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Diagnosis of Capital Structure as a Tool for Administering the Financial Activities of Enterprises

Abstract. The development of market transformations in Ukraine has led to the noticeable changes in the sphere of formation and using enterprise capital. Formation of the optimal capital structure, which allows to combine an increase in financial results with the existing risk level, is the main factor of maintaining effective functioning. In this connection, processes of financial activity administration require rethinking and improving the approaches to diagnosis of financing sources both in the theoretical and practical aspects. The aim of the study is to improve the methodological approaches to the diagnosis of enterprise capital structure as an instrument of justifying and making managerial decisions in financial management system on the basis of theoretical approaches and specifying the definition of the term "enterprise financial activity administration". Methods of scientific cognition were used in the work, in particular: of system approach, analysis, synthesis, scientific abstraction, generalizing. Methods of financial coefficient analysis and Shuhart's control charts creation were used to carry out capital structure diagnosis on the example of JSC "Zhytlobud-1" (Kharkiv). The author's vision of the essence of enterprise financial activity administration as a process of developing and implementing managerial decisions was formed, including formation and use of its capital with the aim of financial strength, profitability and creating conditions for fulfillment of obligations, based on information, diagnostic and analytical support for the realization of managerial procedures. It was concluded that diagnosis of capital structure served as the key element in the system of instruments for the administration of enterprise financial activity. The use of Shuhart's control charts for diagnosing the capital structure was proposed, and relevant calculations were carried out on the example of JSC "Zhytlobud-1", the level of manageability of its capital components was assessed, and key management objects in the structure of the company's financing sources were identified. The results of the research can be useful for scientists, students of economic specialties of higher educational establishments, managers and employees of financial divisions of enterprises and financial institutions

Keywords: financial management, sources of financing, management decisions, analysis of financial ratios, Shuhart's control charts

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INTRODUCTION

In today's conditions, the solution of financial problems faced by Ukrainian enterprises requires the analysis of basic concepts and determination of priority directions for the effective administration of financial activities of business entities. In the conditions of an aggressive economy, the size of the company's financial capital and its structure are the determining factors of sustainable development. Therefore, an essential direction of the financial activity administration of a business entity is the establishment of the optimal ratio of equity and loan parts of the capital, which determines the conditions of development and the results of the enterprise activity. Capital structure is a factor that affects financial strength, solvency and liquidity, profitability and market value of the enterprise. Thus, the effectiveness of management decisions in the field of investment and financial policy is based on a qualitative diagnosis of the capital structure, an assessment of alternative options for financing the company activity.

Structural changes in economic processes in Ukraine alter the conditions of enterprises functioning, the conditions

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of formation and use of their financial resources. In this context, the issue of improving the diagnosis of the capital structure as a tool for enterprise financial activity administration in both theoretical and practical aspects is growing in importance.

Both Ukrainian and foreign scientists paid attention to particular issues of diagnosing the capital structure of enterprises. So, O. Podolianchuk, T. Plakhtii, N. Gudzenko [1] emphasized revealing of the essence of the concept of "capital" and pointed out the problems of the content of equity and loan capital. The authors [2] also focus attention on the different understanding of capital category by scientists and the reflection of its circulation. However, in the works [1; 2] issues regarding the evaluation and optimization of the enterprise capital structure were left out of consideration. G.B. Pohrishchuk, R.E. Voloshchuk [3] formed the author's definition of the company's equity capital, analyzed the essential characteristics of the company's equity capital, defined its functions, considered the sources of formation, summarized and characterized the advantages and disadvantages of the formation of the company's equity capital. Nevertheless, the authors did not pay attention to the capital involved, which plays a significant role in the formation of the enterprise resource potential.

General issues of administrative management were studied in scientific works [4-6], where the authors highlighted the peculiarities of the functioning of administrative management systems in market conditions. A significant number of publications are devoted to public administration [7; 8]. In the articles [9; 10] the essence and features of business administration were analyzed, its place in the enterprise management system was determined, the principles of building an effectively functioning business administration system in the organization and at the enterprise were considered and characterized. The authors [11] studied the essence and content of the definitions of public management and administration. Scientists [12] summarized recommendations on tax administration. However, there are no studies as to the administration of financial activity of exactly enterprises in scientific works.

V.A. Petrenko, Yu.Yu. Gurbyk, M.V. Salnikova [13] in their scientific papers reflected the essence and characterized the components of the enterprise financial activity based on the analysis of the concepts of "finance" and "enterprise finance". Therefore, the authors proposed to consider the interpretation of the concept of "enterprise financial activity" within the limits of two aspects: legal and economic-managerial. However, issues regarding managerial aspects and tools of enterprise financial activity administration were left out of consideration.

Thus, in the conditions of aggressive economy, in order to preserve competitive positions, ensure solvency and financial stability, stability of financial activity development, enterprises need to pay more attention to the diagnosis of financial activity, because effective capital management will allow enterprise to get stable positions.

The purpose of the study is the development and improvement of methodological approaches to the diagnosis of enterprises capital structure as a tool for justifying and making managerial decisions in the financial management system based on the generalization of theoretical approaches and clarifying the meaning of the concept of "enterprises financial activity administration".

To achieve the aim of the study, the following tasks were set and solved:

– on the basis of studies of scientific projects and current legislation, to form and clarify the meaning of the concept of "enterprise financial activity administration";

– to justify the expediency of using capital structure diagnosis as a tool for administrating financial activity of enterprises;

– to conduct diagnosis of enterprise capital structure, in particular, determine the level of its management, based on the application of Shuhart's control charts.

The scientific novelty of the study: methodological support for the diagnosis of the capital structure of enterprises has been further developed, which, unlike the existing ones, is formed as a tool for the administration of financial activity and involves the use of Shuhart's control charts, which allows to determine the level of manageability of the capital components of a business entity.

MATERIALS AND METHODS

The object of the study is the process of diagnosing the capital structure as a tool for administrating the financial activity of enterprises.

The study was conducted on the basis of statistical information using methods of scientific knowledge. The methods of system approach, analysis, synthesis, scientific abstraction, and generalization were used to research and clarify the conceptual apparatus of enterprise financial activity administration. The methods of analyzing financial ratios and creating Shuhart's control charts were used to diagnose the capital structure on the example of JSC "Trest Zhytlobud-1" (Kharkiv) for 2014-2021.

RESULTS AND DISCUSSION

In today's conditions, the sources of enterprise funding represent a set of functioning and expected sources of obtaining financial resources, as well as economic entities that can provide them. Therefore, a company faces acute problems of rational organization of finances and increasing the efficiency of their use, since these measures in particular allow to ensure the continuity of the production process and the appropriate level of production profitability. All the above mentioned determines special significance of the process of competent enterprise financial activity administration at various stages of its existence.

Respecting the research of scientists on defining the essence of the concepts of "administration" and "enterprise financial activity", it should be pointed out that there is no single interpretation of the concept of "enterprise financial activity administration". So, first of all, it is advisable to study the conceptual apparatus.

To determine the essence of the concept of "enterprise financial activity administration", the existing approaches to the essence of administration will be analyzed in the first place. In general, administration is a form of providing a management service that takes into account the interests of society [14].

Theoretical and practical research on management activity allows to state that the concept of "administration" is quite often used in the system of knowledge about taxes, where the phrases "tax administration", "public administration", "personnel administration", etc. are quite often used.

The scientist V. Dzyudzyuk notes that the term "administration" originated from the Latin "ministrare", which means "to serve". The researcher draws attention to the fact that the Oxford dictionary [15] and Webster's dictionary [16] define it as "management of affairs" or "direction or management of execution" [17, p. 9]. According to the results of T. Semenchuk's research, administration is "a method of managing society, which is based on the power and credibility of the authorities, that is, in orders, resolutions, commands, instructions and guidelines. This method is mainly used by executive authorities in the form of civil servants" [6, p. 387].

Theoretical and practical research on managerial activities allows to state that the concept of "administration" is quite often used in tax science, where the phrases "tax administration", "public administration", "personnel administration", etc. are actively used.

The multifaceted views regarding the interpretation of the concept of "administration" are given in works [7; 8; 18], etc. So, I.P. Yakovlev [7, p. 121] states that the term "administration" is used, as a rule, to describe: "management and its mechanism; execution of administrative orders in the judicial branch of state power; executive and administrative activities of the state; processes of mandatory payments; science of public administration, etc." Scientists O.Ya. Lazor and O.D. Lazor [8, p. 111-*121], based on the analysis of dictionary editions, note that administration is: "leadership and management of the affairs of governments and institutions; controlling a deceased person's estate to pay taxes and assign assets to heirs; execution and implementation of public policy; a generalized term for all political decisions of various government officials; time in the office of the main performer". O.V. Serov [18, p. 18] notes that in foreign practice the essence of the analyzed concept is defined as: "control and management of something (systems, organization or business); a group of people who organize or control something; activities that combine the management of the work of an enterprise or organization; the government of the country in a particular period of time; the process of managing something (especially laws, government inspections, etc.)".

A significant number of researchers adhere to the statement that the concept of "administration" is a constituent part of the concept of "management". So, Yu.O. Myronenko [5, p. 65] considers administration as "an independent type of management activity or one of the functions of a manager". L. Lipych and R. Hryniuk emphasize that "administration should facilitate prompt decision-making in the process of economic activity of enterprises, coordinate the functioning of their divisions, determine the organizational structure and coordinate the activities of divisions, as well as ensure the achievement of the main tax goals and objectives" [4, with. 44]. A.O. Savchenko [12, p. 147] in the work defines administration as "organizational and managerial activity of leaders and management bodies, which is carried out by issuing orders and commands". A similar opinion regarding the essence of administration is expressed by M.P. Voynarenko and O.M. Kostyuk [9, p. 50], considering it as "the professional activity of managers of the organization or civil servants, aimed at implementing the decisions of the management, that is, the implementation of the tasks and the search for optimal ways to solve them".

Taking into consideration the outlined direction of the research, administration will be considered as the process of management activity, based on information, diagnostic and analytical provision of management procedures.

The concept of "enterprise financial activity" is also debatable. So, V.A. Petrenko, Yu.Yu. Gurbyk and M.V. Salnikova, conducting the analysis of the essence of "enterprise financial activity" concept, came to the conclusion that some scientists believed that the studied concept was the main category of economic science, while others considered it from the standpoint of legal science [13].

According to [19], financial activity of the subjects, operating in the market, includes financial intermediation, insurance and additional activity in the specified areas. A clearer definition of this concept is provided in [20], where it is stated that "financial activity is an activity that leads to changes in the size and composition of company's equity and loan capital".

Therefore, financial activity embodies the continuous process of capital formation of an enterprise, aimed at establishing the optimal ratio of loan and equity components, their rational use in order to ensure financial stability, profitability and creating conditions for fulfilling obligations to other business entities and the state.

The main tasks of enterprise financial activities are: provision of financial resources for current activities; search and analysis of reserves for increasing the level of profitability and solvency; repayment of financial obligations to enterprises and organizations, state bodies and financial institutions; mobilization and formation of the optimal level of financial resources to ensure industrial, economic and social development; control over the distribution and use of financial resources [13].

Summarizing the above, it can be noted that the administration of the financial activities of enterprises is the process of developing and implementing management decisions regarding the effective formation and rational use of its capital in order to ensure its financial stability, profitability and creating conditions for the fulfillment of obligations to other economic entities and the state based on information, diagnostic and analytical support for the implementation of management procedures.

Thus, enterprise capital is the object of financial activity administration.

The practical model of enterprise financial activity administration should be effective, flexible, meet the set strategic goal and take into account the influence of factors of both the external and internal environment. The leading role in this belongs to the rational application of management tools and their timely adaptation to the requirements of economic development. If the set of tools is considered directly, then their use in the management system ensures a direct and clearly defined effect. The complex of administration tools is the basis for the formation and organizational influence of the management subsystem of the economic entity, which is formed by combining the tools positioned in such a complex [21].

The term "instrument" comes from the Latin "instrumentum", which is translated as "tool" and generally means an object, device or mechanism, machine or algorithm used to change or measure any object. Considering the term "tool" in a broad sense, a means of transformation and creation of an object can be understood. As for an enterprise, management tools are understood as mechanisms, means and methods of its managing subsystem influence

on the managed one in order to ensure the effective implementation of the process of management decisions [22].

The practice of management offers many administrative tools, but modern changes in the environment of the functioning of enterprises reveal their shortcomings, causing the impossibility or insufficient effectiveness of their application. Therefore, the intensity of economic competition requires the introduction of management tools capable of solving the tasks of efficiency and effectiveness and quickly responding to changes in the market environment. Today, tools of wide application, which will allow to combine information for effective management of company's financial activities, are of current interest.

A key element in the system of tools for enterprise financial activity administration is the diagnosis of the capital structure. This is explained by the fact that effective formation and rational use of financial resources in today's conditions are strategically important tasks of financial management of business entities. In turn, the implementation of the specified tasks requires the identification, research and consideration of the influence of internal and external environmental factors, as well as the need to diagnose and monitor the financial condition of an enterprise as a whole and, in particular, the structure of the involved sources of funding and their investment directions. This requires the formation of a well-founded set of relevant reliable diagnostic indicators and the establishment of target or desired criteria for their values. It is possible to agree with the authors [23], who note that "the system of indicators for capital structure diagnosis should be based on the principles of completeness, reliability, consistency, openness and adaptability. Their observance will ensure efficiency and flexibility of the use of indicators, as well as allow a comprehensive and critical study of the peculiarities of capital structure formation and advantages in the choice of sources of enterprise financing.

The analysis of literary sources [24-26] and methodological recommendations regarding the analysis of the financial and economic state of enterprises [27; 28] showed that for assessing the capital structure, the indicators reflecting various ratios of funding sources are mainly used, which, in particular, include:

1. equity capital (EC);
2. loan capital (LC), which, in its turn, is divided into:

– long-term loan capital (LLC);
– short-term loan capital (SLC).

This is justified by the fact that the need to determine the optimal ratio between equity and loan funds at the expense of determining the compromise between the growth of the level of profitability and ensuring financial stability is the goal of managing the capital structure of an enterprise [29]. Thus, the authors formed a set of indicators that are proposed to be used to diagnose the capital structure of economic entities (Table 1).

Table 1. Indicators of an enterprise capital structure

№	Indicator title	Symbol	Economic content	Inf. provision for the calculation
1	Coefficient of autonomy	Caut	shows the share of own funds in the total volume of funding sources	$\frac{r.1495\ f.1}{r.1900\ f.1}$
2	Coefficient of financial leverage	Cfl	demonstrates the ratio of borrowed and own funds	$\frac{(r.1900 - r.1495)\ f.1}{r.1900\ f.1}$
3	Share of SLC in the balance	Sslcb	shows the share of short-term loan capital in the total capital sum	$\frac{r.1695\ f.1}{r.1900\ f.1}$
4	Share of SLC in LC	Sslclc	shows the share of short-term loan capital in the loan capital cost	$\frac{r.1695\ f.1}{(r.1595+r.1695)\ f.1}$
5	Coefficient of financial strength	Cfs	demonstrates the share of long-term sources of funding in the total amount of the enterprise capital	$\frac{(r.1495+r.1595)\ f.1}{r.1900\ f.1}$
6	Coefficient of maneuverability EC	$Cman_{ec}$	reflects the share of own funds invested in current assets	$\frac{(r.1495 - r.1095)\ f.1}{r.1495\ f.1}$
7	Coefficient of financial independence of capitalized sources	Cfics	shows what part of long-term sources of funding was formed at the expense of equity capital	$\frac{r.1495\ f.1}{(r.1595+r.1495)\ f.1}$

Source: compiled by the authors

However, it should be noted that there are no reference values for the vast majority of capital structure indicators in literary sources and methodological recommendations for the analysis of the financial condition. This is due to the fact that the specifics of the industry affiliation of enterprises, the selected financial strategy and type of credit policy, and other variable parameters do not allow to establish single unified characteristics regarding the ratio of various sources of funding. In this connection, it is suggested to use Shuhart's control charts to diagnose the capital structure of enterprises, in particular, to determine the level of its manageability.

A control chart is a graph (diagram) on which the values of a statistical indicator are sequentially plotted in the order of sample selection, which is calculated based on sample data and which (graph) is used for analysis and process management in order to assess and reduce the variability of the studied statistical indicator [30]. Since the creation of charts is based on the theory of probability, and the economic processes for the characteristic of which the use of maps is proposed are subject to the normal distribution law, it allows the application of control charts to find reference values and evaluate the characteristics of the capital structure of an individual enterprise in terms of their deviation from the level that is usual for them in the studied period.

A peculiarity of the use of Shuhart's chart is the presence in it of marginal boundaries placed symmetrically relative to the central line of the map. The distances

between the central line and the marginal boundaries are determined based on the calculation of the standard deviation σ and are:

– 3σ – for the upper control boundary (UCB) and lower control boundary (LCB). This means that "approximately 99.7% of the indicator values fall within these limits, provided that the process is in a statistically controlled state" [31].

– 2σ – for the upper warning boundary (UWB) and lower warning boundary (LWB). This means that "any sample value outside 2σ can serve as a warning about the possibility of the process leaving the state of statistical controllability" [31].

Standard deviation is an indicator of the variability of the object that is actively used and shows how much on an average the individual values of the characteristic x_i deviates from their average value *Xav*. It is calculated according to formula (1):

$$\sigma = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(x_i - x_{av})^2}, \quad (1)$$

where x_i-i – that element of totality; x_{av} – the average arithmetic value of all totality indicators; n – number of indicators in the totality.

The initial data for calculating the indicators of Shuhart's control charts for JSC "Zhytlobud-1" are presented in the Table 2. The calculation of statistics for indicators is presented in Table 3.

Table 2. Initial data for creating Shukhart's control charts for JSC "Zhytlobud-1"

	31.12.14	31.12.15	31.12.16	31.12.17	31.12.18	31.12.19	31.12.20	30.09.21
Coefficient of autonomy	0.025	0.013	0.020	0.297	0.237	0.420	0.367	0.291
Coefficient of financial leverage	39.089	75.820	49.804	2.364	3.224	1.379	1.725	2.436
Share of SLC in the balance	0.351	0.305	0.536	0.542	0.475	0.338	0.448	0.625
Share of SLC in LC	0.358	0.310	0.547	0.771	0.623	0.584	0.707	0.881
Coefficient of financial strength	0.654	0.692	0.464	0.458	0.525	0.662	0.552	0.375
Coefficient of maneuverability EC	-2.351	-3.222	-3.235	0.800	0.781	0.896	0.857	0.843
Coefficient of financial independence of capitalized sources	0.038	0.019	0.042	0.649	0.451	0.635	0.664	0.775

Source: compiled by the authors

Table 3. Calculated indicators for creating Shuhart's control charts

Indicator	The value of statistics					
	x_{cep}	σ	LCB (X_{av}-3σ)	LWB (X_{av}-2σ)	UWB (X_{av}+2σ)	UCB (X_{av}+3σ)
Coefficient of autonomy	0.209	0.155	-0.257	-0.102	0.520	0.675
Coefficient of financial leverage	21.980	27.2	-59.621	-32.42	76.381	103.581
Share of SLC in the balance	0.452	0.106	0.134	0.240	0.665	0.771
Share of SLC in LC	0.598	0.182	0.051	0.233	0.962	1.145
Coefficient of financial strength	0.548	0.106	0.229	0.335	0.760	0.867
Coefficient of maneuverability EC	-0.579	1.844	-6.110	-4.266	3.109	4.952
Coefficient of financial independence of capitalized sources	0.409	0.303	-0.499	-0.196	1.015	1.318

Source: compiled by the authors

Based on the calculated data, Shuhart's control charts for JSC "Zhytlobud-1" were created (Figs. 1-7) and the obtained results analyzed.

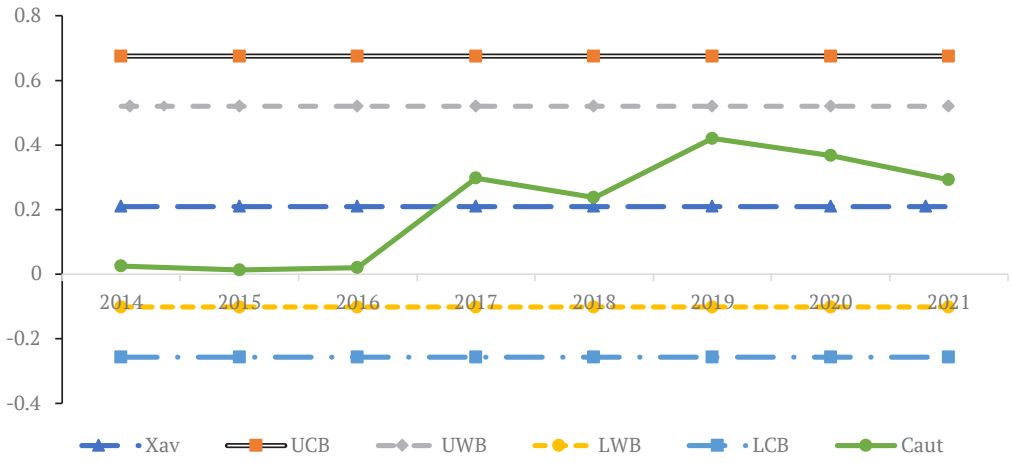

Figure 1. Shuhart's control chart for the coefficient of autonomy
Source: compiled by the authors in MS Excel

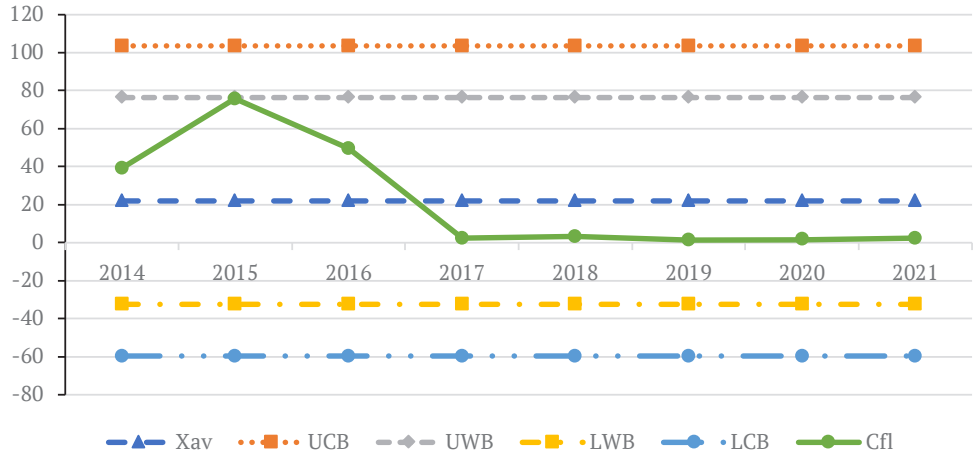

Figure 2. Shuhart's control chart for the coefficient of financial leverage
Source: compiled by the authors in MS Excel

So, as for the coefficient of autonomy (Fig. 1), it is significantly lower than the standard normative value (0.5) during the entire analyzed period, which indicates a low share of equity capital in the structure of the enterprise sources of finance and, accordingly, can negatively influence its financial stability. At the same time, its dynamics on Shuhart's chart shows that the indicator is within the control limits, not touching either the lower or the upper warning limits (LWB and UWB) throughout the studied period. This means that this indicator is well managed, and its dynamics is under control, does not cause threats to the company's financial condition.

The coefficient of financial leverage (Fig. 2) has very unstable dynamics in the period from 2014 to 2017. At the same time, its value is very high, which indicates a significant excess of loan capital over the equity one. Such a situation indicates a significant threat to the loss of the company's financial stability. At the same time, attention should be paid to the fact that in 2015 the value of the indicator crossed the upper warning limit, which indicates its exit from the controllable zone. It can be seen that the company took measures to change the capital structure by increasing the amount of own funds, which led to a decrease in the financial leverage ratio and its subsequent stability. In the period from 2016 to 2021, the ratio is in the range between UCB and LCB, which indicates a high level of its manageability and maintenance of a stable ratio between loan and equity capital, and accordingly, maintenance of an acceptable level of financial risk for JSC "Zhytlobud-1".

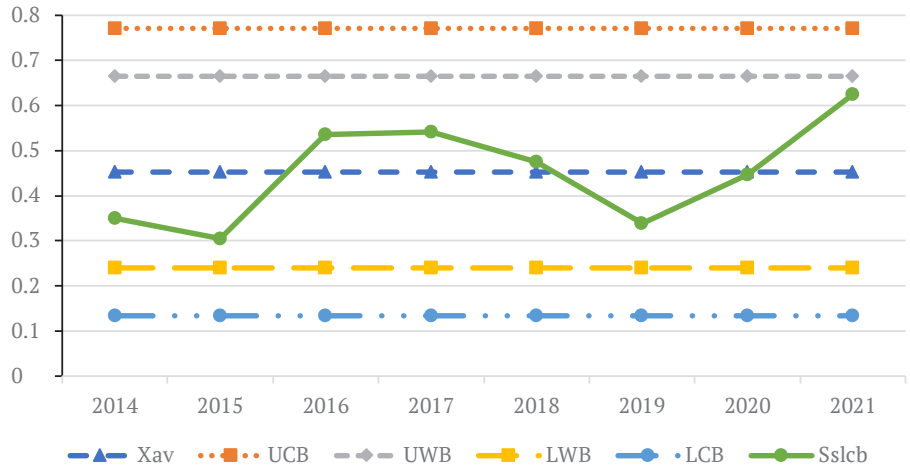

Figure 3. Shuhart's control chart for the share of short-term loan capital in the enterprise balance
Source: compiled by the authors in MS Excel

Analyzing the dynamics of the share of short-term liabilities in the company's balance sheet (Fig. 3), it can be seen that during the analyzed period, the indicator is mostly within the recommended limits. At the same time, it can be seen that its value is in the range from 0.3 to 0.6, and in 2016-2017 it exceeds 0.5, that is, more than 50% of the company's capital is formed at the expense of short-term loan capital, which negatively characterizes it financial stability. It can be noted that in 2021 this indicator almost reached the value of the upper warning limit (UWB), therefore, financial managers should pay attention to this and take immediate measures aimed at restructuring the company's sources of financing, aimed at increasing the share of long-term funds in order to ensure sufficient level of financial stability.

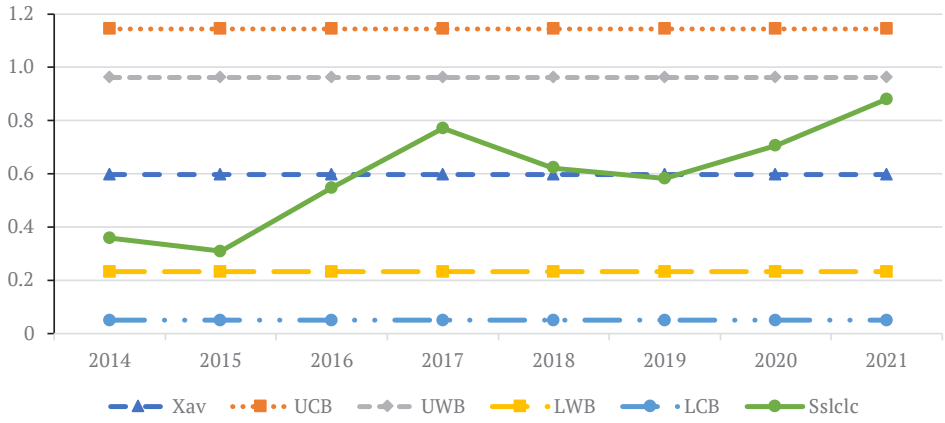

Figure 4. Shuhart's control chart for the share of short-term loan funds in the loan capital
Source: compiled by the authors in MS Excel

The analysis of Shuhart's control chart data (Fig. 4) shows that the structure of loan capital of JSC "Zhytlobud-1" has undergone significant changes during the period under study. Thus, in 2014-2015, the majority of loan funds were formed at the expense of long-term capital, however, since 2016, the share of short-term loan funds has begun to grow, and as of September 30, 2021, almost 90% of loan funds have a maturity of less than 1 year. Such dynamics negatively characterizes the enterprise financial stability. At the same time, as the control chart shows, the indicator is approaching the upper warning limit, which specifies possible threats of control loss and deterioration of the company's financial condition.

The coefficient of financial stability reflects the share of long-term sources of funding in the structure of the company's balance sheet. The analysis of Shuhart's control chart (Fig. 5) reflects negative changes in the dynamics of this indicator starting from 2019. The share of sources providing financial stability decreased from 66% to 37%, the value of the indicator is approaching the lower warning limit. This may indicate that the enterprise has lost control over the process of forming the capital structure, which, accordingly, leads to a decrease in the level of its financial strength.

Regarding the level of maneuverability of the company's equity capital, the analysis of Shuhart's control chart (Fig. 6) shows that the indicator throughout the analyzed period is within the control limits, which indicates a high level of its manageability.

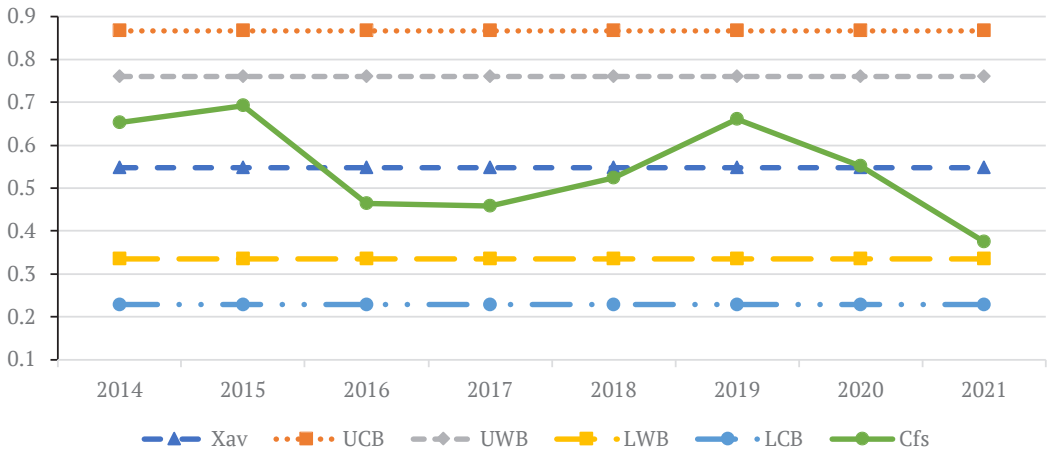

Figure 5. Shukhart's control chart for the coefficient of financial strength
Source: compiled by the authors in MS Excel

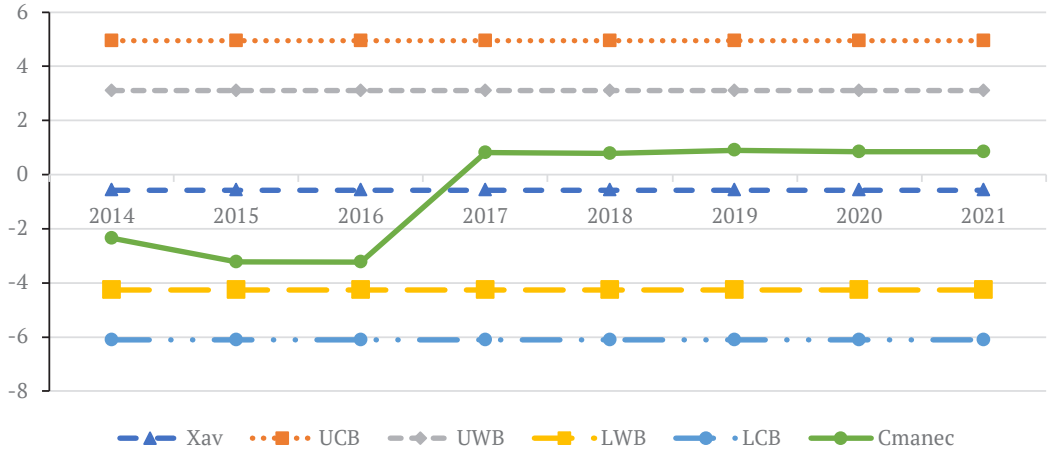

Figure 6. Shuhart's control chart for the coefficient of maneuverability of equity capital
Source: compiled by the authors in MS Excel

In addition, it is a positive fact that since 2017 to the present, the indicator has had a stable positive value. The share of equity capital invested in current assets is on average at the level of 80%, which indicates a high level of financial stability in the structure of the company's equity funds.

The coefficient of financial independence of capitalized sources demonstrates the share of equity funds in the structure of long-term sources of financing. The dynamics of this indicator on Shuhart's control chart (Fig. 7) is positive, it has an upward trend and is within manageability.

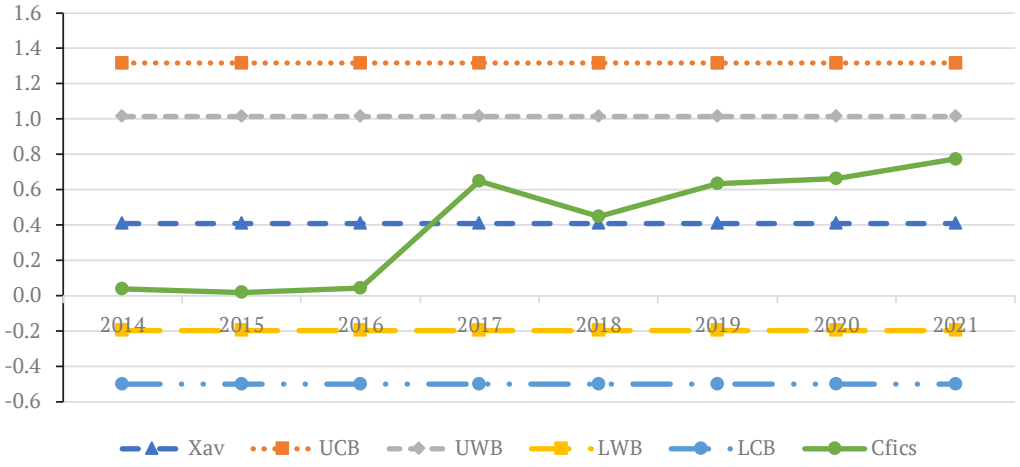

Figure 7. Shuhart's control chart for the coefficient of financial independence of capitalized sources
Source: compiled by the authors in MS Excel

Thus, the diagnosis of the capital structure of JSC "Zhytlobud-1" using Shuhart's control charts allows to draw the following general conclusions:

1) the capital structure of the enterprise underwent significant changes during the analyzed period, while some of the indicators have a high level of manageability, but there are indicators that require additional attention from financial managers;

2) at the beginning of the studied period, the capital of the enterprise was mainly formed at the expense of loan funds, the share of equity capital was very low (2014-2016). At the same time, financial stability was maintained due to the predominance of long-term funds in the structure of loan capital;

3) since the beginning of 2017, the share of equity capital has increased significantly, but it has started to decrease again since 2019;

4) in the structure of loan funds, there is a significant increase in the share of short-term loan capital. Moreover, the indicators reflecting its share both in the total volume of financing and in loan capital tend to go beyond the zone of control limits, which indicates an insufficient level of their manageability;

5) in this connection, the key management objects in the capital structure of JSC "Zhytlobud-1" are the volume and share of short-term loan funds in the structure of the company's financing sources.

In the work, the content of the concept of "enterprise financial activity administration" was formed and clarified, which, unlike the existing studies, is based on a combination of studies on modern research of scientists and current legislation regarding the content of the concepts of "administration" [4; 13; 18] and "enterprise financial activity" [18-20].The result of solving the first task is an improved definition: enterprise financial activity administration is the process of developing and implementing management decisions regarding the effective formation and rational use of its capital in order to ensure its financial stability, profitability and creating conditions for the fulfillment of obligations to other business entities and the state, which is based on information, diagnostic and analytical support for the implementation of management procedures.

In the course of solving the second task, the expediency of using capital structure diagnosis as a tool for the enterprise financial activity administration was substantiated. The solution to the third task is confirmed by the results of the diagnosis of the capital structure on the example of JSC "Zhytlobud-1" (Kharkiv), which, in contrast to the existing studies, was carried out on the basis of the application of Shuhart's control charts (Figs. 1-7). The use of Schuhart's control charts as a diagnostic toolkit should be considered a positive direction in the development of the conducted research for the formation of sound management decisions in the field of financial activity of the enterprise, which made it possible to assess the level of manageability of capital components and to identify key management objects in the structure of funding sources of JSC "Zhytlobud-1".

CONCLUSIONS

The analysis of the treatises of the scientists, who studied the issue of defining the essence of the concepts of "administration" and "financial activity of an enterprise", legislative and regulatory acts, revealed the lack of a single interpretation of the concept of "enterprise financial activity administration", which determined the feasibility of conducting research in this direction. On the basis of the study and combination of the content of the categories "administration" and "enterprise financial activity", the author's vision of the essence of the administration of the financial activity of enterprises as a process of development and implementation of management decisions regarding the effective formation and rational use of its capital in order to ensure its financial stability, profitability and the creation of conditions for the fulfillment of obligations to other business entities and the state, which is based on information, diagnostic and analytical support for the implementation of management procedures.

In the work it was established that the key element in the system of tools for the enterprise financial activity administration is the diagnosis of the capital structure, which is determined by the following. Firstly, the practical model of the enterprise financial activity administration must be effective, flexible, meet the strategic goal and take into account the influence of external and internal factors. Secondly, the effective formation of the structure and the rational use of the enterprise capital are strategically important tasks of financial management. In its turn, this requires research, understanding and processing of the consequences of the influence of these factors, as well as determines the expediency of objective and comprehensive diagnosis and monitoring of the financial state, structure of financial resources and directions of their use.

In the study it was offered to use Shuhart's control charts to diagnose the capital structure on the example of JSC "Zhytlobud-1". The use of this tool provides an opportunity to determine the optimal values and manageability limits for indicators that do not have universal standards, and also makes it possible to diagnose and evaluate trends in their development, on the basis of which the management of the enterprise is able to make adequate managerial decisions. In this connection, the use of Shuhart's control charts made it possible to assess the level of manageability of the capital components of the enterprise under study and to identify key management objects in the structure of funding sources of JSC "Zhytlobud-1".

Prospects for further investigations in this direction are the application of economic and mathematical methods of forecasting the capital structure of the enterprise under study in order to ensure long-term financial stability and sustainable development.

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Діагностика структури капіталу як інструмент адміністрування фінансової діяльності підприємств

Анотація. Розвиток ринкових трансформацій в Україні призвів до суттєвих змін в сфері формування і використання капіталу підприємств. Ключовим чинником забезпечення ефективного функціонування є формування оптимальної структури капіталу, яка дозволяє поєднати зростання фінансових результатів з прийнятним рівнем ризику. У даному зв'язку процеси адміністрування фінансової діяльності вимагають переосмислення та удосконалення підходів до діагностики структури джерел фінансування як в теоретичному, так і практичному аспектах. Метою дослідження є удосконалення методичних підходів до діагностики структури капіталу підприємств як інструменту обґрунтування та прийняття управлінських рішень в системі фінансового менеджменту на підґрунті узагальнення теоретичних підходів та уточнення змісту поняття «адміністрування фінансової діяльності підприємств». В роботі використано методи наукового пізнання, а саме: системного підходу, аналізу, синтезу, наукової абстракції, узагальнення. Для проведення діагностики структури капіталу на прикладі АТ «Житлобуд-1» (м. Харків) було застосовано методи аналізу фінансових коефіцієнтів та побудови контрольних карт Шухарта. Сформовано авторське бачення сутності адміністрування фінансової діяльності підприємств як процесу розробки та впровадження управлінських рішень щодо формування та використання його капіталу з метою забезпечення фінансової стійкості, прибутковості та створення умов для виконання зобов'язань, який базується на інформаційному, діагностичному та аналітичному забезпеченні реалізації управлінських процедур. Встановлено, що ключовим елементом в системі інструментів адміністрування фінансової діяльності підприємств виступає діагностика структури капіталу. Запропоновано використання контрольних карт Шухарта для проведення діагностики структури капіталу та проведено відповідні розрахунки на прикладі АТ «Житлобуд-1», оцінено рівень керованості складових його капіталу та виділено об'єкти ключового управління в структурі джерел фінансування підприємства. Результати дослідження можуть бути корисними для науковців, здобувачів економічних спеціальностей закладів вищої освіти, керівників та працівників фінансових підрозділів підприємств і фінансових установ

Ключові слова: фінансовий менеджмент, джерела фінансування, управлінські рішення, аналіз фінансових коефіцієнтів, контрольні карти Шухарта

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Factors in the Formation of Super-Cycles in World Commodity Markets

Abstract. Over the past few years, the world's leading commodity markets have seen an upward trend in prices, which may indicate the beginning of a new super-cycle or may be of a short-term nature, driven by current changes in demand and supply. Commodity super-cycles are important for the global economy, especially for macroeconomic policies in commodity-exporting countries, and are also reflected in the dynamics of international financial markets. The purpose of the article is to determine the essence and features of super-cycles in world commodity markets as well as to identify the factors that led to the increase in commodity prices in 2020-2022. To solve the objectives set in the article, a number of general scientific and special methods of scientific cognition are used, namely the method of theoretical generalization, historical and logical methods, descriptive-analytical method, analysis and synthesis, induction and deduction, abstract-logical method and method of economic-statistical analysis. The article outlines the mechanism of deployment of the conjunctural cycle in commodity markets and its connection with long cycles of business activity, which are conditioned by the implementation of revolutionary technological innovations. It discusses the dynamics of the main composite commodity indices. The factors influencing the growth of prices for commodity assets at the micro and macro levels are identified. The article traces changes in the course of commodity super-cycles during the 20th and early 21st centuries and investigates their causes. It is revealed that global inflationary processes, the dynamics of the US dollar index as well as the disruption of supply chains in international trade due to the COVID-19 pandemic had a significant impact on the global growth of commodity prices in 2020-2022. At the same time, forecasts about the recession of the global economy caused by the large-scale military aggression of russia in Ukraine and the long-term consequences of the pandemic as well as macroeconomic policies of large economies aimed at overcoming excessive inflation may somewhat cool the prices of commodity assets. To assess the sentiments and expectations of economic entities, the dynamics of the basis for WTI oil is analyzed, which gives grounds to conclude that the price fluctuations in global commodity markets in 2020-2022 are short-term in nature as well as to question the beginning of a new super-cycle. Identification and forecasts of conjunctural fluctuations in global commodity markets are important without any exaggeration for all economic entities – both for producers in making strategic as well as tactical management decisions on the development of production and in the formation of structural and macroeconomic policies of the country in order to increase the export potential of the national economy and to ensure its competitiveness

Keywords: commodities, cyclical fluctuations in global commodity markets, long waves, composite commodity indices, financialization of commodity markets

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INTRODUCTION

The study of global commodity super-cycles is important in making production, investment and management decisions and in shaping economic policies. Commodity super-cycles are reflected in the dynamics of financial markets, since financial investors consider the conjuncture of the world markets for key commodities when making decisions on optimizing the portfolio of assets, hedging risks and obtaining speculative profits in commodity derivatives markets. Commodity indices have become not only a profitable investment tool, but also fuel speculative demand for commodity derivatives, and have an impact on commodity prices in the relevant spot markets. In the context of intensified processes of economic financialization, investigating the

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impact of the state macroeconomic policies (in particular, monetary) on the nature of the relationship between commodity prices and fluctuations in production volumes and other macroeconomic indicators is of particular interest to economists.

Long-term cyclical fluctuations in commodity markets are the object of research for many economists and practitioners in the financial sector of the economy. Studying the causes of commodity super-cycles, researchers note that they mostly coincide with the periods of industrial revolutions [1; 2] as well as are precipitated by disturbances in demand rather than supply [3]. In particular, D. Jacks and M. Stuermer [3] argue that the phase of growth in commodity markets, caused by the growth in global demand for raw materials, is the result of the interaction of two processes – investment in new production facilities and technical progress. They distinguish three factors of long-term fluctuations in the real price of raw materials – demand disturbances, supply disturbances and specific disturbances. Analysing the annual data during 1870-2013 for a sample of 12 agricultural commodities and metals, D. Jacks and M. Stuermer concluded that the determinants of super-cycles were demand disturbances and specific shocks.

Disturbances in commodity markets also affect the macroeconomic environment in developing countries that are commodity exporters [4-6] and need to apply appropriate macroeconomic tools to mitigate them [7; 8]. T. Drechsel and S. Tenreyro [4] carried out a quantitative assessment of the impact of disturbances in world commodity markets on the macroeconomic indicators of Argentina, which is a vivid example of the commodity economy. They found that commodity prices had a significant direct impact on production, consumption as well as investment, and showed an inverse relationship with Argentina's external trade balance as well as interest rate spreads. F. Roch [5], based on the analysis of panel data for 22 exporting countries, obtained similar results confirming the direct impact of positive commodity price disturbances on production, consumption and investment. Super-cycles in world commodity markets are also a significant factor of fluctuations in business activity in commodity-exporting countries and account for a 25-34% variation in the main macroeconomic indicators. Moreover, a floating exchange rate regime, inflation targeting, moderate debt burdens and prudent fiscal policies mitigate the negative impact of commodity super-cycles on the macroeconomic environment of exporting countries.

Over the past few years, economists have noted the increasing dynamics of world prices for key commodities. Analysing their dynamics and causes, they increasingly make assumptions about the onset of another commodity super-cycle in the global economy. Undoubtedly, in a market economy prices tend to fluctuate. *The purpose of the article* is to track and analyse the features and patterns of long-term fluctuations in world commodity prices during the 20th and early 21st centuries, and to investigate the factors of their increase in 2021-2022, which will allow to make a conclusion on the nature of conjunctural fluctuations in world commodity markets in the post-pandemic period.

The novelty of the study is further development of the analysis of the factors of growth of world commodity prices in the post-pandemic period. Along with the fundamental factors that cause imbalances in commodity markets, a number of factors related to the functioning of the monetary sector of the economy are taken into account, namely excess liquidity in the economy as a result of the fiscal discretionary policies of governments during the pandemic, the growth of global inflation rates, the intensification of the financialization of commodity markets, anti-inflationary policy measures in large open economies and forecasts of the dynamics of economic growth in developing countries.

MATERIALS AND METHODS

The methodological basis of the research results presented in the article comprises fundamental provisions of analytical economics, in particular macroeconomics, microeconomics, international economics and international finance, scientific concepts of scholars about the essence and cause of conjunctural fluctuations in the economic system.

To achieve the aim set in the article, both general scientific and special methods of scientific cognition were used, namely: theoretical generalisation (to clarify the content and essential features of the commodity super-cycle); historical and logical methods (to study the dependencies between long-term fluctuations in prices in world commodity markets and the dynamics of long economic cycles due to the implementation of technological advances of industrial revolutions); descriptive-analytical method for the theoretical substantiation of evolutionary changes in the endogenous mechanism of commodity super-cycles during the 20th century); analysis and synthesis, induction and deduction (to identify patterns in the dynamics of prices observed in commodity markets during the last two centuries); abstract and logical method (which gave grounds for making a conclusion about the specifics and causes of conjunctions in world commodity markets in 2021-2022). The solution of the objectives set in the article is also based on the methods of economic and statistical analysis. In particular, the latter were used to analyse the dynamics of commodity price indices as well as to identify dependencies between the indicators of the global macroeconomic environment and the dynamics of world commodity prices in 2021-2022.

RESULTS AND DISCUSSION

The long-term growth of world commodity prices within the commodity super-cycle is reflected in the growth rate of the global economy by slowing it, increasing global inflationary pressure on the prices of final goods and services.

However, the positive structural changes that have taken place in the world's leading economies as well as effective macroeconomic policies based on certain nominal anchors, allow for the reduction (mitigation) of the negative stagflationary impact of a commodity super-cycle on the global economy.

Commodities are goods (oil, natural gas, coal, copper, nickel, wheat, corn, sunflower seeds, beef, coffee beans, etc.) that are used as resources in the production of final industrial goods and services. These commodities are often exchange-traded because they are traded on both national and global commodity exchanges. The main suppliers of such goods to global markets are producers from those countries that own relevant natural resources for their production [9].

One peculiar feature of such goods is a relatively high degree of standardization, i.e. there is insignificant difference between the properties of raw materials from

one supplier and those from another. Commodities are a special asset that differs from other exchange-traded assets, such as bonds or equities. The prices of such goods during a commodity super-cycle move mainly synchronously. At the same time, such price fluctuations cover a wide range of commodities.

Economists from Wells Fargo Investment Institute traced 6 commodity super-cycles during 1791-2021 [10]. Thus, commodity super-cycles are defined as long periods of upswing and recession in commodity markets with prices falling significantly above or below their long-term trends. Such fluctuations are quite long (20-40 years) and exceed the duration of average business cycles. However, their duration correlates with long cycles of business activity, the driving factor of which is most often the implementation of technological innovations in production. Changes in investment volumes due to the development of technological innovations generate economic growth in new sectors of the economy and the decline of outdated production methods. The implementation of innovation forms a phase of prosperity, which is later followed by a phase of stagnation, during which innovation is acquired by industries, and technology becomes standardized.

Commodity prices are directly linked to these phases of prosperity and stagnation, which form long cycles. In the prosperity phase, competition in resource markets increases and provokes price increases in global commodity markets, especially for those goods related to the implementation of innovative production technologies. In the stagnation phase, the implementation of these technologies by a wide range of producers leads to a decrease in opportunities for gaining overprofits, reduces demand for raw materials, and therefore reduces the conjuncture in commodity markets.

During the super-cycle, commodity prices in world markets deviate from their long-term trends. Each commodity super-cycle consists of two phases – the phase of price increase (commodity bull super-cycle), which on average lasts 17 years, and the phase of global price decrease (commodity bear super-cycle), the average duration of which is 20 years, and the price amplitude is 20-40% around the long-term global price trend [10].

The dynamics of composite commodity indices such as the Bloomberg Commodity Index, S&P GSCI, The Refinitiv/CoreCommodity CRB Index (RF/CC CRB), etc. are most commonly used to track commodity super-cycles. They generally consist of 24-28 exchange futures contracts comprising physical goods belonging to different sectors of the economy: energy, industrial metals, precious metals, agricultural products, livestock products. These indices also serve as a benchmark for investment in commodities [11; 12].

The increase in prices for raw materials is mainly driven by the increase in demand for them from producers of final goods in the context of relatively inelastic supply as well as the problems of "underinvestment" of supply companies (market supply shock), and therefore the emergence of market imbalances. Simultaneously, the increase in demand from producers means an increase in the production of final consumer goods and the absolute prices for most of them eventually become lower.

Overcoming this imbalance requires a long time that is necessary to discover new deposits of raw materials, invest in extractive and processing enterprises, which will be able to increase the supply of goods. For example, the utilisation of investments to expand production at copper mining and supplying enterprises requires about ten years. Supply companies make such investment decisions in anticipation of a sustained price increase. Thus, during periods of increased demand the cause of imbalances in commodity markets is generally underinvestment of supply enterprises, which causes the failure to meet the growing demand.

At the macroeconomic level, the onset of a commodity super-cycle is associated with an unexpected increase in aggregate demand. The prices for certain groups of commodities display different global GDP price elasticity, which is primarily due to the technological features of their production. Thus, according to some estimates, during 1991-2015, the price elasticity of oil was twice as high as for agricultural commodities (14% and 7.2%, respectively), and the price elasticity of metals was 9.2%. Thus, the prices of commodities increase mostly in response to global GDP growth, i.e., commodity super-cycles generally coincide with periods of global economic growth driven by technological revolutions [13].

The impact of super-cycles in global commodity markets on the terms of trade in developed countries specializing in high-tech products and developing countries that are exporters of raw materials is explained by the Prebisch-Singer hypothesis. Under this hypothesis, firstly, the low income elasticity of demand for commodities causes a relative decrease of their prices and/or the slowdown of economic growth rates in developing countries. This impact is exacerbated by the low price elasticity of demand for commodities. Secondly, asymmetries in developed countries' labour markets compared to that of developing countries are redistributing the benefits of increasing prices in favour of the former. Innovation in the production of high-tech goods causes income growth in producing countries, and the benefits of technical progress in the production of commodities are mostly received by consumers in developed countries as a result of lower prices for resources. Thus, in the phase of rising commodity prices, the terms of trade in exporting countries improve to some extent, but in the phase of a global recession, the relative decline in prices is also exacerbated by the excess supply of commodities [2].

During the 20th century, the nature and dynamics of commodity super-cycles evolved. Firstly, commodity super-cycles occur in the global economy, in which, due to the improvement of national macroeconomic policies and the implementation of unconventional measures, a new macroeconomic environment has been formed, objective structural changes have taken place in national and world economies.

Secondly, the duration and amplitude of such cycles is determined by the nature of long-term technological and investment processes in the economy, the duration of the implementation of developments in scientific and technological progress into production, which in turn generate imbalances in commodity markets. In the 20th century, the processes of implementing the developments of scientific and technological progress into production accelerated. This contributed to a reduction of the phases of the commodity super-cycle [2].

Thirdly, the financialization of commodity markets, which means the penetration of financial capital into commodity markets and the growth of investments in commodity derivatives, has become an additional driver of a modern super-cycle.

Studies of super-cycles have also allowed to identify a pattern that can be traced throughout the 20th century, namely a decrease in the average value of real prices for a group of non-energy commodities and resources of each subsequent super-cycle. In other words, the average real price of a commodity (excluding energy commodities and resources) declined at a certain point in each subsequent super-cycle [2].

It should be noted that super-cycles differ from short-term fluctuations in commodity prices determined by conjunctural factors primarily in their duration and generally extend to the markets for specific goods.

The emergence of the first commodity super-cycles is associated with industrial revolutions, and other significant events that caused significant shifts in demand or supply in resource markets. For instance, the economic growth in the United States in the late 19th and early 20th centuries led to a steady and long-term increase in commodity prices.

Another long-term price increase occurred during the period of economic reconstruction in Europe and Japan after World War II. The reason for the long-term increase in prices was an increase in demand for commodities. Commodity super-cycles can also be triggered by supply shocks, such as the oil embargo of the Organization of the Petroleum Exporting Countries (OPEC) in the 1970s [13].

The last commodity super-cycle, which unfolded in early 2000, was due to the rapid pace of economic growth and urbanization in developing countries, particularly India, China and Brazil as well as China's accession to the World Trade Organization in 2001 – and, consequently, an increase in demand for key raw materials which manifested itself in a steady increase in prices in world commodity markets [14].

During the upswing phase of the last super-cycle (2000-2011), demand for metals increased particularly. For example, copper prices (which economists consider a barometer of global economic health) rose from $2,000 to $10,000 per tonne during 2000-2010. Oil prices rose from $10 to $150 per barrel. The price of gold rose from $250 to $1,900 per ounce, and the price of corn rose from $2 to $8 per bushel [10]. During 2001-2008, the Bloomberg Commodity Index increased by almost 350% [15]. The global financial crisis affected the dynamics of this index causing its decline. In 2008, there was a drop in all commodity indices (Fig. 1), but it was of a short-term conjunctural nature and it is associated with stock market participants' expectations of an increase in the interest rate in the United States and the fall of the Chinese stock market. This affected investors' uncertainty about the resilience of the Chinese economy.

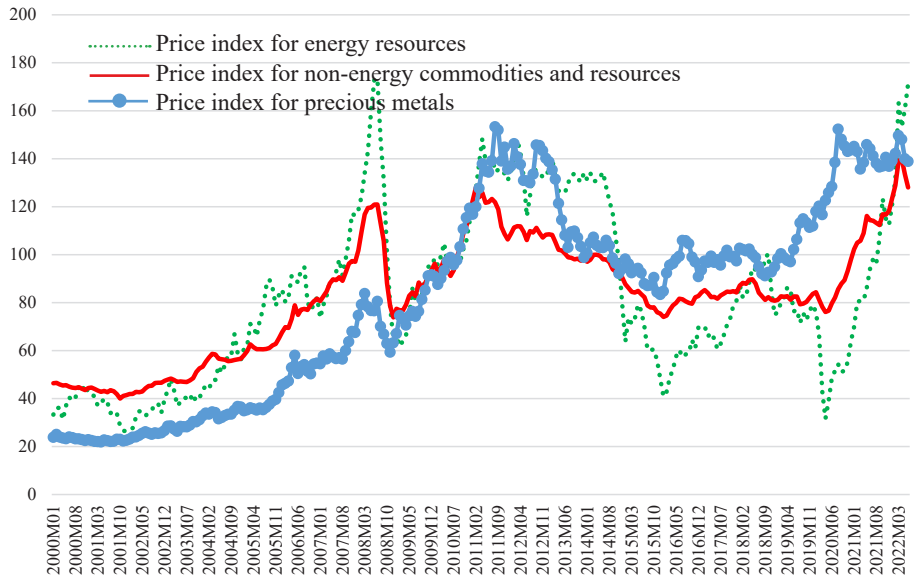

Figure 1. Commodity price indices in 2000-2022

Source: [16]

In 2012, a new phase of the last commodity super-cycle began, when commodity prices began to decline. The end of the period of high commodity prices was followed by a slowdown in economic growth, mainly due to a decrease in demand in global commodity markets. During 2021 and in the first half of 2022, there was a sharp increase in prices in commodity markets. The Bloomberg Commodity Index at the end of 2021 rose to its highest level in 2011, and the S&P GSCI index as of June 2022 increased by 213% compared to 2020, when it reached the minimum value during the pandemic (Fig. 2).

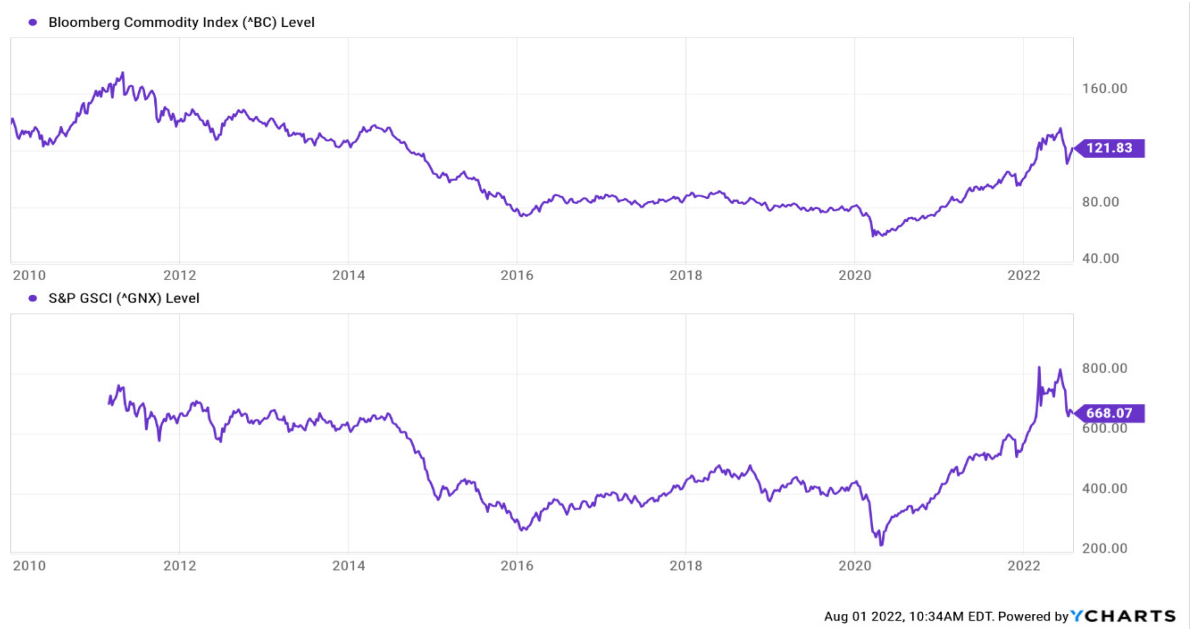

Figure 2. Dynamics of the Bloomberg Commodity Index and the S&P GSCI index in 2010-2022

Source: [15]

Most economists see this upswing as the beginning of a growth phase of a new global commodity super-cycle that may probably last for decades [17]. In their opinion, the new super-cycle is determined by the so-called energy (green) transition or the Fourth Industrial Revolution, which involves the mass introduction of energy-intensive information technologies into industries (the commitment of developed economies to reduce carbon emissions, achieve environmental neutrality and reduce energy intensity requires serious investments in infrastructure, which in turn involves significant costs for raw materials). Under these conditions, decarbonization and the green revolution significantly increase the demand for nickel, copper, lithium, and cobalt. Simultaneously, focusing on issues related to global climate change is not likely to contribute to increased investment in extractive industries, which in turn can exacerbate the supply shock, thus failing to facilitate overcoming imbalances in world commodity markets.

Researchers of commodity markets view high demand from China as the main reason for the increase in prices. At the same time, there is uncertainty of whether the global business recovery from the pandemic and green investments are drivers strong enough to stimulate a new super-cycle [14].

A study conducted by Marquette Associates shows that modern drivers may not be strong enough. Imports to China rose sharply in 2020, and the new super-cycle will require sustained growth in demand. However, the World Bank predicts a slowdown of economic growth in the world's second largest economy of China to 4.3% in 2022, compared to 8.1% in 2021, due to a recurring outbreak of COVID-19 in the country and a slowdown in the global economic growth to 2.9% in 2022. This forecast may cause a fall in commodity prices [18].

Identifying and examining the causes of price increases is relevant. In fact, if the increase in prices is determined by market factors, it is of a short-term nature and it can be expected a bounce in prices in the near future. But such price dynamics can also be a sign of the deployment of another super-cycle, in which the upswing phase can last for several decades.

The increase in commodity prices can be explained by several fundamental reasons that account for the unfolding of global inflationary processes in recent years (Fig. 3), namely: supply chain disruptions that emerged during the pandemic, an increase in aggregate demand due to macroeconomic policy measures taken during the pandemic, adverse weather conditions in Brazil that is the main supplier of soybeans and other crops to the world market, disruptions in the supply of raw materials caused by the armed aggression of russia in Ukraine, seasonal growth in gasoline demand in the northern hemisphere.

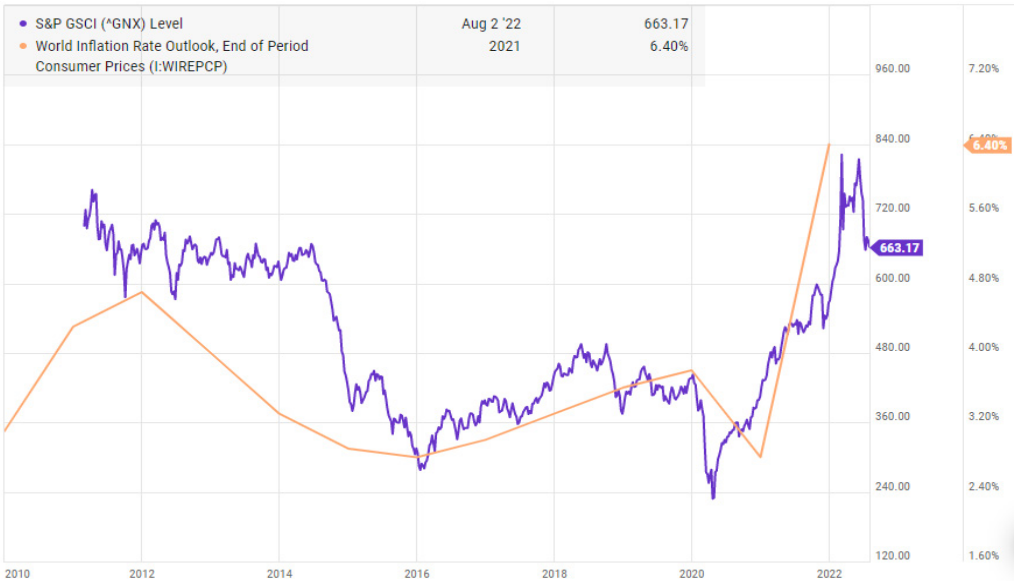

Figure 3. Dynamics of the S&P GSCI and the World Consumer Price Index (CPI) in 2010-2022

Source: [15]

The oversupply of money, driven by stimulative monetary policies pursued by advanced economies, also triggered demand for commodities, but the latter was somewhat weakened by supply chain disruptions during the pandemic.

Vanguard researchers concluded that during 2011-2022, there was a 7-9% increase in commodity prices per each percentage of the increase in unexpected inflation (the actual rate of inflation exceeding the forecast inflation) [19].

Moreover, the oversupply of money leads to an unprecedented movement of capital to financial and commodity time markets for the purpose of obtaining speculative income.

Rising inflation and a weakening US dollar will generate additional demand from investors for commodities for the sake of hedging their portfolios against risks. Investors increasingly consider financial instruments with commodities as the underlying asset to be an appealing investment opportunity. It is thought that commodities may be used to hedge the risks associated with inflation due to their intrinsic value, and hedging has a strong effect when prices of consumer goods rise and the dynamics of stock indices are inferior to the dynamics of the commodity index.

In 2022, the growth rate of commodity prices has exceeded the dynamics of stock indices. The S&P GSCI index has increased by 34% since the beginning of 2022, while the total returns of the S&P 500 index have shown a decline (-22.5%) since the beginning of the year, and the NASDAQ-100 stock index of high-tech companies has decreased by 31% [15]. If the dynamics of commodity prices shows a low correlation with the dynamics of stock indices, it allows investors to consider commodity derivatives as effective tools for diversifying the portfolio of assets. Entering financial markets, these investment flows indirectly put additional pressure on spot prices of commodities.

Simultaneously, forecasts of a slowdown in the world economy, and particularly in China's economy, as well as macroeconomic policies pursued by large economies in order to overcome excessive inflation will cool global commodity markets.

In response to high inflation a central bank generally resorts to raising interest rates, which in turn leads to a decrease in the current value of future cash flows. In order to cope with rapid inflation in the post-pandemic period, the US Federal Reserve System (Fed) resorted to certain measures to strengthen monetary policy aimed at curbing inflation – namely, raising the Fed fund rate. The Fed's efforts to curb inflation have proven to be much more radical compared to the European Central Bank (ECB), which plans to exit the negative interest rate zone only by the end of the third quarter of 2022. At the same time, the Bank of Japan and the People's Bank of China are pursuing a stimulative policy in the context of low inflation rates in these countries. Under these circumstances, the increase in commodity prices observed in 2022 has been occurring in the context of a strengthening US dollar, which is demonstrated by the dynamics of the dollar index (Fig. 4).

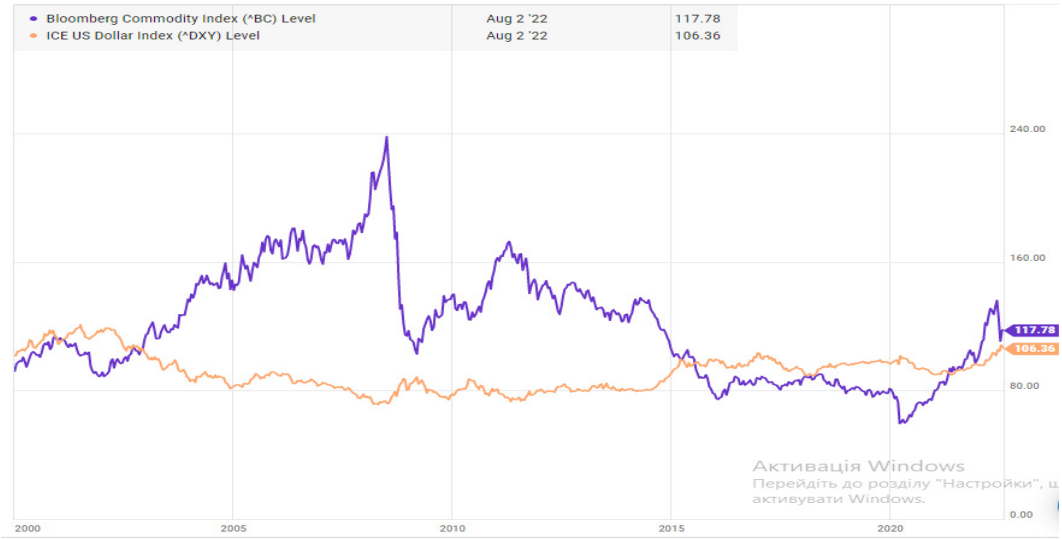

Figure 4. Dynamics of the Bloomberg Commodity Index and the US Dollar Index in 2000-2022

Source: [15]

As long as the dollar remains strong, it will partly absorb price increases in world commodity markets and affect the expectations and behaviour of economic actors. As a rule, there is an inverse relationship between the dynamics of commodity prices and the dynamics of the dollar index due to the fact that the key currency of pricing (quotation) in world commodity trade is the US dollar. A stronger dollar should partially neutralize the effects of those factors that drive commodity prices up.

Moreover, in 2020-2022, spot prices for key commodities have exceeded futures prices. The price forecast is a reflection of the sentiments and expectations of economic entities, which may change in accordance with circumstances and events occurring in the economy. On the example of WTI oil, the positive basis (the difference between the spot and futures price) is observed in 2021-2022, with the exception of an atypical 2020 with a known case of negative futures prices (Fig. 5). Basis 1 is calculated as the difference between the spot and the futures price of the nearest contract, bases 2-4 – as the difference between the spot price and the futures price of the corresponding delivery month. This ratio between the spot and futures prices indicates a high level of income from owning physical oil reserves and an upcoming certain deficit expected in the market.

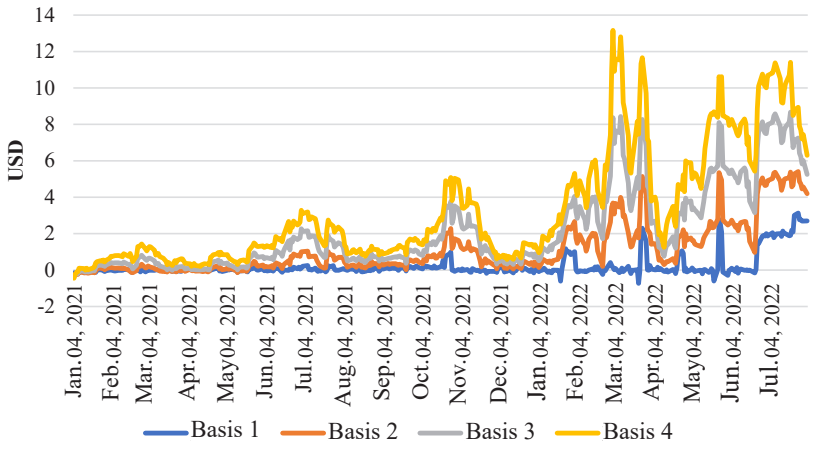

Figure 5. Dynamics of the basis for WTI oil in 2021-2022

Source: [20; 21]

Thus, the increase in prices for commodities is mainly determined by market factors – supply interruptions due to the armed aggression of russia in Ukraine and supply chains disruptions that emerged during the pandemic. These factors are of a short-term nature and affect the conjuncture of the relevant markets.

CONCLUSIONS

The existence of commodity super-cycles is important when making management, investment and production decisions. As the upswing and recession phases of the super-cycle usually last 15-20 years, it may be difficult at first to distinguish the start of a new super-cycle of commodity

prices from more conventional short-term price fluctuations. It remains to be seen whether commodity prices will hold steady above long-term averages.

The separation of short-term market fluctuations from long-term trends in world commodity markets is important directly for suppliers, for example, extractive companies, where the implementation of investment projects is long-term and often takes twenty years. Furthermore, the analysis of commodity super-cycles is important for financial investors for an effective management an investment portfolio that includes commodity derivatives.

Forecasting long-term trends in world commodity prices is important for so-called commodity economies, which are generally inherent in developing countries, and their economic growth is essentially dependent on the magnitude of net exports. In particular, the decrease in the average price for non-energy commodities and resources in each subsequent super-cycle especially actualises the necessity of testing the Prebisch-Singer hypothesis for the Ukrainian economy as one of the largest exporters of agricultural products and importers of energy commodities. Specifically, it is advisable to analyse the impact of market fluctuations in global commodity markets on the dynamics of production, consumption, investment and balance of payments in Ukraine, which will give grounds for substantiating effective structural and macroeconomic policies.

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Чинники формування суперциклів на світових сировинних товарних ринках

Анотація. Упродовж останніх кількох років на провідних світових ринках сировинних активів простежується тенденція зростання цін, що може свідчити про початок нового суперциклу або ж може мати короткостроковий характер, зумовлений поточними змінами у попиті та пропозиції. Товарні суперцикли мають важливе значення для світової економіки, особливо для проведення макроекономічної політики в країнах-експортерах сировини, а також позначаються на динаміці міжнародних фінансових ринків. Метою статті є з'ясування суті та особливостей суперциклів на світових сировинних товарних ринках, а також виявлення чинників, що зумовили зростання цін на сировину у 2020–2022 рр. Для розв'язання поставлених у статті завдань було використано низку загальнонаукових і спеціальних методів наукового пізнання, а саме метод теоретичного узагальнення, історичний та логічний методи, описово-аналітичний метод, аналіз та синтез, індукцію й дедукцію, абстрактно-логічний метод та метод економіко-статистичного аналізу. Окреслено механізм розгортання кон'юнктурного циклу на ринках сировинних активів та його зв'язок із довгими циклами ділової активності, що зумовлені впровадженням революційних технологічних інновацій. Розглянуто динаміку основних композитних сировинних товарних індексів. Виявлено чинники зростання цін на сировинні активи на мікро- та макрорівні. Простежено зміни у перебігу товарних суперциклів упродовж 20-початку 21 ст. та досліджено їхні причини. Виявлено, що значний вплив на глобальне зростання цін сировинних активів у 2020–2022 рр. мали світові інфляційні процеси, динаміка індексу долара США, а також порушення ланцюгів постачання у міжнародній торгівлі внаслідок пандемії COVID-19. Водночас прогнози щодо сповільнення світової економіки, спричиненого широкомасштабною воєнною агресією росії в Україні і довгостроковими наслідками пандемії та макроекономічна політика, спрямована на подолання надмірної інфляції, яку проводять великі економіки, можуть дещо охолодити ціни на сировинні активи. Для оцінки настроїв та очікувань господарських суб'єктів проаналізовано динаміки базису на нафту марки WTI, що дало підстави дійти висновку про короткостроковий характер цінових коливань на світових сировинних товарних ринках у 2020–2022 рр. та поставити під сумнів початок нового суперциклу. Ідентифікація та прогнози кон'юнктурних коливань на світових сировинних ринках є важливими без перебільшення для всіх економічних суб'єктів – як для виробників при ухваленні стратегічних і тактичних управлінських рішень щодо розвитку виробництва, так і при формуванні структурної та макроекономічної політики країни задля збільшення експортного потенціалу національної економіки та забезпечення її конкурентоспроможності

Ключові слова: сировинні товари, циклічні коливання на світових сировинних товарних ринках, довгі хвилі, композитні товарні індекси, фінансіалізація сировинних товарних ринків

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The Problem of Comparing Financial Reporting Indicators in International Rating Systems for Enterprises

Abstract. The article considers the problem of comparing financial indicators of international companies in the ratings formed by well-known analytical institutions. In practice, the methodology for evaluating and selecting data depends on market expectations and takes into account the requirements of the general public rather than industry professionals, so the question arises as for choosing the optimal system for evaluating the performance of multinational enterprises from different countries due to various managerial approaches, tax and accounting standards. The article aims to review the most common indicators and ratios used in international financial comparisons, and to prove (on the example of a global rating approach) that only the complex business analysis, even at a prior level, should be used for the reliable estimation of a company's stability in the market. The study uses a database of key financial indicators of 2,000 companies included in the Forbes rating, such as sales, profit, asset and market value. Based on these indicators, the financial ratios were calculated and the characteristics of groups of enterprises were given by the methods of descriptive statistics. Net profit is emphasised as a key performance indicator, and it has been proven that the companies with the highest asset value do not have excessive financial ratios. The latest Forbes ranking covers companies from 61 countries, the leaders in headquartering the companies are the United States, China and Japan. It has been found that most companies have assets of up to $500 billion, while the market value of assets (calculated on the value of placed securities) is on average twice as low. The ranking also includes unprofitable enterprises (about 15% of the total), which indicates the lack of effective mechanisms for assessing the effectiveness of management of multinational enterprises and possible errors in investment decisions, as the focus is more on working capital and market coverage (sales) than the ability of management to develop strategic decisions. In the most stable companies, the ratio of net profit to sales does not exceed 20%, which proves the assumption of the advantage of moderate development and financial management. There is almost no correlation between profit/sales and asset value, while it is the strongest between asset value and market value of the company, and profit and market value. The companies with the largest assets have lower absolute and relative financial indicators than the average in the total sample of 2000 enterprises (with some exceptions). The practical significance of the article is the creation of a new sustainable international rating system of enterprises

Keywords: Forbes rating, international comparisons, financial statements, multinational enterprises' assessment

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INTRODUCTION

Well-known world rankings (Interbrand, Fortune Global 500), which estimate international companies such as Apple, Microsoft, Amazon and others [1], based on one or two selected indicators, usually have variable lists, where positions are updated annually, because it is extremely difficult for companies to maintain those heights that attract not as many professional investors as the general public. In addition, ranks are not to be built on only one indicator of market capitalisation or sales, because the company reliability needs to assess the quality of cash flow management. This study will attempt to show how a preliminary analysis can be made based on a set of financial indicators commonly used in reporting, and how to compare data of international companies from different countries.

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Making international comparisons is quite a difficult task for a researcher, as it demands the selection of indicators which will not distort the financial rations used for the final assessment of selected business units. It is even more difficult to choose the reliable global ranking that would fairly describe the multinational enterprise's potential and its attractiveness for a foreign investor. Commonly, the most reputed famous evaluations are predominantly 'image' and 'word-of-mouth' methodologies, which can launch the new company to a national or global market but do not guarantee that it will remain on the top even in the short run. Finally, the issue of comparing manufacturers from different industries challenges an analyst to make a huge mistake when trying to find benchmarks relevant to everyone (for example, material production and services). Scientists prefer to work within a particular industry, but these works can become a basis of selecting the proper list of financial indicators. In this concern, the author would note the following researches. M. Chaffai and P. Coccorese [2] study the international banking sector, suggesting the comparative analysis of the samples from 52 countries. The authors note that the cost efficiency side is the main focus of the most empirical studies, while parametric or non-parametric methods are required. G.C. Bănică and K. Gabeshi [3] make a review of different taxation systems in the selected European countries and the US. Tax policy is one of the prior factors, which determine the headquartering of an international company, and for a financial analyst, it is an additional stage of preparatory work with the statement reports as the company inducing a 50% corporate tax will definitely manage the operating activities and cash-flows differently compared to a business entity under tax haven regulations. H.-W. Sinn [4] makes an enquiry into the problem of direct and indirect taxation in the field of capital movement and global trade. The article by N. Benneth, P. Hosein and J. Aston [5] makes a deep review of the corporate management systems that to some extent predispose the financial policy of a company depending on its national business culture. Another group of works make geographic comparisons, outlining the peculiarities of business management in different locations. For example, C. Rowley considers the employment systems in Asia [6]. Altogether, with tax legislation, national work regulations and non-efficiency of trade unions it is the second prior factor for manufacturing facilities relocation. T.-H. Le, A.T. Chu and F. Taghizadeh-Hesary [7] examine the financial sustainability study for Asia. So to say, the Asian region is popular among global market researchers as the experts must know the differences in governmental fiscal policy and forecast parameters even if they do not intend directly to cooperate with any Asian country, as the eastern world is included into the global financing system in the same way as the western one. Nevertheless, there are few publications, which suggest how to make international comparisons in practice and select the unified indicators, which will avoid the prejudication of locally-based practices. The author supports the approach that could provide the technique to assess the international companies belonging to different industries and financial systems based on the annual reporting data.

Of course, not only financial assets determine the success of a company. Intellectual capital (in a broader sense – human resources) is as important as tangible and intangible assets valued by standart accounting methods [8]. However, for some reason, success ratings do not take into account this factor, although it is very important for a transnational business interacting with multinational teams with different levels of training, knowledge and mentality. Work [8] highlights the urgency of the personal effectiveness and the necessity to stimulate innovative decision-making skills in high-tech industries – namely those that position themselves as 4.0 representatives. It is interesting to compare it with the research of M. Palczyńska [9], who says about the phenomenon of overeducation and its negative influence on wages. New approaches to the industrial property management, based on knowledge and information as the main driving force of social-economic development, are suggested in [10]. The authors emphasize the legal mechanisms of a company's property management and protection, which predisposes strict formalising and registration, often with free access (for example, trademarks and patents are allocated in various international and domestic databases – this enables easiness of subindex's composition). The article [11] issues business models transformations due to the impact of globalisation and the process of new strategies formation in retail business. The key components of trade are compared to the features of trade innovations, so the efficiency of their implementation predetermines the success of a trade organisation operating abroad. The developed model of innovative trade company can be decomposed to quantitative estimations that may create a unified industry-based binding for ranking of the similar organisations. M. Martínez-Matute [12] investigates the process of strategy making under the conditions of uncertainty in the European countries and proposes the set of disaggregated uncertainty indicators, which influences the firm's decisions and structures labour market dynamics. On the contrary, the work [13] assesses the impact of the global economic policy uncertainty for emerging economies. Stock volatility made up the research background for 16 years (from 2002 to 2018), which is more reliable and gives more relevant evaluation for the long-term stability than the yearly share prices of a company included into the rankings based on market capitalization. Anyway, the number of international ratings and rankings is overwhelming; P. Beaumont & A. Towns constitute [14], and try to summarize "the rule of the game". They figure out nation brands and industrial rankings, describing the relations between rankees, estimators and the society.

The purpose of the article is to consider the most common indicators and coefficients used in international financial comparisons and to prove that only a comprehensive business analysis, even at the preliminary level, should be used to reliably assess the sustainability of a company in the market. To fulfil the aim of the research, the following tasks are set and resolved: 1) to review the methodology of the global ranking composition, the most common approaches and popular indicators; 2) to describe the differences between the financial data and ratios for individual (for a single enterprise) and group analysis, especially in the long datasets where information comprises many national economies with completely different accounting standards; 3) to select the global ranking system which covers a group of business indicators and proves or neglects the common trends. The scientific novelty of the article is to the point that it proved the need to revise the generally accepted approach to building ratings and scales of international comparisons.

MATERIALS AND METHODS

For companies' data evaluation and comparison, descriptive statistics method is used.

Forbes' Global 2000 list was firstly introduced in 2003. According to its methodology, an equal average weight of four financial metrics (sales revenue, profits, assets, or balance value, and market value) of the world's largest public companies are assessed. Unlike some other reputed rankings, such as the Incorporated 5000 [15] that includes the fastest growing companies based in the US measured only by the yearly growth rate of revenue, it takes into account several economic factors that determine the success of the enterprise in the market. In general, many experts deny the growth rate of sales as a financial indicator of power. It is good at the start-up stage, or in the case of estimating a strategy for expanding into new markets, but in stable economies of developed countries, the domestic market is usually closed with limited growth, there is strict antitrust regulation, so even large and popular companies do not count on boom sales. The global market is also effectively divided among the largest exporters, so, paradoxically, small and medium-sized businesses achieve greater success in relative terms. Finally, a large established company holds significant assets, its shares may be highly quoted, but it is not able to maintain ultra-high sales growth rates annually – it has already attracted the maximum number of available consumers. Thus, the ratings formed by any volatile indicator have very "flexible" lists, in which the leaders change annually.

To assess the stability and reliability of enterprises in the long run, it is reasonable to use indicators of assets and net profit (if a company was able to correctly plan the cost and manage solid property, then it will survive for some time even in a crisis, as it has formed the necessary margin of safety). On the contrary, the market value of shares and sales volume (both in absolute terms and in growth rates) shows the current potential and state in the today's market environment, which is very unstable, so these indicators are suitable for assessing the launching quality, but are unlikely to be objective when making forecasts even for next year. For the study, the author selected companies that were included in the Forbes rating based on the values of both "fast" and "slow" estimates.

Sales (or *sales revenue*) is the income a company receives from its sales of goods or the provision of services. In standard financial ratio net sales (revenue excluding VAT and other special taxes/payments) are used, but the author thinks it is a bit controversial as the consumer market volume (and more significantly, the total sum of money a buyer can spend on a certain product) must be summarized on the final price basis. Net revenue is useful to avoid discrepancies in trade regulation, as many exporters pay zero VAT at home, thus dumping in poorer national economies. Comparison of different countries may exclude these or those elements from financial statements, but international databases often lack the main items (to be "turned back" if a researcher decides to look deeper), so the author is not able to explain some principal dependencies in corporate statements as if analysing a complete balance sheet. For example, it is impossible to calculate ROS (return on sales) for the selected 2000 entities as the ratio includes net sales and operating profit (but net profit is also widely used). That is why the author will name the calculated ratios simply by the fraction elements.

Profit illustrates the financial benefit gained after the expenses, costs, and taxes reduce revenue generated from a business activity. It is a lump sum, which may be withdrawn from the balance sheet to business owners in cash, or they decide to reinvest it back into the company activity. Namely, the profit is the most objective and unambiguous result, the effectiveness of business performance. A company may operate billions and raise EBITDA (Earnings before interest, taxes, depreciation and amortization), but finish the fiscal year in huge indebtedness and losses (i.e. negative net profit). Therefore, the analyst should not rely exclusively on "promotional" estimations. The loudest bankruptcies occurred when the board of directors tried their best to capitalize the business and keep high dividend payments altogether with share prices (at the expense of reinvestment) for several years that destroyed the initial potential and productive power of a previously successful entity. This problem is deeper than the mistakes of individual financial directors – it grows out of the failure of the extended reproduction system and extensive expansion of sales markets [16]. National economies of almost all countries of the world were built on its background that eventually led to an international conflict due to the need for global redistribution of resources (primarily, approximately two centuries ago – oil and other fossils, and the high-tech and IT industries are now struggling for energy and intellectual capital). Remember 'Alice in the Wonderland' by Lewis Carroll and one of the most cited quotation: "It takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!" It perfectly describes the current paradigm of economics applied in the developed countries. By the way, developing ones are in better conditions, as they have at least domestic markets to expand.

Market value and *assets* should also be compared, as these financial indicators reflect the subjective (sometimes prejudiced) and objective (unbiased) estimation of the company's value (tangible such as premises, equipment, machinery, investments etc. and intangible such as goodwill, reputation, trademarks, patents and other intellectual property issues). Marker value is quite easy to be assessed if the company is traded on any of popular and reputable stock markets. If not (but it is less uncommon), there are several approaches how to calculate 'the price' of an enterprise as a product. The assets (the company's property) makes the basis, and other factors add to or subtract from it then. Often the market and the asset value contradict, as booming in some industry, for example, may unreasonably boost the value of an enterprise despite its shortage of even the prior equipment etc. [17].

Therefore, to characterise the companies included in the rating, the author will calculate additional ratios (based on the given data):

Profit to Sales – very similar to return on sales, describes the quality of a company's management (as an enterprise may have perfect manufacturing facilities, technology and high demand for its production, but end in losses due to bad planning); is measured in money unit to unit – how much money was left from the revenue got. *Sales to Assets* – shows the efficiency of assets usage, as how much income each money unit of assets brings. *Profit to Assets* – the same as the previous one, but compares the net profit value with

the value of assets. *Market value to Sales* – demonstrates the eligibility of market estimation of a company, if it really costs its reputation, whether the market price is relevant or not. If market value exceeds sales many times, it means that the company is overestimated, and the new owner could not be able to receive as much profit as expected (taking into account that he has spent funds for buying the company and re-organising the operating processes). *Market value to Assets* – evaluates the relevance of a company's value from the other point of view, comparing the 'public opinion' with the real value of assets. The higher this ratio is, the more confident the company management may be in its image – but, in case of trying to sell some assets urgently, the enterprise may get in trouble convincing a potential buyer that all those premises, goodwill, contracts with consumers and experience are really worth the value of issued shares.

RESULTS AND DISCUSSION

Descriptive statistics (Figs. 1-2, Tables 1-2) [15] shows the main characteristics of the indicators and provides prior information for the comparisons. The histogram distribution plots resume that almost all companies possess less than $500 bn assets and $250 bn market value, generating up to $50 bn sales. Profit is the most dispersed indicator, and it should be noted that 289 (14%) companies resulted in losses; despite getting income from sales. 83% of businesses received profit of less than $10 bn. The highest correlation is between Market value/Assets and Market value/Profit, which proves the importance of a good company image to increase its value. The smallest discrepancies are noted in terms of net income, the average – in sales volumes, and the largest – in the value of assets. The highest range have assets and market value. As the companies belong to different industries, it is a typical result, as large manufactures demand much more equipment, premises and other non-current assets than non-material producers. Nevertheless, within the same group, some businesses may appear to be more effective than the other. Profit to Sales ratio is usually less than one. Commonly, businesses receive the income from sales, subtract the costs and other expenses including taxes and result in net profit which must be at least positive. If the ratio exceeds 1.0, it reveals other sources of income than selling the main product in the market. Among the analysed business units, only several ones are so untypical. These are 23 companies, top three are No 1640 (RMB Holdings from South Africa), which reach the maximal score in 1000, No 606 (Porsche Automobil Holding, Germany) with 24.6 and No 1384 (Sofina, Belgium). However, such indicators are the exception rather than the rule and should not be used as a benchmark. There is no world reference level of profitability as commercial activity outcome is compared with the interest rates of other average sources of income like bank deposits or government securities, these margins can range from 5 to 10 per cent in more stable economies to 20-30 per cent in transition markets. On the contrary, international enterprises are equal to some extent, as they have multiple opportunities to widen the geographical investment map. Therefore, it was distinguished the units with P-to-S score above 0.2 (but less than 1.0) – operating management must bring a company at least 20 cents per each dollar of annual sales (Table 3).

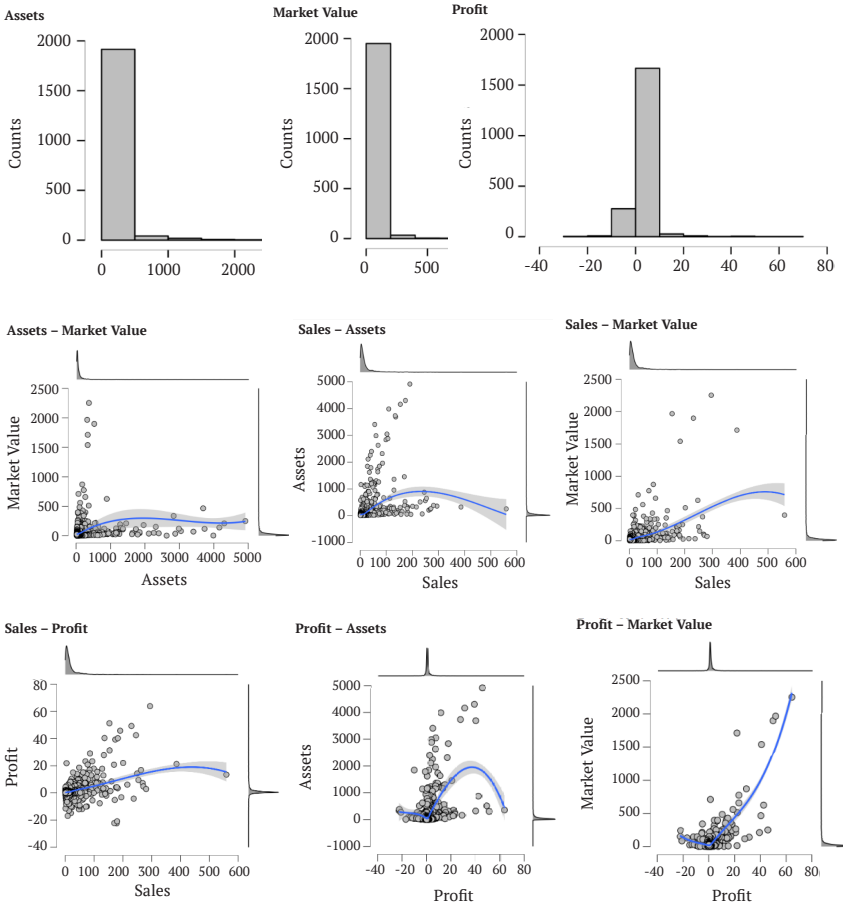

Figure 1. Distribution and scatter plots of the financial indicators
(all figures in USD bn, horizontal axis; missing data for co N 1933 substituted by 0)

Table 1. Descriptive Statistics for the hard data

Indicator	Sales USD bn	Profit USD bn	Asset USD bn	Market Value USD bn	P to S	S to A	P to A	MV to S	MV to A
Mean	19.881	1.268	111.703	39.855	0.625	0.531	0.040	4.780	1.657
Std. Deviation	34.400	4.314	346.209	111.704	22.374	0.606	0.173	16.882	2.986
Minimum	0.002	-22.40	0.00	0.034	-13.718	0.000	-2.112	0.007	0.000
Maximum	559.200	63.90	4914.70	2252.3	1000.0	8.095	6.061	576.471	23.222

Table 2. Companies with the highest efficiency

P to S ratio	Companies	Group average
0.90 – 0.99	1	0.9231
0.80 – 0.89	0	–
0.70 – 0.79	1	0.7252
0.60 – 0.69	0	–
0.50 – 0.59	3	0.5271
0.40 – 0.49	15	0.4128
0.30 – 0.39	260	0.3421
Less than 0.29	46	0.2621

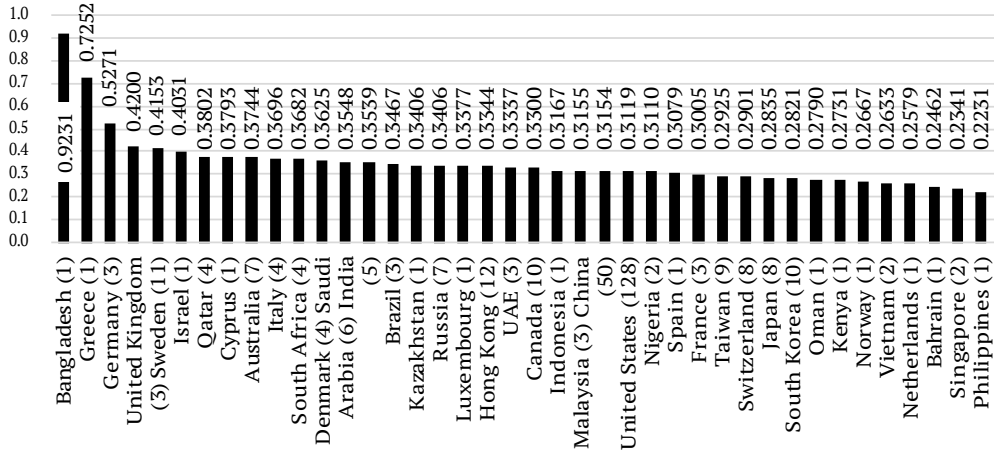

Figure 2. Average Profit to Sales ratio

Source: calculated by the author

Definitely, it cannot be argued that if the return on sales (in our case, Profit to Sales ratio) is less than 1, then the company received annual income exclusively from the main activity (operating profit), but at least this way the author immediately exclude enterprises that definitely had other significant sources of income [18].

In total, 326 companies (from 41 national economies) keep Profit to Sales above 0.2. The vast majority (80% of the selected companies, of which 39% headquartering in the US) return on their sales 30-39 cents of each dollar that is also the affordable efficiency rate in many countries. 14% return 20-29 cents, and 4.6% – a bit higher, 40-49 cents. The other cases are also untypical. The companies with the highest assets value (exceeding 1 000 US bn, 26 of them are in Top 100) are headquartered only in 12 countries: China (12), United States (8), United Kingdom (5), Japan (4), France (3), Canada (2), Germany (2), Italy (2), Hong Kong (1), Netherlands (1), Spain (1), Switzerland (1). Since industrial and telecommunications companies usually have the highest value of assets, this distribution indirectly reflects the structure of production. This list includes most of G7 and other world leaders. It should be noted that four of these entities have negative profit, and 26 of 38 profitable keep the Profit to Sales ratio below 0.2. The other ratios are all beyond the average for the entire data set (Table 3), which proves that the most stable and efficient companies do not have the ultra-high rates of the most popular ratios used by marketers.

Table 3. The distribution of companies with the highest assets value compared to the total mean

Grouping factor, among 42 companies	Sales	Profit	Assets	Market Value	P to S	S to A	P to A	MV to S	MV to A
Lower (No of units)	2	7	–	11	42	42	42	41	42
2000 units average	19.881	1.268	111.703	39.855	0.625	0.531	0.040	4.780	1.657

Table 3, Continued

Grouping factor, among 42 companies	Sales	Profit	Assets	Market Value	P to S	S to A	P to A	MV to S	MV to A
Higher (No of units)	40	35	42	31	–	–	–	1	–
Selected units average	*71.73*	*10.19*	*2077.66*	*97.78*	*0.123*	*0.036*	*0.005*	*1.738*	*0.050*

Source: calculated by the author

2000 companies chosen for the Forbes' Global, are not equally distributed by geographic regions or the operating volumes. 61 countries are presented with a completely different number of enterprises (Table 4).

Table 4. Groups of countries by the number of companies

Group	Companies' number	National economies
Leading	more than 200	United States (590) China (291), Japan (215)
Highly-ranged	⩾ 60	United Kingdom (66), South Korea (62)
	50-59	Hong Kong (59), Canada (56), Germany (54), France (53), India (50)
	40-49	Taiwan (45), Switzerland (42)
Medium-ranged	30-39	Sweden (32), Australia (31)
Law-ranged	20-29	Russia (24), Italy (23), Brazil (21), Spain (21), Netherlands (20)
	10-19	Ireland (18), South Africa (15), Thailand (14), Saudi Arabia (13), Denmark (12), Israel (10), Mexico (10)
Minimally-ranged	5-9	Austria, Belgium, Finland, Singapore, Turkey, United Arab Emirates (9); Malaysia, Norway (8); Poland (7); Bermuda, Indonesia, Luxembourg, Philippines, Qatar (6); Chile, Greece, Vietnam (5)
	< 5	Portugal (4); Colombia, Kuwait, Morocco (3); Argentina, Hungary, Kazakhstan, Nigeria (2); Bahrain, Bangladesh, Cyprus, Czech Republic, Egypt, Kenya, Monaco, Oman, Peru, Venezuela (1)

The definite leaders are the United States headquartering 590 companies, China (291) and Japan (215). More than 50 companies are located in the United Kingdom, South Korea, Hong Kong, Canada, Germany, France and India. On the contrary, Bahrain, Bangladesh, Cyprus, Czech Republic, Egypt, Kenya, Monaco, Oman, Peru and Venezuela are represented by only one enterprise.

Thus, descriptive statistics support the original assumption that stable companies should not aim for ultra-high financial performance that allows them to gain some short-term advantages (for example, a sharp increase in the price of shares, perhaps before a sale of a company; or recognition due to ratings based on capitalisation or speed of growth). The rating score obtained on the basis of a comprehensive analysis of even a small list of precisely long-term financial indicators gives a much more objective result than a rank built on short-term indicators such as growth rate or similar, which the company cannot maintain even for 3-5 years. The use of long-term financial indicators in international rating systems is also the result of researches by such scientists as Gomaa A. and Sinha U., who dealt with the issues of the effective selection of financial reporting indicators for international rating systems of enterprises [19; 20].

CONCLUSIONS

In modern conditions, the rating of an enterprise in international rating systems is very important, as it has significant influence on the behavior of the consumer (potential consumer) of the goods or services of this enterprise, as well as the investor. That is why the issue of weighted and reasoned selection of financial reporting indicators for international rating systems of enterprises, especially for enterprises from different countries of the world, is important.

In the article the most common indicators and ratios used in international financial comparisons are analyzed. It is proved that the selection and use of long-term financial indicators can and should become the basis for creating a sustainable international rating system.

This analysis can be extended by taking a closer look at the characteristics of global market leaders by country or industry. As a rule, entrepreneurs are primarily interested in business profitability, and the average performance indicators for national economies if there is a decision to allocate subsidiaries abroad. The assessment of unprofitable business entities can be supplemented by an analysis of individual financial statements to see if there are certain trends that lead to losses specifically for international companies.

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Проблема зіставлень показників фінансової звітності у міжнародних рейтингових системах підприємств

Анотація. Стаття розглядає проблему використання зіставлень фінансових показників, що належать міжнародним компаніям, у рейтингах, які формуються відомими аналітичними установами. Часто методологія оцінювання та підбору даних залежить від ринкових очікувань та враховує вимоги радше широко загалу, ніж фахівців галузі, тому постає питання вибору оптимальної системи оцінювання ефективності роботи мультинаціональних підприємств, які походять з різних країн світу і тому мають різні підходи до управління, податкові та бухгалтерські стандарти. Метою статті є розглянути найпоширеніші показники та коефіцієнти, які використовуються в міжнародних фінансових порівняннях, і довести (на прикладі глобального рейтингового підходу), що лише комплексний бізнес-аналіз, навіть на попередньому рівні, повинен використовуватися для достовірної оцінки стійкості компанії на ринку. Дослідження базується на базі даних ключових фінансових показників 2000 підприємств, які входять до рейтингу Форбс, зокрема обсягів продажів, прибутку, вартості активів та ринкової вартості. На основі цих показників було розраховано відносні фінансові коефіцієнти та надано характеристику групам підприємств методами описової статистики. Останній рейтинг Форбс охоплює підприємства з 61 країни, лідерами з розміщення головних офісів компаній є США, Китай та Японія. З'ясовано, що найбільша кількість компаній володіють активами до 500 млрд. доларів, тоді як ринкова вартість активів (що розраховується на основі вартості розміщених цінних паперів) у середньому удвічі менша. Також до рейтингу потрапили збиткові підприємства (близько 15 % від загальної кількості), що свідчить про відсутність дієвих механізмів оцінки ефективності управління мультинаціональними підприємствами та ймовірну помилковість у прийнятті рішень щодо інвестування, оскільки увага акцентується на наявності обігових коштів та охопленні ринків (продажах), аніж на здатності керівництва розробляти стратегічні рішення. У найбільш стабільних компаній відношення чистого прибутку до обсягу продажів не перевищує 20 % що доводить припущення про перевагу помірного розвитку та фінансового управління. Виявлено, що практично відсутня кореляційна залежність між прибутком / обсягом продажів та вартістю активів, тоді як вона є найсильнішою між вартістю активів та ринковою вартістю компанії й прибутком та ринковою вартістю. Компанії, що володіють найбільшими за вартістю активами, мають нижчі за середні у загальній вибірці із 2000 підприємств абсолютні та відносні фінансові показники (за окремими виключеннями). Практичне значення статті полягає у створенні нової сталої міжнародної рейтингової системи підприємств

Ключові слова: рейтинг Форбс, міжнародні зіставлення, фінансова звітність, мультинаціональні підприємства

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Fiscal Instruments of Regulatory Competition in the Face of Challenges to Macroeconomic Stability During a Pandemic COVID-19

Abstract. The article's relevance lies in need for empirical testing of theoretical concepts in the new economic conditions caused by the corona crisis. The purpose of the paper is to identify the manifestations of macroeconomic instability in the period before and after the pandemic and to demonstrate the effectiveness of the use of fiscal instruments of regulatory competition to achieve the goals of the stabilization policy of the governments of countries with developed economies. The research is based on the categories of theoretical and empirical levels of knowledge. The use of the method of analysis, abstraction and synthesis, induction and deduction, as well as the system-structural method, the method of idealization, made it possible to identify new forms of manifestation of the phenomenon of fiscal regulatory competition and establish its place in the implementation of the stabilization and incentive programs of the government. It was found that the stimulation of economic activity and the increase in net exports using the instruments of fiscal neo-protectionism occurs due to a simultaneous increase in employment and a decrease in the cost of domestically produced goods, accompanied by the rise in relative consumer prices for imported goods. Using economic analysis and mathematical modelling methods confirmed the hypothesis about the stimulating effect of fiscal policy. Based on the regression analysis of the mechanism of the fiscal channel of the stabilization policy of developed countries, which influenced the dynamics of the conjuncture in the period from 2018 to 2022, a conclusion was drawn regarding the strength of its impulse. It has been found that the fiscal channel less clearly transmits the impulse from the growth of expenditures (financed by loans) to the real sector. It is assumed that in the process of signal transmission, it scatters. It has been established that in the short term, in a recession, the fiscal impulse also does not cause a jump in inflation. In the context of inflationary growth in the United States, Japan, and Germany, there is a turn towards tightening monetary policy, which limits the use of financial instruments to counter the recession and therefore increases the demand for the benefit of fiscal tools to counter the recession

Keywords: recession, fiscal policy, macroeconomic policy, debt, inflation, crisis

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INTRODUCTION

By neglecting the history of economic thought and preventing its study, modern macroeconomic theorists avoid the use of its powerful toolkit, thereby providing an intellectual monopoly for theories that are intended to be mainstream. After all, the significance of economic ideas and their explicative ability can be assessed in terms of their comparison and sometimes even convergence. And suppose the conclusions of existing economic theories are

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methodically distorted by the carriers of a specific set of new ideas, whose adherents perceive the latter as a reference. In that case, they receive disproportionately high recognition in society, acting as an indicator for politicians armed with them when choosing appropriate economic policy instruments at different stages of the business cycle.

The development of stabilization programs by the governments of countries with leading economies in the context of the corona crisis is carried out according to the Walrasian principle [1] of "finding by touch" for optimal combinations of a combination of monetary and fiscal policy instruments to achieve the goals of attaining (restoring) economic growth, combating unemployment, settling payment and in particular, trade imbalances (in terms of interpreting the latter as a result, including either the loss of competitive positions in specific markets or under the influence of transnationalization processes that led to the excessive power of the policy of multinational enterprises on structural transformations (deindustrialization, unemployment) within their home countries), which implies the implementation of a complex of both short-term and long-term measures to stimulate supply and demand, provided with appropriate regulatory and institutional support.

Since the New Macroeconomic Consensus is based mainly on the New Keynesian Macroeconomics model, it is inherent in the appeal to the concept of "discoordination" as part of the strategic complementarity [1; 2]. Strategic complementarity occurs when the marginal benefit from the action of one agent increases depending on the level of activity chosen by other agents. Therefore, the critical issue in modeling international economic policy in the context of the corona crisis lies in the choice between cooperation and competition strategies. In 2005, commissioned by the European Central Bank (ECB), M. Karlberger finalized in a book under the eloquent title "International economic policy coordination" [3] the results of a multi-year project aimed at finding compromises between the use of monetary, currency and fiscal policies in the context of regulatory cooperation or regulatory competition between trading partners (on the example of European Monetary Union (EMU) member countries and the United States) to achieve the most optimal state of equilibrium in different conditions in EMU. Therefore, such a statement of the research problem deprives us of illusions: it is recognized that the world is driven not by good intentions but by selfish goals.

The actors that make decisions and set these same goals are central banks, national governments, and national trade unions. At the same time, all possible spillover effects of monetary and fiscal policy between partner countries are declared. Indeed, an increase in the volume of money supply in the EMU can reduce the US aggregate output and vice versa. The manipulation of taxes and wages can provide additional competitive advantages to the country's producers adopting such a strategy. However, an increase in government purchases, for example, by Europeans, can simultaneously increase the volume of American production. Therefore, the critical issue in the modeling of the international economic policy lies in the choice between cooperation and competition strategies, and the focus is not on achieving the desired balance by any measures but, first of all, on finding ways to stimulate aggregate output to achieve full employment, subject to price stability.

Current international economic policy is characterized by increased demand for regulatory competition [4]. Regulatory competition can take place, among other things, through fiscal, monetary, foreign exchange, and debt policy instruments, radically transforming the concept of "protectionism", which has traditionally been associated with tariff and non-tariff trade policy instruments to correct the balance of payments [5; 6]. This allows us to introduce into terminology the concept of "fiscal regulatory competition" (or "fiscal neo-protectionism" [7]), which is adaptive for describing the tools for implementing a stabilization or stimulating program which aims to promote economic activity and increase net exports by simultaneously increasing the level of employment and reducing the cost of goods of national production, which is accompanied by an increase in the relative consumer prices of imported goods.

LITERATURE REVIEW

Supporters of the "new synthesis" recognize and analyze the possibilities of the stabilization impact of monetary policy. The instruments of anti-inflationary response in the modern sense differ from the approach of traditional monetarists [1]: direct control over the money supply to prevent its fluctuations (money supply targeting) has been replaced by interest rate management based on special monetary rules (inflation targeting). This kind of rule underlay the monetary policy pursued by many central banks during the Great Moderation period. But in a recession, it is recognized that monetary policy needs to be loosened and, with interest rates at a minimum, recourse to unconventional methods of monetary stimulus. When discussing the possibilities of fiscal "pumping" of economic growth, representatives of the "new synthesis" usually point to its limitations and inefficiency. Their arguments are based on the standard neoclassical vision of fiscal policy. In addition, statements are made about time lags and political conditioning in the conduct of budgetary policy, as well as the adverse long-term effects of accumulating budget deficits. As a rule, Keynesian methods [1; 8] of fiscal stimulus are given one of the last places in the hierarchy of anti-crisis response tools – their use is inevitable only when all monetary measures have failed. The coronavirus pandemic has created a demand for a combination of monetary, fiscal, and debt policy instruments as monetary policy fails to stimulate economic activity amid restrictions on international trade, disruption of traditional value chains and supply chains, and commodity and health crises. O. Blanchard and R. Perotti identify fiscal shocks by exploiting decision lags in fiscal policymaking [8]. Although T. Davig and E.M. Leeper have not addressed why policy regimes change, they found that tax policies fluctuate between responding by more than the quarterly real interest rate to debt and reacting negatively to debt [9]. Having studied empirical data for the US, UK, Germany, and Italy, A. Alfonso and R. Sousa conclude that when assessing the macroeconomic consequences of fiscal policy on GDP, asset markets [10], and interest rates [11], it is necessary to take into account the dynamics of the debt burden on the government. H. Chung and D. Leeper characterize the debt policy's role in forming fiscal and non-fiscal shocks [12]. R. Beetsma and H. Jensen assessed the consequences of the coordination of monetary and fiscal policy at the level of the monetary union, including, in fact, the integration factor of the correction of national policies [13]. A. Fatás and I. Mihov argue that investment does not react significantly

to increases in government spending [14]. C. Bredemeier, F. Juessen, and A. Schabert have established moderate output effects of fiscal expansions even when monetary policy rates fall [15]. C. Leith and S. Wren-Lewis showed the countercyclical impact of tax policy while maintaining debt sustainability [16].

Today, macroeconomist practitioners responsible for the conduct of economic policy rely more on common sense, independent analysis of the actual situation, experience, and knowledge, mainly based on the Keynesian approach: the response to the corona crisis by advanced economies consisted of a complex interweaving of neoclassical and Keynesian recipes [17]. In difficult times, state macroeconomic regulators often begin to act "by trial and error", reacting situationally to changes and choosing the most appropriate measures from the existing "window of opportunity", taking into account not only purely economic but also political and social goals and constraints. The article aims to determine the role of fiscal instruments of regulatory competition in the face of challenges to macroeconomic stability under the influence of the COVID-19 pandemic. To achieve the goal of the study, the authors set the following tasks: to identify the pitfalls of modelling international economic policy through the lens of macroeconomic theories; identify manifestations of regulatory competition in global monetary policy; determine the goals of economic policy at the micro and macro levels in the context of the corona crisis; consider the phenomenon of "disruption of coordination" as a component of the concept of strategic complementarity; propose the concept of "fiscal neo-protectionism"; consider the spillover effects of fiscal policy; determine the potential of regulatory competition with debt policy instruments; identify opportunities for fiscal-monetary cooperation by considering monetary and fiscal incentives for stabilization policy in the context of the corona crisis; identify the current crisis as the result of a combination of demand shocks and supply shocks; characterize the instruments of fiscal, monetary and debt stimulation in the stabilization policy of developed countries; identify channels for fiscal devaluation in the procedure of stimulating economic activity; analyze the effect of the budgetary channel of macroeconomic policy on economic activity; to focus on the inflationary consequences of the fiscal-monetary package of economic stimulus; analyze the relationship between the increase in public debt and GDP growth rates using the example of the United States, Japan and Germany; analyze the growth factor of the consumer price index as a side effect of the fiscal channel of the macroeconomic stabilization policy. The novelty of the article lies in a new understanding of the concept of "fiscal regulatory competition" (or "fiscal neo-protectionism"), which is adaptive to describe the tools for implementing a stabilization or stimulus program, the purpose of which is to stimulate economic activity and increase net exports by simultaneously increasing employment and reducing the cost of domestically produced goods, which is accompanied by an increase in relative consumer prices for imported goods.

MATERIALS AND METHODS

The authors proceed from the fact that each of the methods and tools of macroeconomic regulation in different periods has its advantages and disadvantages associated with various factors that are used to ensure the equilibrium state of the economy, and the combined use of these methods and tools at the right time contributes to the achievement of the chosen goal. In practice, there are no inappropriate and inefficient methods of macroeconomic regulation. The only question is how to determine the most appropriate use for each situation. A feature of this study is the analysis of the phenomenon of regulatory competition, which is considered a set of principles, methods, and tools of state regulatory policy aimed at stimulating economic activity and implementing social initiatives, as well as ensuring the competitiveness of national producers in the domestic and foreign markets. In the context of a pandemic that has led to a health crisis, disrupted established links in global value chains and supply chains led to a reduction in global trade volumes, and actualized the problem of trade balances and budget deficits, regulatory competition manifests itself in the capabilities of national governments. Using fiscal, monetary, and debt instruments of stabilization policy can stimulate economic activity (aggregate demand) and solve social problems (unemployment). The current fiscal policy of the three developed countries – the USA, Germany, and Japan is considered not only through the prism of empirical facts but also based on a deep analysis of the theoretical foundations of economic policy. The information base of the study is the scientific developments of academic economists and practical economists. The research is based on the categories of theoretical (hypothesis, concept, theory, problem) and empirical (facts, empirical generalizations, empirical dependencies) levels of cognition, the characteristic features of which are: objectivity; rationality; high level of generalization; universality and use of particular ways and methods of cognitive activity. To achieve the goal and solve the problems of the study, scientific and special research methods were used, namely: methods of analysis, abstraction, synthesis, induction, and deduction, as well as a system-structural method (when studying fiscal policy as a policy and practice; when determining new forms of manifestation of fiscal politicians); method of idealization (when selecting the conceptual foundations of the New Macroeconomic Consensus doctrine); methods of economic and mathematical modeling (when assessing the impact of budget expenditures and the debt burden on GDP growth rates; when establishing a relationship between debt growth and inflation); regression analysis tools were used as part of the study of the fiscal channel.

RESULTS

The economic crisis as a result of the COVID-19 epidemic is expected to lead to an unprecedented recession, resulting from both a demand shock (as a result of a reduction in household income) and supply shocks (as a result of a reduction in the production of goods and services), which will actualize the request for the use of monetary and fiscal anti-crisis regulation tools [18]. As J. Keynes noted, the quantitative theory remains valid in the long term; that is, control over the money supply by the central bank can ensure long-term price stability, but the long-term perspective is ill-suited for discussing current problems [19].

Consequently, the aphorism of J. Keynes "In the long run, we will all die" [19] has acquired extraordinary relevance, thereby emphasizing the need for quick economic decisions, state intervention in the economy, and also the rejection of the desire to rely on the power of the "law of

markets". Even if the health crisis is temporary, its long-term economic consequences could be dramatic. In this context, the role of governments and central banks is to ensure that millions of people do not become unemployed and that the poor become even poorer. Support for households and enterprises takes the form of a wide range of subsidies, in particular, tax incentives, debt and tax deferrals, assistance programs for partially unemployed, i.e. those whose working hours or wages have been reduced, as well as saving income for workers and people directly affected by the virus.

This strategy will be supported by fiscal and monetary stimulus measures at the macroeconomic level. First, EU heads of state and finance ministers have agreed to introduce a special provision in the Stability and Growth Pact (SGP), under which national governments can pump as much money into the economy as they need. Secondly, the European Central Bank announced a new temporary program of quantitative easing in the amount of 750 billion euros. The Pandemic Emergency Purchase (PEPP) program lasted until the end of 2020, with governments able to increase budget deficits without fear of speculative attacks by financial markets. Through the Emergency Purchase Program, the ECB will have plenty of room to intervene in the bond market to keep government bond yields from rising to unsustainable levels. Thus, the ECB duly prevented another debt crisis in the Eurozone, which could occur in addition to the health crisis [20].

However, it is vital to understand that the combination of fiscal and additional quantitative easing is not an incentive to prevent recession by increasing demand. Such a strategy is projected to be at odds with the business containment strategy needed to slow the spread of the virus. At the moment, the priority is not to expand economic growth by boosting demand but to ensure that companies do not close and do not leave vulnerable households alone in the fight against the manifestations and consequences of the crisis.

To keep businesses afloat, almost every country has revised its tax schedule. It is an efficient and easy way for the government to provide credit to businesses and households. Other policies involve hard compromises. Italy and Spain have imposed a moratorium on the repayment of many loans. However, there is a risk that bank refinancing loans will lead to a financial crisis. Central banks buy government bonds to keep interest rates low and provide loans to banks directly to companies without limits and at low-interest rates. Thus, the Central Bank is at significant risk that these numerous loans will not be returned. Central banks have now introduced a modified network of each other's lending (through so-called swap lines). However, this network has many gaps, leaving many emerging markets at risk of running out of foreign funding as private investors flee their markets. More problematic is the question of how to provide enterprises with liquidity – in the form of a loan or grants. Germany provides loans without limits on how much firms can borrow from the state, but loans must be repaid, even if it takes many years. Denmark leans towards grants, compensating companies for up to 90% of wages, sick leave, rent, and other fixed costs [21]. The target orientation of fiscal packages in developed countries was dictated by the motives for preventing the economy's collapse and achieving the desired structural changes [22].

The fiscal channel of economic policy realizes its influence on the economic situation by changing government purchases, reducing taxes, and social transfers to the population. As already noted, it relies on an amplifying multiplier effect and works well if fiscal stimulus spending is financed through tax increases and debt borrowing. In itself, debt financing is considered harmful, as it represents the transfer of current costs to future generations who will have to repay the debt. But in a crisis, they are recognized as justified.

Also, the strengthening of the state's presence in the economy through the increase in government purchases upsets the balance in the commodity market, expands aggregate demand, and, in conditions of unchanged or falling supply, causes inflation. Similarly, once at the disposal of households, social transfers expand their consumption opportunities, stimulating demand and, possibly, inflation. Therefore, an undesirable consequence of using the fiscal channel may be additional inflation.

Therefore, as part of the study of the work of the fiscal channel, using regression analysis tools, it was proposed to analyze the relationship between the increase in public debt and GDP growth, as well as the side effect of this process – inflation growth – based on statistical data from the three leading countries of the world – the United States, Japan, and Germany (Fig. 1).

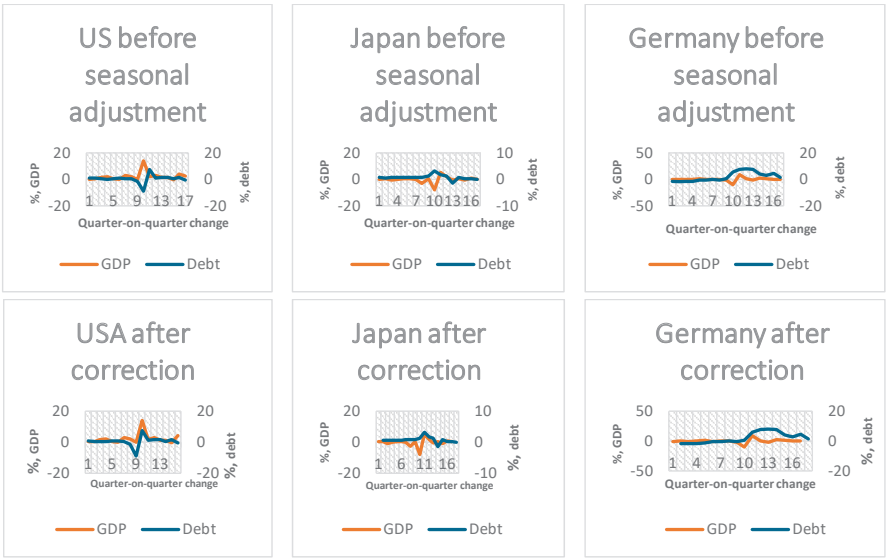

Figure 1. Dynamics of changes in GDP and changes in public debt before and after seasonal adjustment
Source: [23; 24]

Visually, implementing the correction of changes in public debt by one quarter brings its dynamic series closer to the changes in GDP in the cases of the USA and Japan. In the case of Germany, debt and GDP fluctuate asynchronously. However, the regression analysis carried out for all the studied countries gives a different result (Table 1): the best correlation between the selected indicators is observed before, and not after, seasonal adjustment. The behavior of the two arrows can partly explain this in the segment of normal (pre-crisis) dynamics, as well as by the effect of the fiscal impulse that does not manifest itself in a quarter but much faster, which is in line with theoretical predictions. R^2 is a statistical measure representing the proportion of variance for a dependent variable explained by one or more independent variables in a regression model. Using the F-test, the authors will calculate the probability of no critical difference between the variances of two dispersions. P-value – the minimum significance level at which the leading hypothesis is rejected.

Table 1. Dependence of GDP growth on public debt growth without taking into account the time lag adjustment

Country	R^2	F-test	Equation	P-values of coefficients
USA	0.491	14.439 (0.002)	*GDP=1.92+0.64*Debt*	0.0107 0.0017
Japan	0.117	1.993 (0.178)	*GDP=0.61–0.96* Debt*	0.4488 0.1785
Germany	0.086	1.327 (0.268)	*GDP=-0.52+0.295* Debt*	0.6246 0.2685

Source: [23; 24]

From the data collected in the Table 1. it follows that the relationship between debt growth and GDP growth for Japan and Germany is unreliable; regression requires revision in favor of other parameters. The relationship can be traced in relief only in the case of the United States and explains 49% of the variation in the variable. With the United States' public debt growing by 0.64%, GDP growth of 1% can be expected in the short term. Let's supplement the analysis of the fiscal channel, taking into account the undesirable effect – the growth of the consumer price index (CPI) as a result of increasing public debt. The results of the regression analysis are presented in Table 2.

Table 2. Dependence of CPI growth on public debt growth without taking into an account time lag adjustment

Country	R^2	F-test	Equation	P-values of coefficients
USA	0.176	3.04 (0.094)	*CPI=1.07–0.101*Debt*	0.0002 0.0937
Japan	0.277	5.744 (0.030)	*CPI=0.25–0.206* Debt*	0.0257 0.0300
Germany	0.057	0.842 (0.374)	*CPI=0.51+0.057* Debt*	0.0637 0.3743

Source: [23; 24]

Country-by-country data indicate a weak link between debt growth and inflation. It is irrelevant for Germany and the USA and needs an improved approach. In the case of Japan, the regression results are in the normal range, but a 27% increase in debt explains inflation, and its 1% increase can be explained by a 0.2% decrease in debt, not by its expansion. Perhaps the reason for this is that most of the Japanese government's borrowing is done in the domestic market, not in the foreign market, and debt repurchase will mean an increase in the amount of money at the disposal of economic entities, using it to increase demand, and then additional inflation will occur.

DISCUSSION

The content of the government's economic policy at the macro level is the desire to establish full employment (the fight against unemployment); ensure price stability (fighting inflation); achieve economic growth and balance of payments; conduct fiscal policy (changes in tax rates and government spending); ensure an optimal monetary policy (control over the money supply and interest rates); exchange rate management. At the micro level, economic policy content is based on the efficient use of limited resources. However, given the multiplicity of goals, their simultaneous achievement is almost impossible to determine the request to prioritize among them. In the context of the corona crisis, the issue of combating unemployment, and therefore stimulating the supply of jobs, is achieved by simultaneously stimulating demand with the instruments of both monetary and fiscal policies.

Authors proceed from the fact that the vital mistake of the government was the selection of the austerity regime as a benchmark (without considering the trend or non-trend fluctuations in economic activity), which corrected monetary authorities and limited the fiscal deficit to 3% of GDP. Continued use of this approach in the corona crisis can cause public discontent and protests [18; 19]. The budgetary policy influences the economic situation to stabilize it by manipulating the state budget by increasing or decreasing state budget revenues and expenditures. At the same time, these budget manipulations are not accompanied by a change in the amount of funds in circulation. The objectives of fiscal policy, like any other, which is aimed at smoothing the cyclical fluctuations of the economy, are to maintain a stable level of economic growth, fight unemployment or increase employment and maintain a sound

price level, i.e. fight against inflationary processes. Fiscal policy is focused on regulation, primarily of aggregate demand. Although, in pursuing fiscal policy, the government may focus on regulating aggregate demand and supply. This is mainly due to the impact on the level of aggregate spending. However, some fiscal policy instruments can be used to influence aggregate supply through the effect on the level of business activity. Alternative varieties of fiscal regulation, the sharp confrontation of which accompanies the movement of modern financial systems to an optimum state, are the Keynesian [1; 8] and neoclassical models [9].

The search for sources of financing budget expenditures for the government always involves a choice between taxes and loans, which has become especially relevant in the fight against the consequences of the corona crisis. The use of debt as a tool for increasing the competitiveness of national producers and stimulating the economic activity of various business entities allows us to speak about the existence of regulatory competition with instruments of debt policy, which the authors propose to understand as a tool for implementing the economic and security interests of countries and companies, which consists in the formation of alternative sources of attracting credit resources and opportunities for debt refinancing. Regulatory competition in debt policy is implemented through the introduction of new debt refinancing instruments, which is partially ensured in the process of adapting the "helicopter money" mechanism; stimulation of demand for debt securities; reducing the debt burden on the economy through the implementation of a policy of stimulating inflation (to reduce the country's domestic debt); creation of accessible direct lending channels.

The combination of monetary and fiscal stimulus is not accidental: on the one hand, monetary policy solves the problem of lack of borrowing by replacing private borrowing with public ones; on the other hand, the issue of excessive debt in fiscal policy can be solved by monetizing part of it. Such fiscal-monetary cooperation makes it possible to simultaneously reduce the share of loans in the private sector and increase nominal demand. While one can be unsure how exactly monetary financing affects actual variables and the price level separately, W. Buiter argues that it will constantly stimulate aggregate demand, either through an increase in actual output or through inflation (or a combination of the two) [20].

CONCLUSIONS

Fiscal policy affects GDP in the short, medium, and long term. Before the outbreak of the corona crisis, there was a consensus in economic thought that an increase in the government deficit increases GDP in the short run. However, it does not affect GDP in the medium run and reduces capital accumulation and GDP in the long run. The practice of stabilization programs implemented in developed countries since 2020-2022 is unique, combining monetary and fiscal regulatory instruments. The use of unprecedented fiscal aid packages makes it possible to identify this tool of financial regulation as a component of the policy of regulatory competition since developed countries have large open economies and significantly influence the state of affairs in the global economy. From the regression analysis of the mechanism of the fiscal channel of influence on the dynamics of the conjuncture in the period from 2018 to 2022, the authors can draw the following conclusions for the group of the most developed countries of the world (USA, Japan, Germany). The fiscal channel less clearly transmits the impulse from increased expenditures (financed by loans) to the real sector. Obviously, in the process of signal transmission, it is scattered. In the short term, in a recession, the fiscal impulse also does not cause a jump in inflation. In some circumstances, even the opposite weak effect of its application is possible. The polarity of views on the interaction of economic theory with economic policy results in the lack of consensus on the ability of economic theories to provide legitimacy and scientific validity of the expediency of government decisions. The request for empirical verification of theoretical concepts in the new economic conditions caused by the corona crisis indicates another paradigm shift in economic theory.

It is promising to check the obtained results considering the quarterly data series of the relevant indicators. This will allow us to compare the impact of the fiscal and monetary channels of the stabilization policy on the recovery of economic activity.

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Фіскальні інструменти регуляторної конкуренції в умовах викликів макроекономічній стабільності під час пандемії COVID-19

Анотація. Актуальність статті полягає у необхідності емпіричної перевірки теоретичних концепцій у нових економічних умовах, спричинених коронакризою. Метою статті є виявлення проявів макроекономічної нестабільності в період до та після пандемії та перевірка ефективності використання фіскальних інструментів регуляторної конкуренції у досягненні цілей стабілізаційної політики урядів країн із розвиненою економікою. В основу дослідження покладено категорії теоретичного та емпіричного рівнів пізнання. Використання методу аналізу, абстрагування та синтезу, індукції та дедукції, а також системно-структурного методу, методу ідеалізації дозволило виявити нові форми прояву феномена фіскальної регулятивної конкуренції та встановити її місце у реалізації урядових стабілізаційних та стимулюючих програм. Виявлено, що стимулювання економічної активності та збільшення чистого експорту за допомогою інструментів фіскального неопротекціонізму відбувається за рахунок одночасного збільшення зайнятості та зниження вартості товарів вітчизняного виробництва, що супроводжується зростанням відносних споживчих цін на імпортні товари. Використання методів економічного аналізу та математичного моделювання підтвердило гіпотезу про стимулюючий ефект фіскальної політики. На основі проведеного регресійного аналізу дії механізму фіскального каналу стабілізаційної політики розвинених країн, яким реалізовувався вплив на динаміку кон'юнктури в часовому періоді з 2018 по 2022 рік, було зроблено висновок щодо сили його імпульсу. Встановлено, що фіскальний канал менш чітко передає імпульс від зростання витрат (що фінансуються за рахунок кредитів) реальному сектору. Зроблено припущення, що у передачі сигналу він розсіюється. Встановлено, що у короткостроковій перспективі, за умов рецесії, фіскальний імпульс також викликає стрибка інфляції. За умов інфляційного тиску в США, Японії та Німеччині відбувається розворот до проведення більш жорсткої монетарної політики, що обмежує використання монетарних інструментів протидії рецесії і підвищує попит на використання фіскальних інструментів протидії рецесії

Ключові слова: рецесія, фіскальна політика, макроекономічна політика, борг, інфляція, криза

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Tourism and Digital Technologies: Analysis of the Relationship

Abstract. Based on a bibliographic analysis of the literature, it is determined that most current studies point to the impact of digitalization on tourism. Digital technologies are changing tourism preferences, consumption, and the essence of the interaction of tourism business entities. In this context, the study aims to identify the specifics of the relationship between the level of international tourism development and digital technologies. The purpose of the study is to determine the features of the relationship between the level of international tourism development and digital technologies. Methods such as bibliographic, standardization, correlation analysis, factor analysis without rotation and, factor analysis with rotation using the Varimax method, comparative analysis, graphical analysis were used in the article. The World Bank International Tourism Indicators (such as expenditures, the number of arrivals, the number of departures, and receipts) and the Network Readiness Index were used for the analysis. The data covers 130 countries for 2020. The research identified correlations between indicators of international tourism development and the Networked Readiness Index and its components. The analysis shows that there is a direct relationship between the analyzed indicators. Also, factor loadings were calculated in the paper using factor analysis without rotation and factor analysis with rotation by applying the Varimax method. The Varimax rotation method made it possible to identify two well-defined factors, one closely related to the Networked Readiness Index sub-indices and the second – to the international tourism indicators. By using factor analysis without rotation, one factor was identified. Based on this analysis, it was concluded that the level of international tourism development and the degree of digitalization of the economy are linked. In the case of determining the relationship between the sub-index Networked Readiness Index Technology and expenditures and the number of arrivals, this relationship was not identified. The results highlight the importance of digitalization in the tourism business. In doing so, the paper points out that in addition to digital technologies, tourism companies should also pay attention to other factors such as security, risks, fluctuating economic situation, changing geo-economic and social conditions, etc.

Keywords: digital economy, digitalization, international tourism development, Networked Readiness Index (NRI), International Tourism Indicators

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INTRODUCTION

The digital economy is changing our lives. People spend more time online, getting information, choosing products, and making electronic payments. It is only easy to imagine life with digital technology nowadays. Digitalization is changing economic and social relations by transforming the meaning and content of the communication. Digital technologies are gradually embracing all areas of the economy, changing the principles and methods of business.

Digital technologies have affected all spheres of activity, including tourism. Online booking and reservation systems, itinerary search and building services, tools for forming a list of services, and tour payment systems are all modern integral parts of the travel business. These are the primary online services, but their list and classification are expanding yearly. The travel business is becoming increasingly integrated into the digital space, and this is not even a trend but a pattern of existence in modern society.

The irreversibility of digital transformation makes it necessary for tourism businesses to integrate into the digital community. However, the degree of such integration is uneven from country to country as the digital inclusion of society. It is essential to understand how the digital economy

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affects international tourism and related sectors to determine the tourism industry's future.

The digital economy is gradually embracing all areas of the economy and society. Sales of goods and services with a significant or predominant digital component in their value are increasing. Tourism is one of the economic sectors where digitalization's impact is powerful. M. Suyunchaliyeva, N. Shedenova, B. Kazbekov & S. Akhmetkaliyeva [1], having reviewed the level of tourism development in the field of information technology over the past twenty years, argue that from a limited marketing toolkit, digital technologies in tourism have gradually evolved into a key driver and a tool for knowledge-based value creation. As S.B. Hojeghan & A.N. Esfangareh [2] point out, the impact of the digital economy on the tourism industry is mainly through the internet and web technologies. In the context of the inevitable wide digitalization of tourism activities, the functioning of modern travel companies is impossible without online services such as Booking.com and Expedia [3]. Digital technologies are increasingly embracing the travel industry, changing travel practices and tourist behavior [4]. Digital technology is also influencing the tourism experience by shaping digital well-being. According to U. Stankov & U. Gretzel, digital well-being is the basis for a new tourism philosophy and business strategy in the tourism industry [5].

Modern digital technologies are changing society, the economy, consumer relations, and the value chains of goods and services in all areas. In particular, the digitalization of economic processes lays the foundation for emerging markets, including tourism and hospitality [6]. In addition, digital technologies are changing the interaction system between the actors in the tourism market. A well-developed digital infrastructure increases the tourist flow in a destination [7]. Digitization contributes to the differentiation of tourist activity in the sociocultural context [8].

Digital technologies also play a significant role in ensuring the quality of tourism services [9]. Tourism services are a driver of economic growth, stimulating consumption and employment and generating foreign exchange earnings for the country. In doing so, the digital part of tourism services provides more excellent value to customers, increasing their satisfaction and generating sustainable positive interactions [10]. Tourism is one of those sectors that are heavily dependent on digitalization. However, this influence varies from country to country. The impact of the digitalization level is determined by the extent to which the economy depends on tourism [11].

Tourism and economic growth are linked, as confirmed in the research [12]. Countries with low economic growth often take advantage of digitalization to promote tourism. Studies show that tourism and information and communication technologies affect economic growth, so stimulating tourism and Information and Communication Technologies (ICT) will help increase economic growth [13]. Conclusions from S. Gössling suggest that ICT affects both tourism and the Sustainable Development Goals [14]. S. Adeyinka-Ojo & S.K. Abdullah [15] identified in their paper the prospects and dangers of widespread digital innovation and sharing economy in the tourism and hospitality industry. They noted the importance of government support for the digital economy and the need to invest in digital development and staff skills building. These findings raise the actuality of state support for tourism development in the emerging digital economy.

In this context, the article aims to determine the features of the relationship between the level of international tourism development and digital technologies.

The study's novelty lies in developing methodological approaches to assessing the relationship between digital development and international tourism indicators.

MATERIALS AND METHODS

Methods such as bibliographic (to investigate the degree of elaboration of the problem dealt with in the article), standardization (to bring the data used for analysis into a comparable form), correlation analysis (to determine the strength of the relationship between the indicators under study), factor analysis without rotation and factor analysis with rotation using the Varimax method (to determine the structure of relationships between variables), comparative analysis (to compare study results), graphical analysis (to present the results of the study visually) were used in the article.

To determine the relationship between digital technologies and international tourism development, this study proposes to use the Networked Readiness Index (NRI) as an indicator of digital development and the International tourism indicators estimated by the World Bank [16], which include: expenditures, current US$ (ITE), the number of arrivals (ITA); the number of departures (ITD) and receipts, current US$ (ITR).

The Networked Readiness Index is a composite indicator of the development of information and communication technologies and the networked economy in countries worldwide [17]. Developed in 2002, the index is an indicator of the level of digital capacity achieved by a country. The index value is determined based on 62 indicators, categorized into four groups: Technology, People, Governance, and Impact. The study covers 130 countries for 2021, with data analyzed for 2020. Countries are ranked according to the principle that the country with the best index value ranks first and the country with the worst index value ranks last.

RESULTS AND DISCUSSION

Obviously, in the era of digitalization, industries can only function effectively in digital reality. However, the impact of information and communication tools affects areas of economic activity to varying degrees. The effect of digitalization in today's world is uneven. Digital technology is spreading differently across countries, regions, and economic sectors.

Tourism as an industry is significantly affected by digitalization, which is manifested in the transition of many interactions of tourism business entities to the digital space. Digitalization in tourism ranges from creating simple websites for travel agencies to distributing complex modern software products in hotel chains, aviation, insurance, etc. Despite the apparent dependence of tourism on digital technologies and scientifically confirmed quantitative estimates, more than such a relationship is needed at the moment. Therefore, this study aims to address this issue.

During the initial research phase, it is helpful to analyze the correlations between international tourism development indicators and NRI and its components (Figs. 1-5).

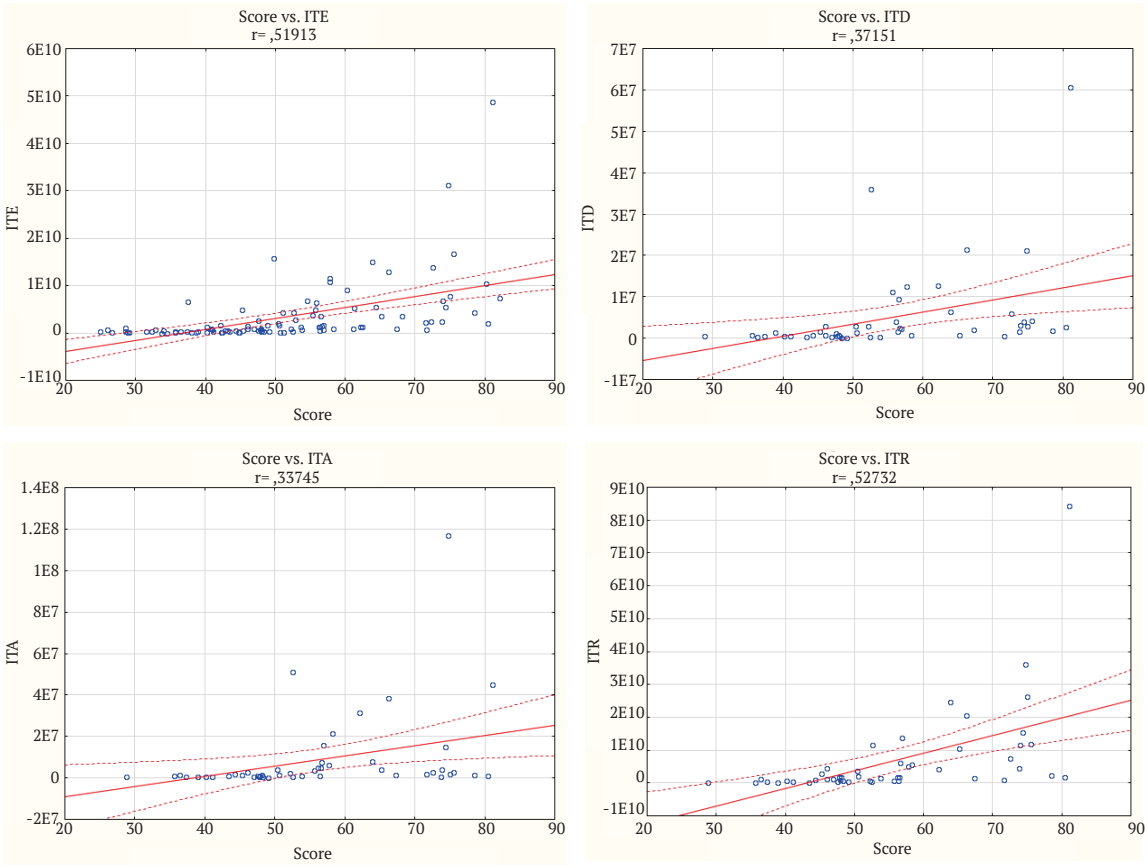

Figure 1. Relationship between NRI and International tourism (ITE, ITA, ITD and ITR)

Source: developed by the author

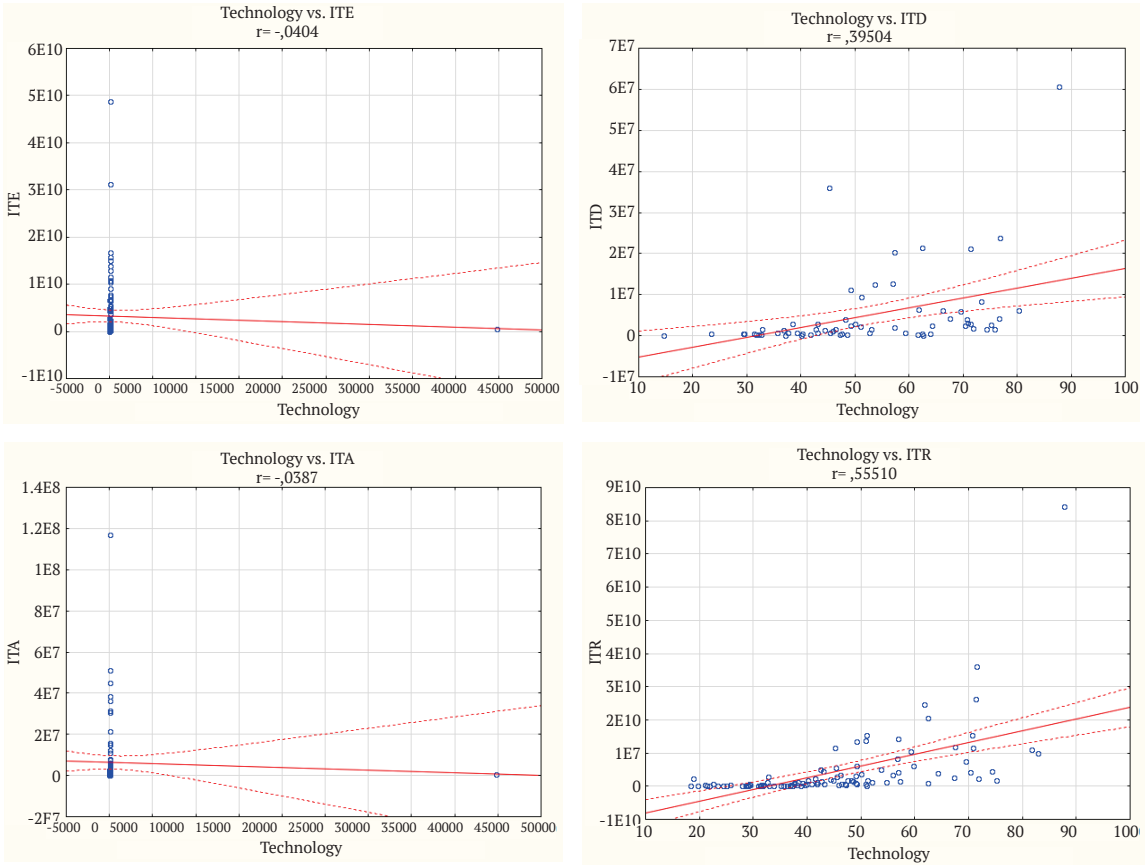

Figure 2. Relationship between Technology and International tourism (ITE, ITA, ITD and ITR)

Source: developed by the author

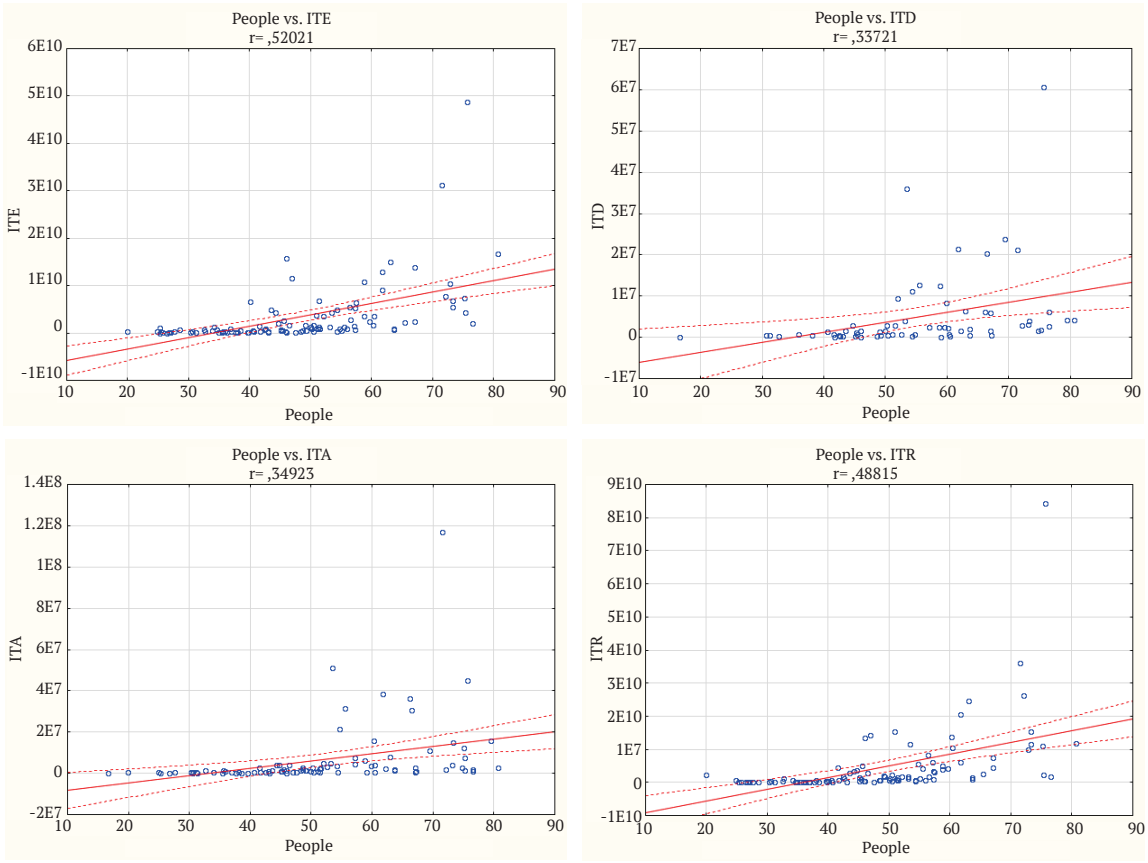

Figure 3. Relationship between People and International tourism (ITE, ITA, ITD and ITR)

Source: developed by the author

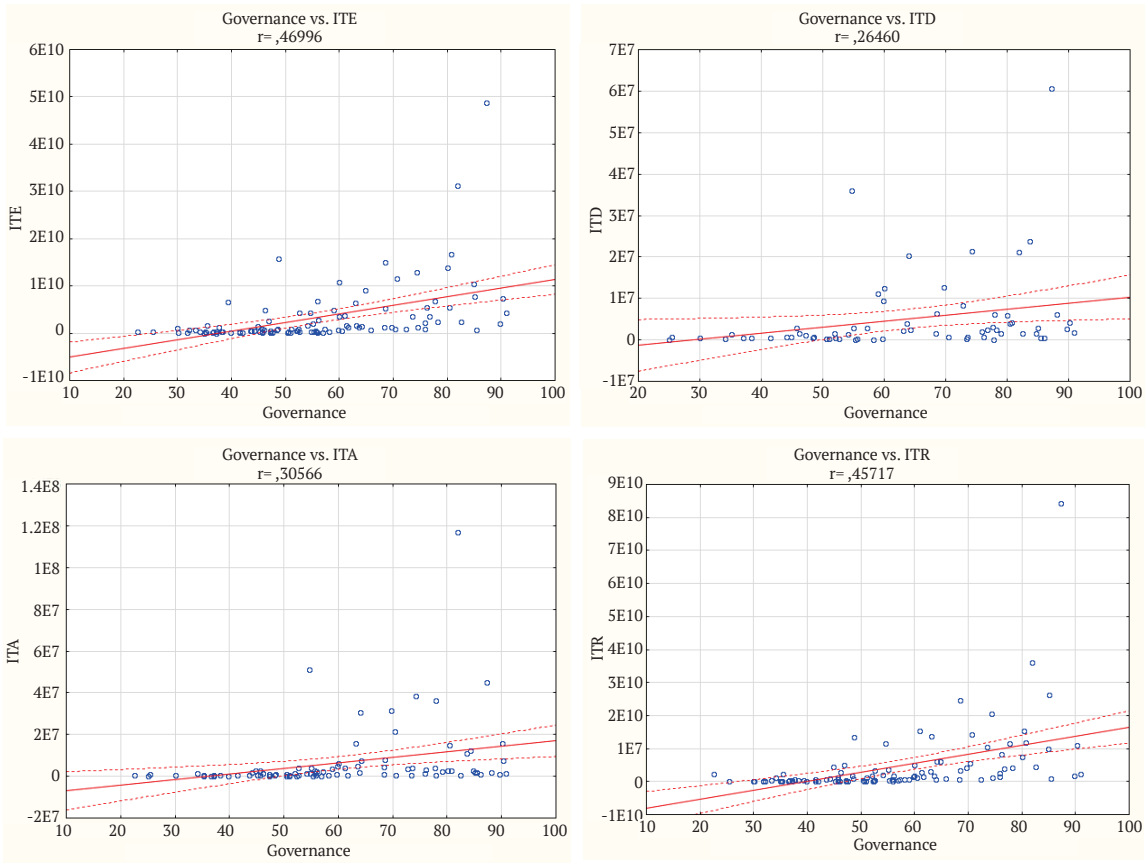

Figure 4. Relationship between Governance and International tourism (ITE, ITA, ITD and ITR)

Source: developed by the author

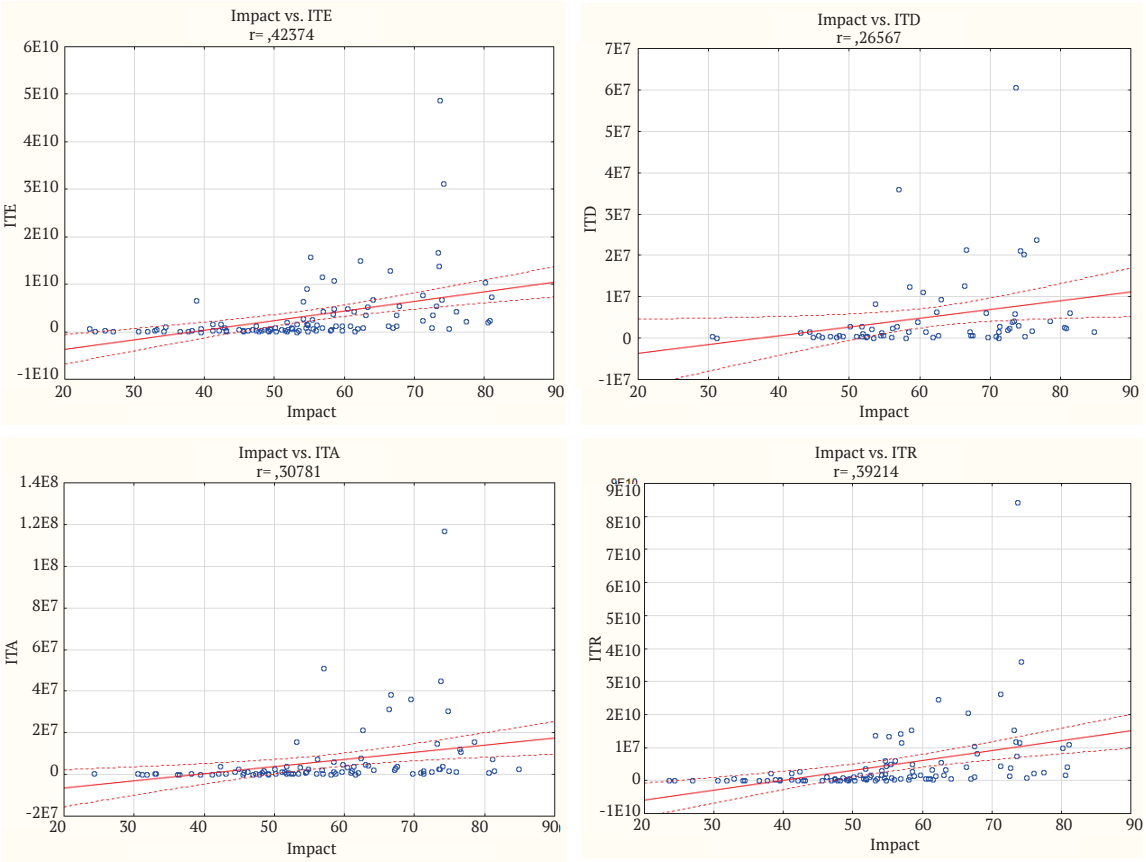

Figure 5. Relationship between Impact and International tourism (ITE, ITA, ITD and ITR)

Source: developed by the author

A visual representation of the relationship between international tourism development indicators and NRI and its components (Figs. 1-5) shows that the relationship between the analyzed indicators is manifested in most cases and is direct. Based on this fact, it can be concluded that the degree of network readiness and digital development are related to international tourism development in countries worldwide. However, the international tourism development indicators and the Technology sub-index of NRI are not linked. Pearson Correlations are presented in Table 1.

Table 1. Pearson correlations between international tourism development indicators and NRI and its components

Variable	Marked correlations are significant at p <,05000 (Casewise deletion of missing data)			
	ITE (N = 106)	ITA (N = 92)	ITD (N = 66)	ITR (N = 103)
NRI	0.519134	0.337644	0.327816	0.493471
Technology	-0.040383	-0.038672	0.395040	0.555096
People	0.520211	0.349233	0.337211	0.488150
Governance	0.469957	0.305655	0.264600	0.457172
Impact	0.423745	0.307814	0.265668	0.392141

Source: developed by the author

As can be seen from Table 1, the correlation between all the analyzed indicators (except Technology) is quite strong (significant correlations are highlighted in red). To in-depth analyze the impact of the indicators on the sample as a whole, the factor loadings of the variables need to be determined. The indicators have been normalized to make the data comparable. Next, factor analysis without rotation and factor analysis with rotation using the Varimax method were applied (Table 2).

Table 2. Factor Loadings (Extraction: Principal components; Marked loadings are >700000)

Variable	Factor rotation			
	Unroteted		Varimax normalized	
	Factor 1	Factor 2	Factor 1	Factor 2
Technology	-0.914825	-0.328833	0.907341	0.348954
People	-0.869321	-0.410709	0.926405	0.257243

Table 2, Continued

Variable	Factor rotation			
	Unroteted		Varimax normalized	
	Factor 1	Factor 2	Factor 1	Factor 2
Governance	-0.851463	-0.479584	0.957899	0.193440
Impact	-0.830012	-0.494841	0.951633	0.167874
ITE	-0.840325	0.432544	0.353380	0.876563
ITA	-0.617042	0.514692	0.130688	0.792823
ITD	-0.704049	0.600832	0.140251	0.914884
ITR	-0.818157	0.455726	0.321450	0.879623
Expl. Var	5.258483	1.772368	3.769627	3.261225
Prp. Totl	0.657310	0.221546	0.471203	0.407653

Source: developed by the author

Table 2 shows that the first factor explains most of the sample, while the second factor is not representative when factor analysis without rotation has been applied. Two distinct factors were obtained using the Varimax rotation method: one closely related to the NRI sub-indices and the other pertaining to international tourism indicators. The proportion of the overall variance explained by the factors is almost the same in both cases. Thus, rotation of the axes using the Varimax method provided an opportunity to improve the explanation of factor loadings interpretations. The visual interpretation of the factor analysis results is shown in Figures 6-7 without and with axis rotation using the Varimax method, respectively.

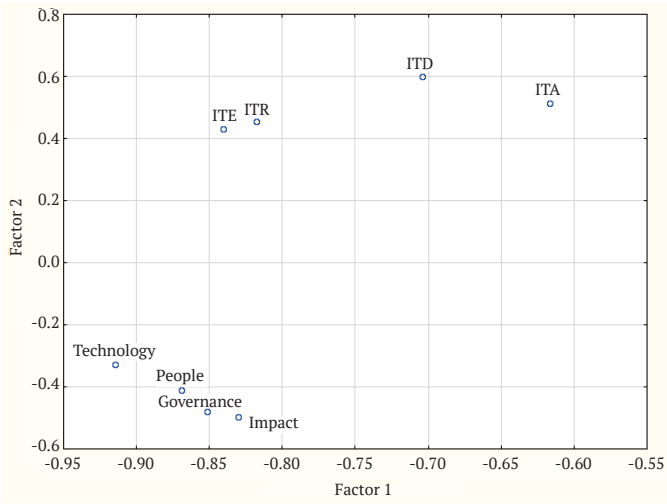

Figure 6. Factor Loadings (Factor rotation: Unroteted, Extraction: Principal components)

Source: developed by the author

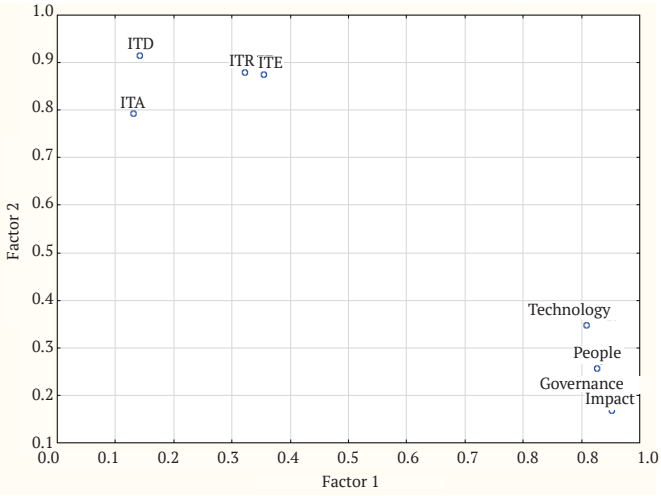

Figure 7. Factor Loadings (Factor rotation: Varimax normalized, Extraction: Principal components)

Source: developed by the author

The factor analysis results show that the sub-indices of the Networked Readiness Index form the first factor with a factor loading of 47.1%, which proved to be entirely predictable. The second factor consists of tourism development indicators with a factor loading of 40.7%. Together, the two factors describe 87.1% of the variance. The results show that the degree of influence of NRI on the sample is slightly higher than that of tourism indicators, but this difference is insignificant.

Thus, the level of international tourism development and the degree of economic digitalization are linked. At the same time, there is a relationship between the components of NRI and tourism indicators. As it turned out, the indicators Technology and ITE and Technology and ITA are unrelated. The reason may explain this fact that expenditure in the visiting country and the number of tourists arriving in that country are independent of the digital development level in that country, as the decision to travel is made in the country of departure, not the arrival. However, this exclusion from the general relationship trend between tourism development and digital technologies does not refute the importance of digital service development. Instead, it points to the need for a more detailed search for patterns between these indicators in future studies.

The findings of this study are consistent with the results obtained by O. Adeola & O. Evans [18]. Researchers using African examples have found a significant direct positive relationship between ICT and infrastructure in tourism development from 1996 to 2016. The authors emphasize that ICT should be considered the basis for Africa's tourism development. A study by C.-C. Lee, M.-P. Chen, W. Wu & W. Xing [19] showed that ICT, in general, has a broad positive impact on international tourism. At the same time, the host country's ICT positively impacts tourist arrivals and tourism revenues. The data from 118 nations for 2006-2017 were used in the paper.

Conclusions from C. Zhou & M. Sotiriadis in the case of China 2004-2018 confirm the positive relationship between ICT and the convergence of culture and tourism [20]. C. Berné, M. García-González, M.E. García-Uceda & J.M. Múgica [21] identified in the Spain case that ICT contributes to the efficiency of tourism businesses. Based on an analysis of data from 2011 to 2019 for the UK, R. Tang found that the digital economy substantially impacts tourism, particularly the tourism business and holiday market. Moreover, the level of digital development matters not only in the country of visit but also in the countries where tourists come from [22].

Other studies also confirm the positive impact of ICT on tourism. Thus, T. Hidayat, R. Mahardiko & M. Alaydrus point out that information technologies contribute to tourism development in Indonesia [23]. B.N. Adeleye, B. Aderounmu, O. Owolabi, V. Okafor & A. Ohonba on the example of 44 Asian economies in 2010-2019 determined that ICT stimulates tourism [24]. N. Kumar & R.R. Kumar found that ICT generates tourism demand. Researchers have identified a unidirectional causal relationship between ICT and tourism demand when evaluating data for nine major tourism destinations (China, France, Germany, Italy, Mexico, Russia, Spain, United Kingdom, United States of America) [25].

In summary, this study confirms previous research findings that there is a relationship between tourism development indicators and the level of information technologies, which highlights the importance of digital tools to stimulate the tourism sector. What sets this study apart is the choice of the Networked Readiness Index as an indicator of digital development.

CONCLUSIONS

The widespread use of digital tools empowers the opportunities for attracting customers and partners in any business. Currently, the tourism sector depends heavily on information and communication technologies. And analysis has shown that this relationship is direct and quite strong. However, it needs to explain the trends for tourism fully. There are other factors affecting international tourism flows. Therefore, given tourism's dependence on digital technologies, the impact of different factors should not be overlooked, the negative value of which can significantly offset the benefits of digitalization. Thus, the tourism industry is much more dependent than others on economic fluctuations and geopolitical risks. Despite the desire to travel, the choice of a tour is determined not only by its cost but also by the level of security in the host country. Russia's military action against Ukraine will have a significant negative impact not only on Ukraine but also on the whole world, ranging from a global redistribution of power on a geopolitical scale and transformation of fuel markets to changes in tourist flows related both to the desire to travel and rest safely (for example, mining the Black Sea) and to shifting geo-economic and social conditions (food problems in Africa, increased migration of Ukrainian refugees to Europe, etc.). There is no doubt that in a global world, this will also impact tourist flows.

There will be a significant redistribution of tourist flows in Europe and nearby regions. The sanctions imposed against Russia and the inability of Ukrainian citizens to travel because of the war will significantly reduce the number of tourists from these countries. Rising fuel and food prices in other countries will adversely affect some social groups, leading to a corresponding decrease in tourist demand. Thus, in pursuing digitalization, tourism companies should remember factors such as security, shifts in the economic and consumer demand structure, changes in income levels, etc., which also significantly impact international tourism.

In addition, the tourism product is not an essential good but is often viewed as a luxury item, the demand for which is highly elastic. There will be a significant decline in tourism activity due to falling incomes. If the decrease in revenues were to have a long-term trend, it could severely affect the tourism industry, which has already suffered severe losses during the quarantine period. On the other hand, lifting quarantine restrictions on many tourist destinations will to a certain extent, become a catalyst for tourist activity, as substantial pent-up demand for tourist services has emerged during the quarantine period.

Prospects for further research in this subject area lie ahead of the causal relationship between indicators of international tourism development and digital technologies. It is of scientific and practical interest to determine whether a country's high level of information and communication technology development promotes tourism or whether countries with a high level of digital development are more attractive to tourists.

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Туризм і цифрові технології: аналіз взаємозв'язку

Анотація. На підставі бібліографічного аналізу літератури визначено, що більшість сучасних досліджень вказують на факт впливу діджиталізації на туризм. Цифрові технології змінюють туристичні вподобання, туристичне споживання та суть взаємодії суб'єктів туристичного бізнесу. У цьому контексті це дослідження спрямоване на визначення особливостей взаємозв'язку між рівнем розвитку міжнародного туризму та цифровими технологіями. Мета дослідження – визначити особливості взаємозв'язку між рівнем розвитку міжнародного туризму та цифровими технологіями. У статті використано такі методи, як: бібліографічний, стандартизації, кореляційний аналіз, факторний аналіз без обертання та факторний аналіз з обертанням за методом Varimax, порівняльний аналіз, графічний аналіз. Для аналізу було використано індикатори розвитку міжнародного туризму Світового банку (такі як: витрати; кількість прибуттів; кількість виїздів; надходження) та Індекс мережевої готовності. Дані охоплюють 130 країн за 2020 р. У роботі було визначено кореляційні зв'язки між показниками розвитку міжнародного туризму та Індекс мережевої готовності і його компонентами. Аналіз показав, що для аналізованих показників існує прямий взаємозв'язок. Також на основі використання факторного аналізу без обертання та факторного аналізу з обертанням з використанням методу Varimax у роботі було розраховано факторні навантаження. Використання методу обертання Varimax дало змогу виокремити два чітко виражені фактори, один з яких тісно пов'язаний із субіндексами Індекс мережевої готовності, другий – з показниками міжнародного туризму. При використанні факторного аналізу без обертання було виокремлено один фактор. На підставі проведеного аналізу було отримано висновок про те, що рівень розвитку міжнародного туризму і ступінь цифровізації економіки пов'язані між собою. Виключенням виявилася відсутність зв'язку між субіндексом Індекс мережевої готовності Технологія і витрати та кількість прибуттів. Результати вказують на важливість впровадження цифрових технологій у туристичний бізнес. При цьому в роботі зазначається, що, окрім цифрових технологій, туристичним компаніям слід приділяти увагу й іншим факторам, таким як безпека, ризики, коливання економічної кон'юнктури, зміна геоекономічних і соціальних умов тощо

Ключові слова: цифрова економіка, цифровізація, розвиток міжнародного туризму, Індекс мережевої готовності (NRI), показники міжнародного туризму

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