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Article

Medium-term prospects of the functioning of Ukrainian seaports

Economy and forecasting

Provided in Cooperation with:
ZBW OAS

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MEDIUM-TERM PROSPECTS OF THE FUNCTIONING OF UKRAINIAN SEAPORTS

The article presents the results of a medium-term forecast of the development of Ukraine's seaports (USP) under pessimistic and optimistic scenarios. It is emphasized that this forecast is an important component of the Industry Development Strategy, as well as a basic element for the development of the Action Plan for the implementation of strategic medium-term development priorities in accordance with the long-term goals.

The author carried out a retrospective analysis of the volume of cargo transshipment in Ukrainian seaports, and of selected the indicators on which the forecast model is based, namely: Ukraine's GDP and the volume of world sea freight. The macroeconomic medium-term forecast of Ukraine's GDP for the period up to 2024 was developed by the Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine, and the forecast of the volumes of world sea freight was developed by the UN Conference on Trade and Development (UNCTAD).

Attention is focused on the fact that effective management of the development of seaports in Ukraine depends on the accuracy and reliability of medium-term forecasting. In addition, emphasis is placed on the need to study future trends in the seaports' development, whose foundation is being laid today. For this purpose, the author highlights the economic factors influencing the dynamics of cargo handling in Ukrainian seaports, outlines the global trends influencing the development of global sea freight transportation and operation of seaports, and analyzes various current short-term and medium-term trends in sea freight transportation and functioning of seaports, in particular, in the context of the spread of COVID-19, which affect the seaports' performance.

It is proved that the chosen statistical model of forecast calculation is accurate and reliable. The results quoted indicate that the volume

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of cargo transshipment in Ukrainian seaports for the period up to 2024 will grow in both optimistic and pessimistic scenarios. Emphasized the necessity of substantiation of the recommendations to the current Strategy of the Development of Ukrainian Seaports of Ukraine in view of modern tendencies of the industry's development.

Keywords: *seaports, forecast, strategic management, pessimistic scenario, optimistic scenario, cargo transshipment volumes, COVID-19*

Methodological approaches to industry forecasting in particular forecasting the dynamics of cargo turnover of enterprises in the field of transport are set out in many works of domestic scientists. Thus, M.I. Skrypnychenko, Yu.P. Lukashyn, O.M. Stepanov, L.V. Moskaliuk, V.I. Davydova, etc. in their works paid attention to theoretical developments, methodological approaches and adaptation of statistical forecasting methods to the needs of economic analysis.

A.H. Demianchenko, S.V. Ilchenko, Yu.Iu. Kruk, N.V. Kudrytska, O.I. Nykyforuk, O.M. Stasiuk, O.H. Rudakov, etc. dealt with the issues of development of transport sector forecasts, especially forecasts of the dynamics of cargo handling in Ukraine's seaports (USP). In addition, much attention to macroeconomic and sectoral forecasting is paid by the staff of the Institute of Economics and Forecasting of the National Academy of Sciences of Ukraine and Academician of the National Academy of Sciences of Ukraine V.M. Heyets.

The purpose of this article is the medium-term forecast of cargo handling in Ukraine's seaports (USP) for the period up to 2024, in order to further substantiate the need to improve the mechanism of strategic management of Ukraine's seaports (USP) development in the crisis caused by the spread of COVID-19 and provide recommendations to the Strategy for Ukrainian Sea Ports Development for the period until 2038.

The dynamics of cargo handling in Ukraine's seaports (USP) is quite ambiguous, this indicator was significantly influenced by both economic processes that can be calculated mathematically, and political and social processes that are difficult to predict and predict their impact on the further development of the industry. ***The main factors influencing the volume of cargo handling in the USP*** are primarily economic in nature. In addition, they are divided into *internal and external*, and have a *positive and negative impact*.

Among the *external factors* that are *positive in nature*, we have identified the following: the possibility of attracting foreign investment through EU support programs, the introduction of a new form of Public-private partnership (PPP) for Ukraine as a concession in the USP and high export potential of ferrous metals, coal, iron ore concentrate and grain, which contributes to the integration processes of the UPS. The dynamics of cargo handling in the UPS in terms of integration is negatively affected by the state of Ukraine's economy and the purchasing power of the population, which is also related to the state of the world economy and the aggravation caused by the COVID-19 epidemic. In addition, we attribute to external economic factors the processes of forced sectoral integration that are manifested today.

Domestic positive economic factors influencing the growth of USP are that from 2020 the procedures for registration of small vessels in the Shipping Register of Ukraine have been simplified. Ukraine's tariff policy on port dues and reduction of capital investments in the development of seaports is a domestic *negative* factor, given that their volumes are already insignificant, and, as a rule, the actual volumes of investments are twice lower than planned.

The development of our forecast is based on the time period from 2010 to 2020. This time series includes certain events in the world and Ukraine that affected the dynamics of the indicator for this period, namely: the effects of the economic crisis of 2008 and military action on eastern Ukraine, initiated in 2014 and related changes in traffic flows past the territory of Ukraine due to the reorientation of foreign economic relations, Ukraine's signing of the Association Agreement with the EU and the crisis caused by the spread of COVID-19.

These events, together with other global trends, shape global long-term trends in the development of sea freight and the functioning of the seaport, and the spread of COVID-19 has caused some short-term and medium-term trends.

The ***main trends affecting the development of maritime freight transport and the functioning of the seaport in the global dimension*** can be divided into **three** groups:

1) *economic* - globalization and consolidation of transportation through the creation of alliances;

2) *technical* - containerization of cargo, increasing the carrying capacity of ships, digitalization of logistics processes, customs, trade and port operations, as well as the growing role of maritime safety and environmental safety;

3) *spatial* - changes in the routes of liner shipping, generating changes in the localization of seaport.

In the medium and short term, the outlined trends will be transformed and / or strengthened by the spread of COVID-19, as a global economic boom was projected for 2020, offset by the COVID-19 epidemic. Expert studies [1, 2] and the forecast developed by the International Monetary Fund (IMF) [3] show that world trade in goods in 2020 in real terms may fall by 13.6-32% (optimistic and pessimistic scenarios). The Secretariat of the World Trade Organization (WTO) submitted a report [4], where one of the conclusions was made that the restoration of the V-shaped trajectory of world trade dynamics will begin in 2021 (Fig. 1). However, world trade is not expected to return to previous levels after the COVID-19 epidemic. Recovery will depend on the scale and actual duration of the COVID-19 outbreak, as well as on the effectiveness of policies around the world.

In addition, today there are some regional features, for example: the pandemic affects all regions of the world; however, the degree of impact is asymmetric, as Europe and the United States have suffered the most.
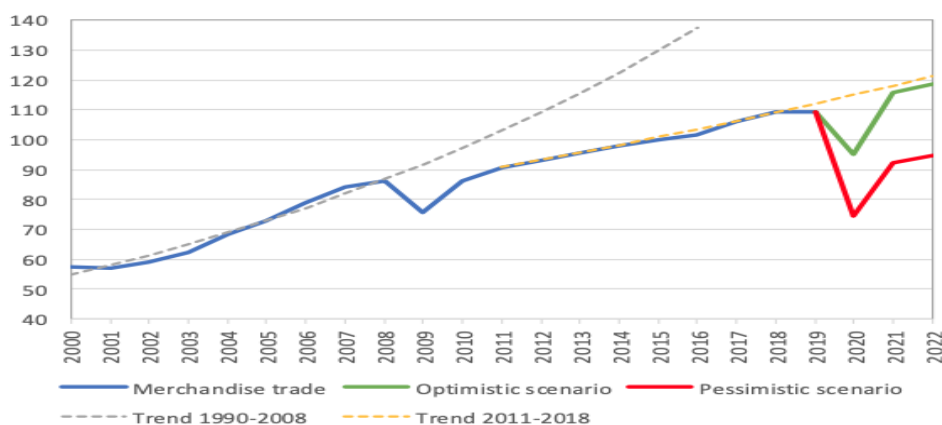
Fig. 1. World merchandise trade 2000-2022 as compared to 2015 = 100%
Source: WTO Secretariat [4].

What *trends have developed in the field of maritime transport and in the func-tioning of the seaport of the world and the USP due to the impact of the COVID-19* epidemic will be outlined below.

Since 80% of international trade is carried out by sea freight, it is necessary to take into account the conclusions of experts on the dynamics of these indicators in 2020-2022. Therefore, the current trends in the activities and further development of seaports in the context of the COVID-19 epidemic are outlined by a strict policy to slow the spread of the virus, reducing world merchandise trade, which, accordingly, is reflected in the decrease in vessel traffic.

In general, the trends in the development and operation of the seaports, which are associated with the spread of the COVID-19 epidemic, relate first of all to compliance with the requirements of labor law; secondly, the reduction of container traffic on the main routes of liner shipping; thirdly: regional features of seaports functioning.

Compliance with the Maritime Labor Convention is reflected in the imposition of restrictions on vessels and crew, including prohibitions on the replacement of crew required by shipping companies to comply with the requirements of employment contracts and labor law. There are usually about 100,000 crew changes each month, but 120 of the 126 countries currently have crew change restrictions: crew replace-ment is prohibited in 92 countries, and crew replacement is subject to inspection and approval in 28 countries (Inchcape Shipping Services (ISS) 2020). In Ukraine, crew replacement is available to all nationalities; borders are open to foreigners from the "green zone" with COVID-19 insurance [5]. Because of these restrictions, ships have become "floating quarantine zones" because countries refuse to accept ships in their ports until the crew is declared tested for the virus. In most countries, the normal quarantine period is 14 days.

In terms of the structure of cargo transported by sea and transported to the sea-ports, the strongest quarantine restrictions with the arrival of vessels in the seaports affected the *transportation of containers*. In the first half of 2020 alliances of leading container carriers canceled 13% (1675 flights) of 2M flights and 17% of flights to Ocean Alliance and THE Alliance [6]. This situation is because strict quarantine

measures have been imposed on seaports, which are the largest trade container hubs, such as Singapore, Hong Kong, Busan, Rotterdam, Antwerp, Shanghai, etc. This list includes seaports, which are the largest exporters and importers of goods on liner shipping routes connecting Asia and Europe. Thus, local restrictions associated with quarantine measures affect not only a particular seaport, but also other seaports that have a relationship with it on the index of bilateral involvement in liner shipping; and the higher this index, the broader the effects of the restrictions it imposes, and consequently, the greater the impact on international trade. Expert studies have shown that container traffic on routes between seaports, which imposed a ban on crew replacement, fell by 20%, while container traffic between seaports, which impose milder restrictions, is characterized by a decrease of 6% for destinations [7]. In general, it is noted that sea freight returns to pre-crisis levels, but this trend is not typical for container traffic [8].

As already mentioned, in the *regional aspect*, the largest decline in the volume of container handling is observed for the seaports of China and Europe. Thus, on January-February 2020, exports from China fell by 17.2% compared to the same period in 2019. Chinese seaports are overcrowded with imported containers, which leads to additional fees for the maintenance of these containers. In turn, there is a shortage of empty containers for export to Europe and other countries [9].

Understanding the global long-term and urgent (related to the spread of the COVID-19 epidemic) trends, their impact and the consequences of this impact on the activities and development of the USP determines the relevant requirements. First of all, these are the requirements for the quality of port infrastructure, the condition and availability of railway and road infrastructure, as well as the quality of management of seaports and state stevedoring companies present in the market of port and logistics services in Ukraine. In addition, the need to forecast the volume of cargo handling in the USP is actualized, as their growth increases the need to modernize the infrastructure and change the mechanisms for managing the development of the USP.

The analysis of the basic time series of cargo handling volumes in the USP is based on changes in macroeconomic and sectoral indicators, which we presented in the form of relative values: the index of the indicator in % to 2010 and the growth rate or decrease in the value in % to the previous year. As the main indicators for the analysis of trends in the volume of cargo handling in seaports of Ukraine, we took the following indicators: the dynamics of Ukraine's GDP at constant prices in 2010, the volume of maritime traffic in the world and the volume of cargo transported by all modes of transport (excluding pipeline) in Table 1.

Visualization of growth rates dynamics of Ukrainian GDP in constant prices, world volume of sea freight transportations and total volumes of cargo transportation in Ukraine, in comparison with dynamics of growth rates of volumes cargo transportation in the USP, makes it possible to notice some differences in development trends on these indicators (Fig. 2, 3).

Table 1

The dynamics of GDP in nominal prices, volumes of global maritime trade, volumes of cargo transported by all transport types (except pipeline) and volumes of cargo transshipment in Ukrainian seaports for the period 2010-2019

| Indicator	Value	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross domestic product, *UAH billion (at constant (2010) prices)*	**GDP**	1079.3	1138.3	1141.1	1140.8	1066.0	961.8	985.3	1009.6	1044.0	1077.4	-*
Index until 2010, %	I^{10}_{GDP}	100.0	105.5	105.7	105.7	98.8	89.1	91.3	93.5	96.7	99.8	-
The growth rate, decrease (-)as compared to previous year, %	T_{GDP}		105.5	100.2	100.0	93.4	90.2	102.4	102.5	103.4	103.2	-
Volumes of global sea freight, billion tons	**M**	8378.0	8796.7	9189.5	9501.3	9837.5	10017.9	10276.6	10702.3	11002.2	11376.2	-*
Index until 2010, %	I^{10}_{M}	100.0	105.0	109.7	113.4	117.4	119.6	122.7	127.7	131.3	135.8	-
The growth rate, decrease (-)as compared to previous year, %	T_M		105.0	104.5	103.4	103.5	101.8	102.6	104.1	102.8	103.4	-
Volume of cargo transported by different types of transport in Ukraine (excluding pipeline), million tons	**P**	1612.3	1731.7	1725.0	1710.7	1523.6	1377.1	1435.8	1467.2	1533.6	1466.2	-*
Index until 2010, %	I^{10}_{P}	100.0	107.4	107.0	106.1	94.5	85.4	89.1	91.0	95.1	90.9	-
The growth rate, decrease (-) as compared to previous year, %	T_P		107.4	99.6	99.2	89.1	90.4	104.3	102.2	104.5	95.6	-
Volume of cargo handling in Ukraine's seaports, million tons	**R**	148.2	155.0	151.0	148.2	144.9	144.6	131.7	132.6	135.2	160.0	158.9**
Index until 2010, %	I^{10}_{R}	100.0	104.6	101.9	100.0	97.8	97.6	88.9	89.5	91.2	108.0	107.2
The growth rate, decrease (-) as compared to previous year, %	T_R		104.6	97.4	98.2	97.8	99.8	91.1	100.7	102.0	118.3	99.3
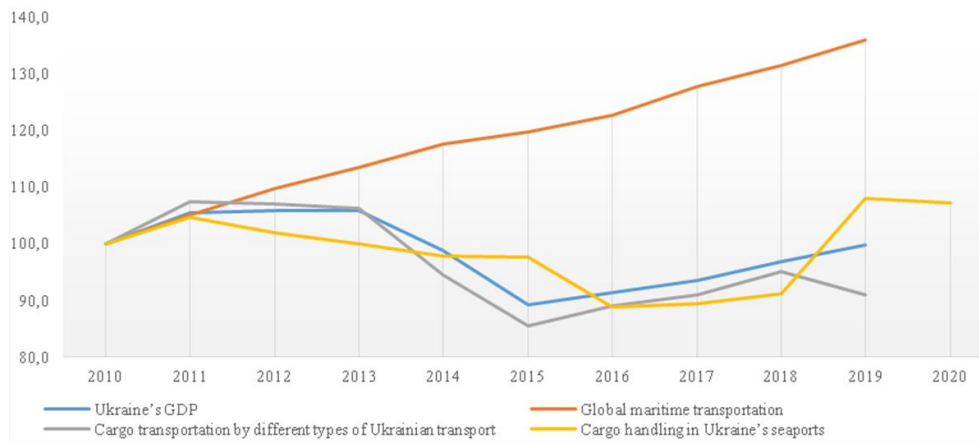
Fig. 2. Growth index of Ukraine's GDP, global maritime transportation, cargo transportation by different types of Ukrainian transport and cargo handling in Ukraine's seaports, *% to 2010*

Source: author's own calculations.
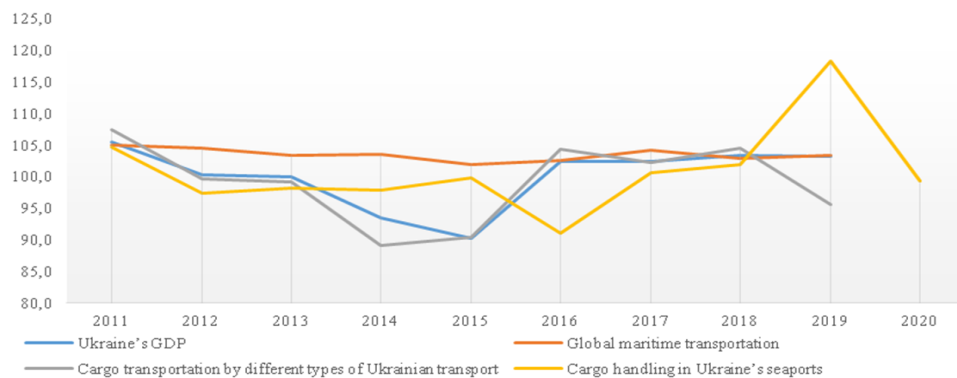
Fig. 3. Growth rates of Ukraine's GDP, global international maritime transportation, cargo transportation by different types of Ukrainian transport and cargo handling in Ukraine's seaports, *% to previous year*

Source: author's own calculations.

Thus, the analysis of growth indices relative to 2010 shows significant fluctuations in Ukraine's GDP, its value increases until 2013 and shows a significant decline in 2014, when the hryvnia devalued and there was significant inflation. Since 2014, Ukraine's GDP growth index has been below 100%. To date, the figures for 2010 have not been reached, so its value in 2019 is 99.8%. The volume of world sea freight traffic has a stable annual growth, which in 2019 is 136% compared to 2010. In turn, the total volume of cargo transportation by transport of Ukraine increased in the period from 2010 to 2013, however already from 2014 to 2019 inclusive, the growth index of this indicator until 2010 continues to decline. The same trend is inherent in the volume of cargo handling in the USP in the period 2010-2013, the increase in the index of transshipped cargo in the seaports to the value of 2010 has a slight fluctuation, and in 2014 shows a decline that lasted until 2018, while in 2019–2020 the

value of this index is 107-108%, which indicates an increase in the volume of cargo handling USP.

Demonstration of the growth rate of Ukraine's GDP in constant prices, the volume of sea freight, the volume of freight transport in Ukraine and the volume of cargo handling in the USP shows some similarities in development trends at certain stages. In 2011, all indicators showed a positive increase compared to the previous year. Since 2012, all indicators show different duration trends of growth rates. And if the growth rate of Ukraine's GDP in constant prices and volumes of cargo transportation by different modes of transport in Ukraine show a significant parallel decline until 2015 and subsequent increase in 2016 and a significant stabilization of fluctuations from 2016 to 2018. The volume world maritime trade has slight fluctuations through-out the period. The curve of growth rates of cargo handling in the USP shows a pronounced V-shape in 2016 and a further increase in growth rates until 2019, but in 2020 there was a significant decline in this indicator compared to the previous year.

The next stage in the calculations was to identify the relationship between the volume of cargo handling in the USP and the GDP of Ukraine between the volume of cargo handling in the USP and the volume of sea freight, because this is one of the main tasks of statistical analysis. First, in the case of dependence of one indicator on another, one of them can be influenced through another. Secondly, even if there is no causal relationship, it is possible to predict the change of one, based on infor-mation about the change of another. This aspect is the most important for the deve-lopment of the forecast for GDP and total world maritime freight traffic.

The scientific substantiation of the interdependence of our selected indicators was carried out using the linear Pearson's Correlation Coefficient, which allowed to iden-tify the regularity of the dependence of cargo handling in the USP on the value of Ukraine's GDP and world sea freight, as well as the degree of this dependence.

Taking into account the conclusions made when calculating the linear correlation coefficient for further calculation of the forecast, we chose the dynamics of Ukraine's GDP and total world maritime freight traffic, as well as the time period is conditio-nally divided by the decreasing trend of cargo handling in USP in 2010-2018 and the trend of increasing the volume of cargo handling in the seaports of Ukraine in 2016-2020 (in 2016-2018, the dynamics of cargo handling in the USP remains stab-le at 130-135 million tons per year). The latter needs to be clarified. The forecast of cargo handling volumes in the USP is calculated based on the forecast of Ukraine's GDP, as well as most industry forecasts. However, the Pearson correlation coefficient, cal-culated for the GDP of Ukraine and the volume of cargo handling in the USP, shows the degree of dependence of 0.46 for the time series in 2010-2020, while the value of this coefficient for the period 2010-2018 is 0.74. That is why we chose as a basis for calculating the first scenario of the industry development the continuation of the trend line of cargo handling volumes in USP depending on the GDP forecast of Ukraine, developed by the Institute of Economics and Forecasting of NAS of Ukraine, adjusted for the economic crisis associated with the epidemic COVID-19. The relationship demonstrated by the Pearson correlation coefficient between the volume of sea freight and the volume of cargo handling in the USP, in the period

from 2010 to 2020 is -0.02. While the value of this coefficient for the period 2016-2020 is 0.89, which prompts us to choose this time series as the baseline for calculating the second forecast scenario.

The calculations proved that the best result of the reliability of the approximation (R^2 in the figures) of the volumes of cargo handling in the USP for the GDP of Ukraine for the period 2010-2018 (Fig. 4) and for sea freight transportation for the period 2016–2020 (Fig. 5) demonstrates a linear trend model.
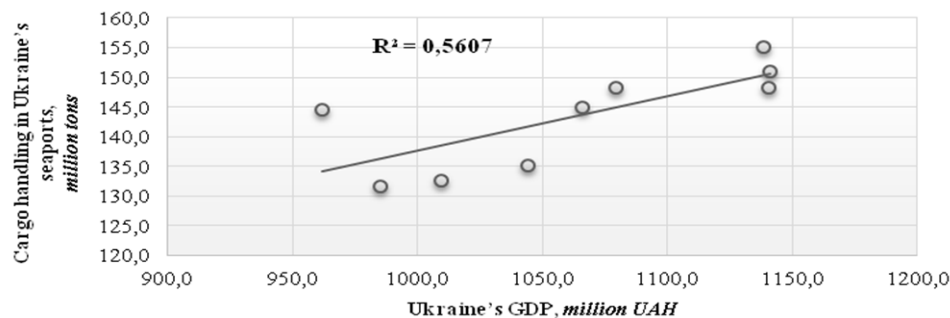
Fig. 4. The results of Ukrainian GDP approximation for the period 2010-2018
Source: author's own calculations.

The forecast is developed as indicators of the continuation of the trend line for four periods ahead, which corresponds to the period until 2024. The following formula (1) was used for the first scenario:

$$R_n = 0.0917 * GDP_{year} + 46.068 \tag{1}$$

where: R_n – an indicator, volumes of cargo transshipment in USP for the corresponding year – as a result of calculation;
GDP_{year} – projected Ukrainian GDP for a given year.
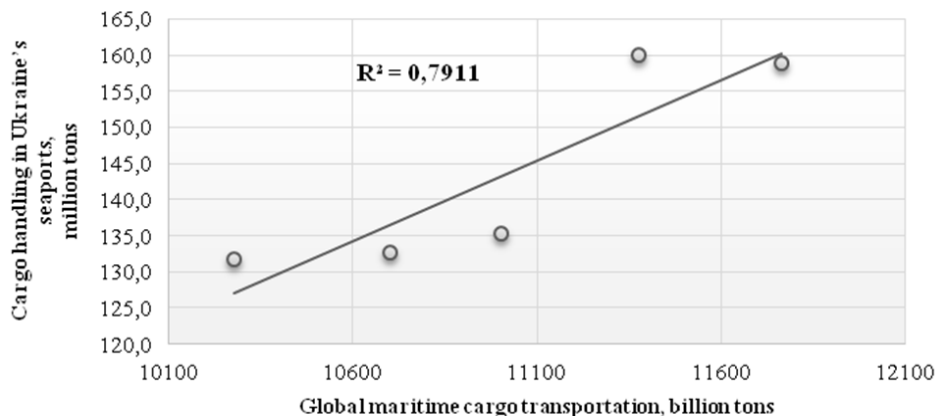
Fig. 5. Approximation of global maritime cargo transportation for 2016-2019
Source: author's own calculations.

For the second scenario, the formula (2) was used:

$$R_o = 0.0223 * M_{year} - 101.73 \tag{2}$$

where: R_o is indicator of cargo handling volumes in the USP for a given year, obtained as a result of the calculation;

and M_{year} is forecast indicator of world maritime trade for a given year.

To assess the statistical significance of the regression coefficient of Ukraine's GDP and the volume of cargo handling in the USP, the Student's *t*-test was calculated, that is 2.99. Since the actual value of the *t*-test is greater than the table, which is 2.36 for a confidence level of 95%, we can say that GDP is a significant parameter for calculating the volume of cargo handling in the USP. That is, the actual value of the *t*-test corresponds to 98% confidence level.

Similarly, Student's *t*-test for the regression coefficient of world shipping and cargo handling in the USP has an actual value, more than the tabular value for the 95% confidence level: 3.37> 3.18, which confirms the importance of our chosen parameter. That is, the actual value of the *t*-test corresponds to 96% confidence level.

Evaluation of the reliability of the obtained regression equations using Fisher's F-test proved that the actual value of the F-test is greater than the tabular value of the F-test, which indicates that the coefficient of determination is statistically significant; therefore, the regression equation was estimated statistically reliable:

1) for the first regression equation, the actual value of the F-criterion is 8.93, while the tabular value of the F-criterion for the 95% confidence level is 5.59; accordingly, the actual value of the F-criterion corresponds to a confidence level of 98%;

2) for the second regression equation, the actual value of the F-criterion is 11.36, the tabular value of the F-criterion for a confidence level of 95% - 10.13 for a confidence level of 95%, respectively, the actual value of the F-criterion corresponds to a confidence level of 96%.
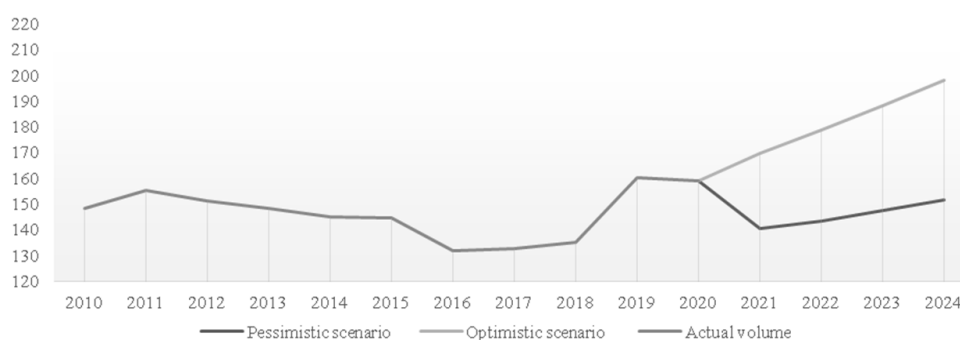
Fig. 6. Forecast of cargo transshipment volumes in Ukraine's seaports for the period until 2024: optimistic and pessimistic scenarios, *million tons*

Source: author's own calculations.

Table 2

Forecast of cargo transshipment volumes in seaports of Ukraine for the period until 2024: optimistic and pessimistic scenarios, *million tons*

	2010	2011	2012	2013	2014	2015	2016	2017
	Retrospective (actual)							
Pessimistic scenario	148.2	155	151	148.2	144.9	144.6	131.7	132.6
Optimistic scenario	148.2	155	151	148.2	144.9	144.6	131.7	132.6

	2017	2018	2019	2020	2021	2022	2023	2024
	Perspective period (forecast)							
Pessimistic scenario	132.6	135.2	160	158.9	*140.4*	*143.4*	*147.2*	*151.7*
Optimistic scenario	132.6	135.2	160	158.9	*169.5*	*178.7*	*188.3*	*198.1*

Source: author's own calculations.

The quality of the proposed models was estimated by the Mean Absolute Percentage Error (MAPE), which for the first regression equation is 3.1%, which proves the accuracy of the prediction of 96.9%, for the second regression equation MAPE showed 3.7%, respectively, the prediction accuracy is 96.3%.

The projected forecast for the medium term until 2024 demonstrated two scenarios of further dynamics of cargo handling in the USP: pessimistic (forecast for Ukraine's GDP) and optimistic (forecast for world sea freight) (Fig. 6, Table 2).

Pessimistic scenario. Thus, according to this scenario, the volume of cargo handling in seaports of Ukraine is significantly reduced to 140.4 million tons in 2021. Starting from 2022, the dynamics of the indicator shows a gradual increase to 2024 tons by 2024. This situation is possible under the condition of a further decline in the volume of transshipment in the seaports of Ukraine of transit and export cargo, the transportation will be limited due to security protocols involved in the seaports of the world. In addition, this trend may be associated with a reduction in container traffic, as in the first half of 2020 there is a decline in this figure by 13% for world container trade, the share of containers in the overall structure of transshipped cargo in seaports of Ukraine is an average of 8% in recent years.

Optimistic scenario is based on the UNCTAD maritime trade and port cargo traffic forecast in its Review of Maritime Transport 2019, which is an increase of 3.4% annually over 2020-2024. This forecast has not been adjusted according to impact on the industry from the COVID-19 epidemic. However, it should be noted that the impact of the pandemic and the decline in cargo volumes would be stronger in the world's central seaports, while peripheral seaports are less affected by the pandemic. Also, according to the analytical agency Clarksons Research, the decline in sea cargo traffic in May 2020 is 10.6%, but the global index of activity in seaports in June was 7.4 against 9.9% in May, indicating that the industry is gradually recovering [11].

However, despite the USP pandemic, in the first half of 2020 the trend of increasing the volume of cargo handling by 10% compared to the first half of 2019 continued, and according to the results of 2020 the volume of cargo handling in the USP

compared to 2019 fell only at 0.7%. That is why we believe that the upward trend in cargo handling is more realistic than the downward trend. Given that Ukraine's seaports continue to increase cargo handling. The optimistic scenario looks without a funnel falling on the schedule. According to this scenario, by 2024 there will be a gradual increase in the volume of cargo handling in the seaports of Ukraine to 198.1 million tons.

Conclusions and prospects for further research

Our approach to forecasting the volume of cargo handling in the USP is based on the regression equation of economic indicators (Ukraine's GDP and global maritime freight volumes) for different periods of time. The adequacy of the model is confirmed by checking the statistical criteria of Student and Fisher and the calculation of Mean Absolute Percentage Error (MAPE). These criteria have proven the high accuracy of the approximation equation, but the influence of these factors, which cannot be calculated mathematically (for example, COVID-19), can significantly affect the accuracy of the forecast.

In the process of forecast development, the following conclusions were made: first, the dynamics of cargo handling in the USP has a high degree of dependence on our selected parameters on which the forecast is based; secondly, the calculated medium-term forecast proved that the volume of cargo handling in the USP will increase to a greater or lesser extent. This makes it possible to assume the need for further research in terms of improving the mechanism of strategic management of USP development, the development of its specific elements and the need to pay attention to the system of strategic documents for managing the development of USP. This is also indicated by the strengthening of the processes of integration of Ukraine's transport system into the EU transport network, including through the Eastern Partnership program, which will require appropriate solutions for short-, medium- and long-term perspectives, that should be concentrated in Strategy for Ukrainian Sea Ports Development until 2038 in the form of goals for the development of seaports and tasks for their implementation.

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СЕРЕДНЬОСТРОКОВІ ПЕРСПЕКТИВИ ФУНКЦІОНУВАННЯ МОРСЬКИХ ПОРТІВ УКРАЇНИ

Викладено результати прогнозування розвитку морських портів України (МПУ) на середньостроковий період за песимістичним та оптимістичним сценаріями. Акцентовано на

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тому, що зазначений прогноз є важливою складовою Стратегії розвитку галузі, а також базовим елементом для розроблення Плану заходів щодо виконання стратегічних середньострокових пріоритетів розвитку згідно із довгостроковими цілями.

Проведено ретроспективний аналіз обсягів перевалки вантажів у МПУ, а також обраних показників, на яких базується модель прогнозу, а саме: обсягів ВВП України та обсягів світових морських вантажних перевезень. Макроекономічний середньостроковий прогноз ВВП України на період до 2024 року розроблено в ДУ "Інститут економіки та прогнозування НАН України", а прогноз обсягів світових морських вантажних перевезень – Конференцією ООН з торгівлі та розвитку (UNCTAD).

Увагу зосереджено на тому, що ефективне управління МПУ залежить від точності та достовірності середньострокового прогнозування, крім того, акцентовано на необхідності дослідження майбутніх тенденцій розвитку морських портів, підґрунтя яких закладається сьогодні. Для цього виокремлено економічні фактори впливу на динаміку обсягів перевалки вантажів у морських портах (МП) України, окреслено глобальні тенденції, що впливають на розвиток світових морських вантажних перевезень та функціонування МП, а також проаналізовано сучасні короткострокові та середньострокові тенденції розвитку морських вантажних перевезень та функціонування МП, які пов'язані з поширенням COVID-19, що впливають на показники діяльності морських портів.

Доведено що, обрана статистична модель розрахунку прогнозу точна та достовірна. Наведені результати свідчать про те, що обсяги перевалки вантажів у морських портах України на період до 2024 року зростатимуть і за оптимістичним, і за песимістичним сценаріями. Підкреслено необхідність обґрунтування рекомендацій до чинної Стратегії розвитку морських портів України з огляду на сучасні тенденції розвитку галузі.

Ключові слова: *морські порти, прогноз, стратегічне управління, песимістичний сценарій, оптимістичний сценарій, обсяги перевалки вантажів, COVID-19*