services in the EU (Directive of the European Parliament and of the Council 97/67/EC, 1997), considering the digitalisation of business (expansion of broadband, digital skills of end users and enterprises; readiness of government agencies to implement e-government applications). Based on the results of the analysis, recommendations are given to increase the value of postal services for the end user by ensuring the universality of postal services, improving the quality level, regulating prices, competitive conditions, and access to the postal services market.

O.Ya. Kobylukh & O.B. Hirna (2022) investigated the main trends in the express cargo delivery market and, in order to harmonise the activities of express delivery market operators, developed a number of recommendations for the successful functioning of the sector's enterprises in crisis situations.

Despite the diversity of the conducted research, the issues of specific transformation of the functioning of the Ukrainian express cargo delivery market in conditions of

disturbances, isolation of dominant factors influencing the development of the express cargo delivery market in war conditions, identification of the main competitive advantages against the background of increased competition and the dominance of counterparties in the core of the market under study remain insufficiently covered; identification of actual requirements of consumers of express cargo delivery services based on primary marketing information.

MATERIALS AND METHODS

To achieve the purpose, a set of scientific methods that ensured the conceptual integrity of the study was used, in particular: systematic – to highlight the general principles of the functioning of the Ukrainian market for express cargo delivery; comparative and statistical analysis of the results of enterprises' activities by type of economic activity in accordance with the classification of types of economic activity (Order of the State Consumer Standard of Ukraine No. 457, 2010): sections H "Transport, warehousing, postal and courier activities", in particular, sections H 49.2, H 49.4; H 49.5; H 50.2; H 50.4; H 51.2; H 52.1; H 52.2; H 53.2 – to investigate the dynamics of development of enterprises of the Ukrainian express cargo delivery market; index method – to assess the concentration levels of the Ukrainian express cargo delivery market.

To determine the market share of express cargo delivery, which is occupied by a separate enterprise, the equation was applied:

$$S_i = \frac{D_i}{M}, \quad (1)$$

where D_i – net income from sales of products by a separate enterprise, thous. UAH.; M – capacity of the Ukrainian express cargo delivery market, thous. UAH.

To assess the level of concentration of the Ukrainian express cargo delivery market, the Herfindahl-Hirschman index was used, which is determined by the equation:

$$HHI = \sum_{k=1}^n p_k^2, \quad (2)$$

where p_k^2 – market share of the k-th enterprise in the express cargo delivery market, %; n – number of firms for which the indicator is calculated, units; $k = 1, \dots, n$.

According to the results of the assessment, the market for express cargo delivery is considered low-concentrated if the $HHI < 0.1$. If the $HHI < 0.18$, then the market under study is moderately concentrated. If the HHI index values are > 0.18 – the express cargo delivery market will be considered highly concentrated. An alternative to the Herfindahl-Hirschmann index is the market concentration coefficient, which is calculated using the equation:

$$IPK = \sum_{k=1}^n p_k. \quad (3)$$

If the value of this coefficient approaches 100%, the express cargo delivery market will be characterised by a high level of monopolisation, and if the index is close to zero, then the express cargo delivery market will be considered competitive.

The paper calculates the market concentration coefficient for Nova Poshta LLC, Ukrposhta JSC, and Meest Express Trading House LLC.

The Lind index was calculated to determine the number of enterprises that dominate the express cargo delivery market (the boundaries of the oligopoly). This index is used to identify leading companies in the express cargo delivery market and track the emergence of monopolists. The Lind index for two businesses is determined by the equation:

$$IL2 = \frac{p_1}{p_2} \cdot 100\%, \quad (4)$$

where $IL2$ – Lind index for two businesses in the sector; p_1 – market share of the first enterprise, %; p_2 – market share of the second enterprise, %.

The Lind index for three enterprises in the express cargo delivery sector is determined by the equation:

$$IL3 = \frac{1}{2} \cdot \left(\frac{s_1}{\frac{p_2+p_3}{2}} + \frac{p_1+p_2}{p_3} \right). \quad (5)$$

The Lind index for four enterprises is determined by the equation:

$$IL4 = \frac{1}{3} \cdot \left(\frac{s_1}{\frac{p_2+p_3+p_4}{3}} + \frac{p_1+p_2}{\frac{p_3+p_4}{2}} + \frac{p_1+p_2+p_3}{p_4} \right). \quad (6)$$

The index is calculated to the value $L_{m+1} > L_m$, which is called "violation of the continuity of the indicator L ", that is, before the calculation of a small share of the enterprise in the express delivery market.

The Gini coefficient is calculated to determine the degree of uneven income of enterprises with express cargo delivery, which reflects the degree of deviation of the value of the actual distribution of shares of experimental enterprises in the express cargo delivery sector from the value of the uniformity of the distribution of shares. As the values of the Gini coefficient approach unity, the distribution of income of enterprises in the express cargo delivery sector becomes more uneven.

The Gini coefficient is determined by the equation:

$$G = 1 - 2X \sum_{i=1}^n x_i X_{cum} y_i + \sum_{i=1}^n x_i X y_i, \quad (7)$$

where x_i – share of the i-th enterprise in their total number; y_i – share of the i-th enterprise's revenue in the structure of the express cargo delivery market capacity.

To identify the change in the structure of needs of consumers of express delivery services in the context of disturbances and identify the profile of the target consumer of express delivery services, the following methods were used: an express survey of 135 respondents in four regions of Ukraine in the period from September 4 to October 7, 2022, based on a form created using Google Forms and

shared on social media such as Instagram, Telegram, and Viber. The geographical breadth of the study consisted of all regions of the country, of which the largest number of participants was from the Western region (70%), the rest from the Central region (20%), the Southern region (5%), and the Northern region (5%).

The main questions asked to respondents included the following:

1. How often did you use express delivery services before the full-scale invasion?
2. Which express delivery service operator did you prefer before the full-scale invasion?
3. For what needs did you use express delivery services before the full-scale invasion?
4. Did you use express delivery services in the first days after the full-scale invasion?

5. Which express delivery service operator did you prefer after the full-scale invasion?

6. How often did you start using express delivery services after three months of full-scale intrusion?

7. What needs do you use express delivery services for after a semi-large-scale invasion?

Marketing research was conducted in accordance with the rules of the Helsinki Declaration (2013). During the survey, the authors observed all ethical standards when working with people. The survey was conducted on the basis of anonymity and confidentiality, so that the results of the survey are used in a generalised form, and with the consent of the person concerned in the processing of personal data. An integral component of the development of a marketing survey is the development of marketing research hypotheses, which are presented in Table 1.

Table 1. Goals, questions, and hypotheses of marketing research of the needs of consumers of express cargo delivery services in war conditions

Study objectives	Hypothesis
1. Identify the features of the transformation of demand for express cargo delivery services, investigate the structure of shipments, and determine which operator of express delivery services consumers preferred before and during the invasion (during the “shock” and after it).	1. The use of such methods of collecting primary information as surveys and monitoring the actions and behaviour of consumers of express cargo delivery should reveal the specifics of consumer preferences in terms of identifying needs that are met with express delivery, the structure of orders, and the characteristics of regular consumers before and during the war. In addition, it will help identify the parameters of the target profile of the consumer of express cargo delivery services before the war and change their behaviour during the “shock” from the war and after it.
2. Identify the profile of the target audience (observation and survey at the points of delivery of express orders to consumers) before and after the war.	2. The experience of studying the specifics of the express cargo delivery market, the analysis of the literature on the research topic and the results of marketing research on the needs of individual consumers of express cargo delivery services and in-depth interviews with the heads of express cargo delivery departments allowed the authors of the study to assert that the express cargo delivery market is closely connected with the field of e-commerce. Therefore, it is expected that the share of online orders for the B2C sector will prevail in the structure of cargo turnover for the segments (B2B; B2C; C2C; B2G; D2C). The share of orders to meet individual needs is expected to decrease in favour of increasing the flow of humanitarian and military cargo, considering war adjustments.

Notes: B2B – business-business relationship; B2C – business-consumer relationship; C2C – consumer-consumer relationship; B2G – business-government relationship; D2C – direct sales

Source: developed by the authors

Quantitative assessment of factors and trends in the development of the Ukrainian express cargo delivery market is supplemented by a qualitative assessment of the subject of research.

RESULTS AND DISCUSSION

Estimates of the concentration of the Ukrainian express cargo delivery market. In accordance with the results of the study by P. Klaus & C. Kille (2007), the express cargo delivery sector is a structural segment of the logistics services market that specialises in providing logistics services for parcel delivery, courier services, and specialised express transportation.

In 2020, the global express delivery market capacity was estimated at USD 262.86 billion (Express delivery global market report, 2023). In the same year, the capacity of this market in Ukraine reached UAH 28.2 billion (State Statistics Service of Ukraine, n.d.) that is, USD 1.046 billion

at the average annual exchange rate of the National Bank of Ukraine (NBU) for 2020. Accordingly, the share of the Ukrainian express cargo delivery market in the global express cargo delivery market is 0.4%. In 2021, the global express delivery market capacity was USD 279.68 billion (Express delivery global market report, 2023), while the same indicator in Ukraine amounted to UAH 34.4 billion or USD 1.26 billion at the average annual exchange rate of the NBU for 2021 (State Statistics Service of Ukraine, n.d.). That is, the authors of this study calculated that the share of the Ukrainian express cargo delivery market in the world market reached 0.45%, which in comparison with the previous period indicates an increase of 0.05%.

The Ukrainian express cargo delivery sector is one of the most sensitive industries regarding the impact of external disturbances. Such disturbances include the consequences of the global financial crisis of 2008-2009, the spread of the pandemic, and the invasion of Ukraine by

the Russian Federation. However, despite the above-mentioned factors of influence, the express delivery market has a high growth potential in the face of disturbances. This is confirmed by the growth of the express cargo delivery market capacity during 2020-2021: the capacity of the express cargo delivery market in 2020 amounted to 432 million shipments worth UAH 28.2 billion, while in 2021 the vol-

ume of shipments increased by 15.97% and amounted to 501 million shipments worth UAH 33.4 billion (State Statistics Service of Ukraine, n.d.).

The analysis of the capacity of the express cargo delivery market and the shares of the five main counterparties-leaders of the express delivery market is presented in Table 2.

Table 2. Analysis of the capacity of the express cargo delivery market and the share of counterparties in Ukraine, thous. UAH

No.	Enterprise	Net income from sales of products and the company's share, thous. UAH.				Relative deviation of net income 2021/2020, %
		2020	%	2021	%	
		1	Nova Poshta LLC	16,902,857	59.94	
2	Ukrposhta JSC	9,180,000	32.55	11,200,000	32.56	122.00
3	Meest Express Trading House LLC	353,082	1.25	451,752	1.31	127.95
4	Delivery LLC	244,592	0.87	265,685	0.77	108.62
5	Just In LLC	36,192.7	0.13	133,521.6	0.39	368.92
6	Other	1,483,276.3	5.26	1,505,539.4	4.38	101.50
7	Capacity of the express cargo delivery market	28,200,000	100	34,400,000	100	-

Source: calculated according to the State Statistics Service of Ukraine (n.d.), Delivery Group (n.d.), Justin (n.d.), Meest Express (n.d.), History of “Nova Poshta” company (n.d.), Ukrposhta (n.d.), Reporting of Ukrainian enterprises (n.d.), K. Khutorna (2022)

The largest relative deviation in net income (368.92%) is typical for Just In LLC, which entered the express delivery market as a new operator in 2018, and in 2020 increased cargo turnover to 7 million shipments per year (Taranenko, 2020). This indicates increased competition in the express cargo delivery market.

Consequently, it actualises the need to assess the severity of intra-industry competition between participants in this market. Identification of changes in the specifics of production and economic processes of express delivery operators under the influence of the invasion factor on the territory of Ukraine is shown in Table 3.

Table 3. Changing the specifics of production and economic processes of express cargo delivery operators in war conditions

Parameters	Before / after the invasion	Enterprise				
		Nova Poshta LLC	Ukrposhta JSC	Meest Express Trading House LLC	Delivery LLC	Just In LLC
Number of delivery points	Before	22,256	11,000	5,500	420	480
	After	19,743	6,300	4,000	400	450
Delivery speed, h	Before	23	72	48	24	36
	After	32	72	48	30	40
Number of localities served	Before	All cities in Ukraine	All cities in Ukraine	Regional centres and major cities of Ukraine	340	128
	After	All cities except the occupied ones	All cities except the occupied ones	Regional centers and major cities of Ukraine, except for the occupied territories	340	128
Average delivery cost, UAH.	Before	70	45	70	50	60
	After	120	55	100	60	60
Focus on the segment	Before	B2C	C2C	B2C	B2B	B2C
	After	C2C	C2C	B2C	B2B	B2C

Notes: B2B – business-business relationship; B2C – business-consumer relationship; C2C – consumer-consumer relationship

Source: compiled according to Taranenko (2020), Express delivery global market report (2023), State Statistics Service of Ukraine (n.d.), Delivery Group (n.d.), Justin (n.d.), Meest Express (n.d.), History of “Nova Poshta” company (n.d.), Ukrposhta (n.d.), Reporting of Ukrainian enterprises (n.d.), K. Khutorna (2022)

The results of calculating the dynamics of changes in the Herfindahl-Hirschman index and the market concentration index of the express cargo delivery market in Ukraine are presented in Table 4.

Table 4. Analysis of the dynamics of changes in the Herfindahl-Hirschman index and the market concentration coefficient of the express cargo delivery market in Ukraine

No.	Enterprise	Market share, %			
		2020	2021	2020	2021
		P_k	P_k^2	P_k	P_k^2
1	Nova Poshta LLC	59.94	35.9271	60.59	36.7134
2	Ukrposhta JSC	32.55	10.5971	32.56	10.6003
3	Meest Express Trading House LLC	1.25	0.0157	1.31	0.0172
4	Delivery LLC	0.87	0.0075	0.77	0.0060
5	Just In LLC	0.13	0.0002	0.3	0.0015
6	Other	5.26	0.2767	4.38	0.1915
	Herfindahl-Hirschmann index	-	46.8242	-	47.5300
	Market concentration index	94.74	-	95.62	-

Source: compiled by the authors

In 2020-2021, the Herfindahl-Hirschman index for the express cargo delivery market was 46.8242 and 47.5300, respectively (HHI>0.18); the market concentration index – 94.74 and 95.62, respectively, which indicates a high degree of monopolisation of the express cargo delivery market in Ukraine. The results of calculating the Lind index for the express cargo delivery market are presented in Table 5.

Table 5. Results of calculating the Lind index for the Ukrainian express delivery market for 2020-2021, %

Lind index	Year		Relative deviation of indicators 2021/2020, %
	2020	2021	
For two companies, IL2	184.14	186.08	101.05
For three companies, IL3	20.28	19.56	96.45
For four companies, IL4	28.24	30.31	107.33

Source: compiled by the authors

The value of the Lind index decreases to indicator L3 (2020-2021), at the level of which there is a “violation of the continuity of the indicator L” ($L_{m+1} > L_m$). Thus, in 2020-2021, two of the most profitable enterprises (Nova Poshta LLC, Ukrposhta JSC) formed a “hard” oligopoly. That is, Nova Poshta LLC in 2020-2021 with a share of 59.94% and 60.59%, respectively, as well as the state delivery service of Ukrposhta JSC with a share of 32.55% and 32.56%, respectively, form the “core” of the Ukrainian express cargo delivery market. Calculation of the differentiation indicator and Gini coefficient in the Ukrainian express cargo delivery market in 2020 and 2021 is given in Tables 6 and 7, respectively.

The Gini coefficient in 2020 was: $G = 1 - 2 \cdot 0.251583 + 0.1667 = 0.6635$. In 2021, according to similar calculations, the Gini coefficient was 0.6657. There is an increase in the value of the Gini coefficient in the express cargo delivery market during 2020-2021. The resulting Gini coefficient estimate characterises the express cargo delivery market as a market with an uneven distribution of market shares between enterprises in the sector. The higher the Gini coefficient, the higher the uneven distribution of market shares between enterprises, and therefore the higher the level of concentration of the express cargo delivery market in Ukraine.

Table 6. Calculation of the differentiation indicator and Gini coefficient in the Ukrainian express delivery market in 2020

Enterprise	y_i	x_i	Differentiation indicator, y_i/x_i	$\Sigma(x_i)$	$\Sigma(y_i)$	$x_i \cdot y_i$	$x_i \cdot \Sigma(y_i)$
Just In LLC	0.0013	0.1667	0.0078	0.1667	0.0013	0.0002	0.000217
Delivery LLC	0.0087	0.1667	0.0522	0.3333	0.01	0.0015	0.001667
Meest Express Trading House LLC	0.0125	0.1667	0.075	0.5000	0.0225	0.0021	0.003750
Other	0.0526	0.1667	0.3156	0.6667	0.0751	0.0088	0.012517
Ukrposhta JSC	0.3255	0.1667	1.953	0.8333	0.4006	0.0543	0.066767
Nova Poshta LLC	0.5994	0.1667	3.5964	1.0000	1.0000	0.0999	0.166667
Total	1.00	1.00	-	-	-	0.1667	0.251583

Source: compiled by the authors

Table 7. Calculation of the differentiation indicator and Gini coefficient in the Ukrainian express delivery market in 2021

Enterprise	y_i	x_i	Differentiation indicator, y_i/x_i	$\Sigma(x_i)$	$\Sigma(y_i)$	$x_i \cdot y_i$	$x_i \cdot \Sigma(y_i)$
Just In LLC	0.0039	0.1667	0.0234	0.1667	0.0039	0.0007	0.000650
Delivery LLC	0.0077	0.1667	0.0462	0.3333	0.0116	0.0013	0.001933
Meest Express Trading House LLC	0.0131	0.1667	0.0786	0.5000	0.0247	0.0022	0.004117
Other	0.0438	0.1667	0.2628	0.6667	0.0685	0.0073	0.011417
Ukrposhta JSC	0.3256	0.1667	1.9536	0.8333	0.3941	0.0543	0.065683
Nova Poshta LLC	0.6059	0.1667	3.6354	1.0000	1.0000	0.1010	0.166667
Total	1.00	1.00	-	-	-	0.1667	0.250467

Source: compiled by the authors

According to the analysis of the core of the express delivery market and determining the specifics of the activities of leading counterparties, it is established that oligopolists in the express delivery market quickly adapt to changes in the market conditions under study due to the influence of environmental factors. For example, Nova Poshta LLC adapted to the disturbances of the external environment caused by the pandemic and increased its net income from sales of products by 23% in 2021 compared to the previous year, which amounted to UAH 20.8 billion. For 2022, the development strategy of Nova Poshta LLC provides for a plan with a development budget of UAH 5 billion (Khutorna, 2022). Despite the full-scale invasion, the company does not stop operating, but has narrowed and reduced logistics supply chains, transformed product supply chains towards safe regions. The following parameters of the company's activity were adjusted:

- increase in the average cargo delivery time from 23 hours (pre-war period) up to 32 hours during the war, which amounted to 139.13% ;
- decrease in cargo turnover from 1.2 million up to 100 thousand express invoices per day, which is 12 times less than in the pre-war period;
- due to curfew restrictions, a ban on night shifts in sorting centres has been introduced, which makes it impossible to carry out effective urban and intercity movement of elements of the suprastructure of companies (Khutorna, 2022).

A direct industry competitor, which is at the core of the express cargo delivery market, Ukrposhta LLC, due to a wide range of services, such as courier delivery, issuance of pensions, cash, payment of utility bills, reduced the work of its branches from 11 thousand to 5 thousand branches and 1.3 thousand mobile branches during the war to a state of improvement in the security situation (Ukrposhta, n.d.).

Results of the conducted marketing research on the transformation of the needs of end users of express cargo delivery services in Ukraine during the war. Since the full-scale invasion of the Russian Federation on the territory of Ukraine significantly changed the market conditions of express delivery, it was decided to conduct a marketing study, the purpose of which was to identify the change in the structure of needs of consumers of express delivery services in the context of disturbances. The profile of the target audience of express cargo delivery confirms that

before the war, the dominant users of express delivery services were the younger generation aged 16-28 years – active internet users who are used to analysing a huge amount of information at the same time. Therefore, they have up-to-date information from applications and make purchases on various online marketplaces in order to optimise their own time. As delivery operators, companies are involved in the express delivery of goods to the places of nearest consumption of the ordered goods. On average, the frequency of express cargo shipments is monthly.

According to the results of a marketing study conducted by the authors in this study, after the correction of the military invasion, consumers between the ages of 18 and 50 became active users of express delivery services: internally displaced persons, entrepreneurs, and volunteers. They are characterised by large-sized shipments that are associated with the intensification of humanitarian cargo transportation in war conditions.

Consequently, based on the conducted research, it was established that the purchasing behaviour of consumers has undergone a significant correction due to the invasion of Ukraine. Prior to the invasion, 47% of respondents used delivery on a monthly basis, 38% – several times a year, and 11% – weekly. However, the express delivery market changed dramatically in the first weeks of the invasion. According to the question: “Did you use express delivery services in the first weeks of the war?”, 73% of respondents answered: “No”.

The appeal to the expert assessment confirmed the representativeness of the results obtained and the general trend of decreasing demand for commercial cargo transportation. In particular, according to an expert assessment provided by the Chief Operating Officer of Nova Poshta LLC, a month after the invasion, the number of orders for express cargo transportation decreased to 300-400 thousand units per day, depending on the day of the week and the military and civilian market conditions for express cargo delivery. At the beginning of the war, during the shock period, e-commerce stopped: the volume of shipments per day was 30 – 40 thousand shipments. The main senders were customers of the C2C sector, whose needs were structured into bulky cargo and heavy humanitarian aid (Khutorna, 2022).

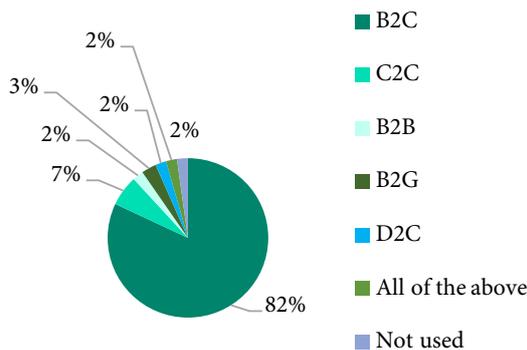
At the end of the shock period (February-March 2022), cargo turnover parameters gradually returned to pre-war

indicators (Khutorna, 2022). Based on the results of a survey conducted by the authors, the number of respondents who did not use express delivery services after the invasion increased by 18%. At the same time, the share of consumers who send or receive parcels on a monthly basis increased by 10%. It is worth noting that there is a sharp decrease in “inactive” consumers of services in the

delivery market: before the war, their number was 38%, while after the invasion – 2%. Such data indicate that the share of regular users has not changed and is constant regardless of military operations.

An infographic of the percentage of consumer needs in the express delivery market before and after the invasion is shown in Figure 1.

For what needs did you use express delivery services before the full-scale invasion?



For what purposes do you use express delivery services six months after the invasion and up to now?

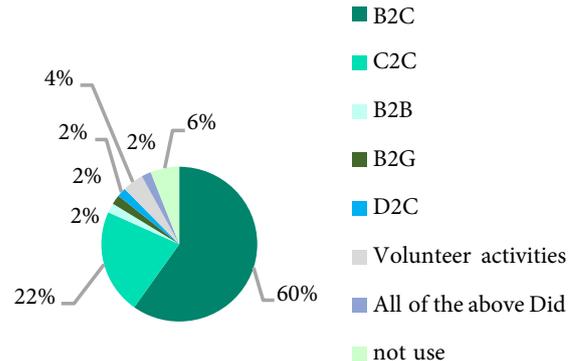


Figure 1. Comparison of changes in consumer needs in the express delivery market before and after the invasion based on market research

Note: B2C – business-consumer relationship; C2C – consumer-consumer relationship; B2B – business-business relationship; B2G – business-government relationship; D2C – direct sales

Source: compiled by the authors

As a result of the invasion, the percentage of online cargo orders in the B2C segments decreased by 22% and amounted to 210 thousand orders per day, while in the pre-war period this figure was 1,050 thousand orders per day (Hlinenko & daynovskyy, 2018). The share of cargo on the transfer of personal belongings (C2C segment) increased: from 7% to 22%, which is due to the growth of internally displaced persons in the Western region of Ukraine. It is worth noting that during the war, demand in the B2G segments decreased due to the security of documentation transfer, especially in uncontrolled territories and close to the war zone. Demand in Ukraine was distributed not only by geolocation, but also by gender. SimilarWeb report (n.d.) showed that 61% of e-commerce consumers are men, while 39% are women. Data on the audience of the social network Facebook also confirm this information: in March 2021, the percentage of women was 61.64%, men – 37.65%. In March 2022, the percentage of men increased to 51.97%.

According to Figure 1, the percentage of volunteer activity during the war appears in the structure of cargo turnover – 4.4%. It should be noted that the volunteer movement has been particularly relevant since 2014. In particular, within the framework of the corporate social responsibility strategy, Nova Poshta LLC implemented the project “Humanitarian post of Ukraine” in 2014, due to which volunteer organisations transport humanitarian goods to the active combat zone for free. In 2014-2016, more than 15,000 tonnes of cargo were transported for

300 volunteer groups in Ukraine (History of “Nova Poshta” company, n.d.). In the process of a full-scale invasion, the volume of international humanitarian cargo increased to 600 thousand tonnes (as of July 2022), according to information provided by the State customs service of Ukraine (n. d.).

Ukrposhta JSC, which follows the leader and is at the core of the express cargo delivery market as a state-owned operator, has its own advantages in international trade, unlike commercial operators. As a member of the Universal Postal Union (VSP), Ukrposhta JSC has benefits for transit tariffs, which significantly reduces the price and increases the speed of delivery. Therefore, the privilege of international delivery provides opportunities for effective transportation of humanitarian aid in war conditions. In particular, as part of the charter programme, Ukrposhta JSC delivers humanitarian cargo via the logistics route New York – Warsaw – Lviv to its final destinations in Ukraine.

The main competitive advantages of Courier, Express and Parcel Services (CEP) enterprises that should be considered due to the sharpness of intra-industry and inter-industry competition and digitalisation of business are high automation and mechanisation of production processes; expansion of supply and value formation for the end user, compliance with quality standards (dominant in time) on a marketing and logistics basis (for example, fulfilment and door-to-door service provision); the level of geographical coverage of the network.

In the course of the study, the growth of the express delivery market capacity was predicted by the leaders of Nova Poshta LLC and Ukrposhta JSC, which remain in the “core” of the express delivery market during the pandemic and during the war. Further consolidation of business and exit from the market of weak counterparties should be expected due to their low solvency, limited access to resources, and other factors that form a favourable institutional environment for operators in the cargo delivery sector, which will contribute to the recovery of activity and the Ukrainian economy as a whole.

The analysis of the express cargo delivery market is devoted to most of the scientific papers, the authors of which focused on the quantitative assessment of the development of the express delivery market using the results of research by industry or international associations (Ukrainian Retail Association, n.d.; Pro-Consulting, n.d.). This allowed determining the dynamics and features of individual components of the express cargo delivery market and identifying trends in the development of the express cargo delivery market, considering certain areas of the research subject.

The analysis of the economic situation of the Ukrainian express cargo delivery market and the dynamics of the development of its individual segments identified the main types of competition in the market under study, namely: significant competition between Ukrainian enterprises providing express cargo delivery services. Until the end of active hostilities in Ukraine, there are no expectations of potential foreign players in the express cargo delivery market, investors, and activation of other stakeholders. As a factor in the development of the market for express cargo delivery during the war, the development of enterprises of related industries (for example, the food delivery sector, retail chains) and other industries (for example, the military-industrial complex in war conditions), whose development strategies relate to the future entry into the market of express cargo delivery; increasing intra-industry pressure due to technical and technological innovations in transportation and increasing the efficiency of operational activities (due to the speed of decision-making, optimisation of cargo transportation routes, etc.); competition of individual logistics supply chains for express cargo delivery due to the growth of flexibility, territorial presence and the width of the offer of express cargo delivery; competition for dominance in the core of the express cargo delivery market, considering the possibility of dictating competition conditions, forming barriers to access to this market, etc.; pressure from consumers who are often dissatisfied with the level of logistics services and have access to the distribution and exchange of marketing information.

In the competitive struggle, enterprises should focus on increasing the value of express cargo delivery services for the end user due to non-price parameters, identifying the profile of the target consumer, and improving the quality of services provided, considering the achievements of business digitalisation (expansion of broadband, digital skills of end users and enterprises, etc.). In related sectors,

further business consolidation and withdrawal from the market of weak counterparties is expected due to their low solvency, limited access to resources and other factors that form a favourable institutional environment for the active use of cluster technologies and models in the express cargo delivery market.

The difference between this and the previous studies is:

- investigation of the specifics of adapting the functioning of enterprises in the market of express cargo delivery to the conditions of war in Ukraine using secondary marketing information. In previous studies, the authors A. Gautam & P. Pareek (2022) noted the impact of the coronavirus pandemic on the complexity of logistics decision-making on the example of Japan and other countries. Other researchers, such as M. Kiba-Janiak *et al.* (2021), I. Cárdenas *et al.* (2017) O. Fedirko *et al.* (2021) presented the results of studies of individual components of the express cargo delivery market in stable conditions, without revealing the specifics of the transformation of models of market behaviour of business entities in the express cargo delivery market in conditions of disturbances;

- identification of changes in the needs of end-users in Ukraine through the analysis of primary information based on the conducted marketing research, where the tool was a questionnaire using Google Forms software, which allowed forming a profile of the target audience in the Ukrainian market of express cargo delivery and providing recommendations to enterprises regarding the value approach in the formation of the offer of express cargo delivery services and a customer-oriented approach in business. For comparison, other researchers focused on identifying areas for improving the marketing system of consumer segmentation on the example of Greece (Griva *et al.*, 2022). Ukrainian researchers O. Prokopenko *et al.* (2016), N. Ptytsia & K. Kovtsur (2022), O. Taranenko (2020), although disclosed the specifics of marketing and logistics activities of enterprises in the express cargo delivery sector, did not reflect the provisions of the functioning in the context of neutralising the consequences of the spread of the pandemic and war;

- analysis and assessment of the concentration of the Ukrainian express cargo delivery market using index methods, which contributes to the deepening of approaches to studying the specifics and assessment of competition in the analysed market, structuring the core of the express cargo delivery market, and identifying enterprises that dictate the conditions of competition in it. Studies by other researchers, although they reflect the specifics of the express cargo delivery market, however, relate to separate ones that are completely different from this subject of research.

CONCLUSIONS

Based on the results of calculations that clearly show the specifics and level of concentration of the express cargo delivery market for the period 2020-2021, it is stated that the Ukrainian market is characterised by a high degree of monopolisation, as evidenced by the market concentration coefficient CR_3 at the level of 94.74 and 95.62, respectively.

According to the values of the Lind index, in 2020-2021, Nova Poshta LLC and Ukrposhta JSC entered the core of the express cargo delivery market. These enterprises have the opportunity to create competitive conditions and put pressure on other counterparties of the express cargo delivery market. The obtained values of the Gini coefficient characterise the express cargo delivery market as a market with an uneven distribution of market shares between enterprises of the sector. Despite the ability to exert pressure and create competitive conditions, the high adaptive ability of enterprises providing express delivery services to changes in the market conditions under study and adaptation to customer requirements due to the influence of environmental factors has been established. According to the results of a survey of end users of express cargo delivery services, it was found that the latter reacted sensitively to various kinds of disturbances, such as the spread of a pandemic or the war in Ukraine. It was noted that the profile of the active target audience of express cargo delivery aged from 16 to 28 years in stable conditions, and from 18 to 50 years in war conditions, which expanded due to the appearance of segments of internally displaced persons, entrepreneurs, and volunteers in it. Consumer demand, digitalisation of business, and life safety, research shows, remain determining factors in the development of the express cargo delivery sector in the face of disturbances.

The use of index methods for evaluating the Ukrainian express cargo delivery market allowed identifying characteristics that differ from the developments of other authors in the results: in terms of identification, evaluation, and analysis of the core of the express cargo delivery market and to characterise the distribution of “market power” between the subjects of the market under study. Conclusions are drawn about the intensification of competition in the target markets of express cargo delivery enterprises due to the need to retain regular customers during disturbances, which collectively cause the need to activate aggressive marketing activities by market participants. The active hostilities have complicated the economic situation in the express delivery market and transportation logistics, which has affected the efficiency of supply chains. These conclusions should be interpreted as elements of the scientific originality of the study, and this actualises the need to develop alternative competitive strategies, considering the risks of their marketing and logistics activities in the target sales markets, which should be the subject of a separate study.

None.

None.

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CONFLICT OF INTEREST

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Особливості функціонування ринку експрес-доставки в Україні в умовах війни

Анотація. Ринок експрес-доставки є одним із найбільш динамічних секторів економіки, без якого неможливе ефективне функціонування бізнесу, електронної комерції, ритейлу тощо. Під впливом зовнішніх чинників, таких як військове вторгнення на територію України з боку Російської Федерації у 2022 році, змінилися параметри діяльності операторів ринку експрес-доставки, що актуалізує питання аналізу показників діяльності ринку експрес-доставки та дослідження змін у поведінці споживачів у сфері послуг експрес-доставки. Метою роботи є представлення результатів комплексного дослідження особливостей трансформації функціонування українського ринку експрес-доставки в умовах нестабільності. Для досягнення мети дослідження використано комплекс наукових методів: системний, статистичного аналізу, індексний метод. З метою виявлення змін у структурі потреб споживачів послуг експрес-доставки в умовах збурень, було проведено маркетингове дослідження та експрес-опитування кінцевих споживачів. Досліджено динаміку розвитку українського ринку експрес-доставки в період повномасштабної війни з точки зору ідентифікації конкурентних позицій підприємств у сегменті та розподілу «ринкової влади» між учасниками досліджуваного ринку. Визначено підприємства, які формують «ядро» досліджуваного ринку та їх роль у формуванні інтенсивності конкуренції на ринку експрес-доставки в Україні. Представлено результати проведеного маркетингового дослідження щодо зміни купівельної поведінки споживачів під час війни в Україні та встановлено профіль цільової аудиторії послуг до та під час війни. Відзначено високу адаптаційну здатність підприємств, що надають послуги експрес-доставки, до умов нестабільності в частині відновлення операційної діяльності, коригування параметрів логістичної діяльності відповідно до змін у потребах споживачів. Потреби споживачів, діджиталізація бізнесу та безпека життєдіяльності залишаються визначальними факторами розвитку досліджуваного сектору в умовах збурень. Результати досліджень можуть бути застосовані на практиці керівниками відділу маркетингу і логістики, планово-економічного відділу підприємств сектору експрес-перевезень вантажів та зацікавленими групами стейкхолдерів на ринку експрес-доставки вантажів

Ключові слова: експрес-перевезення; економічна кон'юнктура; концентрація; маркетингове дослідження; кінцеві споживачі