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Methods of financial assessment of the intellectual assets of an enterprise and features of their reflection in accounting

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Abstract. Modern common accounting methods have been created and improved over the years; nevertheless, finding methods for their improvement still remains relevant. Thus, in the work it was decided to evaluate one of the important components of accounting for many enterprises in Azerbaijan, namely the assessment and display of intellectual assets, as well as to propose methods for their improvement based on the experience of other countries. Therefore, the purpose of the work is to find the shortcomings in the valuation of intellectual assets existing in the modern accounting system of the country and offer them an alternative or an opportunity for improvement. The main method in the study was analysis, since during the work the primary processing of significant amounts of data was carried out. Other methods can also be noted, namely comparison, historical, induction and others. Thus, some methods of valuation of intellectual assets at Azerbaijani enterprises were evaluated in the work. It has been shown that the most commonly used are the historical method of valuation, as well as fair value. Subsequently, a much larger number of them were described, proposed by other scientists and referred to under other reporting standards. In addition, the features of the process of subsequent revaluation of intellectual assets are indicated, as well as the corresponding entries that the accountant must make, depending on some variables. The work brings new knowledge for the formation of the basic principles of accounting, in particular in the context of intellectual assets and their display in statements

Keywords: intangible assets; finance; the economy of Azerbaijan; international accounting standards; entrepreneurship

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Introduction

Accounting plays an important role both in ensuring the well-being of the enterprise, and the state and society. In the first case, this is due to the fact that accounting allows you to notice any problems that exist in the enterprise at their earliest stage, as well as keep certain statistics on it. In the second case, accounting allows the state to assess how lawfully an enterprise behaves, what income it actually receives, what taxes it must pay, etc. (Gajindranath, 2019; Cotoc *et al*., 2021). In addition, this makes it possible to assess the general economic situation in the country, to tally up statistics on how enterprises feel at the moment, what activities they are conducting.

In the modern realities of accounting, the valuation of intellectual assets plays a very important role. At their core, they are a reflection of the assets (economic resources) of the company that have been recreated as a result of intellectual or creative work, and also have the property of rarity and the ability to bring economic benefits to their owner (Zakharchyn & Sytnyk, 2023; Kryvovyazyuk, 2023). The main reason for the increase in their influence in modern realities is the creation and spread of completely different types of enterprises that create products of intellectual power: among these are audit firms, IT companies, marketing agencies (Tarczynski *et al*., 2020). They may have a small number of registered and reported tangible assets, but they can be expensively valued by market participants. Another reason is the creation of new methods of information dissemination, among which the Internet has played an important role. Its development has led to an increase in the role of the brand and company image for their well-being and economic efficiency (Tarczynski *et al*., 2020). Modern accounting standards have certain sets of rules about how the valuation and display of intangible assets should be carried out. Nevertheless, it is still relevant to find methods for their improvement. In this paper, the study is carried out precisely in the context of the accounting standards of Azerbaijan.

A large number of scientists have been studying this issue. The study by C.-N.B. Cotoc *et al*. (2021) focuses on the effectiveness of anti-money laundering measures in the European Union member states. The authors analyze different cases to identify which strategies and policies are most effective. The results of the study show that a comprehensive approach, including international cooperation, constant monitoring and updating of legislation, is key to successfully combating money laundering. The study also emphasizes the importance of using modern technologies to detect and prevent illegal financial transactions. The paper by E.K. Laitinen (2019) examines the discounted cash flow (DCF) method as a tool for assessing the financial success of startups. The author analyzes in detail the advantages and limitations of DCF, emphasizing its ability to take into account future cash flows and the time value of money. The study shows that DCF can be an effective valuation method if it is used with the specific risks and uncertainties inherent in startups. The author also discusses examples of DCF application in various industries, which allows for a better understanding of its practical value.

A.U. Shehu (2020) provides an overview of the fair value approach to asset valuation. The study emphasizes the importance of this approach to ensure transparency and accuracy in financial reporting. The author discusses various methods of determining fair value, including the market approach, income approach, and cost approach. The author also analyzes the main challenges that companies face when applying this method, such as determining market prices and managing subjective estimates. Z. Spacirova *et al*. (2020), T. Shou (2022) propose a general framework for classifying cost estimation methods in health economic evaluation. The authors analyze different methodological approaches to cost estimation, including microeconomic and macroeconomic models. They emphasize the importance of accurate cost estimation for evaluating the effectiveness of health care interventions. The study also addresses the issue of standardization of costing methods and their application in international contexts.

Thus, the purpose of the work is to describe the existing problems or shortcomings of the current methodology for assessing and displaying intellectual assets in the financial statements of Azerbaijan.

Materials and Methods

The analysis method was applied to process and review a large number of materials related to the assessment and display of intellectual property objects in accounting. With its help, a systematic study of various methods of valuation of intellectual assets was carried out, as well as their comparison based on the ease of application to intangible assets in general. The analysis made it possible to assess the development of changes in the methods of accounting for intellectual assets in accordance with the requirements of IFRS 38 and to compare them with the accounting methods and principles of other countries, in particular, former members of the USSR. In addition, thanks to the analysis, the most popular methods of valuation of intellectual assets in Azerbaijan were determined, as well as the process of accounting and display of intangible assets in reporting, taking into account changes in their value due to revaluation and depreciation, was considered. In addition, the historical method made it possible to assess the development of changes in approaches to the assessment and display of intellectual property objects in accounting. Another method was induction, which makes it possible to evaluate the general most popular methods used for the valuation of intellectual assets in the country, based on known individual data on their effectiveness and application; the deduction method, in turn, is used on a much smaller scale. The comparison since the paper analyzes several methods for evaluating intellectual assets, and subsequently shows their comparison based on the convenience of applying to intangible assets in general.

Thus, the entire research process can be divided into several stages, in which the main features of accounting were evaluated in accordance with the accounting policy of Azerbaijan using the requirements of IAS 38 and in comparison, with the accounting methods and principles of other countries, in particular, the former members of the Union of Soviet Socialist Republics (USSR) (Rovshan, 2019).

At the second stage, the most popular methods of valuation of intellectual assets in Azerbaijan were reviewed, namely, the methods of historical and fair value. In addition, the analysis method considered the entire process of accounting and reporting intangible assets in the statements, taking into account the assessment of changes in their value due to revaluation (its corresponding increase or change), taking into account depreciation. All results were subsequently shown in the framework of the table, which can allow accountants and auditors to greatly simplify the understanding of the process of conducting revaluation and accounting of intellectual assets. At the end of the study, the results obtained using the two main valuation methods in Azerbaijan – the historical cost method and the fair value method – were evaluated by comparing them with other methods mentioned in international standards and scholarly works.

Results

Taking into account that the system of economic relations of Azerbaijan was formed on the basis of the system of economic relations of the Soviet economy, the necessity of the concept of reconstruction of the traditional national accounting system in accordance with the international standards of financial statements in our republic was characterized by the similar reasons and features as in the CIS countries. Although, unlike the countries of the Soviet Union, reforms in the sphere of accounting in our Republic started with a certain delay due to objective and subjective reasons, as a result of the practice of transitioning to the International Standards of Financial Statements of those countries and the study and analysis of the experiences collected in this regard, these reforms were carried out by step-by-step implementation of the determined national strategy in accordance with the country's uniform accounting policy (Jafarov *et al*., 2011).

In accordance with the requirement of International Accounting Standards (IAS) 38 "Intangible Assets", the valuation of intellectual assets should be carried out only by professionals and experts with many years of experience (Rovshan, 2019). This is especially important given the special nature of this type of assets, which in fact does not have obvious physical manifestations. Therefore, private audit companies or accounting companies should pay more attention not to what methods or principles are used in the assessment, who conducts it, what experience and background this person has.

One of the main components for displaying intellectual assets in financial statements is their valuation. In the literature, one can find a very large number of methods by which the valuation of intangible assets is carried out, and to be precise – about 40 (Sveiby, 2001). In Azerbaijan, there are two main methods of primary valuation: initial (historical) and fair value. In the first case, the asset is valued based on an estimate of the amount of cash (cash equivalents) paid or the fair value of the consideration paid (exchangeable non-monetary assets, obligations assumed, equity instruments issued) at the time of its acquisition (Tkachuk, 2019). This includes both direct and indirect purchase costs. In turn, a fair estimate is based on measuring the amount that can be received if the asset is sold to another party that has an interest and is sufficiently informed about it (Shehu, 2020). The second method is more universal, since intellectual (as well as intangible) assets are not always acquired: for example, identifiable assets acquired by a company during a business combination are paid taking into account business reputation (goodwill).

There are some more features of displaying the value of intangible assets in the process of their acquisition. In particular, if the asset was acquired with a government grant (with no subsequent compensation required), then the grant and the asset must be measured using the fair value method; if this fails and is not feasible, the face value of the asset should be used, taking into account the cost of bringing it to a usable condition. If an asset was obtained by exchanging for another asset (or a certain amount of monetary and non-monetary assets), then their cost is also measured using the fair value method, except in certain cases: if the transaction does not have commercial substance and / or when the fair value of the asset or assets, acquired or transferred cannot be determined reliably. In the latter case, the value of the asset must be determined based on the fair value of the assets given up.

Within the framework of the norms for the financial assessment of intangible assets of Azerbaijan, goodwill created through the direct activities of the company during its existence should not be recognized as an asset. In the case of valuation of other assets that have been created in this way, the valuation should be based on the historical cost of directly attributable costs necessary for their creation, production and preparation in order for them to function in the manner planned by the management of the enterprise. Otherwise, such assets (trademarks, newspaper headlines, publishing rights, customer lists and other similar items) are not recognized as assets, and the costs associated with their acquisition are recognized as expenses in the periods in which they are incurred (Kiesler *et al*., 2002; Al-Khasawneh *et al*., 2014).

After the initial appraisal of the value of an asset, the company must regularly (within reporting periods) update its value. There are also two main models for this, namely the cost model and the revaluation model. It is important to note that if a company uses a valuation model for one specific intangible asset, then it must also apply it to other assets of the same class. Thus, the first and most common model is the cost model, in which an asset is carried at its historical cost less accumulated depreciation and impairment losses. Another model, more complex, is the revaluation model. In connection with it, the asset also, after initial recognition, the asset must be carried at fair value at the revaluation date, less accumulated depreciation and impairment losses. However, the most important difference is that this fair value must be remeasured every certain amount of time and regularly enough that the carrying amount of the asset does not differ materially from its fair value at the balance sheet date. There may be scenarios where only a portion of an asset can be revalued using this method: in such a case, it is applied to the portion to which it can be applied. In turn, the part that reduces the value of the asset due to depreciation is not subject to revaluation: thus, the remaining part of the asset is revalued (subject to depreciation).

Consider some of the points from the above operations. The initial cost of acquired intangible assets is the sum of the direct costs incurred to bring the asset to a condition appropriate for its intended use, including customs duties and non-refundable taxes, after deducting discounts from their purchase price. An intangible asset does not arise during the exploration phase (or during the exploration phase of an internal project). At this time, the costs of the research phase (or the costs incurred during the research phase of an internal project) are reflected in accounting as costs of the reporting period from the moment they are incurred. Costs of intangible assets created in the course of development work (or intangible assets created as part of the development stage of an internal project) are reflected in accounting as capitalization of intangible assets. Acquired intangible assets are used after recognition. After recognizing an intangible asset using the historical cost model, the accounting entity calculates the depreciation of this asset at historical cost, followed by an assessment at the end of each reporting period if they have any signs of impairment. If there is such an indicator, the corresponding impairment losses are calculated. In these cases, accounting entries are made (Table 1).

Table 1. List of accounting entries for the calculation of asset impairment losses

The procedure for maintaining accounting records in commercial enterprises in accordance with IFRS by points	Content of the financial transaction	Debit	Credit
11.19.1	The initial cost of acquired (purchased) intangible assets after deducting sales discounts from their purchase price, including customs duties and non-refundable purchase taxes.	103	531, 532, 537, 538, 545
11.27.	Costs for intangible assets created during the research phase (or costs incurred during the research phase as part of an internal project) are reflected in accounting as expenses of the reporting period from the moment they are incurred.	731	102, 112, 201, 204, 207, 522, 531, 532, 533, 537, 538
11.28.	Costs of intangible assets created in the course of development work (or intangible assets created as part of the development stage of an internal project) are reflected in accounting as capitalization of intangible assets.	103	102, 112, 201, 204, 207, 522, 531, 532, 533, 537, 538
11.29.	When using acquired, accepted on the balance sheet intangible assets.	101	103
11.31.	Once recognized as an asset, depreciation is calculated for intangible assets using a cost model.	202, 203, 711, 721, 731	102
11.31.	The assets are then assessed at the end of each reporting period for any indication of impairment.	731	102

Source: created by the authors

When an accounting entity uses intangible assets after recognizing them as assets, the revaluation model is reflected in accounting at the revaluation cost, which is their fair value. At the end of the reporting period, these assets are revalued regularly enough that the carrying amount of intangible assets does not differ materially from their fair value. As a result of the revaluation of intangible assets, its book value may either decrease or increase. If the carrying amount of an asset increases as a result of a revaluation, the increase is recognized directly in capital reserves as a revaluation reserve under the heading “revaluation increase”. In this case, the carrying amount of the intangible asset must be adjusted to its revalued amount. At the date of revaluation of the asset using the method of zeroing accumulated depreciation, accounting entries are made (Table 2).

Table 2. The procedure for maintaining accounting records in the event of an increase in the carrying value of an asset

The procedure for maintaining accounting records in commercial enterprises in accordance with IFRS by points	Content of the financial transaction	Debit	Credit
11.34.1.	Zero accumulated depreciation is determined by subtracting it from the cost of the asset.	102	101
11.34.2.	If the carrying amount of an asset increases as a result of a revaluation.	101	331

Source: created by the authors

When applying the method of proportional adjustment of the cost of an asset and the amount of accumulated depreciation, its cost is changed in accordance with the revaluation of the residual value. The initial value is adjusted in proportion to the market price or the change in the residual value. Accumulated depreciation at the revaluation date should be adjusted to equal the difference between cost and residual value, taking into account any accumulated impairment losses. As a result of the revaluation, an increase in the carrying value of an asset is credited to the respective reserve capital sub-accounts. When the carrying amount of an intangible asset is reduced as a result of a revaluation, the amount of the reduction (net of accumulated depreciation charges on that asset) is written off to a loss in the reporting period. If an increase from previous revaluations was recognized in equity, subsequent impairment losses are charged to other equity reserves to the amount of the increase, with the remainder recognized in profit or loss.

If impairment losses arising from previous revaluations are recognized in the statement of profit or loss and other comprehensive income, subsequent increases in the statement of profit or loss and other comprehensive income are included in other operating income up to those impairment losses, and the amount in excess of previous years' impairment losses, the revaluation is credited to a reserve account (Table 3). At the date of revaluation of the asset using the method of proportional adjustment of the initial cost of the asset and the amount of accumulated depreciation, the following accounting entries are made.

Table 3. Accounting entries in the asset revaluation process

The procedure for maintaining accounting records in commercial enterprises in accordance with IFRS by points	Content of the financial transaction	Debit	Credit
11.35.	Once recognized as an asset, depreciation is calculated for intangible assets using a cost model.	202, 203, 711, 721, 731	102
11.35.	The assets are then assessed at the end of each reporting period for any indication of impairment.	731	102
11.35.1.	If the carrying amount of an asset increases as a result of a revaluation.	101	331
11.35.2.	Accumulated depreciation at the revaluation date is adjusted as the difference between the gross carrying amount and the carrying amount of the asset, after accounting for accumulated impairment losses.	101	102
11.36.	A decrease in the carrying amount of an intangible asset as a result of revaluation is recognized as an expense.	731	102
11.36.	At the same time, accounting entries are made to reflect these expenses in losses.	801	731
11.37.	If an increase from previous revaluations was recognized in equity, subsequent impairment losses are charged against other equity reserves up to the amount of the increase.	331	101
	The remaining amount is charged to profit or loss.	731	102

Table 3, Continued

The procedure for maintaining accounting records in commercial enterprises in accordance with IFRS by points	Content of the financial transaction	Debit	Credit
11.38.	If impairment losses arising from previous revaluations are recognized in the statement of profit or loss and other comprehensive income, subsequent increases in the statement of profit or loss and other comprehensive income are included in other operating income up to and including those impairment losses, and the amount in excess of previous years' impairment losses, the revaluation is credited to a reserve account. At this time, the following accounting entries are made:		
11.38.1.	For the amount of the impairment loss resulting from the revaluation for the previous period	102	611
11.38.2.	By an amount exceeding the impairment losses of previous years	101	331
	Alternatively	102	331

Source: created by the authors

The presented data can be used by the auditor as a guide for the revaluation of intangible assets, since it provides virtually all the necessary data for its implementation. The results of the study showed that the system of economic relations in Azerbaijan, formed on the basis of the Soviet economic system, requires the reconstruction of the national accounting system in accordance with international financial reporting standards. It was found that the valuation of intellectual assets should be carried out only by professionals with many years of experience, as these assets do not have obvious physical manifestations. The main methods of initial valuation of intellectual assets in Azerbaijan are historical cost and fair value. The results also highlighted the importance of regularly updating asset values and using cost and revaluation models to reflect changes in asset values in financial statements. This data can be used by auditors to simplify the process of revaluation and accounting for intellectual assets.

Discussion

Among the methods for valuation of intangible assets presented in the article, which are the most common, there are other methods established by IAS 38. One of them is the current cost method, which is described in Z. Spacirova *et al.* (2020). Its essence is to compare assets at prices that exist in an efficient market. If the market is not efficient enough or the assets being valued differ too much, the accountant has the right to apply additional asset valuation techniques to determine the price. These methods should subsequently be described in the notes to the financial statements if they are presented in accordance with International Standards. It can be seen that this valuation method is very similar to the fair valuation method, however, they have one difference: the current cost method estimates the price of an asset based on market prices, and the fair valuation method estimates what price the buyer can pay for this asset having reliable information about it. To be honest, the present value method is quite difficult to implement, given that most, if not all, intangible (and especially intellectual) assets can be traded in an efficient market. The exception is some digital assets that are currently gaining popularity, such as cryptocurrencies, NFTs (non-fungible token), and others (Burchell *et al.*, 1980; Apostu *et al.*, 2022).

Another method is the replacement cost estimate, which is described in their work by S.E. Jackson *et al.* (2014). In general, replacement cost is the cost of recreating an exact copy of a given asset at current prices. This method is similar to historical cost, in which the price of an asset is based on the cost of creating it in the past. However, they also have obvious differences, since the replacement cost method makes estimates in modern prices, and the original cost price based on prices in the past; thus, asset valuations made using any of these methods will in any case differ from each other in one direction or another. Also, the replacement cost method has such a disadvantage in application, as well as the historical method: it is almost impossible to estimate the amount of money that needs to be invested in order to recreate many types of intellectual assets.

The discounted present value method, partially described in the work of T. Shou (2022), is also interesting: although it is most often used to evaluate investment projects in terms of their profitability, it is also suitable for assessing the value of assets. This method is based on the expected future cash flows received from a certain asset at a certain interest rate and number of periods, as well as its estimated value in the most recent period. Another option for finding this value is to estimate the future flows in a certain number of periods that an asset can bring

(Panigrahi *et al.*, 2021). If an asset is valued for a conditionally endless period of time, then the assessment of its future value may not be necessary, since in any case it turns into conditional 0, which simplifies the calculation process. However, in practice it is better to estimate the returns to be received from the asset in the next few years and its approximate value in the future, rather than apply such a simplification (Grobys, 2021). In this case, the accuracy of the calculation largely depends on who conducts it, that is, on the expertise of an accountant or auditor, which is one of the main components for accurately determining the valuation of an intangible asset. Note that the methodology for estimating the value of an intangible asset using the discounted cash flow method is quite effective, since it introduces a clear list of the necessary data for the assessment. On the other hand, evaluation with it may give a false result due to its strong dependence on any changes in variables (Khodakivska *et al.*, 2022).

The discounted cash flow method was also studied by E.K. Laitinen (2019). He also believes that the tasks that this method takes on to generate an estimate of the value of an asset are too complex due to the fact that there are too many variables. Note that due to the complexity of forecasting, the accuracy of the results obtained in the case of using the method will vary depending on the business cycle, as well as the political and economic situation in the world as a whole (Kanaryk, 2024). Thus, during recession years, most experts' estimates will gravitate towards lower asset values, and during the "economic boom" – to overestimated ones. Therefore, a good auditor and accountant should take these factors into account when making their own assessment (Heaton, 2022).

There are some other evaluation methods, but they are less global than those described above, and can be used in rare cases to evaluate the results obtained. For example, the market capitalization method involves finding the value of all the intellectual assets of an enterprise by finding the difference between the market capitalization and the declared amount of tangible assets (Brown and Cliff, 2005). Although such a technique is quite logical, since market participants, when choosing to buy shares of a particular company, take into account not only the value of its assets, but also prospects, ideas, image and other factors. Thus, if we believe that market valuation is always effective, then the level of intellectual assets of an enterprise is indeed the difference between capitalization and monetary value of tangible assets. However, markets do not always carry out their assessment carefully enough. In addition, the formation of an assessment based on such factors would be problematic due to the frequent fluctuations in the company's price during the trading session (Spytska, 2023). Also, this method does not allow you to estimate the price of each individual asset, which makes it highly specialized.

Another possibility for evaluation is the use of the ROA (Return on Assets) method, which is also rather doubtful in application. To do this, you first need to calculate the actual ROA, which can be found with data on the company's net profit and its asset value. When applying it, an accountant or auditor must evaluate the level of profitability of the company's assets, and then compare the result with the average in the industry in the country (Horoshkova *et al.*, 2022). Thus, if the value of this indicator in the company is higher than in the industry on average, then the value of this difference is the return that intangible assets bring to the company. On this basis, it is possible to estimate the total value of intangible assets. However, the reliability of this method leaves a large number of questions, as well as applicability. The methods described above in the article are more effective. Thus, the methods described in the work above can become quite useful for accountants and auditors of Azerbaijan: with their help, they can get new opportunities for evaluating intangible assets and compare the results obtained with those obtained using other methods. Although they are still not widespread in the country, if recommendations are provided by the state for their application, it will definitely help to increase their significance. In addition, auditors can always use them on their own to evaluate a particular result obtained during the assessment.

Conclusions

This paper discusses the main methods of valuation of intellectual assets in Azerbaijan. The most commonly used methods are the historical cost method and the fair value method. Both methods, although different in nature, do a good job of valuing assets, including intellectual assets, although they have certain peculiarities and existing problems. The study showed that the much more time-consuming part is not the initial valuation of an asset, but its subsequent regular revaluation. It has been found that revaluation can be done through depreciation (i.e., without revaluation in principle, but only by reducing the actual value from year to year) and by estimating the new price of the asset. The article describes in detail how an asset should be revalued and how it should be reflected in the financial statements.

In particular, the final posting after revaluation may differ depending on how the asset was valued last year and on which accounts the value of the asset is currently recorded. The paper presents these nuances in a table that can be used in accounting at enterprises. The paper also evaluates other methods of intellectual property valuation that are not common in Azerbaijan but are mentioned in the economic literature: among them are the current value method, the replacement method, the discounted present value, and others. It turned out that their application in some situations for the valuation of intellectual assets can be useful for identifying errors or inaccuracies in the use of basic methods. The study also showed that the system of economic relations of Azerbaijan, formed on the basis of the Soviet economic system, requires reconstruction of the national accounting system in accordance with international financial reporting standards. The cost of other assets created in this way should be based on the historical cost of direct costs necessary to create, produce and prepare them for operation in accordance with the company's management plans.

In further research, it would be appropriate to display empirical examples of the assessment of a certain intellectual asset at an enterprise using different assessment methods to compare their effectiveness. This would allow not only to clearly demonstrate the advantages and disadvantages of each method, but also to provide practical recommendations for accountants and the audience.

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Conflict of Interest

None.

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Методи фінансової оцінки інтелектуальних активів підприємства та особливості їх відображення в обліку

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Анотація. Сучасні загальноприйняті методи бухгалтерського обліку створювалися та вдосконалювалися протягом багатьох років, проте пошук методів їх вдосконалення залишається актуальним. Таким чином, в роботі було вирішено оцінити одну з важливих складових бухгалтерського обліку для багатьох підприємств Азербайджану, а саме оцінку та відображення інтелектуальних активів, а також запропонувати методи їх вдосконалення на основі досвіду інших країн. Тому метою роботи є пошук недоліків в оцінці інтелектуальних активів, що існують в сучасній системі бухгалтерського обліку країни, та запропонувати їм альтернативу або можливість для вдосконалення. Основним методом у дослідженні був аналіз, оскільки під час роботи було здійснено первинну обробку значних обсягів даних. Також можна відзначити й інші методи, а саме порівняння, історичний, індукції та інші. Таким чином, у роботі було оцінено деякі методи оцінки інтелектуальних активів на азербайджанських підприємствах. Було показано, що найчастіше використовуються історичний метод оцінки, а також справедлива вартість. Згодом було описано значно більшу їх кількість, запропонованих іншими науковцями та згаданих в інших стандартах звітності. Крім того, зазначено особливості процесу подальшої переоцінки інтелектуальних активів, а також відповідні проводки, які повинен зробити бухгалтер залежно від деяких змінних. Робота привносить нові знання для формування основних принципів бухгалтерського обліку, зокрема в контексті інтелектуальних активів та їх відображення у звітності

Ключові слова: нематеріальні активи; фінанси; економіка Азербайджану; міжнародні стандарти бухгалтерського обліку; підприємництво

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Gender budgeting in Ukraine: Tools, financial security and gender equality in economic sectors

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Abstract. Issues of gender equality have come to the fore in recent years. Since gender budgeting is one of the tools for achieving this goal, conducting research on maximizing its effectiveness remains relevant. The purpose of the study was to justify the use of a comparative approach in budget financing as a tool for gender equality and improving the stability of the country's financial system. Analysis and forecasting were the main methods used during the research. The article explored the evolution of budget financing in Ukraine, with a focus on gender budgeting as a mechanism for safeguarding human rights within the institutional framework. The study emphasized the pivotal role of gender mainstreaming in achieving gender equality and ensuring financial stability within the state. It provided a comprehensive framework, including a detailed step-by-step algorithm, for both the development and execution of budget programs within economic sectors and the defense sector, with a strong focus on integrating gender perspectives. Furthermore, it delved into the concept of synergistic gender budgeting development, showcasing its potential as a powerful tool for bolstering financial security while advancing gender parity. Additionally, the research conducted an insightful evaluation of the alignment between Ukraine's regional development strategies and key principles of human rights and gender equality. Moreover, it conducted a meticulous analysis of the distribution of gender budgeting across various economic sectors and the defense sector, shedding light on regional development strategies' approach to gender-sensitive budget allocation. Research is a tool for improving the distribution of financial resources and ensuring gender equality in Ukraine and other countries, contributing to increased economic development by involving more people in the economy

Keywords: public policy; sustainable development; legislation; social sphere; finance

Introduction

The Ukrainian human rights security system, along with technologies, labour productivity, innovations, and the accumulation of human capital, is a factor in the development of gender budgeting. Its stability and ability to withstand threats plays an important role in the formation of public finances of the state, contributes to the development of gender parities in society under the conditions of financial protection and the growth of the quality of life of individuals of different backgrounds and ages. For a long time, gender budgeting in Ukraine was characterized by the instability of development due to the suboptimal organizational and institutional structure of the country's financial system, the accumulation of imbalances, the complication of macro-financial processes, the increased risk of external borrowing on the market for the formation of the state budget and budgets of local self-government bodies, which, in the absence of proper coordination, leads to a decrease in the effectiveness of the implementation of its basic functions – rational and proportional provision of income and expenses, with an emphasis on gender equality, safety and protection of the individual at the level of social needs and quality of life (Komircha, 2023). A. Binagwaho *et al.* (2021) studied the commitment to gender equality through the implementation of gender responsive finance. The results showed that the introduction of gender-responsive budgeting significantly increases the effectiveness of financial policy in addressing gender inequality and promotes equitable distribution of resources, thereby supporting gender equality in various sectors.

I. Steccolini (2019) identified that while gender-responsive budgeting is an important tool for achieving gender equality, it faces a number of challenges, such as lack of political will, insufficient data, and insufficient integration into mainstream budget processes. The author emphasizes the need for comprehensive strategies to overcome these barriers. E.D. Ampaire *et al.* (2019) examined the integration of gender into climate change, agriculture and natural resources policies in East Africa. The results of the study showed that gender aspects are often not adequately addressed in these policies, leading to gender inequalities in climate change impacts and resource management. The study emphasized the importance of incorporating a gender perspective to ensure equitable and sustainable policy outcomes. In Ukraine, the formation of budgets at all levels taking into account gender aspects is a requirement of the European community, since this approach ensures the targeted and safe use of financial resources, increases the transparency of the inclusion of budgeting for social services and the needs of women and men (Protosavitska, 2023).

Theoretical and applied aspects of personal security management as an important social phenomenon in the policy of state financial inclusion and as a driver of the modernization of the pension system, from the standpoint of sustainable human development, were studied by such scientists as: G.V. Ortina & N.V. Trusova (2023), N.V. Trusova *et al.* (2022); such scientists as S. Atkins (2018), who actualized the problem of gender identification, singled out changes in traditional ideas about the role abilities of men and women, with the elimination of gender stereotypes of individuals in the distribution of financial resources according to the levels of demand for social needs. F. Cunha *et al.* (2021) analyzed the current state of sustainable finance and investment and proposed a research agenda for future research. The findings highlighted the growing importance of integrating environmental, social and governance (ESG) criteria into financial decision-making processes. The study of the dependence of gender equality on the financial potential of the country, territorial affiliation, economic development and the level of social security of a person was engaged in such scientists as N. Davydenko *et al.* (2021), M.M. Babak *et al.* (2021). However, the problem of fair distribution of budget funds by gender remains insufficiently researched and does not have a systemic nature.

The priority of this research is the substantiation of a comparative approach to the development of gender budgeting in Ukraine as a tool for stabilizing financial security and promoting gender equality in the parity synergy of the rights of women and men, which ensures their ability to receive financial support and social assistance in accordance with the requirements of the European community.

Materials and Methods

The methodology for this study is designed to comprehensively analyze the impact of gender mainstreaming on budget financing programs across different sectors, including the defense sector, with the aim of addressing inequalities in budget funding through the Women's Participation in Development (WID) approach.

The article used the analysis of the budget financing program based on the evaluation of the existing budget financing programs from the point of view of gender perspective. This is an analysis of program documents, budget reports and financial statements to assess current budget allocations and their impact on gender equality. The research used an analysis of goals and positions aimed at defining the goals of gender equality and an analysis of the current situation regarding gender disparities in budget allocations.

Descriptive analysis was utilized to depict the current state of various aspects of gender equality in budget financing. Content analysis was employed for a systematic examination of the content of political documents, budgetary reports, and other materials to identify gender disparities in budget financing. Monitoring and evaluation were used to track the implementation of gender integration and assess its effectiveness over time. Literature review allowed for the study of existing literature on gender equality and gender budgeting to build the theoretical foundation of the research. The method of analogy involved comparing the experiences of other countries in gender integration in budget financing to determine best practices and opportunities for improvement.

A significant number of sources of information were used for the research. In particular, were analysed Resolution of the Cabinet of Ministers of Ukraine No. 695 "On Approval of the State Strategy for Regional Development for 2021-2027" (2020), Law of Ukraine No. 156-VIII "On the Principles of State Regional Policy" (2015), Decree of the President of Ukraine No. 722 "On the Sustainable Development Goals of Ukraine for the Period until 2030" (2019). These sources were analyzed to gather information relevant to regional development policies, state regional policy principles, methodologies for development, monitoring, and evaluation of regional development strategies, as well as sustainable development goals and European security strategies.

The main method used in the research was analysis. It made it possible to review a large amount of information on the peculiarities of budget financing in Ukraine, including in terms of gender inequality. In addition, forecasting was used to assess likely future trends in the formation of budget financing in Ukraine. The historical method, in turn, allowed to draw conclusions about the reasons for the current principles of budget financing in the country.

Results

Synergistic development of gender budgeting and financial security

Comparative gender budgeting provides dynamics, a process aimed at development and results, rather than performance for the sake of performance and without prospects for change. It includes a gender budget analysis of programs funded at all levels, which assesses the degree of security in meeting the goals of development and self-realization of women and men (measures to ensure financial capacity, protection of social needs, satisfaction of consumer demand for food and lifestyle of various target groups – women and men), in order to make the executors of gender programs (projects) aware of budget financing, achieve qualitative changes in society and ensure the principle of gender equality in the spheres of the economy and in the defense sector (Steinþorsdottir *et al.*, 2018 Perrin & Weill, 2022). Accordingly, gender budget analysis is carried out at all levels of income and expenditure formation and assesses situations, intentions of interested parties, problems and their purposeful actions to achieve the relevance of proposed gender programs (projects) financing social needs (services) of the target group of beneficiaries (women and men) (Elson, 2017; Hessini, 2020).

An action plan based on a preliminary analysis of the use of financial resources and clearly defined indicative results ensure the ability of gender budget programs (projects) to guarantee financial support and social assistance to the target group of women and men at all levels of their implementation, in accordance with the defined goals of gender mainstreaming.

Thus, according to the above-mentioned concept, the synergy of the development of gender budgeting, as a tool for stabilizing financial security and developing gender equality, balances the models of self-organization of gender mainstreaming through the general principles of dynamics and self-development of complex systems and forms a new methodological vision of the nature of complexity (Marx, 2018; Nassani *et al.*, 2019). Within the synergistic approach, society "can be represented as an unbalanced system of a special type, the stability of which is ensured by artificial mediation of external (with the natural environment) and internal relations" (Hrytsai, 2018). This approach confirms the opinion that the financial security of gender budgeting has a specific feature – in it, self-organization is supplemented by organization, since there are people in society who possess a certain level of consciousness development and form their own goals and procedures for their achievement. Therefore, various regulatory norms and rules of behavior, in the sense of control units of the system, are formulated and adopted in order to correct and correct the shortcomings of spontaneously flowing self-organized processes. A synergistic understanding of gender budgeting in the financial security of the state through the prism of the principle of gender equality is expressed in the need for a reasonable expansion of rights and opportunities to implement society's initiatives with the aim of guaranteeing gender parity, stimulating the financial potential of the individual in all spheres of the economy and in the state security sector (Pidkhomnyi & Rubakha, 2020).

Gender budgeting is one of the most important tools and financial stabilizers for the security and development of gender equality in all spheres of the economy and in the country's defense sector, with the aim of protecting human rights (Roy & Patro, 2022). Today, in Ukraine, the financial security and capabilities of the target group of beneficiaries in terms of gender parity are contrasted with traditional budget financing without the allocation of measures to support them and eliminate discrimination, because any individual must have financial support and social assistance from the state, be protected by the institutional environment of the country's gender policy. Guaranteed financial security of women and men in Ukraine with the financial support of the European community constructs a stable environment of gender budgeting with the management actions of the communication structure of public finances. Therefore, the active efforts to incorporate gender considerations into the sustainable regional development process in the country commenced following the approval of the State Regional Development Strategy for 2021-2027 (Resolution of the…, 2020). The overarching objective of the regional policy during the 2021-2027 period is centered on development and unity, emphasizing a person's dignified life in a united, decentralized, financially capable, and democratic Ukraine. Notably, a distinct operational goal, Goal 5, was established for the first time, focusing on "Ensuring equal rights and opportunities of women and men, preventing and combating domestic violence and discrimination". To actualize this objective, a gender perspective has been integrated into the strategic planning and budgetary processes at both regional and local levels, with the active participation of local women's organizations and individuals facing various forms of discrimination.

Implementation analysis of gender policy and regional development strategies

The analysis of the implementation of gender policy in the regions of Ukraine for the period 2020-2021 demonstrated that during this period the State Social Program for ensuring equal rights and opportunities for women and men was implemented. Before the full-scale invasion of the aggressor country on the territory of Ukraine, it was partially implemented (Fig. 1).

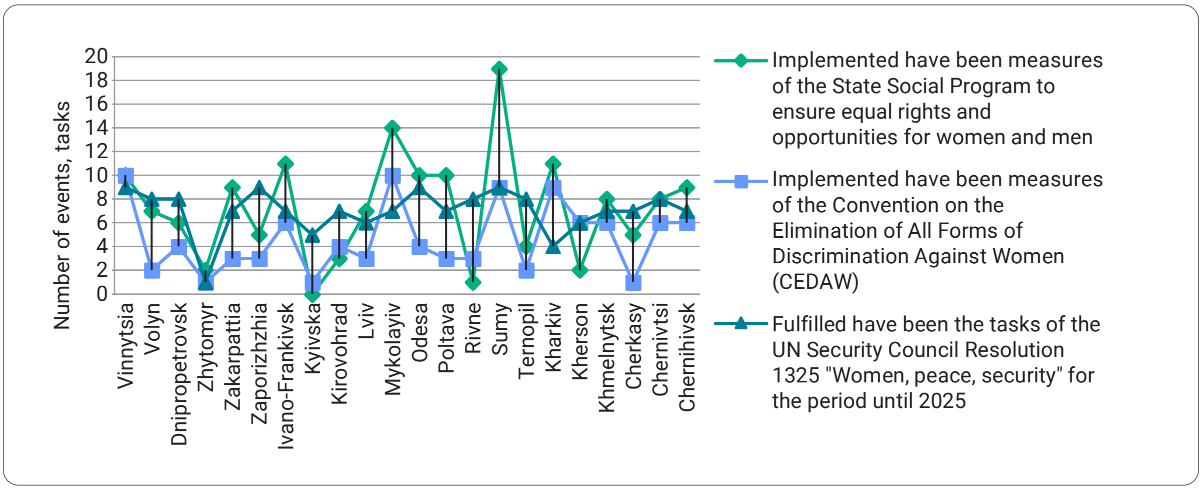

Figure 1. Analysis of the implementation of gender policy in the regions of Ukraine for 2020-2021
Source: built by the authors based on the Gender analysis of regional development of Ukraine (2021) and Indicators for monitoring gender equality in Ukraine (2021)

In Ukraine, the gender-sensitive budgeting policy has analytical tools for the implementation of the National Action Plan aimed at meeting the real needs of the target group of women and men of different social status, taking into account their financial interests, needs, opportunities and experience in the relevant spheres of the economy and in the defense sector. However, it should be noted that the state of implementation of gender budgeting measures by the regions of Ukraine in accordance with the National Action Plan for the Implementation of UN Security Council Resolution 1325 "Women, Peace, Security" until 2020 was more optimistic than in 2020-2021 (Ierusalymov, 2016; 2019). According to the rating of implemented budget programs development of gender equality, according to the National Gender Budgeting Plan in 2019, the Odesa region took the first place – 56% of measures were implemented (19 out of 34) and 40% of budget projects from the planned volume were financed (17 out of 40). Sumy region implemented 53% of measures and 42% of gender funding. Weaker results were demonstrated by Kyiv, Kharkiv, and Zhytomyr regions, which reported that they had implemented only 15%, 12%, and 6% of measures and implemented only 9%, 7%, and 5% of the amount of funding of budget programs for the development of gender parity, respectively (Fig. 2).

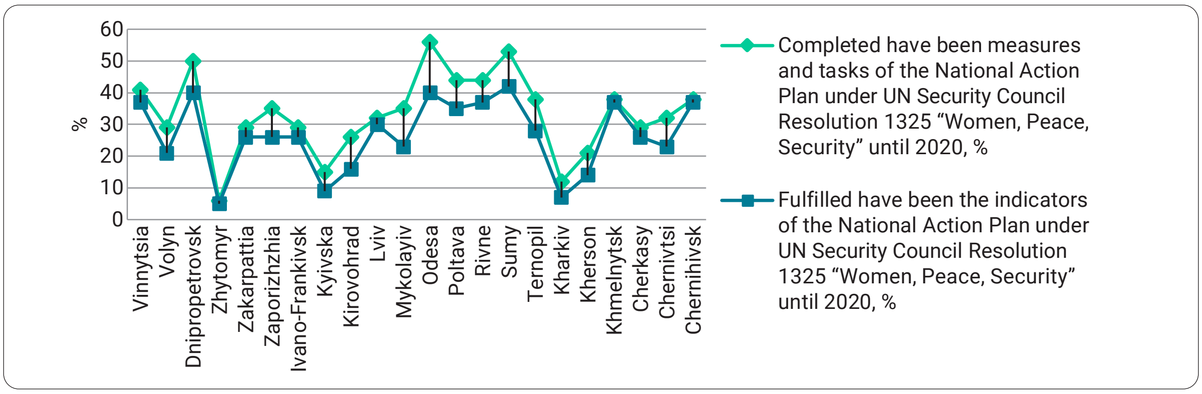

Figure 2. Analysis of the implementation of gender budgeting measures in accordance with the National Action Plan of Ukraine under UN Security Council Resolution 1325 "Women, Peace, Security" until 2020

Source: built by the authors based on the Gender analysis of regional development of Ukraine (2021) and Indicators for monitoring gender equality in Ukraine (2021)

Regional development strategies of Ukraine for the period 2021-2027 (Resolution of the…, 2020) and action plans for their implementation for 2021-2023 (Gender disparities in…, 2023) are aimed at ensuring human rights and gender equality (Fig. 3). It should be noted that the compliance of regional development strategies of Ukraine according to the current legislation on the implementation of measures on human rights and gender equality is 72.2% on average. However, according to international obligations, the developed regional strategies meet the requirements of the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and UN Security Council Resolution 1325 "Women, Peace, Security" for the period until 2025 only by 66.1%. When developing development strategies, gender profile is implemented in only 68% of the total number of regions. This indicates an inappropriate attitude in Ukraine to human rights, and especially to women and the elderly. In the regional development strategies for 2021-2027, the distribution of gender budgeting by gender in the sectors of the economy takes place according to the following categories: demographic, economic and budgetary, in particular health care, education, social protection, physical culture and sports, public safety and law and order, administrative services and others (Fig. 3).

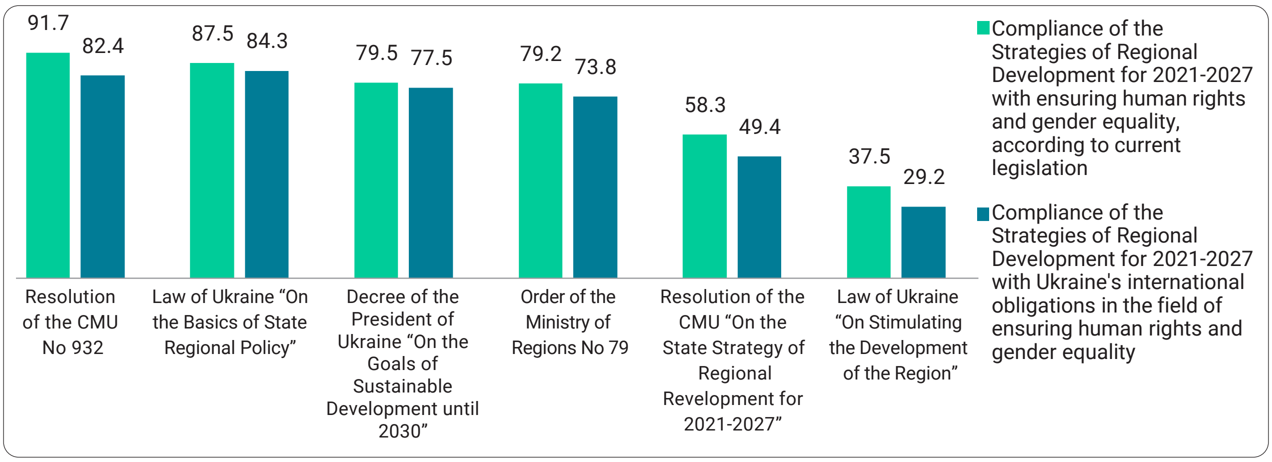

Figure 3. The level of compliance of regional development strategies for 2021-2027 with the areas of ensuring human rights and gender equality, in accordance with current legislation and international obligations

Source: built by the authors based on the Decree of the President of Ukraine No. 722 (2019), Law of Ukraine No. 156-VIII (2015), Law of Ukraine No. 2850-IV (2005), Order of the Ministry of Regional Development, Construction and Housing and Communal Services No. 79 (2016), Resolution of the Cabinet of Ministers of Ukraine No. 695 (2020), Resolution of the Cabinet of Ministers of Ukraine No. 932 (2015)

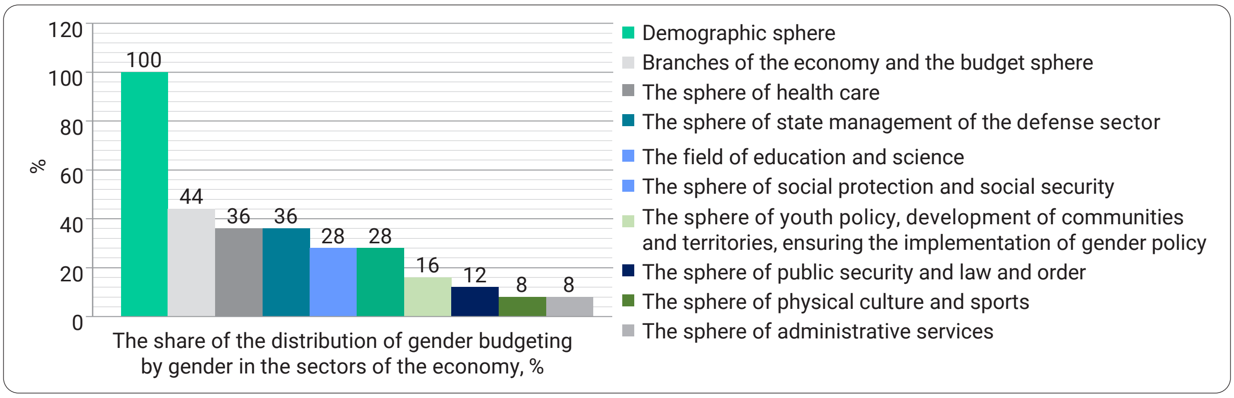

Figure 4. Distribution of gender budgeting in the economic and defense sectors of Ukraine by gender according to the Strategies of Regional Development for 2021-2027

Source: built by the authors based on the Gender analysis of regional development of Ukraine (2021), Gender disparities in Ukraine during the war (2023), Indicators for monitoring gender equality in Ukraine (2021), Resolution of the Cabinet of Ministers of Ukraine No. 695 (2020)

According to the results of the gender analysis, it was found that 44% of the regions use gender-insensitive budget financing that discriminates against human rights and protection, stereotypes of gender inequality are observed in the plans of regional programs and territorial development projects. In the gender gap index, Ukraine is in 81st place out of 147 studied countries. Since 2021-2022 in Ukraine, this has worsened by 0.7% (Global Gender Gap…, 2022).

Gender inequality began to be acutely felt in 2021-2022, and was, among other things, caused by the level of unemployment among women and men, especially vulnerable groups. Women who have the status of internally displaced persons (IDPs) are in an economically more vulnerable position than men (27.5% of women are forced to save even on food compared to 20.7% of interviewed men). Women with IDP status are often financially dependent on men. They support children more often than men, are less employed in the labor market and less likely to start their own business, experience a greater lack of funds than IDP men and are more forced to save (Babak *et al.*, 2021; Senyk, 2021 Gender disparities in…, 2022). Discriminatory attitudes of employers towards women in employment and career development are widespread. Widespread age discrimination against women in the labor market – is women over 45 years of age under 35, pregnant women and women with small children. The number of unemployed women in 2021-2022 increased by 93 thousand people (to 773 thousand people), and the unemployment rate increased from 7.9% to 19.1% of the workforce.

It is necessary to single out the target group of women and men in Ukraine who are participants in hostilities, anti-terrorist operations (ATO) or operations of joint forces (OJF). 80% of this target group for avoid discrimination in employment do not indicate their military experience in their resumes (Babak *et al.*, 2021; Senyk, 2021; Gender disparities in…, 2022). Defense sector institutions in Ukraine need a variety of skills, both women and men, that take into account the protection of the civilian population. The number of women in the Ukrainian army increased by 12 thousand in 2021-2022, and almost 43,000 female military personnel are currently serving. Domestic deployment of armed forces is becoming increasingly common in most European countries, but it is still considered the exception rather than the norm. The percentage of female military personnel, military observers and staff officers in the contingents of the 12 main troop suppliers to the UN missions is presented in Figure 5. However, women have traditionally been and remain underrepresented in the armed forces. In most armed forces, few women serve in senior positions, they are better represented in combat support, logistics, administration and medical services (Fig. 6).

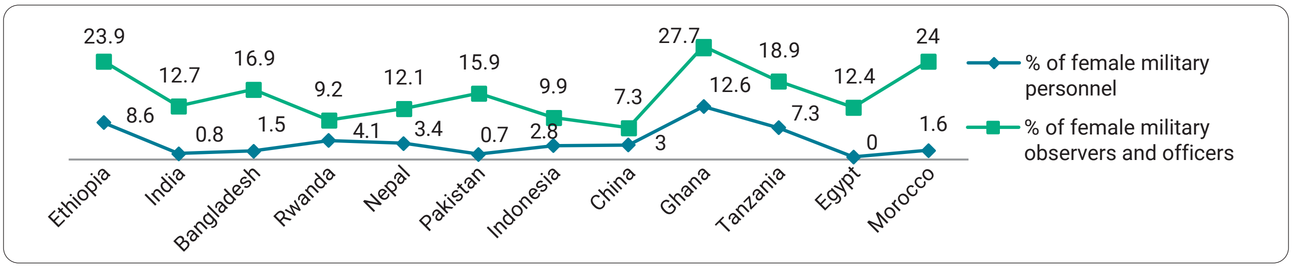

Figure 5. The share of female military personnel, military observers and staff officers in the contingents of the 12 main troop suppliers to UN missions

Source: built by the authors

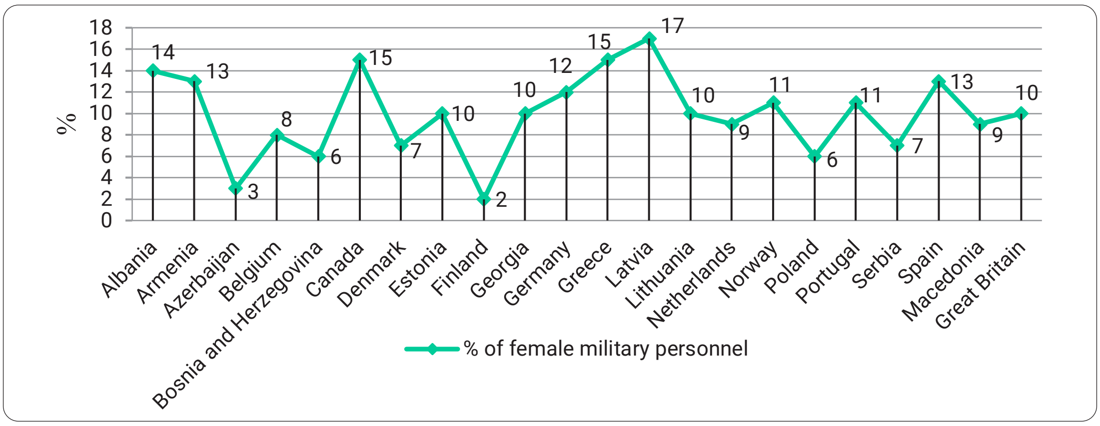

Figure 6. Share of female service personnel in active service in selected OSCE participating states
Source: built by the authors based on the K. Atkins (2018)

Returning to Ukrainian realities, it is necessary to pay attention to the gender characteristics of women living in rural areas. Thus, the vast majority of workers who provide household and personal services in families (domestic workers) are in the shadow sector of the economy. In Ukraine, the total number of such workers is about 162 thousand people, the share of women among them is about 80% (mostly rural women) (Babak *et al.*, 2021; Senyk, 2021; Gender disparities in…, 2022). During the period of martial law in Ukraine, women cannot combine employment and motherhood due to the underdevelopment of the network and the closure of children's institutions. This leads to limited opportunities for women to find work and to a high level of workload due to the need to perform agricultural work on their own land.

EU financial rehabilitation and gender equality measures

It should be noted that out of 135 countries and territories in 2021, the average share of women in the national parliaments of the world reached 25.6%, continuing the slow growth trend that needs 40 years to achieve gender parity. The share of women in local advisory bodies was 36.3% and 28.2% in managerial positions. In European countries, the main ideas related to gender equality and the integration of gender aspects indicate that the European recovery plan also requires significant public and private investments at the European level. Sustainable recovery, job creation, and compensation for immediate damage caused by the war in Ukraine, while simultaneously supporting environmental and digital priorities, are laid down in the Multi-Year Financial Development Program, which is reinforced by the "Next Generation EU" program (Gender Equality Strategy…, 2017). The overall structure of this program will reduce the level of bureaucracy for beneficiaries and authorities, promote equality of opportunities, ensuring the gender nature of activities in relevant programs and tools to promote equality between women and men. The role of the EU budget in supporting the effective implementation of general political goals is strengthened by strengthening the ties between the EU budget and the European Semester, promotes the implementation of the European pillar of social rights, as well as in the areas of migration, environment, climate change, equality of women and men, rights and equals opportunities for everyone (Current trends of…, 2020).

In 2020, the European Council determined the terms and size of a comprehensive package of financial rehabilitation, which includes the previously approved Multiannual Program for Financial Development (MPFD, which is the EU budget until 2027) and a specific recovery tool, which was named "Next Generation EU" (NGEU). In addition, there is a Brexit Adjustment Reserve designed to compensate for unforeseen and adverse consequences in the EU member states and, in the industries, most affected by this reality (Current trends of…, 2020). The total amount of the NGEU is 750 billion EUR; it includes instruments and additions to the Recovery and Stability Fund, which is distributed in the form of loans to EU member states (360 billion EUR to be repaid by 2026) and grants – 312.5 billion EUR (to be used by the end of 2023). The European Commission was granted permission to borrow funds on behalf of the Union in the capital markets for transfer to programs within the NGEU.

The EU's €1074.3 billion multi-annual financial programme (MPFD) for 2021-2027 has been adjusted to take into account the impact of the crisis. New taxes, including taxes on non-recyclable plastic waste, cross-border carbon transfer, digital levies and a potential financial transaction tax ("Tobin tax"), have been approved as revenue sources to cover loans. Achieving gender equality goals is expected to strengthen the fiscal position of EU countries. By 2050, strengthening gender equality could create between 6.3 and 10.5 million additional jobs, in particular by addressing gender segregation in education and increasing women's participation in STEM fields, with approximately 70 per cent of these jobs going to women. This could have a positive impact on gross domestic product (GDP) per capita, contributing to EU growth of 9.6% over time. Implementing gender equality measures in EU Member States with lower levels of gender equality, based on the Gender Equality Index, could individually increase GDP per capita by up to 12% by 2050.

However, Ukraine faces legislative challenges that necessitate a new financially secure gender model. Key components of the proposal involve viewing social financing as an investment in economically active human resources that meet the requirements of a socially secure state. Other aspects include delineation of power in gender budgeting, activation of women in the social sphere at all levels of government, harmonisation of legislative norms with international law, prioritisation of income aspects, reform of social and labour relations, advocacy for gender partnership, creation of mechanisms for protection of human rights, creation of comprehensive gender budgeting programmes, establishment of independent social expertise, reform of institutional structures, democratisation of the social sphere, and the establishment of a gender budgeting system. These initiatives are based on a state-society approach to gender policy.

Discussion

The financial implication of the concept of security and development of gender equality and parity synergy of women and men is considered in a broad context as "freedom from fear" (freedom from fear) and "freedom from want" (freedom from want). According to the first financial subtext of the security concept, decisions are made to provide social assistance to women and men from threats and focus on conflict prevention mechanisms (financial losses) using a peacekeeping mission for social services. The second financial implication of the concept of security expands the scope of protection of rights to financial assistance for women and men, including natural disasters, famine, disease, loss of property (that is, almost all possible financial threats to an individual's well-being). It should be noted that the financial implication of the concept of security and development of gender equality began to spread in a broad interpretation. Thus, A. Kofi (2000) and H.G. Kryvchyk *et al*. (2004), the former Secretary General of the UN, noted: "the paradigm of the concept of security and development of gender equality between women and men, in a broad sense, includes much more than just making a decision to suspend conflict situations. It covers human rights to ensure their financial capabilities, access to education and health protection, provision of economically active human resources with labor relations without gender differences. J.S. Clancy & N. Mohlakoana (2020) explore the concept of gender audits as an approach to engendering energy policy in Nepal, Kenya, and Senegal. The authors delve into the complexities of gender dynamics within the energy sector, highlighting the importance of incorporating gender perspectives into policy formulation and implementation.

The study emphasizes the significance of gender audits in identifying existing gender disparities and inequities within energy policies and programs. By conducting gender audits, policymakers can gain insights into how energy policies may disproportionately impact different gender groups and tailor interventions to address these disparities effectively. The financial subtext of security and development of gender equality between women and men is formed by the combination of two elements – protection and empowerment of individuals. They are considered as a single unit of financial security guarantee. For example, the Human Security Commission emphasizes that the right to financial support of an individual is a reinforcing element when making financial decisions of state authorities regarding the provision of top-down protective actions, when adequate institutions, norms and institutional structures are created to prevent threats and human security (Musevych, 2023). The empowerment of the individual, in turn, involves the opposite processes (bottom-up), when people themselves are able to determine their financial capabilities to ensure security.

For the European Union, the financial subtext of security and the development of gender equality between women and men is a narrative that includes the goals and methods of the financial system of the state to implement the external policy of financial security, which has a representative form of discussions about financial support and protection for different audiences, both public and the professional sector, as well as the security and defense sector (A European way…, 2007). It should be noted that in the European discourse, the financial subtext of security and the development of gender equality between women and men is often identified with the "duty to protect", reorienting attention from human security within the Union to ensuring it from the outside (as part CSDP/ ESDP). Both concepts, according to the resolution of the European Parliament, have "practical consequences and significant political motivation for a safe strategic orientation of European politics...". At the same time, "there is neither an automatic obligation nor means at the disposal of the EU to deploy ESDP missions, civilian or military, in all crisis situations" (European Parliament Resolution…, 2010). This indicates the limited financial resources of the EU and the understanding of security and the development of gender equality between women and men, within the financial support of the regions of the world, and not within the EU itself. Obviously, within the EU, the problems of gender budgeting, as a stabilization tool of the security system and the development of gender equality between women and men, have been overcome in their critical form.

G. Sen (2019) points out the progressive trends in the financial context of security provision and the development of gender equality that emerged after the disappearance of the bipolar world order and the full involvement of a wide range of age and gender target groups in the state finance system at all levels. The authors of this study agree with the findings of G. Sen (2019) as they recognize the importance of this factor in the development of financial security and gender equality. This context reflects not only the growing attention to the financial aspect of security but also the expansion of participants involved in shaping and implementing state finances. The transition from the bipolar world has opened up new opportunities for involving diverse groups of citizens in financial planning and resource allocation processes, thereby promoting greater consideration of the needs of various social and gender groups.

Views on the role of men and women regarding their financial capabilities prejudice the safety of life in society and formed the influence of the family, school, mass media, social environment, as well as gender policy in state structures in the process of socialization of an individual (Saifnazarov & Saifnazarova, 2023). American political scientist R. Inglehart defines gender equality as a sensitive indicator that shows how developed, democratic and financially stable the state is. The conclusions of his research prove: countries with high indicators of financial capacity in public institutions have a higher level of security and development of gender equality for women, as they ensure their rights to freedom of action in society. Such states are more economically developed, as they create conditions for political and economic diversity, tolerance, inclusiveness, and interpersonal trust (Chornyi, 2013).

L. Hessini (2020) explores the crucial role of feminist funds in financing gender equality and women's rights initiatives. The author sheds light on the significance of these funds in providing financial support to grassroots organizations, advocacy groups, and women-led initiatives that work towards gender equality and women's empowerment. The study underscores the importance of feminist funds in filling the funding gap for gender equality initiatives, particularly in contexts where traditional sources of funding may be insufficient or inaccessible. By prioritizing women's rights and gender equality, feminist funds play a pivotal role in amplifying the voices of marginalized communities and addressing systemic barriers to women's empowerment. The authors of this study recognize the critical contribution of feminist funds to advancing gender equality and women's rights. They acknowledge that feminist funds serve as vital mechanisms for channeling resources to initiatives that challenge patriarchal norms, promote women's leadership, and advocate for policy change.

A study on gender budgeting was carried out by R. Khalifa & S. Scarparo (2021). The researchers noted that it is worthwhile to target policies in this direction to promote social change and support gender equality. It argues that gender-responsive budgeting support for gender equality can lead to, among other things, significant positive effects on the economy. The analysis also emphasises the need for mainstreaming to challenge gender stereotypes and contribute to transforming society. Although the authors in the paper have focused less on gender-responsive financing specifically, their assessment that it is important to follow this approach to accounting is also correct. Indeed, contributing to the transformation of society is a very important part of the functioning of both the enterprise and the economy as a whole (Rud & Shubala, 2023). T. Polzer *et al.* (2021) examined gender budgeting in public financial management. They noted that the topic of gender budgeting is one of the main topics at the moment, but many other works still do not have a clear methodology on how it should be conducted. This indicates the subsequent need for additional research in this direction in different countries. When assessing budget financing in Ukraine, one of the models was described, which is quite effective, however, within the framework of modern economic science, their number is much greater, and all of them remain relevant for a more detailed study. T. Addabbo *et al.* (2020) in a study looked for opportunities to implement gender budgeting in research organisations to address the problem of gender inequality. Some strategies to address the problem and steps to implement them were proposed. Researchers believe that integrating gender budgeting can lead to transformation of the organisation and will increase their performance. In general, based on the research conducted on gender financing in Ukraine, authors can agree with this information.

F. Cunha *et al.* (2021) discussed the evolution of the concept of "gender security" in the social sciences and its wide application across various disciplines. They noted that approaches to gender security have expanded into diverse academic fields such as sociology, psychology, education, history, philosophy, religious studies, literary studies, art studies, political science, law, public finance, economics, and statistics. The authors of this study agree with this assertion regarding the dissemination of the concept of "gender security" across different academic disciplines, as they acknowledge the significance of this concept within the context of social sciences as well as its application in economic and legal domains. In supporting this statement, they may refer to authoritative sources and publications demonstrating the extensive application of the gender security concept across various fields of knowledge, underscoring its relevance and importance in the contemporary world. Unlike a biological interpretation, gender security is viewed as a socio-role and financial-cultural personality trait embedded in the behavioural patterns of both women and men. The pursuit of gender equality at the national level, considering the established gender relations in society, is crucial for developing highly effective mechanisms of gender budgeting. This involves eliminating gender stereotypes and prejudices, ensuring and affirming the successful progress of modern society, and directing efforts toward state authorities, political parties, and civil organizations.

Conclusions

The examination of gender budgeting within the framework of a synergistic approach highlights its potential as a tool for achieving sustainable development and fostering gender equality across various sectors of society. The study emphasizes the importance of non-linear establishment of gender equality paradigms within financial support and protection frameworks, encompassing areas such as political, legal, personal, labor, consumer, household, moral, and psychological protection. Concrete outcomes of this analysis include the identification of key principles guiding the development of budgetary protection programs, which prioritize gender equality within social protection and financial security systems. Specifically, the study underscores the necessity of establishing an extensive institutional and organizational network comprising state authorities and local self-government entities. This network should focus on ensuring the safety and protection of professional employment for women, conducting gender analyses of legislation, allocating sufficient funding for gender-focused programs, expanding gender-sensitive indicators, and combating societal gender stereotypes.

At the level of the institutional and organizational structure of gender budgeting, there should be an extensive network of state authorities and local self-government in the areas of: safety and protection of professional employment for women who enter or return to the labour market after performing reproductive functions; conducting a comparative gender analysis of Ukrainian and international gender legislation; allocation of sufficient amount of funding for gender programs of personality development; expanding the list of indicators by gender; overcoming gender stereotypes in society.

Future research could explore the implementation and effectiveness of gender budgeting initiatives in different contexts, assessing their impact on promoting gender equality and social protection. Additionally, examining the intersectionality of gender with other dimensions of identity, such as race, ethnicity, class, and disability, could provide deeper insights into the complexities of financial security and rights protection within diverse populations. Ultimately, continued inquiry into these areas will contribute to the refinement and enhancement of gender-responsive policies and practices aimed at fostering inclusive and equitable societies.

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None.

Conflict of Interest

None.

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Гендерне бюджетування в Україні: інструменти, фінансова безпека та ґендерна рівність у секторах економіки

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Анотація. Питання гендерної рівності за останні роки стали актуальними. Оскільки гендерне бюджетування є одним із інструментів досягнення цієї мети, проведення досліджень з максимізації його ефективності залишається актуальним. Метою дослідження було обґрунтування використання порівняльного підходу у бюджетному фінансуванні як інструменту для досягнення гендерної рівності та покращення стабільності фінансової системи країни. Аналіз та прогнозування були основними методами, використаними під час дослідження. Стаття досліджувала еволюцію бюджетного фінансування в Україні, з фокусом на гендерному бюджетуванні як механізмі захисту прав людини в рамках інституційної структури. У дослідженні була підкреслена ключова роль гендерного включення у досягненні гендерної рівності та забезпеченні фінансової стабільності в державі. Була надана всебічна рамка, включаючи детальний алгоритм крок за кроком, як для розробки, так і для виконання бюджетних програм у різних економічних секторах та оборонному секторі, з великим акцентом на інтеграцію гендерної перспективи. Крім того, досліджено концепцію синергетичного розвитку гендерного бюджетування, демонструючи його потенціал як потужного інструменту для зміцнення фінансової безпеки та сприяння гендерній рівності. Крім того, проведено осмислену оцінку відповідності регіональних стратегій розвитку України ключовим принципам прав людини та гендерної рівності. Було проведено докладний аналіз розподілу гендерного бюджетування у різних економічних секторах та оборонному секторі, розкриваючи підходи регіональних стратегій розвитку до алокування коштів з урахуванням гендерних аспектів. Дослідження є інструментом для покращення розподілу фінансових ресурсів та забезпечення гендерної рівності в Україні та інших країнах, що сприяє збільшенню економічного розвитку шляхом залучення більшого числа людей у економіку

Ключові слова: державна політика; сталий розвиток; законодавство; соціальна сфера; фінанси

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Transformation of Ukraine's socio-economic development in the context of global turbulence and war: Challenges and opportunities

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Abstract. Global changes in modern Ukraine are destroying the usual way of life, but also opening up new opportunities. Assessing this potential and calculating the ways of its realization in advance is an extremely important task. The purpose of this paper was to study the social and economic development of Ukraine. The study analysed such indicators as the volume of foreign investment, the composition of the general fund of the state budget, and the financing of the defence sector before and after a full-scale invasion. Also, by synthesizing individual news reports, a generalized picture of the current situation at the front was formed. The work identified such challenges as a forced decline in maritime exports by 55% in 2022 (in 2024, Ukraine increased trade through seaports to 75% of the pre-war level); energy shortages, which reached 38% at the time; a 40% drop in harvest volumes; forced migration of 6.5 million Ukrainians from the country, etc. However, for each of the challenges, ways to overcome them and methods to turn them into additional opportunities were developed. In particular, these include diversification of logistics routes, increasing the value of human capital, developing alternative energy sources and moving closer to sustainable development goals. A separate proposal was made to create a global educational hub in Ukraine, where Ukrainian military and medical professionals with practical experience in combat and tactical medicine could train foreign colleagues. In addition, in order to increase the motivation of internally displaced persons (IDPs) to return to their homeland, it is proposed to develop an appropriate communication strategy. The practical significance of the study lies in the development of specific proposals for the post-war reconstruction of Ukraine, which should be of interest to the leadership of the departments of the Ministry of Community Development, Territories, and Infrastructure of Ukraine

Keywords: post-war recovery potential; human capital; alternative energy; foreign investment; transformation; socio-economic development; sustainable development

Introduction

With the beginning of Russia's full-scale invasion of Ukraine in February 2022, the country entered a state of emergency – both at the legislative level with the declaration of martial law, and at the level of social relations within society, and at the level of finance, when the national economy could have collapsed without foreign assistance. Moreover, for the entire global community, which has been in a state of permanent turbulence since 2020 due to COVID-19 and its consequences, the outbreak of Russia's great war against Ukraine has added even more chaos and uncertainty.

Accordingly, the topic of Ukraine's further development in the context of existing challenges and the peculiarities of its interaction with the outside world is essential for the scientific community – both for Ukrainian specialists and the international community. O. Bokii & O. Kovalenko (2024), predicting the innovative aspects of the country's economic development, noted that the factors of extensive development have largely outlived their usefulness and the need to conserve natural resources, which are exhaustible, is driving the world's attention to intensive solutions. However, there is a certain restriction of access to the most relevant innovative developments by developed countries – by "dumping" outdated technologies into "Third World countries", the competitive position of global technological leaders is maintained.

M. Dykha (2016) assessing Ukraine's place in modern civilizational transformations, note the destruction of numerous enterprises, logistics, and infrastructure facilities during the war and emphasize the impact of these processes on the economies of other countries. In particular, the destruction and contamination of arable land in Southern Ukraine has already significantly changed the balance of food supply and food security in the Middle East and Africa. Other examples of today's global turbulence include a complete revision of the concept of European energy independence and diversification of supplies, which, in turn, has led to the development of innovative energy-saving solutions. All of this underlines the importance of Ukraine's early post-war recovery.

V. Strilets *et al.* (2024) focused on the mechanisms of rebuilding the Ukrainian economy and the role of the international community in these processes. Having studied the experience of other countries and financial and economic instruments of recovery, the authors developed their own methodology for calculating the integral efficiency coefficient and used it to form a roadmap for post-war construction. Particular attention was paid to the importance of foreign direct investment (FDI) in the project, the campaign to attract it, and the transparency of the mechanisms for its use. M.A. Orenstein (2023) pointed out the irreversibility of the transformation processes that took place within the European Union (EU) after the outbreak of a large-scale war. The severance of all economic and energy ties with the aggressor country, which initially seemed impossible, was implemented without catastrophic consequences for the European energy system. This project was made possible only thanks to the high managerial competence of the heads of the relevant international structures and the political will of the leaders of the leading EU countries.

In conformity with P. Żuk & P. Żuk (2022), the return to energy independence by Ukraine and other European countries is much more than just a change in energy logistics on the continent. In fact, the forced abandonment of fossil energy sources has given impetus to a much more intensive development of renewable energy and accelerated the common phase transition to the next technological mode. Decarbonization as a factor in the socio-economic development of Ukraine was also discussed by Z. Allam *et* *al.* (2022). The authors put the war in Ukraine on a par with such global challenges as the COVID-19 pandemic and its consequences, and emphasized the growing role of financing the energy transition and restoring climate sustainability. The same conclusions, but on the example of the German concept of Energiewende, were reached in the work of T. Wiertz *et al.* (2023) – the energy discourse, which since February 2022 has a clear geopolitical context, increasingly considers Ukraine as a country that will have great potential for economic and social development after the victory.

The temporary occupation of part of the territories has forced a review of regional policy, M. Getzner & S. Moroz (2022) proposed to introduce a territorial-capital approach to Ukraine's development and to increase the incentives for investors to invest in municipal projects. This idea to some extent overlaps with the initiative of T. Wołowiec *et al.* (2022), who propose to focus on the country's tourist attractions in the context of the socio-economic renaissance. Another idea about the prospects for Ukraine's development was expressed by A.L. Dumitrescu & V. Constantin (2022), who studied the employment of Ukrainian refugees in the EU. According to their observations, after the victory, Ukraine will see the return of numerous specialists who have undergone a forced but useful "practice" at European enterprises and thus improved their own qualifications.

Thus, the issue of Ukraine's future fate has been repeatedly raised by the scientific community, but it has lacked a more comprehensive consideration. The purpose of this paper is to fill this gap and explore the challenges and opportunities for Ukraine's socio-economic development in the current environment.

Materials and Methods

In the course of this study, a number of examples of the transformation of Ukraine's social and economic development during the war and the impact of unstable conditions on the behaviour of society were considered. In particular, using the method of statistical analysis, the dynamics of changes in the build-up of Ukraine's military potential in the period from 2014 to 2022, as well as the structure of financing the country's defence sector, sources of supply, and the largest donors were studied. As one of the indicators of the involvement of external factors in the development and recovery of the Ukrainian economy, the dynamics of FDI in the country and investments of Ukrainian finances abroad were studied using statistical economic analysis. To illustrate the impact of a full-scale war on the agricultural sector of Ukraine's economy, the authors used the trend comparison method to compare the exports of agricultural products in 2021 and 2022, as well as changes in the routes of their transportation.

The challenges in the energy sector were studied separately, statistics on the loss of energy capacities and the deficit in electricity production were analysed, and mechanisms for effectively countering the challenges, such as large-scale purchases of generators and temporary energy imports, were described. In the medium term, the report considers the possibilities of rebuilding Ukraine's energy system in accordance with the principles of sustainable development with the commissioning of additional renewable energy sources.

Based on data from a number of open sources, professional publications and expert opinions, a comprehensive assessment of the factors of global turbulence, as well as the opportunities that Ukraine faces in this context, including the unlocking of the state's potential in the construction, medical, military sectors, etc., as well as the mechanisms for realizing this potential, was formed. The materials used in this study included, in addition to the above, operational data from the National Bank of Ukraine (n.d.), the Ministry of Finance of Ukraine (2023; 2024, n.d.), the Report "Ukraine's economy in times of war" by O. Pogarska (2023), as well as information from the European Commission's statistical organization Eurostat (n.d.).

The study also modelled the future prospects of military operations, possible risks of deterioration of the tactical situation and new opportunities that would open up under such a scenario using the open-source intelligence (OSINT) method. Using the method of synthesizing disparate data on the conditions of Ukrainian refugees abroad and their reactions to forced resettlement, a holistic picture was built of changes in their psychological state, educational and professional level, and prospects for returning to Ukraine after the war. Applying the method of extrapolation, based on the statistics obtained, current trends and the studied prerequisites for socio-economic development, the author forecasts the direction of further transformation of Ukrainian society, as well as the prospects, opportunities and economic mechanisms of post-war reconstruction of Ukraine.

Results

Since 2014, the development of Ukraine's economy has been taking place in extraordinary conditions and, accordingly, contains certain unique markers of scientific interest to the entire global community. The fact that Ukraine still exists as a state after ten years of aggressive war and temporary occupation of part of its territory and demonstrates development in certain economic and social areas is the result of internal socio-economic processes and external financial support.

The aggressor country, which started the war in 2014, despite calls for de-escalation, carried out a full-scale invasion of Ukraine in 2022, and in fact made it possible for the international community to be convinced of the seriousness of its intentions to annex the territories of Ukraine. Unfortunately, no preventive measures were taken at the level of the international community to prevent war, as Russia has repeatedly committed aggressive acts in the post-Soviet space (Moldova-1992, Georgia-2008).

Between 1999 and 2014, the national defence expenditures from the State Budget of Ukraine did not exceed 1% of gross domestic product (GDP), and at its peak in 2012, amounted to a record-breaking UAH 16.4 billion, while in

2015 they increased to UAH 52 billion. According to the Ministry of Finance of Ukraine (2023), Ukraine's defence spending has increased significantly since 2022. In particular, in 2023, the resources allocated to the national security and defence of Ukraine reached UAH 2.097 trillion, which corresponds to 52.25% of GDP and is UAH 0.95 trillion higher than in 2022. The structure of expenditures of the state budget of Ukraine is presented in Table 1. Defence expenditures currently account for more than 50% of Ukraine's state budget expenditures, and there is still a need for additional funding. It is worth noting that macro-financial international assistance is directed to the general fund of the budget, from which all expenditures are financed. The dynamics of FDI in Ukraine in recent years is shown in Figure 1.

Table 1. Structure of state budget expenditures of Ukraine (functional classification)

Expenses	2021	2022	2023	2024 (as of 1 April 2024)
State functions	13.87%	7.47%	7.38%	6.61%
Defence	8.56%	42.24%	52.25%	50.37%
Public order, security, judiciary	11.7%	16.39%	14.31%	16.65%
Economic activity	12.14%	3.53%	3.35%	1.58%
Environmental protection	0.55%	0.17%	0.13%	0.2%
Utilities	0.01%	0.02%	0.21%	0%
Health care	11.44%	6.81%	4.47%	4.91%
Spiritual and physical development	1.07%	0.41%	0.29%	0.3%
Education	4.28%	2.16%	1.51%	1.61%
Social protection and social security	22.77%	15.75%	11.69%	13.45%
Interbudgetary transfers	13.6%	5.06%	4.42%	4.31%
Total	100% (UAH 1,490,258.9 million)	100% (UAH 2,705,423.3 million)	100% (UAH 4,014,418.1 million)	100% (UAH 841,145.5 million)

Source: compiled by the authors based on Ministry of Finance of Ukraine (n.d.)

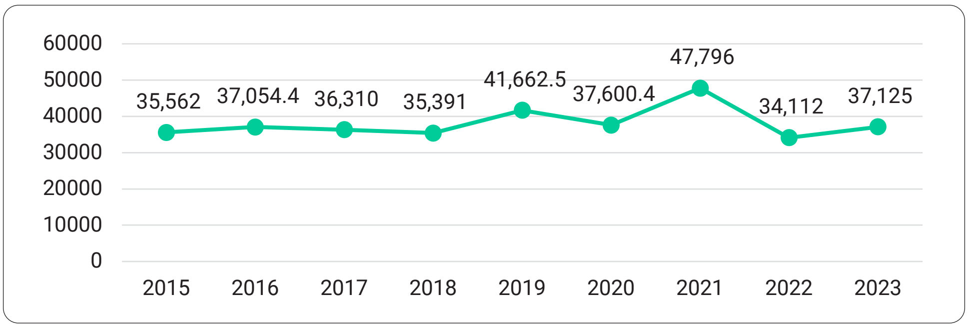

Figure 1. Dynamics of FDI in Ukraine in 2015-2022 (USD million)
Note: excluding the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol and the temporarily occupied territories in Donetsk and Luhansk regions
Source: compiled by the authors based on Ministry of Finance of Ukraine (n.d.)

As it can be seen from the graph, after the relative stabilization of the frontline in 2015, investment flows to Ukraine recovered. Global investors saw the prospects of the Ukrainian economy and resumed FDI, which had an almost linear growth trend over the next four years. Unfortunately, the coronavirus pandemic in 2020 and the uncertainty of its economic consequences of that time nullified investment attractiveness around the world, and Ukraine was no exception. Already in 2021, the flow of investment to Ukraine exceeded pre-coronavirus levels, but in 2022, with the outbreak of a full-scale war, the FDI indicator again showed a significant drop, as foreign investors were not confident that Ukraine would retain its identity during these crucial months. Finally, in 2023, after a series of counter-offensive measures and the consolidation of the front line, Ukraine again became a potential source of socio-economic development and was able to resume the attraction of foreign investments.

As for the financing of the general fund of the state budget in 2023, according to the Ministry of Finance of Ukraine (2024), its volume amounted to almost USD 60 billion, half of which was provided by the US and EU in the form of grants and loans, and another USD 15 billion was provided by the population of Ukraine through the mechanisms of domestic government bonds and military bonds. Doing Business (World Bank, 2020) is also quite informative in the context of studying Ukraine's socio-economic development. Although it covers only the first six years of the war in Ukraine, the dynamics are quite revealing: over a decade and a half, Ukraine has managed to move up 60 positions in the ease of Doing Business ranking. In addition, as of 2020, Ukraine was ranked 61st out of 190 in terms of ease of registering a company, 20th in terms of ease of obtaining a construction permit, 37th in terms of ease of obtaining a loan, and 45th among countries that protect investors' rights.

The transformation of Ukraine's economic development in the crisis became most noticeable with the start of the full-scale invasion – all sectors and industries faced unprecedented challenges and worked at the limit of their capabilities. According to O. Pogarska (2023), in particular, the enemy's blocking of traditional Black Sea grain transport routes reduced exports of goods by 55% in 2022. However, the relevant Ukrainian agencies managed to partially overcome this challenge and reorient logistics routes to road and rail transport, which resulted in an increase of more than 35% in alternative transport routes. And in 2024, Ukraine increased trade through seaports to 75% of the pre-war level.

Another challenge of the first year of the full-scale invasion was the problems with electricity supply caused by the aggressor's deliberate destruction of civilian energy infrastructure. According to O. Pogarska (2023), the electricity shortage at its peak was up to 38% of total needs. This challenge was also turned into an opportunity, and over time, the deficit was eliminated, on the one hand, by importing electricity from friendly countries, and on the other hand, by popularizing autonomous mobile generators, which Ukrainians used in small and medium-sized businesses and in their own households.

Prime Minister of Ukraine D. Shmyhal noted that "the situation in the energy sector is very difficult. 42 power units were actually destroyed. 27% of large thermal power plants remain in working condition, and 73% are destroyed or damaged, so they are not working today. In fact, 20 hydropower units are also out of operation, damaged, which is another 1.3 GW of capacity. Russia destroyed 50% of Ukraine's power generation capacity. Due to missile and drone attacks, Ukraine has lost 9.2 GW of electricity today, which is half of the power with which Ukraine passed last winter" (Bovsunovskaya, 2024).

This state of affairs in the energy sector is threatening to the functioning of the national economy. However, the medium- and long-term prospects in Ukraine's energy industry look more optimistic. The destruction of the existing fossil fuel supply system and the termination of transport obligations to the aggressor country open the way to fundamental energy reform. Traditional routes, which the government has been afraid to change for decades, will be forced to be replaced by "green" energy facilities – solar and wind generation, and tidal power plants. Paradoxically, the war will nullify the usual principles of traditional "dirty" energy in Ukraine and the remnants of its infrastructure, while the country will have a unique opportunity to build energy security in line with the goals of sustainable development. Moreover, the full-scale invasion had a fundamental impact on the European energy market: the policy of "cheap gas" was finally rejected, and there was a significant diversification of risks and suppliers.

However, there are still challenges that, for objective reasons, could not be overcome as quickly. For example, the temporary occupation of southern Ukraine, the high intensity of hostilities, and the contamination of arable land have significantly affected grain production – according to O. Pogarska (2023), the harvest in 2022 was 40% lower than the previous year, and the winter crops in 2023 decreased by 25%. The solution to this problem could be a shift to intensive farming, where losses in the area are compensated for by increased yields, but this transition will take more time. However, in the context of turning challenges into opportunities in the face of global turbulence, the reorientation of the Ukrainian agricultural sector towards more efficient and productive grain varieties may become a significant competitive advantage in the future, which might not have been initiated in normal, non-crisis conditions (Garafonova *et al*., 2023).

Among such potential impetus for forced development is the construction potential that has been developed in Ukraine over the ten years of war. All this time, residential buildings, businesses, educational institutions, and civilian infrastructure have been destroyed with varying degrees of intensity. Many of these buildings were constructed during the Soviet occupation and were already at the end of their useful life. Thus, the destroyed buildings, neighbourhoods, and even entire settlements will be transformed into large-scale construction sites where Ukraine's infrastructure will be rebuilt in accordance with the latest innovative principles and technologies. Taking advantage of the opportunities created by the challenges of the war will also include attracting investment in construction projects, expanding the networks of construction materials companies, inviting foreign specialists and increasing the value of human capital in the industry.

Another significant economic boost that the state will experience after the victory is a significant increase in the qualifications of Ukrainians in such narrow but much-needed areas as military affairs, tactical medicine, and demining (Bunyk, 2023). Ukrainian specialists who have gained practical experience on the battlefield and in other difficult conditions will be highly valued in today's global turbulence, and will be able to fulfil relevant contracts in other countries and act as advisers and instructors.

When analysing opportunities for Ukraine's economic and social development in the current environment, it is important not to forget that as of spring 2024, the war is still ongoing, the front line is unstable, and the temporarily occupied territory is slowly but surely expanding. During the aggressor's new offensive in the north, several Ukrainian settlements were destroyed, the front line is approaching Kharkiv (Defence forces stop…, 2024), and the shelling of the city itself is intensifying. All of this indicates that there are significant risks of losing Ukrainian statehood that still exist.

According to regular official reports from the Ministry of Defence of Ukraine, after a certain stabilization of the enemy's casualty figures in the spring and summer of 2023, which illustrated a decrease in active hostilities and stabilization of the front line, the number of occupants killed began to increase again on a monthly basis in early 2024, reaching a historic high in May. Accordingly, the enemy's active offensive adds uncertainty to the timing of Ukraine's post-war reconstruction and forces us to revise our forecasts for socio-economic development. However, even such a difficult and critical situation can be viewed from the point of view of realizing new opportunities – the EU is aware of all the risks of Ukraine's theoretical loss in the war and is ready to expand the format of its assistance from purely technical and financial to a full-fledged contingent presence if such a scenario is unlikely. In addition to the obvious benefit of preserving its sovereignty, Ukraine will be able to integrate more fully into NATO standards and improve the combat capability of its army.

The social component of Ukraine's development has also undergone a significant transformation in the wake of the war. Since February 2022, numerous people with refugee status have left the country and settled in European countries. According to the official statistics of the United Nations High Commissioner for Refugees (2024), over 6 million Ukrainians were forced to move to Europe in the first two years of the full-scale war, and another 480,000 people were forced to move to other countries. Given that there are at least 5 million internally displaced persons fleeing the approaching frontline, the social migration crisis has reached a scale never seen since the restoration of independence. The negative effect of forced migration is exacerbated by the fact that, according to a survey conducted by the UN High Commissioner, the most productive age groups left the country first and foremost – almost half (47%) of Ukrainian refugees in Eastern Europe are aged 35-59, and another 25% fall into the 18-34 age group. With regard to the education of forced Ukrainian migrants, the loss of human capital seems to be the highest: 47% of internally displaced persons (IDPs) have a university degree, and another 20% have vocational education (Fig. 2).

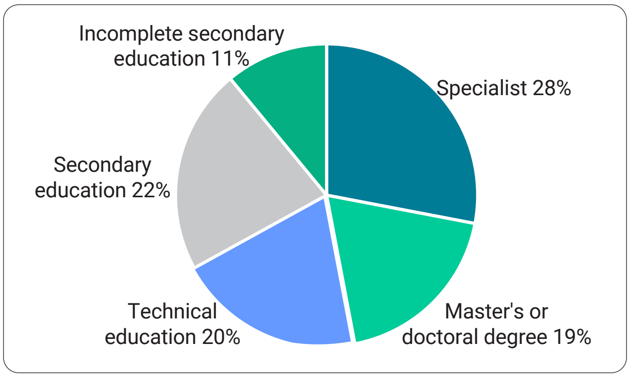

Figure 2. Structure of education among Ukrainian refugees in Europe
Source: compiled be the authors based on United Nations High Commissioner for Refugees (2024)

Thus, the loss of so many able-bodied and educated people to Ukraine's domestic labour market has only exacerbated the social crisis caused by the full-scale war. However, even educated, able-bodied Ukrainians face the challenge of language barriers abroad. In Ukraine, most people with a university degree are fluent in English, but living and working in Poland, the Czech Republic, Germany, etc. requires knowledge of national languages. As a result, IDPs are forced to either look for work in international companies where English is the official language of communication or accept a significant decline in their standard of living and low-paid jobs such as courier, cleaner, or farmworker during harvest. In addition, competition in the labour market of developed countries is intensified by an extensive system of permits, certificates, and licences that confirm the qualifications of potential workers at the international level. Forced migrants from Ukraine find it difficult to navigate this system and are, a priori, at a greater disadvantage than their European counterparts.

Another factor in the loss of human capital by Ukrainians is the forced deportation of citizens from the temporarily occupied territories to the occupying country. According to the data released by the former Ukrainian Parliamentary Commissioner for Human Rights L. Denisova (2022), almost one and a half million Ukrainians have been forcibly deported, of whom almost a quarter of a million are children. Moreover, evidence suggests that prior to this "evacuation", the aggressor country was preparing for a large-scale invasion, creating concentration camps for temporary detention for forcibly deported persons as early as 2021. The conditions of detention in these facilities do not meet international humanitarian standards, the persons held there have no rights or protection, and escape is made impossible by the deliberate location of the camps in regions as far away from Ukraine's borders as possible.

Children and adolescents deported in this way are under constant psychological pressure, forced to lose their own Ukrainian identity and cultural code, and forced to learn a foreign language and culture. A certain number of young people, who naturally have not yet had time to form their own identity, go through such adaptation procedures and lose contact with their homeland. As a result, children have no desire to return and, accordingly, weaken the future economic potential of their country. Even more irreparable losses occur as a result of civilian deaths in the temporarily occupied territories, in the frontline zone and in the interior of the country during air strikes. The United Nations (2022) state that in the first three months of the full-scale invasion alone, more than 4,000 civilians were killed, including 261 children, and as of October 2023, the death toll reached almost 10,000 Ukrainian civilians. At the same time, the Office of the Commissioner warns in advance that the estimates are minimal, and the actual scale of losses among the population is much higher, but cannot be calculated due to the active hostilities.

Indirect economic losses also include the loss of income by commercial enterprises and institutions of Ukraine and, accordingly, the loss of wages by employees. In addition, the inability of the country's intellectual elite to use their creative and scientific potential because of the hostilities can be considered a loss. There are also potential educational losses when, due to the failure to provide educational services in full, young people lose their most valuable resource – time – due to the destruction of educational institutions or danger while in them. All of this can be described as a decline in investment in human capital, which will inevitably affect the country's development in the future.

In general, since the education component is a crucial investment in Ukraine's economic potential and its further innovative transformations, it is worth focusing on the challenges facing this sector. With the increasing digitalization of society and national economies, skilled and educated personnel are becoming a real driver of development. This, in turn, requires strong and systematic investment in a modern and technologically advanced education sector focused on future business achievements. It is all the more worrying that the war is constantly destroying educational institutions and educational infrastructure. According to the Kyiv School of Economics (2024), as of the beginning of 2024, the war has already caused direct damage to Ukraine's infrastructure worth almost USD 155 billion, with at least 3,800 educational institutions destroyed, damaged or seized since the start of the full-scale invasion.

A separate challenge for the education sector is the educational process in the temporarily occupied territories. As a rule, a seized school or university faces three possible options for further development: a complete cessation of any educational activity, a transition to the occupier's educational standards, or continuing to work according to the Ukrainian curriculum, but in a remote mode. It is worth noting that the third scenario, the best but most dangerous for educators and children who remain in the temporarily occupied territories, is the least common. The transition to a remote education format, especially at the beginning of the great war, was also seen in the territories controlled by Ukraine: in the first months after February 2022, when the frontline was extremely unstable, schools and universities in Kyiv, Mykolaiv, Kharkiv, and Chernihiv worked remotely for several weeks. Most institutions were even forced to shorten the school year, which undoubtedly affected the quality of knowledge gained.

As of the spring of 2024, full-time education has resumed in most institutions in the government-controlled area, but the educational process is often interrupted by air raids, sometimes even several times a day, and students are forced to move to civilian protection shelters. As a rule, this means that pupils and students are forced to work on some material taught in an extracurricular format. In addition, the additional stress of air attacks negatively affects the perception of information and, ultimately, the quality of education. In general, in times of war, it is impossible to fully utilize the intellectual and creative potential of human capital, and the full picture of indirect economic losses will only be assessed in the post-war period (Ponomarenko & Pysarchuk, 2024). In addition to the already mentioned lost profits due to the destruction of enterprises and undercapitalization of education due to the forced displacement of children, the negative consequences will also include a decline in economic activity in a number of trade groups that have lost their attractiveness and demand in the war. Firstly, this applies to luxury goods, the entertainment industry, etc. The tourism, aviation, and hotel industries have also largely lost their capitalization as a result of changing public values, government restrictions and an obvious increase in risks.

Even in those regions of Ukraine that are deep in the rear, citizens are having difficulty finding decent jobs, as, on the one hand, the labour market has received an additional influx of workers from the temporarily occupied territories, and, on the other hand, businesses have experienced a decline in business activity. The latter factor is due to the need for entrepreneurs to spend time and financial resources on relocating production to "quiet" regions and setting up all the necessary industrial and legal processes. In the context of general instability and declining solvency of the population, few owners of large enterprises are ready to make such a major investment.

An additional challenge for the majority of Ukrainians is psychological distress and permanent stress (Spytska, 2024). A special study of mental health and mental health problems conducted by the reputable British company Alligator Digital (2023) among residents of eleven countries shows that half of Ukrainians feel emotionally worse than before the full-scale invasion. At the same time, young people aged 13-15 feel the greatest impact and vulnerability due to the war, and in general, among Ukrainians, respondents named the war (88.5%), job loss (16.5%), watching the news (27.2%), and political decisions at the national (27.4%) and international (14.3%) levels as the most significant factors affecting mental health. These factors of influence and their scale obviously have a negative impact on the professional and creative abilities of citizens, which, again, causes undesirable economic effects, both immediate and delayed.

Such extremely difficult social challenges can be turned into additional opportunities. Since the beginning of the full-scale invasion, numerous Ukrainians have re-examined their national and linguistic identity and become more categorical in their Ukrainian self-identification. According to a study by the Razumkov Centre (2023), 81% of respondents from across the country identify themselves as belonging to the Ukrainian cultural tradition, compared to only 56% in 2006. Also, the number of respondents who identify themselves as belonging to the European cultural tradition has increased from 7% to 10%, and those who want to identify themselves as a carrier of the culture of the occupying country have become 0.5% instead of 11% in 2006. As for the state symbols of Ukraine, there have been radical changes here as well – while in 2011, 26%, 25% and 22.5% of Ukrainians were proud of the Flag, Coat of Arms and the National Anthem, respectively, in 2023 the share of respondents who were proud of their country's symbols increased to 75%, 74% and 69%, respectively. It is worth noting that the number of people who are proud of the Ukrainian language has more than doubled over the 10 years of war, from 32% to 74%.

Returning to the issue of forced Ukrainian migrants in Europe, it is worth mentioning another delayed, and therefore not so obvious, negative consequence. It lies in the fact that children forced to flee the war, who found themselves abroad in a new social, cultural, and linguistic environment in 2022, quickly adapted to the new realities and often no longer feel connected to Ukraine, and have no desire to return home even after the victory. This challenge can be countered by a competent information policy of Ukraine, which will encourage parents to make plans for their future in the context of the recovery of post-war Ukraine. This message, if properly communicated, will be transmitted within the families of IDPs, so that children will not lose touch with their native language and history, even despite their new foreign experience. Moreover, this approach creates another opportunity for social development: the high standards of living, education, and medicine that young people have become accustomed to during forced emigration will become new social benchmarks for rebuilding Ukraine.

Discussion

The war against Ukraine, its economic and social consequences are in the focus of attention of the global scientific community, especially as the world has been in global turbulence for several years now and the great war on the European continent is one of its most influential factors.

For example, R. Balcaen *et al.* (2022), studying the use of economic instruments within the concept of "hybrid warfare" even before the start of a full-scale invasion, drew attention to the rapid growth of Ukraine's defence potential since 2015. As noted in this paper, despite the tensions, the country has shown a clear trend of economic growth. The authors stated that Ukraine had managed to adapt all critical sectors to the new realities and correct defence mistakes made during the invasion of Crimea and Donbas. K.N. Röhl *et al.* (2023) devoted their work to the change in the defence doctrine of European countries against the backdrop of the war in Ukraine. The authors noted the growth of arms exports to Ukraine, and used the example of Germany to explore how the Bundeswehr gradually understood the inevitability of escalation and the need to increase production of modern weapons.

In continuation of the topic of assistance from NATO countries raised in this study, it is also worth mentioning the work of J. George & T. Sandler (2022), who tracked the trends of declining defence budgets of the Alliance countries until 2022. According to the authors, such irresponsible behaviour of the defence ministries of leading European countries against the background of the aggressor country's strengthening to some extent provoked the expansion of its aggressive actions, as it seemed that NATO was divided and incapacitated. The changes in FDI volumes that were noted and analysed in this paper have been the subject of attention of a number of European scholars specializing in financial market research. A. Antezza *et al.* (2022) used a special "support tracker" to track the volume of financial assistance to Ukraine and proved a significant increase after the full-scale invasion, which is confirmed by the statistical data of this paper. The increasing influence of foreign investment, in particular Polish, on Ukraine's economic development was also discussed in the work of R. Matera (2022). The author proved that the proposed financial instruments are fully consistent with the goals set and are effective, despite the obvious risks during hostilities.

M. Fink (2022) has written about the challenges in shipping, which are the focus of this paper. The blockade of traditional trade routes in the Black Sea by the aggressor country led to a grain crisis in developing countries and violated several international maritime laws. The authors argue that the references in this case to the laws and customs of naval warfare are not legally justified and are nothing more than an attempt at illegal armed maritime control, which equates the aggressor's army with pirate groups. In turn, A. Rogozińska (2023), who also raised the issue of the occupier's actions in the maritime dimension, emphasized the global nature of hostilities in the internationally recognized Ukrainian territorial waters of the Black and Azov Seas and predicted a possible expansion of aggression to other countries in the region. However, as noted above, Ukraine managed to prevent provocations and losses by opening up new opportunities and reorienting part of the logistics chain. Thus, diversification of traditional logistics, which is no longer safe, is quite important, and the examples of reorientation of grain exports to road and rail transport presented in this paper confirm this. J.S. Srai *et al.* (2023), in their study of the disconnection of supply chains from conflict zones, also confirm the need for a structured approach to diversifying logistics routes in the current geopolitical context.

The challenges in the energy sector provoked by the full-scale war and the transformation of these challenges into new opportunities by Ukrainians, which have been discussed in this paper, have a more global dimension. A. Goldthau & S. Tagliapietra (2022) noted that the continental energy crisis of the winter of 2022/2023 was overcome only due to unprecedented austerity measures and, to some extent, favourable weather conditions. In order to avoid similar crises in the future, it is necessary not to repeat the mistakes and to prevent European economies from becoming energy-dependent on a single supplier. J. Osička & F. Černoch (2022) also wrote about the need to diversify the supply of fossil fuels. The authors argue that the speed of natural gas phase-out will play an important role in Europe's future energy transition. C. Kuzemko *et al.* (2022) also noted that decarbonization of the energy sector will certainly lead to a reduction in the energy vulnerability of EU economies and bring the achievement of sustainable development goals closer.

The new opportunities that await the Ukrainian economy during the post-war reconstruction, as discussed in this paper, are also being considered by foreign experts in order to join the reconstruction projects on time. D. Atstāja *et al.* (2022), for example, developed protocols for the management of construction waste in the reconstruction of war-damaged facilities in advance. To increase the resource efficiency of restoration processes, it is proposed to create additional mobile waste processing complexes based on fractional waste processing. The increase in the competence of Ukrainian doctors in tactical medicine, noted in this study as one of the advantages created by the war, was also reflected by J.T. Shumaker *et al.* (2024). Authors proved the usefulness of simulation training for military medics and recognized the significant progress in the professional skills of Ukrainian tactical medics.

Russian aggression adversely affected the economy of Ukraine and emphasized the need to adapt the best practices of EU countries to determine steps to restore the country's competitiveness (Kichurchak, 2023). The study V. Strilets *et al.* (2024) constructed neural networks to assess the relationships between the factors of innovative development and the competitiveness of the EU countries and Ukraine. This comparative analysis concluded that EU countries consider intellectual property, green economy, and state innovation policy as key components of their competitiveness. In the context of the importance of the role of the state, we draw attention to the publication M.V. Dykha (2016), which describes the system of components of the economic mechanism, means of state regulation of socio-economic processes.

As noted above, the unique practical combat experience of the Ukrainian military will also be an important advantage in the post-war restoration of regional and global balances. A study by V. Savero *et al.* (2024) demonstrated that the transition of the war to a full-scale phase paradoxically strengthened cooperation between Ukraine and NATO, allowed the Alliance representatives to verify the competence and skills of Ukrainian soldiers and significantly accelerated the country's accession to the organization. The ability of the Armed Forces of Ukraine to withstand superior enemy forces in the face of a lack of resources was also noted by D. Kunertova (2023). Furthermore, the author made a good observation, which was not reflected in this work, about strengthening the practical skills of Ukrainian soldiers in working with innovative military technologies, in particular, with a wide range of combat and reconnaissance drones.

The issue of adaptation of Ukrainian refugees abroad is also of critical importance – as noted in this study, there is a certain substantive dualism. On the one hand, Ukraine, as a state, is interested in ensuring that its citizens who were forced to move work and receive education in a new place in maximum comfort. On the other hand, living conditions that are too good compared to their homeland will inevitably lead them to believe that it is not worth returning even after the victory. A. Batuchina & M. Ratkevičienė (2023), who studied the experience of refugee children in Lithuanian schools, noted that the acceptance of newcomers was easy both on the part of classmates and the teaching staff, which helped little Ukrainians to become part of the team almost immediately. R. Walawender *et al*. (2023), in turn, were interested in the problems of adult refugees and their employment. It turned out that the assessment of personal capabilities and the level of confidence have a significant positive impact on the expectation of a good job, and among workers with children, the percentage of self-confidence is even higher. Similar peculiarities of integration of Ukrainian refugee families into society were found in Slovakia by H. Rahman (2023). Using a sample of 12 refugee families who found refuge in the small town of Ruzomberku, the study proved the positive acceptance of new residents by the local community and the provision of appropriate housing, opportunities to maintain cultural ties and religious freedom.

Nevertheless, the language barriers mentioned by all the above-mentioned researchers of the social adaptation of Ukrainians in foreign countries give hope that in the short term, IDP families will still prefer to return to their homeland.

Conclusions

The results obtained in this study form a twofold perception of the current prospects for Ukraine's socio-economic development: as of the first half of 2024, the country is at a bifurcation point and whether it will be able to realize the opportunities mentioned above depends on the further outcome at the front. However, there is every reason to believe that the financial, military and sanctions assistance of Ukraine's partners will not allow the aggressor to turn the tide of the war.

In this case, as we have found out over the course of our work, a wide range of opportunities awaits Ukraine. In particular, due to the blockage of traditional logistics, the Ukrainian transport system has experienced an additional impetus to develop alternative logistics routes and diversify supply chains. Also, as noted above, the extensive destruction experienced by Ukrainian cities and towns, some of which were completely destroyed, will provide an opportunity to rebuild innovative neighbourhoods that meet modern urban standards on the site of outdated buildings and infrastructure. A separate opportunity in this area was identified as the involvement of foreign investment in reconstruction and the world's leading urban planning experts.

Among other potential opportunities created by the invasion and war, the study noted the increased value of human capital among the military and medical professionals. Their practical skills and experience now make it possible to export this knowledge through the formation of educational hubs in military affairs and tactical medicine in Ukraine. The country's great potential has also been unlocked in the energy sector and the achievement of sustainable development goals – the forced abandonment of conventional fossil fuels should further stimulate the increase in clean energy production and the post-war construction of new solar and wind generation facilities. However, the collection and processing of certain statistical data was limited by the classification of information due to its secrecy under martial law.

In addition, when analysing statistics on internally displaced Ukrainians abroad, the growth of the level of education and qualifications of Ukrainians in the European environment was noted. Ukraine's task is to ensure the return of these people to their homeland after the victory and integrate them into the post-war reconstruction of the country. The development of a special communication strategy aimed at encouraging the return of forced refugees could be the subject of a future study.

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Conflict of Interest

None.

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Трансформація соціально-економічного розвитку України в умовах глобальної турбулентності та війни: виклики та можливості

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Анотація. Глобальні зміни в сучасній Україні руйнують звичний уклад, проте й відкривають нові можливості. Дати оцінку такому потенціалу та заздалегідь прорахувати шляхи його реалізації – є надзвичайно актуальною задачею. Метою даної роботи було дослідження соціального та економічного розвитку України. В процесі дослідження були проаналізовані такі показники як обсяг іноземних інвестицій, склад загального фонду державного бюджету та фінансування оборонної сфери до та після повномасштабного вторгнення. Також в процесі синтезу окремих інформаційних повідомлень, було сформовано узагальнену картину щодо поточної ситуації на фронті. В результаті роботи були виявлені такі виклики, як вимушене зниження морського експорту на 55 % у 2022 році (у 2024 році Україна збільшила товарообіг через морські порти до 75 % від довоєнного рівня); дефіцит енергоносіїв, що сягав в моменті 38 %; падіння обсягів врожаю на 40 %; вимушена міграція з країни 6,5 млн українців тощо. Втім, по кожному з викликів були сформовані шляхи їх подолання та методи перетворення їх на додаткові можливості. Зокрема, це диверсифікація логістичних шляхів, збільшення вартості людського капіталу, розвиток альтернативних джерел живлення та наближення до цілей сталого розвитку. Окремо було запропоновано створення в Україні світового освітнього хабу, в якому українські військові та медики, що мають практичний досвід ведення бойових дій та тактичної медицини, зможуть навчати іноземних колег. Крім того, з метою підвищення мотивації внутрішньо переміщених осіб (ВПО) до повернення на батьківщину пропонується розробити відповідну комунікаційну стратегію. Практична значимість дослідження полягає в розробці конкретних пропозицій щодо повоєнної відбудови України, які мають зацікавити керівництво департаментів Міністерства розвитку громад, територій та інфраструктури України

Ключові слова: потенціал повоєнного відновлення; людський капітал; альтернативна енергетика; іноземні інвестиції; трансформація; соціально-економічний розвиток; сталий розвиток

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B2C-oriented quality control of logistics services based on an economic perspective

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Abstract. The research of the quality control of logistics services relevancy is determined by the increasingly dynamic and competitive nature of the market requires companies to ensure the high quality of their logistics services, especially in the sphere of business-to-consumer (B2C). The research aims to analyse and identify optimal approaches and strategies for quality control of logistics services in B2C interactions. The study employed various methods including analytical, statistical, functional, system analysis, deduction, synthesis and comparison methods. An economic relevance assessment identified how service quality can affect business and assessed the potential benefits of improving it. A comparative analysis of practices in the industry identified best practices and innovations. The main results determined that integrating an economic perspective into quality control mechanisms enables companies to ensure smooth and timely delivery while effectively managing resources, optimising costs and improving profitability. A customer-centric, oriented approach contributes to enhancing brand reputation, customer satisfaction and long-term competitiveness. The practical relevance of the findings is to provide companies with valuable tools and insights to improve their logistics operations and enhance customer service on a cost-effective basis

Keywords: quality standards; data and analytics; optimisation of operations; feedback; economic benefit

Introduction

In today's world, where high competition and dynamically changing consumer expectations have become commonplace, the provision of high-quality logistics services in business-to-consumer (B2C) interactions is critical to the long-term success of companies. In this integral context, focused quality control of logistics services, embodied through an economic perspective, is evolving into a key strategic challenge for businesses across all sectors and industries. From the speed of delivery to the condition of goods at the time of receipt, each stage in the global logistics chain has a direct impact on customer satisfaction, which in turn has a direct impact on the financial development of the company. Integrating an economic perspective into a quality control mechanism not only enables companies to ensure smooth and timely delivery of goods but also to effectively manage resources, optimise operating costs and improve overall profitability. This comprehensive approach not only enhances brand reputation and attracts new customers, but also has a profound impact on the overall economic performance of the company. It transforms quality control from a routine element into a powerful catalyst that determines a company's long-term success and competitiveness.

High competition and dynamically changing consumer preferences in the modern economy led to the need for strategic provision of high-quality logistics services in the B2C sector. The economic perspective in this context plays an important role, as the assessment of the cost of logistics quality allows one to determine the optimal investment of resources, maximise profits and achieve long-term competitiveness. G. Pereira Marcilio Nogueira *et al.* (2022) researched the impact of flexible delivery time strategies on last-mile distribution in B2C e-commerce, focusing on economic and environmental sustainability. The authors proposed to involve e-consumers in decision-making to raise environmental awareness and encourage cooperation between e-retailers and transportation companies to increase consolidation. The goal is to improve transportation efficiency, leading to cost savings and environmental benefits, while advocating for support for public policies that address urban logistics challenges. G. Nogueira *et al.* (2024) examined the evolution of last-mile distribution in B2C e-commerce in light of economic and environmental challenges. The researchers emphasize benefits such as lower costs, reduced greenhouse gas emissions, and positive shifts in consumer behaviour toward sustainability.

N. Karimov *et al.* (2022) argue that technological innovations play a key role in ensuring high-quality logistics services. The introduction of Internet of Things devices, automated systems and data analytics allows companies to accurately track and optimise each stage of delivery. Analysing data from an economic perspective allows for more efficient resource planning and cost reduction. C.P. Jayarathna *et al.* (2022) investigated sustainable logistics practices in the context of circular economy (CE) by examining the experiences of senior executives in the logistics sector. The results show that economic value is the primary benefit of CE transformation, with the creation of environmental and social value being secondary. This supports the thesis that CE is more of an economic strategy than an environmental strategy. Quality assessment from an economic point of view helps to identify bottlenecks and prevent negative situations.

A.A. Mamasydykov *et al.* (2019) point out the importance of environmental and social responsibility in the context of quality control of logistics services. Optimisation of processes with an economic perspective can also contribute to the reduction of negative impact on the environment, supporting the principles of sustainable development of enterprises. H. Uvet *et al.* (2023) investigated two hybrid models of logistics service quality in B2C e-commerce, focusing on their impact on satisfaction, loyalty, and future purchase intentions. The authors introduced a second-order construct, the quality of provision, which includes the quality of contact with staff, handling of order discrepancies, and order returns. The researchers suggested that the quality of service and online ordering procedures have a significant impact on customer satisfaction and subsequent loyalty.

In general, the opinions of various authors emphasise the current importance of quality control of logistics services based on an economic perspective. This enables companies to adapt to changing market conditions, increase customer loyalty and achieve more sustainable economic performance. The research aims to comprehensively analyse and understand the contemporary role of oriented quality control of logistics services based on an economic perspective in the context of business-consumer interactions.

Materials and Methods

Data from Kyrgyz Express Post and SF Express were used for the study of the topic. The scientific research on the study of digital economy was carried out using methods that reveal the content of the object. The analytical method allowed to study the current approaches to quality control of logistics services in the B2C sector, to identify the advantages and disadvantages of each approach, as well as to assess their economic efficiency. The statistical method helped to quantitatively analyse the data and identify patterns. Using this method, data on delivery time, cost of operations, customer satisfaction and other indicators were studied to understand the degree of impact of logistics quality on the economic performance of the company. Using the functional method, it was possible to study the types and interactions of the different elements of the system. It examined how the different stages of the logistics chain affect the overall economic performance and how optimising each function can improve logistics quality. The systems analysis method helped to examine the topic as part of a larger system. It was applied to examine the interrelationships between the different elements of the logistics chain, their impact on economic and customer performance, and to understand potential bottlenecks. The deduction method was used to identify basic principles that can be adapted and applied in different contexts to achieve successful outcomes. The synthesis method provided new insights into how the interaction between the economic perspective and quality control can lead to improved logistics processes and the achievement of company goals in the long term. The comparison method provided insight into the differences and similarities between different approaches and companies. It can be used for comparative analysis of different logistics quality control methods and their economic efficiency in organisations.

The study was carried out with the disclosure of some aspects that include theoretical and practical components. The theoretical aspect includes the analysis of existing theories and concepts of quality control, as well as the study of the role of the economic perspective in the context of optimising logistics processes. An important part of the theoretical aspect is to analyse and compare different approaches to integrating economic performance into quality control systems. Another aspect of the study aimed at identifying the applicability and effectiveness of orientated quality control of logistics services based on the economic perspective in real business scenarios. This includes analysing case studies of companies that have successfully implemented this approach and evaluating the results they achieved. Recommendations and strategies that can help companies to successfully implement oriented quality control of logistics services based on an economic perspective are also discussed, which include the development of suitable metrics and indicators for quality assessment, methods of data collection and analysis, and examples of optimising processes and resources based on economic factors. As a result, these actions were applied to consider the feasibility of improving the quality control of logistics services based on an economic perspective for the successful development of the company.

Results

Quality control of logistics services is a system of methods and processes aimed at ensuring a high level of quality at all stages of the logistics chain – from the purchase of goods to their delivery to the end consumer. This aspect is of particular relevance in today's economic environment, where customer expectations are becoming increasingly high, and competition requires companies to continuously improve. The main objective of quality control is to meet the needs and expectations of customers. Quality control is aimed at ensuring that goods and services meet the high standards and requirements of customers, which contributes to building their trust and loyalty (Liu & Wang, 2015). Many industry and international standards regulate the quality of logistics services. Quality control involves checking that these standards and regulations are met at all stages of the logistics chain to ensure compliance. Quality control systems help to identify defects, errors and problems at an early stage so that corrective action can be taken before they affect the end customer. Also, a key aspect of quality control is the principle of continuous improvement. Companies strive to analyse the data obtained as a result of control and implement changes and innovations to improve the quality of services (Lin *et al.,* 2015).

Various approaches to quality control include methods such as statistical data analysis, internal and external audits, application of quality standards, use of technology to monitor and track processes, and assessment of customer satisfaction through feedback. Statistical data analysis is a technique that relies on collecting, analysing, and interpreting data to identify trends and patterns in the quality of logistics services. Statistical methods, such as control charts and variation analysis, identify anomalies and changes in processes to help prevent potential problems. Internal and external audits assess the effectiveness and compliance of the quality control system with predetermined standards and requirements. Internal audits are conducted by the company itself to identify deficiencies and ensure continuous improvement. External audits are conducted by independent experts and organisations to assess objectivity and compliance with standards (Gupta *et al.,* 2018).

Quality standards such as ISO 9001 are universal guidelines for establishing and managing a quality management system. These standards provide criteria for evaluating the effectiveness of processes, management structure and quality assurance to help improve the efficiency and reliability of logistics services. Modern technologies such as tracking and monitoring systems allow companies to obtain real-time data on the status and movement of goods in the logistics chain. This enables rapid response to malfunctions and changes, minimising risks and improving service quality (Bardakçi, 2020). Collecting and analysing feedback from customers allows companies to assess customer satisfaction and identify areas for improvement. This method allows companies to customise their logistics processes and services to meet the real needs and expectations of customers. The combination of these methods and approaches creates a quality control system that helps to ensure reliability, compliance with standards and continuous improvement of logistics services in line with an economic perspective and a quality-orientated approach.

The economic perspective plays an essential role in the field of logistics, providing a basis for assessing the efficiency and optimisation of logistics operations. It becomes a key factor in the formation of quality management strategies for logistics services, balancing quality, and cost, which is essential in a competitive and dynamic business environment. An economic perspective helps to determine the optimal allocation of resources such as labour, materials, and technology to achieve a high level of quality at minimum cost. Optimised quality control helps in avoiding excessive costs and rational use of resources (Zheng *et al.,* 2022). The economic perspective includes the cost of quality analysis, which estimates how much it costs to maintain a certain level of quality or to restore it if it has been compromised. This allows companies to make informed decisions about the necessary investments in quality control. Quality control based on an economic perspective helps to identify and manage risk. Anticipating possible negative consequences in B2C relationships helps to take measures to minimise them, which in turn reduces financial risks (Saragih *et al.,* 2020). Also, this perspective helps to find the optimal price-quality ratio of logistics services. It allows companies to understand what levels of quality can be achieved at different costs and choose the appropriate balance that meets the needs of the market.

The combination of these factors emphasises the importance of integrating an economic perspective into a quality control strategy for logistics services. Companies that can balance high quality with optimal costs ensure customer satisfaction, increase their competitiveness, and achieve sustainable success in the market. A focused approach to quality control in logistics is a meaningful and effective strategy oriented towards meeting customer needs and expectations. In today's business environment, saturated with competition and high service standards, the orientated approach becomes a key tool for success and sustainability in the market.

The main idea behind the orientated approach is not just to meet quality standards, but to target the end customer and their needs. Rather than simply meeting requirements, companies aim to exceed customer expectations by creating unique experiences for customers and delivering real results. This approach implies that quality should be measured not only by standards but also by how it meets real customer needs. The main benefits of a focused approach to quality control are worthy of attention and study. Firstly, it enables companies to achieve high customer satisfaction. Satisfied customers tend to stay loyal to a brand and also recommend it to others. This has a positive effect on the company's reputation and its attractiveness in the market. Another important aspect of a centred approach is the company's ability to be more flexible in adapting to changing customer needs. By continuously exchanging feedback and analysing data, the company can respond to changes in market demands and quickly adjust its processes (Jayasinghe *et al.,* 2019).

Staff education and training also play a fundamental role in ensuring a high level of quality control of logistics services. It is an integral part of a strategy aimed at achieving optimal results and customer satisfaction. Within a quality control-orientated framework based on an economic perspective, trained, and qualified staff play several critical roles. Trained employees can perform quality control processes more efficiently. They can monitor each stage of the supply chain more accurately, detect potential problems and take action to prevent them. This is important to minimise the risks associated with possible errors or non-compliance with standards (Thuong *et al.,* 2022).

The interconnection between the blocks in an integrated approach to orientated quality control of logistics services based on an economic perspective is crucial for the success and sustainability of companies. Well-trained employees ensure that processes (automation and technology) are properly implemented, and quality standards are met. Process automation and the use of advanced technology help to facilitate employee tasks (staff education and training), ensure accurate monitoring and data collection for analysis, and ensure transparency and responsiveness in collecting feedback (Dhaigude & Mohan, 2023). Customer feedback provides valuable information on the quality of services, which can be used to assess quality standards and plan staff training. Implementing quality standards implies certain procedures for educating and training staff to comply with them, as well as the use of technology to automatically verify compliance with the standards. Assessing the economic perspective ensures adequate resource planning for staff training and technology implementation, as well as estimating the cost of collecting feedback and complying with standards. All components cooperatively aim to achieve company success and sustainability. B2C connectivity is enhanced, and the company becomes more competitive through the balanced operation of all the blocks.

In Kyrgyzstan, as in many other countries, there is a growing interest in providing a high level of quality logistics services to consumers. In a dynamic economic environment and competitive environment, companies are realising that providing quality logistics services is becoming a key factor in retaining customers and maintaining their competitiveness. One situation that can be highlighted is the increased demand for efficient logistics solutions in e-commerce. With the growth of online commerce, companies are facing increased customer expectations for fast and reliable delivery of goods. This requires logistics providers to be more quality-controlled and customer-centric to ensure prompt and smooth delivery of goods. The situation is also related to the introduction of modern technologies in logistics processes. Kyrgyzstan is experiencing rapid development of digitalisation, which opens up new opportunities for monitoring and controlling the quality of logistics services. The introduction of cargo tracking systems, automation of warehouse operations and the use of analytical tools allow companies to analyse processes more accurately, identify bottlenecks and improve them (Holzhacker & Skakova, 2019). However, despite the potential and prospects, the logistics sector in Kyrgyzstan also faces several challenges. One of them is underdeveloped infrastructure and limited resources. This can make it difficult to implement modern technological solutions and optimise delivery processes. Overall, the situation in the Kyrgyz Republic emphasises the importance of oriented quality control of logistics services from an economic perspective. Companies that adapt their approaches to customer needs and implement modern solutions can successfully compete and create value in the dynamic B2C environment in Kyrgyzstan.

As one of the world's leading economies and global leaders in international trade, customer-centric quality control of logistics services plays a key role in China. With the scale and complexity of the country's logistics flows high service standards become critical to retaining customers and ensuring a smooth supply chain. This emphasises the importance of an economic perspective, as even small improvements in quality can lead to significant economic results. The situation in China is also having an impact on the global economy. The rapid growth of e-commerce and international trade challenges Chinese companies not only to ensure high-quality delivery domestically but also globally. This requires developing unique quality control strategies and targeting the needs of diverse customers in different countries (Wang, 2019). Comparing the situation in Kyrgyzstan, there is a difference in scale and availability of resources. Kyrgyzstan, as a small country with limited economic resources and infrastructure, may face difficulties in implementing modern technological solutions in logistics. However, this also creates opportunities for more flexible and innovative approaches that can be adapted to country specifics. Focused quality control in Kyrgyzstan has a more localised focus, with an emphasis on meeting the needs of domestic customers. Whereas in China the emphasis is on large-scale logistics activities and international trade, which requires more comprehensive and scalable solutions in the context of the orientated approach. To better assess the control of B2C logistics services in Kyrgyzstan and China, the following companies were selected for analysis: Kyrgyz Express Post and SF Express.

Kyrgyz Express Post is a state-owned logistics company in Kyrgyzstan providing a wide range of postal and logistics services. The company was established to improve and enhance the system of postal and logistics services in the country. The company provides cargo and mail delivery services both domestically and internationally. This includes delivery of documents, goods, parcels, and many other types of cargo. An important aspect of quality control of logistics services is customer satisfaction. It also adopts a customer-centric approach to ensure the quality of services and meet the needs of its customers. The company is an important element of the logistics and postal infrastructure in Kyrgyzstan, and its activities are essential to ensure communication and movement of goods within and outside the country. SF Express is one of the largest logistics companies in China specialising in courier and express deliveries. It is an integral part of the international transport infrastructure and specialises in courier and express deliveries, providing a continuous flow of high-value shipments to a wide variety of destinations. SF Express's key differentiator is its ability to provide fast and efficient delivery to anywhere in China and beyond. One of the key aspects that set SF Express apart in the context of its quality control-orientated approach is its innovative approach. Utilising advanced technology to monitor and track shipments allows the company to provide customers with up-to-date information on the status of delivery in real-time. This ensures a high level of customer confidence and enables "SF Express" to maintain a high standard of service that meets the most stringent requirements (Liu & Wang, 2015).

To provide a comprehensive review and analysis of B2C logistics, here are some relevant statistics and indicators that highlight the performance and effectiveness of logistics operations in the B2C sector. These statistics are categorized based on different aspects of logistics services (Table 1).

Table 1. Comparison of Kyrgyz Express Post and SF Express

Category	Kyrgyz Express Post	SF Express
Delivery Time	3-5 business days	1-3 business days (domestic)
Cost Per Delivery	$10 average	$8 average
Customer Satisfaction Ratings	85%	90%
Percentage of Complaints Resolved within 24 Hours	80%	90%

Source: authors' development

SF Express has implemented route optimization algorithms in 100% of their delivery routes. Route optimization has resulted in a significant reduction in fuel costs, estimated to be approximately 15%. In addition, these algorithms have improved delivery efficiency by 25%, resulting in faster delivery times and improved overall quality of service. Kyrgyz Express prioritized process improvements and successfully implemented these changes in 70% of its operations. This resulted in a 20% reduction in wasted resources, improving resource management and reducing operating costs. In addition, staff training has had a significant effect, with a 30% improvement in delivery accuracy following training. This emphasizes the importance of allocating resources to staff development to improve service quality and efficiency.

Both companies, Kyrgyz Express Post from Kyrgyzstan and SF Express from China play a critical role in setting standards of high quality and reliability in logistics. Despite their successful approaches, the logistics industry also presents several challenges and complexities that require constant attention and innovation to achieve optimal results. One of the key challenges is the dynamic environment in which both companies operate. Rapidly changing technology, rising customer expectations and an unstable global economic environment can all have an impact on logistics processes. In such an environment, Kyrgyz Express Post and SF Express have to constantly adapt and improve their quality control methods to stay at the forefront of the industry. Another challenge is ensuring the safety and security of cargo. The importance of keeping goods safe in transit cannot be underestimated, and both companies face the challenge of ensuring optimal transport conditions. This includes not only technical aspects but also risk management, sustainability, and compliance.

In the face of the current logistics challenges, both Kyrgyz Express Post and SF Express are undertaking aggressive research and innovative approaches to cope with them. For Kyrgyz Express Post, one solution may be to actively explore and implement new strategies to optimise processes. The company can analyse current routes and delivery methods to identify possible improvements. This could include revising routes, using more efficient vehicles and optimising fuel costs. In addition, Kyrgyz Express Post may invest in staff training and implementation of best logistics practices. While Kyrgyz Express Post emphasises its focus on processes, SF Express continues to delve into technology. A key solution for them is to integrate advanced technology solutions to track shipments and increase transparency. This can include the use of GPS trackers, temperature and humidity sensors, and delivery status monitoring applications. This approach allows the company to monitor the movement of shipments in real-time, ensure safe and secure delivery, and provide customers with information on the status of their shipments. Importantly, this level of transparency also helps to reduce risk and increase customer satisfaction. Both companies need to recognise that a commitment to continuous improvement and innovation is required to successfully overcome the challenges of the logistics industry. They stand out for their focus on process and technology, which demonstrates their willingness to embrace the challenges of today's logistics industry and provide customers with the highest level of service and reliability.

Discussion

The results of the conducted research on quality control of logistics services provide a deeper understanding of the significance of the development of this area for companies from different countries of the world, including China and Kyrgyzstan. The integration of an economic perspective into the quality control of logistics services has played and continues to play an important role in improving the efficiency and competitiveness of companies. Economic analysis becomes a key tool in finding the best ways to achieve high customer satisfaction while optimising costs and resources. A customer-centred approach to quality control of logistics services implies attention to customer needs and expectations at every stage of the logistics chain. This approach not only ensures high quality of services but also strengthens B2C relationships, which has a significant impact on the long-term success of the company. This study shows that the situation in the quality control of logistics services in Kyrgyzstan and China is gradually improving. Efficient logistics plays a key role in sustaining the rapid growth of the Chinese economy and meeting the population's demand for high-quality logistics services. Companies such as SF Express are considered leading players in the Chinese logistics industry. They are actively implementing innovative solutions to optimise delivery processes and improve service quality. Kyrgyzstan, with a less developed economy, faces challenges in logistics. However, the country has the potential to develop this industry due to its geographical location at the junction of Central Asia and its proximity to China. Companies such as Kyrgyz Express Post play an important role in developing the country's logistics infrastructure and improving the quality of logistics services.

The study by M. Kadłubek (2020) analysed the relationship between quality management, service quality and business success in logistics companies. The study developed a tool for measuring logistics service quality that combines conceptual approaches of service marketing with quality indicators of operations management. Logistics service quality can be measured along three dimensions: service potential, process and outcome. This provides a more comprehensive view of service quality by considering a variety of dimensions ranging from service potentials to outcomes. The results of the study confirmed that quality management has an impact on the measured constructs of logistics service quality. This paper has broadened the field of logistics research by understanding the impact of quality management and service quality on business success in logistics companies. However, the influence of external factors such as economic conditions, competitive environment, and regulatory changes on the relationship between logistics service quality, quality management and business success should also be considered (Sinoimeri & Teta, 2023). This means that even with effective quality management, companies like Kyrgyz Express Post and SF Express may face variables such as changes in the economic situation or regulations that may affect their success.

S. Winkelhaus & E.H. Grosse (2020) determined that the use of modern technology and monitoring systems allows logistics companies to monitor the quality of their services more accurately. He emphasises the importance of automating processes and using data for decision-making. This discovery emphasises the current trend of moving away from traditional management methods to innovative approaches based on digital technologies. The use of automated systems allows companies to not only improve monitoring efficiency but also to respond more quickly to any anomalies or changes in processes. Providing real-time and accurate data on the current state of logistics operations allows for the rapid identification of potential bottlenecks and deficiencies, which facilitates faster and more accurate corrections (Aubakirova, 2024). It is worth adding that successful implementation of automation and data analysis also requires appropriate training and education of staff. Implementation of new technologies is often associated with changes in work processes and approaches, which requires active involvement and support of employees. For Kyrgyz companies, this solution may become essential in the development of logistics services.

S. Huma *et al.* (2020) in their paper analysed the impact of customer feedback on the processes of evaluating the quality of logistics services provided. In this paper, the author argues that actively collecting and carefully analysing feedback contributes to the ability of companies to respond quickly to problems and shortcomings and to continuously improve the quality of services provided. Communicating wishes, comments and suggestions from customers allows companies to find bottlenecks in their processes and operations that might have gone unnoticed without such information (Melnykova, 2023). It also provides an opportunity for prompt response to a variety of situations and changes in customer requirements. Effective utilisation of customer feedback requires the involvement of the entire company team. Customer feedback should be integrated into work processes, and all levels of staff should be prepared to make operational changes based on this information (Voitovych *et al.*, 2023).

M. Ikram *et al.* (2021) analysed the impact of quality standards, including ISO 9001, on the main quality control processes in logistics companies. In this context, they conclude that the implementation and adherence to such standards have a significant impact on the organisation and structuring of quality control processes, as well as on the development of an overall quality culture in companies. Quality standards provide a systematic approach to quality control. They force companies to evaluate and optimise all stages of logistics processes, from planning to execution and monitoring. This systematic approach helps to identify potential problems at an early stage and allows companies to take measures to prevent them. Quality standards play a significant role in the development and quality management of logistics services. They contribute to more systematic and structured quality control and increase customer confidence in companies, which is important in today's competitive environment (Shyle *et al.*, 2021). The importance of adapting standards to the specific needs and conditions of the company should not be overlooked. For example, in China and Kyrgyzstan, one may encounter different cultural nuances and requirements for logistics services that differ from other countries.

M. Kaur *et al.* (2019) emphasised the importance of staff education and training in the context of achieving a high level of quality control in logistics companies. Well-trained employees play a crucial role in ensuring the correct implementation of all processes and compliance with established quality standards. Employees with the necessary knowledge and skills can identify potential problems in a more accurate and timely manner, prevent errors and perform tasks with high precision. This, in turn, influences customer satisfaction and creates the basis for the sustainable development of the company. Staff training also helps to create a unified quality culture within the company. Trained employees understand the importance of adhering to standards, following best practices and responding to changes in processes (Teta & Xhafka, 2023). The author's study emphasises that staff education and training are an integral part of the quality control strategy in logistics companies. It is worth adding that staff education and training is not a static process, but a continuous cycle that should be adapted to changing market conditions. It is important to consider feedback from employees, as well as to monitor the results of training and their impact on the quality of service.

Overall, the analysis of these studies shows that successful logistics operations include a balanced approach to quality control that combines advanced technology, customer feedback, quality standards and quality staff training. This enables companies to adapt to a dynamic environment, improve service quality and gain a competitive advantage, which ultimately contributes to their long-term success and sustainability in the market.

Conclusions

The study determined that quality control of logistics services include a wide array of methods and procedures that are specifically designed to guarantee excellent quality at every stage of the logistics chain. The suggested effective ways encompass statistical data analysis, internal and external audits, application of quality standards, use of technology for process monitoring and tracking, and assessment of customer satisfaction through feedback. It was deemed essential to incorporate an economic viewpoint into quality control in order to achieve a balance between service quality, cost optimisation, and resource utilisation. Adopting an economic viewpoint allows for the discovery of the most efficient allocation of resources, conducting cost-benefit analysis for quality investments, managing risks, and establishing an ideal balance between price and quality. An effective technique to meet customer wants and expectations throughout the logistics chain is the adoption of a customer-centric, oriented approach to quality control.This method fosters elevated levels of customer satisfaction, adaptability to evolving requirements, brand recognition, and sustained competitive advantage.

The significance of highly skilled personnel was emphasised, as they guarantee the correct execution of procedures, adherence to regulations, prompt identification of issues, and precise execution of tasks. An evaluation of the state of logistics quality revealed a steady enhancement in both Kyrgyzstan and China. Despite encountering infrastructure issues, Kyrgyzstan exhibits promising prospects for growth due to its advantageous geographical location. SF Express, a prominent company, actively employs innovative solutions in China. A comparative investigation has found a range of best practices that involve the integration of current technology, customer input, quality standards, and staff training. These techniques are considered successful and sustainable for quality management. Additional investigation into the effects of customer loyalty, geographical and cultural variables would assist in the development of customised quality plans.

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Conflict of Interest

None.

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B2C-орієнтований контроль якості логістичних послуг на основі економічної перспективи

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Анотація. Актуальність дослідження контролю якості логістичних послуг зумовлена тим, що зростаюча динамічність та конкурентність ринку вимагає від компаній забезпечення високої якості логістичних послуг, особливо у сфері бізнес-споживач (B2C). Метою дослідження є аналіз та визначення оптимальних підходів та стратегій контролю якості логістичних послуг у сфері B2C взаємодії. У дослідженні були використані різні методи, включаючи аналітичний, статистичний, функціональний, системний аналіз, дедукцію, синтез і порівняння. Оцінка економічної релевантності визначила, як якість послуг може впливати на бізнес, і оцінила потенційні вигоди від її поліпшення. Порівняльний аналіз практик у галузі дозволив виявити найкращі практики та інновації. Основні результати визначили, що інтеграція економічної перспективи в механізми контролю якості дозволяє компаніям забезпечити безперебійне і своєчасне надання послуг при ефективному управлінні ресурсами, оптимізації витрат і підвищенні прибутковості. Клієнтоорієнтований підхід сприяє підвищенню репутації бренду, задоволеності споживачів та довгостроковій конкурентоспроможності. Практичне значення отриманих результатів полягає в тому, що вони надають компаніям цінні інструменти та ідеї для вдосконалення їхніх логістичних операцій та покращення обслуговування клієнтів на економічно ефективній основі

Ключові слова: стандарти якості; дані та аналітика; оптимізація операцій; зворотний зв'язок; економічна вигода

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Economic challenges and GDP dynamics in Ukraine from 1991 to 2023: Analysis of growth and recessions

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Abstract. The need for a thorough study of the dynamics of economic indicators of gross domestic product (GDP) over more than 30 years of Ukraine's independence is due to a number of reforms, ongoing conflicts in eastern Ukraine, the COVID-19 pandemic and its consequences, the full-scale invasion of Russia, and global macroeconomic trends. The purpose of this study was to analyse in detail the economic processes that have influenced Ukraine's development since independence in terms of GDP dynamics to identify the key factors that contributed to economic growth and recessions. To achieve this goal, a comprehensive analysis of economic statistics, historical data and political events was conducted. The results of the study show that the transition from a Soviet-style planned economy to a market economy was accompanied by significant political and economic disorganization, as well as challenges related to structural changes and privatization processes. The article analyses the dynamics of Ukraine's main economic indicators, including GDP per capita, GDP growth (%) and budget deficit (%) for the period from 1991 to 2023. Key problems such as hyperinflation, budget deficit and public debt are identified, and measures aimed at stabilizing the financial system are explored. The impact of political events, such as the Orange Revolution, the annexation of Crimea, the COVID-19 pandemic, and the full-scale invasion of Russia, on Ukraine's economic development was analysed. The study assessed the role of international financial assistance and foreign direct investment in supporting the country's economy. The data obtained allowed identifying the main factors that contributed to economic growth and recessions, as well as assessing the effectiveness of reforms and policy decisions. Based on the information collected, recommendations were developed to ensure sustainable economic development in the future. The practical significance of this work is to define key economic factors and develop strategies that can contribute to stable economic growth and sustainable development of Ukraine in the context of a full-scale invasion

Keywords: structural reforms; political instability; foreign investment; macroeconomic stabilization; innovation; national transformation

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Introduction

Ukraine's economic development over the three decades of its independence has been shaped by a number of key processes. The period from 1991 to 2023 covers critical changes in the political and economic systems that had a significant impact on Ukraine's gross domestic product (GDP). Analysing these changes is a key factor influencing economic growth and determining the basic principles of formulating an effective economic policy and development strategy for the country in the future.

During the period under review, Ukraine has experienced a series of economic crises, including hyperinflation in the early 1990s, the financial crisis of 2008, and the crisis caused by the annexation of Crimea and the conflict in the east of the country in 2014, the pandemic of 2020, and the full-scale Russian invasion in early 2022. These events have had and continue to have a significant negative impact on the country's economy, causing a drop in GDP, a decline in investment, and an increase in unemployment. Understanding the causes and consequences of these crises is critical to developing strategies to mitigate their impact in the future. The study also highlights the impact of external factors, such as global economic crises, changes in world markets and international sanctions, on Ukraine's economic stability.

In addition, the study is relevant in the context of Ukraine's European integration processes. Identifying economic challenges and analysing GDP dynamics will help to develop effective measures for Ukraine's integration into the European Union, increasing its competitiveness in the international arena and attracting foreign investment.

Ensuring macroeconomic stability is a key task for any country. An analysis of GDP fluctuations allows assessing the effectiveness of political and economic decisions made in different periods and determining the necessary changes to maintain stable economic growth.

Structural transformations of the economy, interregional differentiation and qualitative problems of economic growth are relevant for both developed countries and countries with economies in transition, such as Ukraine, according to L. Simkiv *et al*. (2022). Usually, the tools of the "backwardness funnel" are used to determine the disproportion of economic growth in regions. Using this method, researchers have found that most regions lag behind the average Ukrainian GDP per capita for a period of four to six years.

O. Yemelyanov *et al.* (2019) analyse the ability of certain sectors of the economy to ensure a steady reduction in natural gas consumption in the context of economic growth and corresponding GDP growth. The authors identify six types of relationships between changes in sectoral value added and energy consumption, including natural gas, and establish the conditions under which economic growth can be accompanied by a reduction in energy consumption.

V. Palekhova (2021), analysing Ukrainian and Polish GDP indicators, found that the Polish economy generally complies with most of these rules, while the Ukrainian economy does not. Poland demonstrates success due to compliance with most of the rules, except for the demographic aspect, which is already being further adjusted. At the same time, in Ukraine, problems that are in line with global trends take the form of populism, corruption, inefficient investments, etc. This analysis helps to structure the main factors, identify multidimensional problems, such as migration, and identify secondary problems that indicate inconsistency in reforms.

O. Mykytiuk *et al.* (2020) investigate the role of welfare and investment as the main drivers of economic growth. The analysis of data from Ukraine, Georgia, Serbia, and Romania shows that foreign direct investment is one of the key sources of GDP growth. Investments contribute to economic development, and their increase has a positive impact on macroeconomic indicators, such as the inflation rate and the discount rate. This demonstrates the importance of creating a favourable investment climate to ensure sustainable economic growth in Ukraine.

The implementation of government policies aimed at supporting "active ageing" will contribute to economic growth by increasing formal employment of people over 60 and reducing informal employment. V. Heyets *et al.* (2019) use a linear regression equation to confirm the hypothesis of a positive impact of active ageing on economic dynamics and productivity in Ukraine. Thus, increased healthcare expenditures, which depend on the activity and mobility of older people, can contribute to economic growth. On the other hand, the absence of appropriate government policies leads to an increase in informal employment and the shadow economy, which negatively affects GDP. VAR modelling has confirmed the relationship between real GDP, informal employment and the size of the shadow economy in Ukraine.

There is a close relationship between the rate of economic growth and the competitiveness of a country: higher economic growth rates contribute to increased competitiveness and vice versa, as noted by H. Fyliuk *et al.* (2019). Various indicators were used to characterize competitiveness, including the Global Competitiveness Index (GCI). The authors substantiated that in order to reach the level of economic development of developed countries, Ukraine and other countries with an average income of USD 8000-9000 per capita GDP should ensure annual growth of at least 8%. This increase is necessary to improve the living standards of the population and achieve competitiveness on the global stage. In their research, L. Matvejciuk & O. Solovyov (2020) emphasize that in order to achieve sustainable economic growth, it is necessary to strengthen the role of the industrial sector, which is key to Ukraine's economy.

One of the main problems when considering changes in GDP is the growing disconnect between monetary and fiscal policies, which significantly affects the country's economic expansion. S. Mishchenko *et al.* (2019) used an autoregressive distributed lag (ARDL) model and found that the inconsistency between monetary and fiscal policies leads to high volatility of macroeconomic indicators. The analysis of the impact of the dynamics of the M3 monetary aggregate (an indicator of the money supply in the economy), the inflation rate and the weighted average prime interest rate on the real GDP growth rate indicates the need to overcome the antagonism between monetary and fiscal policies and strengthen their coordination to stimulate economic growth (Chyzh & Urban, 2023).

The study of Ukraine's economic challenges and GDP dynamics over the period from 1991 to 2023 is a deeply researched topic that attracts numerous scholars and economists. A significant number of studies have analysed various aspects of the country's economic development, including structural reforms, the impact of external factors, macroeconomic policy, and socioeconomic consequences. However, the above issues require further study to ensure a more complete understanding and development of effective strategies for the country's economic development.

The aim of the study was to conduct a comprehensive analysis of economic changes and challenges that have affected Ukraine's GDP since independence, in the context of identifying the key factors that have led to economic growth and recessions. To achieve this goal, the following tasks were performed: identifying key economic issues; studying the impact of important political events, such as the Orange Revolution, the annexation of Crimea, the COVID-19 pandemic and the full-scale invasion of Russia, on the country's economy; developing recommendations to ensure the country's balanced development in the future and implementing comprehensive reforms aimed at improving economic stability and competitiveness.

Materials and Methods

To achieve the research objective, various sources were used, which allowed substantiating the dynamics of changes in the economic indicators of the Gross Domestic Product of Ukraine for the period from 1991 to 2023. The main sources of data were official statistical reports of the State Statistics Service of Ukraine, which provided detailed information on the country's economic performance. In addition, publications by international organizations such as the International Monetary Fund and the World Bank provided a global perspective and comparative analysis of Ukraine's economic development. Analytical reports by the Atlantic Council (Ukraine moves closer…, 2021) and the Centre for Economic Strategy provided additional analysis and recommendations based on in-depth analysis of current economic conditions and forecasts.

To analyse the economic development of Ukraine, data on GDP, inflation, budget deficit, foreign direct investment and other key macroeconomic indicators were collected. The economic transformations were characterized on the basis of data on GDP per capita in US dollars and annual growth rates, as well as budget deficit indicators, which allowed assessing the overall economic situation of the country at different periods over three decades.

Regression analysis was used to examine the relationships between key economic indicators, including between GDP and energy consumption, corruption, innovation and institutional change. The threshold regression allowed identifying critical GDP values at which significant changes in the relationships between key indicators occur and points where economic reforms can have the greatest impact, and to develop appropriate strategies to stimulate economic growth.

The impact of political and socio-economic factors on Ukraine's development was assessed using quantitative analysis. The comparative method was used to compare the economic and political development of several post-Soviet republics after gaining independence in 1991. In particular, the economic difficulties and political instability in Ukraine, Azerbaijan, Georgia, and Uzbekistan are examined, their GDP per capita and main challenges are indicated. This allows us to see the similarities and differences in their development paths, as well as the impact of various factors on their economies and social structures.

The econometric analysis included the use of regression models to determine the relationship between the reforms and changes in economic indicators such as GDP, inflation, unemployment, etc. Panel data was used to analyse the structural reforms implemented in Ukraine and their impact on economic indicators. At the same time, time series models helped to assess the impact of reforms on economic development in the long term. Using case-study tools, specific examples of reforms implemented in Ukraine were substantiated. Measures aimed at fighting corruption, improving the investment climate and increasing the transparency of public administration were described. A comprehensive approach to the study of the main research problem allowed us to summarize and substantiate recommendations for further economic reforms and strategies to increase Ukraine's GDP. These recommendations included measures to stabilize the political situation, modernize the economy, support innovative industries and attract foreign investment.

Results

Political and economic situation in the first decade after Ukraine's independence

In 1991, after gaining independence, Ukraine became one of the poorest Soviet republics, with a GDP per capita of only US$1307. Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, and Uzbekistan experienced a similar political and socio-economic crisis. Since gaining independence, Azerbaijan has faced serious economic difficulties and political instability, in particular due to the conflict in Nagorno-Karabakh. Its GDP per capita in 1991 was one of the lowest among the post-Soviet republics. However, since the mid-1990s, the country has begun to stabilize, largely due to its oil and gas resources. The signing of the "Contract of the Century" in 1994 attracted significant foreign investment in the oil sector, which subsequently contributed to economic growth (The Underachiever: Ukraine's…, 2012).

In the first years of independence, Georgia experienced a severe economic crisis, accompanied by political instability and civil conflicts in Abkhazia and South Ossetia. The country's economy was disorganized and GDP per capita was low. It was only in the second half of the 1990s, after the start of reforms and the stabilization of the political situation, that the country's economic situation began to improve, although the process was slow and unstable. Uzbekistan's independence was accompanied by the preservation of a large part of the Soviet administrative command system, which slowed the process of transition to a market economy. GDP per capita remained low, but the country avoided major economic disorganization due to centralized management. Uzbekistan has been slow to implement economic reforms, focusing on maintaining social stability and gradually transitioning to market relations.

Ukraine's historically established agrarian-industrial model has undergone significant transformations under the influence of political and economic processes of the twentieth century, including two world wars, civil war, forced collectivization, Stalinist industrialization and German occupation during World War II. These events led to environmental problems, social tensions and an imbalance between the agricultural and industrial sectors of the economy. After gaining independence, Ukraine began to build a functioning democratic state, an active civil society and a competitive economy integrated with both post-Soviet and European markets. However, the first years of independence were characterized by political instability and economic disruption.

After Ukraine gained independence in 1991, a large-scale transition from a Soviet-style planned economy to a market economy took place. This process was accompanied by significant structural changes and disorganization of economic activity. The severance of economic ties with other former Soviet republics, which had been important trading partners, led to a decline in production and exports. Privatization of land and other real estate was part of broader economic reforms. The main goal was to reduce state control over the economy, increase the efficiency of enterprises and attract investment. However, the process has been plagued by numerous problems, including corruption, lack of transparency and political instability. Successful privatization deals, such as the sale of Kryvorizhstal, were the exception to the rule. In general, the privatization process contributed to the formation of elements of an "oligarchic system" that controlled large segments of the economy and did not always generate significant economic growth.

One of the most serious challenges of this period was hyperinflation. In particular, in 1992-1994, inflation reached incredibly high levels, reaching several thousand per cent per year. This meant that the prices of goods and services increased many times over, which significantly reduced the purchasing power of the population. Citizens lost their savings, wages did not keep pace with the rapid price increases, leading to mass impoverishment (The Underachiever: Ukraine's…, 2012). In 1996, Ukraine's GDP was USD 46.08 billion. In the following years, the country gradually recovered from the crisis of the early 1990s, and GDP began to grow, reaching USD 181.31 billion in 2008. This growth was driven by stabilization measures, the introduction of a new currency (the hryvnia), and the start of privatization of state-owned enterprises (Ukraine: Gross domestic…, 2024).

The significant decline in production also acted as a negative trigger for the then unstable economic development. Most enterprises failed to adapt to the new market conditions, and their products lost competitiveness both on the domestic and foreign markets. The budget deficit and public debt became another serious problem. The government was forced to resort to significant borrowing, which increased the debt burden on the economy. At the same time, budget expenditures on social needs, such as healthcare, education and social protection, were being cut, further worsening the socio-economic situation.

The introduction of the national currency, the hryvnia, in 1996 was an important step towards stabilizing the financial system. However, the stabilization process was complex and required significant efforts by the government and the National Bank of Ukraine to control inflation and stabilize the exchange rate (Spytska, 2023). It is worth noting that before the presidency of Leonid Kuchma (1994-1996), macroeconomic and structural policies were inconsistent. Liberalization, stabilization, privatization and institutional changes, which covered aspects of the Washington Consensus, were accompanied by growing corruption and shadow economy, which made economic stabilization difficult (Table 1). The budget deficit was 14.4 per cent of GDP, barter, the use of so-called "surrogate money" and foreign currency were widespread, and official GDP almost halved between 1990 and 1994 (Ukraine: Gross domestic…, 2024).

Table 1. Dynamics of the main economic indicators of Ukraine (1991-2000)

Year	GDP per capita (USD)	GDP growth (%)	Budget deficit (%)
1991	1307	-9.7	14.4
1992	1100	-13.6	12.8
1993	950	-18.0	15.2
1994	900	-22.7	14.4
1995	880	-12.2	13.7
1996	860	-9.7	12.1
1997	870	2.1	10.8
1998	880	2.3	9.4
1999	890	2.5	8.7
2000	900	5.8	7.3

Source: compiled by the author based on data from The Underachiever: Ukraine's Economy Since 1991 (2012)

Thus, Ukraine faced profound economic and political challenges in the first decade after independence. High levels of corruption, an expanding shadow economy and political instability hampered the development and establishment of functional administrative institutions. Despite a difficult start and significant challenges, Ukraine has managed to lay the foundations for future growth and development. Thus, starting in the 2000s, the national economy began to show signs of recovery, and GDP grew by 5.8%.

Economic challenges and political crisis at the beginning of the new millennium

In the new millennium, especially in the period from 2000 to 2004, Ukraine continued to actively privatize state-owned enterprises in order to create a competitive market environment and improve economic efficiency. Privatization was one of the key economic reforms aimed at transforming the former socialist structures into modern market mechanisms. State assets were sold to private investors, including both domestic and foreign capital entering the Ukrainian market.

The privatization process attracted significant investments in various sectors of the economy, in particular to modernize production and introduce new technologies, which increased labour productivity and the competitiveness of Ukrainian products on the international market. During this period, GDP grew steadily, with an average annual growth rate of around 7-9%. This growth was driven not only by structural changes in the economy, but also by external economic factors, such as favourable conditions on global markets and growing demand for Ukrainian products.

However, along with positive aspects, the privatization process in Ukraine has been accompanied by significant problems. A significant part of state assets was acquired by individuals close to the political elite, often at low prices, which led to a significant corruption component in the privatization process. This led to an uneven distribution of assets and deepened social inequality in the country. As a result, many privatized enterprises did not receive the necessary investment for development, and their productivity continued to be low.

Corruption scandals related to privatization caused a wide public outcry and reduced the level of trust in the government and economic reforms in general. The lack of transparency and effective control over privatization undermined the confidence of foreign investors and created additional risks for the country's economic development.

While noting both sides of the privatization process, it is important to emphasize that the period from 2000 to 2004 was an important stage in Ukraine's economic history, determining further trends in the development of a market economy and influencing the structure of the national economy (Ukraine: Gross domestic…, 2024). The events of the Orange Revolution in 2004 were a precondition for creating new prospects for economic development through integration with the European Union. In 2009, Ukraine's GDP declined to USD 117.08 billion due to the global financial crisis. This decline was due to a decrease in external demand for Ukrainian products, a reduction in investment, and financial difficulties within the country (Ukraine: Gross domestic…, 2024). After the 2009 crisis, the economic situation in the country stabilized and in 2013 GDP increased to USD 175.78 billion. This situation demonstrated the effectiveness of economic reforms, increased investment flows and improved foreign trade.

Implementation of comprehensive reforms, course towards European integration and stabilization of GDP

The signing of the Association Agreement with the EU in 2014 was an important step in this direction. However, political instability, the conflict in eastern Ukraine and the annexation of Crimea by Russia in 2014 led to a significant decline in economic activity. Thus, Ukraine's GDP declined by 6.6% in 2014 and by 9.8% in 2015.

After 2014, the Ukrainian government initiated a series of comprehensive reforms aimed at stabilizing the economy and increasing its competitiveness. The reforms covered several key areas, including the energy sector, decentralization of power, improvement of the business climate and the fight against corruption. The aim of the reforms was to create more transparent and efficient economic governance mechanisms, which should have contributed to productivity growth and foreign investment.

Significant changes were made in the energy sector to reduce dependence on imported energy resources and improve the country's energy efficiency. State subsidies for gas were reduced, allowing for the introduction of market-based pricing mechanisms, and contributed to the stabilization of the financial system, as state budget expenditures on energy subsidies were reduced and the fiscal deficit was reduced. In addition, the reform of the energy sector has helped attract investment in infrastructure modernization and the development of alternative energy sources. The reforms also included decentralization of power, which involved the transfer of significant powers and resources to the local level. This was aimed at improving the efficiency of governance and stimulating regional economic development. Decentralization helped to strengthen local governance and boost local initiatives, which had a positive impact on economic activity in the regions.

At the same time, the government implemented measures to improve the business climate, enhance the regulatory environment and simplify business processes. In particular, the government simplified business registration procedures, reduced the number of regulatory barriers, and introduced new mechanisms to support small and medium-sized businesses. These steps contributed to the growth of entrepreneurial activity and the attraction of domestic and foreign investment in various sectors of the economy. A separate area of reforms was the fight against corruption schemes, which significantly hampered the implementation of reforms and damaged the country's reputation in the international arena. The government has implemented a number of anti-corruption measures, including the creation of independent anti-corruption institutions, reform of law enforcement agencies and the judiciary. This has improved trust in state institutions and reduced corruption, which has had a positive impact on the investment climate.

As a result of the reforms implemented, the Ukrainian economy has begun to show signs of stabilization. Ukraine's gross domestic product (GDP) began to grow slowly, demonstrating a positive trend of 2-3% annually. This indicated a gradual recovery of the economy after the crisis and laid the foundation for further sustainable growth. Since 2016, Ukraine's economic recovery has been gradual, with gross domestic product (GDP) increasing to USD 153.95 billion in 2019. This economic growth was made possible by the implementation of key reforms and substantial support from international financial institutions (The Underachiever: Ukraine's…, 2012).

The stabilization of the political environment allowed the government to focus on implementing the necessary structural reforms, which included reforming the banking sector, strengthening public financial management and increasing transparency in the management of state-owned enterprises. In addition, financial and technical support from international organizations such as the International Monetary Fund, the World Bank and the European Bank for Reconstruction and Development, which provided not only financial resources but also expert assistance for the implementation of reforms, was an important factor in the economic recovery. As a result of these measures, Ukraine's economy demonstrated positive trends that contributed to GDP growth and gradual stabilization of macroeconomic indicators.

In 2020, Ukraine's GDP declined to USD 130.92 billion as a result of the global COVID-19 pandemic, which caused a significant economic downturn (Fig. 1). The pandemic affected all sectors of economic activity, leading to a decrease in consumption and investment, as well as a decline in production and exports. These factors negatively affected the country's macroeconomic indicators.

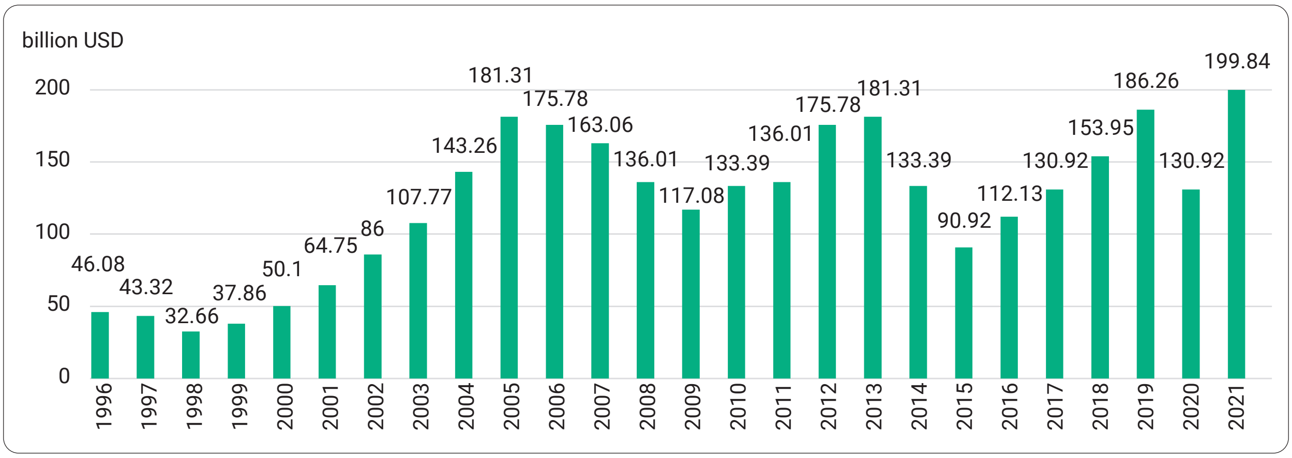

Figure 1. Dynamics of Ukraine's GDP (1996-2021)
Source: compiled by the author based on data from Ukraine: Gross domestic product (GDP) from 1996 to 2028 (2024)

Due to the easing of quarantine restrictions after 2020, economic activity recovered and consumption and investment increased, leading to a significant increase in the country's GDP. In 2021, Ukraine's GDP reached USD 199.84 billion.

Sectoral distribution of Ukraine's GDP

The sectoral distribution of Ukraine's GDP is extremely important for understanding the structure of the national economy and its dynamics over the period of independence. For example, industry, which used to dominate the economy, has experienced a significant decline, while other sectors, such as agriculture and services, have begun to gain importance. The services sector has started to play an increasingly important role, in particular, due to the development of information technology, financial services and trade. In 2010, the share of the services sector in Ukraine's GDP was around 55%. The agricultural sector remains an important sector, contributing a significant share of exports and creating jobs in rural areas. According to the World Bank, in 2014, the share of industry in GDP declined to 25%, while the service sector remained at around 60% (Fig. 2).

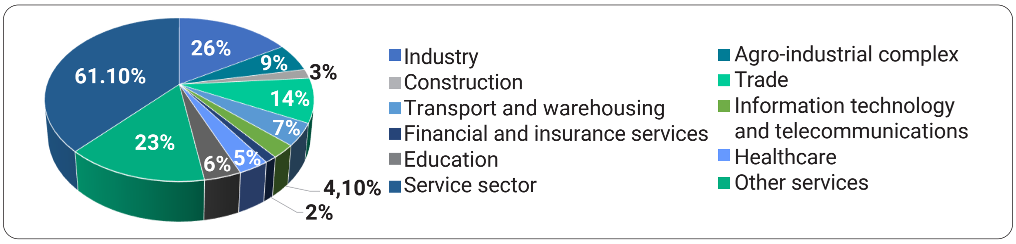

Figure 2. Analysis of the distribution of GDP share in different segments of the Ukrainian economy as of 2021
Source: compiled by the author based on the data of Gross domestic product of Ukraine in 2021 (n.d.)

Recent years have seen an increase in the role of innovative and high-tech industries, as well as intensification of international trade and investment. According to the National Bank of Ukraine, in 2021, the share of information technology and telecommunications in GDP increased to 4.1%, which is evidence of a gradual shift in the economy towards high-tech sectors

The impact of a full-scale invasion on the overall economic situation in Ukraine

In 2022, as a result of Russia's full-scale invasion, Ukraine's GDP fell by almost 30%. However, in 2023, economic growth exceeded expectations. Thus, experts of the National Bank of Ukraine estimated the annual real GDP growth rate at 5.7%, while the initial forecast for 2023 was only 0.3% (Statistics at the…, 2024). According to the National Bank of Ukraine and the International Monetary Fund, GDP is expected to grow by more than 4% annually in the coming years. Even if the war is projected to end by the end of 2024, Ukraine's real GDP will only reach pre-war levels in 2030. After all, in 2022, potential output fell by more than USD 150 billion, and much of the production capacity and infrastructure was destroyed.

The World Bank, together with the Government of Ukraine, the European Union and the United Nations, has jointly estimated the total cost of reconstruction and economic recovery in Ukraine over the next decade at US$486 billion. This amount covers large-scale efforts to rebuild infrastructure, rebuild housing, restore industrial facilities and introduce new projects to ensure sustainable economic growth and development after the period of military conflict. The planned investments involve the active participation of international partners and organizations, which will provide the necessary financial support for the implementation of large-scale projects.

As of the end of 2023, direct losses caused by the war were estimated at USD 152 billion. These losses affect several key economic sectors, including housing, transport infrastructure, trade, industry, agriculture, and energy. Destroyed residential buildings, damaged roads and bridges, lost productive capacity of enterprises and destroyed cultural sites pose serious obstacles to the normal functioning of the economy and require significant financial investments for reconstruction (Studinski, 2022).

Particular attention should be paid to estimates of the indirect costs of war, which amount to almost $500 billion. Indirect costs include lost economic opportunities, reduced labour productivity, a decline in the country's investment attractiveness, healthcare, and social security costs for the victims, as well as costs for temporary housing and support for internally displaced persons. These losses have a significant long-term impact on the economy, reducing its potential for rapid recovery and growth. The need to rebuild economic infrastructure after the war requires a consolidated effort by the international community, which can provide financial and technical assistance to Ukraine. Reconstruction and recovery plans should include both immediate measures to rebuild critical facilities and long-term strategies aimed at creating conditions for sustainable economic development and improving the quality of life of citizens. International financial institutions, partner governments and private investors should play a key role in this process by providing the necessary resources and investments to rebuild Ukraine's economy.

Human capital has also suffered significant losses: more than 6.4 million Ukrainians have become refugees and another 3.7 million are internally displaced, representing 23% of the pre-war population (Table 2). The war has led to a significant deterioration in educational services, and the decline in the number of highly skilled workers will affect overall productivity by around 7% by 2035.

Table 2. Analysis of the dynamics of the deviation of real GDP from the level of 2021 and annual real GDP growth from 2021 to 2035

Year	Deviation of real GDP from the level of 2021 (%)	Real GDP growth (%)
2021	0	0.0
2022	-25	-25.0
2023	-5	5.0
2024	-10	4.0
2025	-9	4.5
2026	-8	4.2
2027	-7	4.1
2028	-6	4.0
2029	-5	4.3
2030	-4	4.1
2031	-3	4.2
2032	-2	4.5
2033	-1	4.7
2034	0	5.0
2035	3	5.2

Source: compiled by the author based on data from Ukraine: Gross domestic product (GDP) from 1996 to 2028 (2024)

Foreign direct investment is an important source of capital for the Ukrainian economy, contributing to industrial modernization, job creation and productivity growth. However, the level of this investment has fluctuated significantly depending on the political and economic stability in the country. For example, after the annexation of Crimea and the outbreak of the conflict in eastern Ukraine in 2014, investment fell sharply as investors began to avoid risks associated with instability. In 2022, foreign direct investment fell to $848 million, down from $7.3 billion the previous year, due to the impact of Russian aggression. International financial assistance, in particular, from the US and the EU, played a key role in stabilizing the Ukrainian economy during the crisis. Since the start of Russia's full-scale invasion in 2022, Ukraine has received significant financial support from international partners. For example, the US Congress allocated a total of $113 billion in aid to Ukraine, of which $61.8 billion was earmarked for military assistance and the rest for civilian aid and infrastructure reconstruction (Krishna, 2023). This support has helped to maintain macroeconomic stability and meet the basic needs of the population.

Structural reforms, energy independence and business integration

In order to develop effective ways and strategies to increase Ukraine's gross domestic product, a comprehensive approach, including both short-term and long-term measures, is needed. Among the priority steps are stabilizing the political situation and ensuring security, which will create a favourable climate for domestic and foreign investment. It is also important to modernize and diversify the economy, in particular, by supporting innovative industries and technology start-ups (Fig. 3).

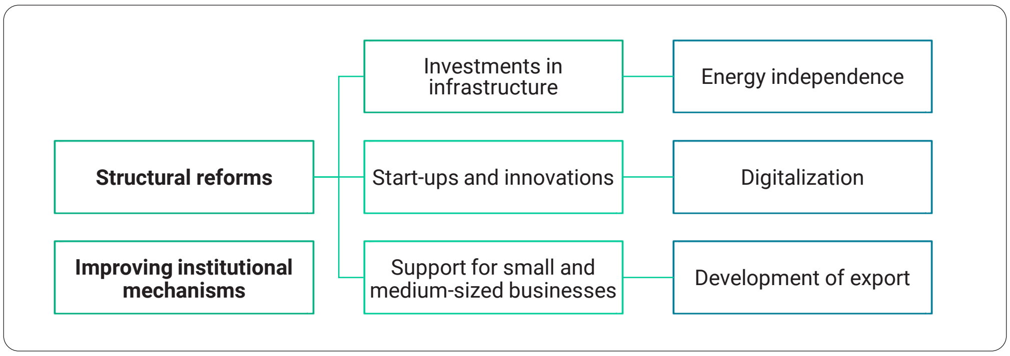

Figure 3. Possible ways and strategies to increase Ukraine's GDP

Source: compiled by the author

To boost Ukraine's GDP, it is critical to continue structural reforms, including fighting corruption, increasing transparency in public administration and improving the investment climate. Reducing corruption and improving institutional arrangements will help attract more foreign investment and support domestic business development. Building energy independence is an important aspect of economic stabilization. The resource conservation system requires the development of own energy sources, including alternative ones, followed by the modernization of the relevant infrastructure. This governmental position will reduce dependence on energy imports and increase the economy's resilience to adverse external factors.

Channelling investment flows into infrastructure, especially transport and energy, is a prerequisite for rapid economic growth. Modernization of infrastructure will help boost productivity, improve logistics and regional development. Attracting international financial resources and government infrastructure development programmes can be important catalysts (European Central Bank, 2017). Expanding exports can significantly increase Ukraine's economic potential. To do so, it is necessary to diversify export markets, develop new industries that can compete on the global market, and support export-oriented enterprises. It is also important to conclude international trade agreements that will open new markets for Ukrainian goods and services.

Innovation and new technologies play a key role in the economic growth and development of countries. They help to increase productivity, create new jobs and stimulate competitiveness. Innovations make it possible to use available resources more efficiently, which leads to higher production volumes and improved quality of products and services. The introduction of new technologies allows for the production of more products with fewer inputs, which increases the overall efficiency of the economy and contributes to GDP growth.

Innovation plays a key role in opening up new markets and creating new products, which in turn expands export opportunities and contributes to revenue growth. For example, the development of information technology has spurred the emergence of new industries such as digital services and e-commerce, which contribute significantly to economic growth.

Countries that actively invest in research and development are becoming more attractive to international investors. Investments in innovation help to create high-tech jobs, which increases the level of qualifications of specialists and, consequently, their productivity. It also helps to strengthen positions in global markets and increase the competitiveness of the national economy. Small and medium-sized businesses play a key role in Ukraine's GDP growth due to their ability to adapt and innovate quickly. This segment of the economy creates a significant number of jobs, reduces unemployment and increases household incomes. In addition, competitiveness indicators are increasing, which leads to improved quality of goods and services and lower costs for consumers.

Discussion

The analysis of economic dynamics from 1991 to 2023 shows that the country faced numerous challenges in its development, including the transformation from a planned to a market economy, political instability, military conflicts, and global economic crises. The study shows that domestic factors such as reforms, institutional capacity and investment climate have a significant impact on economic performance. Successful reforms and stabilization of the macroeconomic environment in some periods contributed to GDP growth, while political and economic instability led to recessions.

The introduction of GDP-linked bonds has a significant impact on economic growth in a stochastically growing small open economy. Z. Kalamov & K. Zimmermann (2023) consider a scenario where the government borrows on the international financial market, collects tax revenues and provides public infrastructure, and public debt can be either conventional or GDP-indexed. The above model, calibrated for developing Ukraine, shows that the introduction of such bonds helps to increase the optimal debt-to-GDP ratio, increase the share of public and private capital, and raise the level of taxes. But Q. Chen *et al.* (2024) develop a mathematical model based on a system of two nonlinear delayed differential equations that describes the relationship between GDP growth and public debt. In the model, GDP growth is directly proportional to public debt, and the absence of debt or its low level leads to slow economic growth. It is worth noting that the introduction of GDP-linked bonds increases the optimal debt-to-GDP ratio, which may be important for Ukraine, which often faces problems with high public debt levels. This may show how such bonds can help manage the debt burden.

M. Sikder and J. Wood (2024) note in their research that the integration of green logistics (GL) and circular economy (CE) has an impact on environmental performance and sustainable development for countries that seek to achieve economic GDP growth with environmental sustainability. The authors estimate short- and long-term effects and heterogeneous causal relationships. The long-term results show that CE and GL can reduce CO_2 emissions, while municipal waste generation (GMW) has a negative impact on the environment. M. Mohsin *et al.* (2022) also emphasize in their work the need to adapt green resources to preserve the environment and suggest that policymakers create a regulatory framework to support environmental sustainability. At the same time, X. Wu *et al.* (2023) point out the importance of analysing the relationship between economic growth, rural tourism and the environment, which can help to understand how economic changes affect environmental sustainability in different countries. This approach will allow devising strategies aimed at balancing economic development and environmental protection. In this context, it is impossible to disagree with the results of the research by X. Li *et al.* (2024), which finds that GDP has a significant spatial autocorrelation, gradually decreasing from the centre to the periphery, with residential areas having the highest correlation with GDP, which contributes to urban planning and regional development in terms of environmental protection.

There is no disagreeing that applying an integrated approach with circular economy principles to policies aimed at reducing CO_2 emissions takes into account the relationship between economic activity and the environmental sustainability of a country. At the same time, X. Yao *et al.* (2022) provide suggestions for developing policy initiatives to achieve environmentally sustainable economic growth by analysing the impact of energy consumption, industrialization, GDP growth and urbanization in 23 developing countries over the period 1995-2018, using the Panel ARDL approach and the heterogeneous causality test. M. Mashhadi Rajabi (2023) uses a dynamic recursive computable general equilibrium (CGE) approach to model the Australian economy and analyses the impact of two carbon tax policies with three revenue recycling approaches, confirming that a carbon tax, together with appropriate revenue recycling, reduces CO_2 emissions and contributes to GDP growth.

The COVID-19 pandemic has had a significant impact on global GDP, causing the largest economic downturn since the Great Depression (Silagadze, 2022). In 2020, global GDP declined by around 3.5%, the worst performance since World War II. This situation was caused by the suspension of economic activity due to quarantine measures and lockdowns. Deaths from COVID-19 had a minor impact on GDP, while changes in quarantine measures had a significant impact on economic activity, especially in emerging economies, as noted by J.E. Gagnon *et al.* (2023). Indeed, the pandemic has exacerbated global economic imbalances, widening the gap between developed and developing countries. High-income countries have been able to implement more effective support measures, while low- and middle-income countries, including Ukraine, have experienced much greater difficulties during this period.

An equally important issue is the analysis of the threshold effect of GDP on the causal relationship between GDP and energy consumption. Using the threshold regression technique and panel data from 26 OECD countries for the period 1971-2014, B.L. Tran *et al.* (2022) investigated whether there is a threshold value of GDP in the relationship between GDP and energy consumption. The empirical results showed that when real GDP per capita is less than USD 48,170, there is a unidirectional causal relationship from energy consumption to GDP in both the short and long run.

The results of the study can guide Ukrainian experts in developing energy-saving initiatives and adapting energy policy to the level of economic development, thus contributing to sustainable economic growth and reducing dependence on energy resources. R. Alvarado *et al.* (2023) emphasize the importance of studying the relationship between natural resource rents, technological innovation and economic complexity using panel data methods for GDP indicators. By applying cointegration techniques with structural breaks, the authors find a long-run relationship between natural resource rents and technological innovation. It is worth noting that the importance of economic diversification to reduce dependence on natural resources is key to Ukraine's resource conservation policy (Yaremko & Dumych, 2024). At the same time, it is necessary to develop various sectors of the economy to ensure sustainable economic growth.

At the same time, it is equally important to understand economic challenges and GDP dynamics in order to formulate policies aimed at sustainable development and efficient use of resources. G. Semieniuk (2024) analyses the history of GDP structural revisions in the United States and international comparisons of purchasing power parity, and compares the results of decoupling for the period 1994-2021 for most countries. The study finds that between 10% and 15% of countries change their decoupling status from energy or materials at ten-year intervals, and many countries that previously decoupled are either stopping or starting to decouple again.

Y. Komaki (2023) investigates the high GDP forecast errors of Japan compared to Canada, the United Kingdom, and the United States, finding that the reason is significant fluctuations in quarterly GDP growth rates, and emphasizes the need to study the factors that cause these fluctuations. O. Bolivar (2024) presents an innovative GDP forecasting strategy for developing countries, including Bolivia, reducing the lag in the release of monthly economic growth from six to two months by integrating machine learning techniques with traditional data sources and satellite imagery, which is tested for reliability using various criteria.

An important issue remains the justification of the specifics of using sign restrictions to identify shocks to aggregate demand and aggregate supply in the economies of leading countries. For example, J.C. Della Chang *et al.* (2023) use historical decompositions to analyse the components of real GDP growth and inflation caused by these shocks. Using the Pagliacci approach, the study assesses the importance of supply shocks for short-term fluctuations in output. Indeed, the above studies highlight the need for thorough reporting, forecasting and data sharing to improve comparisons and monitoring of the current state. It is international experience that is relevant for Ukraine in the context of its integration into the global economy and participation in international environmental sustainability initiatives.

It is worth noting that effective energy-saving management can contribute to a significant increase in GDP, which is relevant for Ukraine in the context of economic challenges and the need for growth (Shahini *et al.*, 2024). For example, a market-based energy conservation model for improving energy conservation in China is presented in the results of research by J. Xue *et al.* (2024). This model consists of three parts: an optimization model with two objectives (GDP and social benefits), a model for determining the optimal volume of energy-saving allowance trading in each province with a division into buyers and sellers of allowances, as well as a cooperative game model for energy saving allowances; and a Nash distribution model for fair distribution of benefits from cooperation between provinces. The analysis was carried out on the case of Shandong, Zhejiang and Jiangsu provinces, showing that interprovincial cooperation based on option trading increased social benefits by 2.79% and GDP by 273.636×10^9 CNY. After fairly distributing the benefits, each province benefited from the cooperation, demonstrating the effectiveness of the proposed model. At the same time, Y. Sun *et al.* (2024) are of the opinion that higher GDP growth targets suppress corporate innovation in China, especially in less developed regions, through direct and indirect government intervention mechanisms, which highlights the risks of over-focusing on short-term economic success for long-term prosperity.

Large-scale globalization transformations require the use of innovative approaches such as deep learning algorithms and artificial neural networks to forecast economic indicators, which can be useful for improving forecast accuracy and decision-making in times of economic instability. U. Shahzad *et al.* (2023) use deep learning (DL) and artificial neural network (ANN) algorithms to predict the response of GDP to supply chain disruptions, energy prices, economic policy uncertainty, and Google trends in the United States based on monthly data from 2008 to 2022.

The study covers various recessionary episodes, such as the 2008 mortgage crisis, the COVID-19 pandemic, Russia's recent invasion of Ukraine, and the current economic recession in the United States. The results show the high sensitivity of monthly GDP fluctuations to changes in supply chain productivity and highlight the significant role of Google trends in ensuring the consistency of GDP forecasts. The findings also point to the greater forecasting efficiency of DL compared to ANN, which has important implications for global policymakers, decision-makers, and firm managers. At the same time, R. Gatti *et al.* (2024), on the other hand, highlight the impact of data transparency on the accuracy of GDP growth forecasts, finding that increased data transparency significantly reduces forecast errors, with World Bank forecasts being more accurate and less optimistic than IMF and private sector forecasts, with particularly large forecast errors in the Middle East and North Africa region.

The analysis demonstrates the importance of international support and cooperation for economic stabilization, as well as the significant impact of green technologies and the circular economy on environmental sustainability. The study also highlights the importance of data transparency for accurate forecasting of economic growth and the need to adapt energy policy to the level of economic development. Prospects for further research include the development of innovative approaches to forecasting economic indicators, the use of machine learning and artificial neural network methods, and the study of the relationship between economic activity and environmental sustainability, which will contribute to the development of more effective strategies for the sustainable development of Ukraine's economy.

Conclusions

This study has identified and confirmed numerous important aspects of Ukraine's economic development over the three decades of independence. One of the main findings is that Ukraine, like many other post-Soviet republics, experienced a deep political and socio-economic crisis in the early 1990s. GDP per capita in 1991 was only US$1307.

It is determined that the historically formed agrarian-industrial model of Ukraine has undergone significant transformations under the influence of political and economic processes of the twentieth century. Events such as two world wars, civil war, forced collectivization, Stalinist industrialization and German occupation led to environmental problems, social tensions and imbalances between the agrarian and industrial sectors of the economy.

An analysis of economic development has shown that since independence, Ukraine has experienced political instability, economic disorganization and hyperinflation. These factors have significantly complicated the transition from a Soviet-style planned economy to a market economy. However, despite the difficult "start" of an independent Ukraine, gradual reforms and stabilization measures, such as the introduction of a new currency (the hryvnia) and the privatization of state-owned enterprises, have contributed to a gradual recovery from the crisis and the resumption of economic growth. The findings of the study show that successful reforms aimed at fighting corruption, increasing transparency in public administration and improving the investment climate are critical to ensuring sustainable economic growth. For example, reforms in the energy sector and decentralization of power, as well as improvements in the business climate, have significantly contributed to the stabilization of the financial system and economic recovery.

It has also been established that foreign direct investment and international financial assistance play a key role in stabilizing and restoring Ukraine's economy. Attracting investment contributes to industrial modernization, job creation and productivity. In addition, financial and technical support from international organizations such as the IMF, the World Bank and the EBRD has helped to stabilize macroeconomic indicators and ensure positive economic growth trends. In general, to stabilize GDP in Ukraine, it is necessary to take a comprehensive approach to solving economic problems, ensuring political stability, structural reforms, infrastructure modernization, energy independence, support for SMEs and intensified international cooperation. Only under these conditions can we expect sustainable economic development and improved welfare of the population.

To improve its performance in the future, Ukraine needs to continue its integration into the global economy, conclude international trade agreements and actively attract investment in high-tech sectors. Supporting small and medium-sized businesses, developing innovative technologies, and promoting exports could be key drivers for sustainable economic growth. Although the study of economic challenges and GDP dynamics in Ukraine in the period from 1991 to 2023 is significant, it has several limitations that should be taken into account. First, individual interpretations of historical events may differ, which affects the objectivity and universality of the study's conclusions. The influence of political processes makes forecasting difficult, and economic instability affects the accuracy of the analysis of growth and recessions. In addition, cultural and social differences in different regions of the country play an important role in the perception of economic processes, and international events and geopolitical changes have an impact on the country's overall development.

Prospects for further research may include a more detailed study of the impact of political factors on the country's economy, analysis of microeconomic stability, research on the relationship between economic instability and socio-cultural aspects of development, research on the prospects for foreign economic relations and the possibility of global trends affecting Ukraine's economic dynamics. Another important area could be the analysis of innovative approaches to stimulating economic growth and the study of the impact of digitalization on the development of the Ukrainian economy.

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None.

Conflict of Interest

None.

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Економічні виклики та динаміка ВВП України в період з 1991 по 2023 роки: аналіз росту та рецесій

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Анотація. Необхідність ґрунтовного вивчення динаміки економічних показників валового внутрішнього продукту (ВВП) за більше ніж 30 років незалежності України зумовлена низкою реформ, тривалими конфліктами на Сході України, пандемією COVID-19 та її наслідками, повномасштабним вторгненням рф, а також глобальними макроекономічними тенденціями. Метою даного дослідження був детальний аналіз економічних процесів, які вплинули на розвиток України після здобуття незалежності, у розрізі динаміки ВВП для виявлення ключових факторів, що сприяли економічному зростанню та спадам. Для досягнення мети проведено комплексний аналіз економічної статистики, історичних даних та політичних подій. Результати дослідження показують, що перехід від планової економіки радянського типу до ринкової економіки супроводжувався значною політичною та економічною дезорганізацією, а також викликами, пов'язаними зі структурними змінами та процесами приватизації. Проаналізовано динаміку основних економічних показників України, включаючи ВВП на душу населення, темпи зростання ВВП (%) та дефіцит бюджету (%) за період з 1991 по 2023 роки. Виявлені ключові проблеми, такі як гіперінфляція, бюджетний дефіцит та державний борг, і досліджені заходи, спрямовані на стабілізацію фінансової системи. Було проведено аналіз впливу політичних подій, таких як Помаранчева революція, анексія Криму, пандемія COVID-19 та повномасштабне вторгнення РФ, на економічний розвиток України. У ході дослідження було оцінено роль міжнародної фінансової допомоги та іноземних прямих інвестицій у підтримці економіки країни. Отримані дані дозволили визначити основні фактори, які сприяли економічному зростанню та рецесіям, а також оцінити ефективність проведених реформ і політичних рішень. На основі зібраної інформації було розроблено рекомендації для забезпечення стійкого економічного розвитку в майбутньому. Практична значущість цієї роботи полягає у визначенні ключових економічних факторів і розробці стратегій, що можуть сприяти стабільному економічному зростанню та стійкому розвитку України в умовах повномасштабного вторгнення

Ключові слова: структурні реформи; політична нестабільність; іноземні інвестиції; макроекономічна стабілізація; інновації; національна трансформація

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Importance of proper management of public finances in economic development

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Abstract. The purpose of this study was to examine the importance of proper public financial management to ensure economic development in the Western Balkan countries. The study was based on a comparative analysis of financial policies and budget management practices in the countries belonging to the Western Balkans region, namely Albania, Bosnia and Herzegovina, Croatia, Montenegro, North Macedonia, the Republic of Kosovo, and Serbia. The methodological approach included analyses of statistical data from official websites and sources. The key findings of this study included coverage of the role of money in the proper management of public finances, as well as the analysis of the economic policy and management of economic resources of each country in the Western Balkans and comparison of the dynamics of the state budget, revenues, and expenditures for 2021-2023 of all countries in the Western Balkans region. Based on the analysis of statistical data, key aspects affecting the efficiency of public financial management in the Western Balkans were identified, such as the transparency of budgetary processes, the effectiveness of the fight against corruption, and

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the efficiency of the use of financial resources. The unique and objective data obtained in the study helped to cover the specifics of financial management in each of the countries of the region and identify factors limiting or facilitating their economic development. The conclusions of the study emphasised the need for reforms in public financial management in the Western Balkans to support sustainable economic growth and socio-economic stability in the region. A special focus on transparency, efficiency, and accountability for budget spending can help increase investor confidence and strengthen the country's economic system

Keywords: financial sustainability; budget deficit; revenue diversification; macroeconomics; management efficiency

Introduction

Public financial management is one of the key components of any country's economic policy and has a decisive impact on its economic development and stability. In the context of the current challenges and instability of the world economic situation, especially in the context of global crises and recovery from them, the significance of sound public financial management becomes even more relevant. Public financial management in the Western Balkan countries is a particularly relevant issue in the context of their economic development and integration into the global economic system. In recent decades, the region has experienced considerable changes, including political, economic, and socio-cultural transformations. However, the instability and weaknesses in the management of financial resources in the countries of this region have been repeatedly noted, making their path to sustainable economic growth much more difficult.

The problem addressed by this study was to identify and analyse the complexities arising in public financial management in the Western Balkan countries. The rationale behind the choice of the problematic of this study stemmed from the need to scrutinise the management of public money in the Western Balkan countries. Countries in the region, like Kosovo, Albania, North Macedonia, Montenegro, face a range of economic and social challenges that limit the region's development. Lack of public financial management can be an obstacle to achieving stability and sustainable economic growth in this region (Loxha, 2019).

The problem of the branch under study lies in the issue of corruption, public debt, the impact of taxation on the budget deficit of the Western Balkan countries. Several researchers have already addressed this topic, including N. Feruni *et al.* (2020), S. Kihombo *et al.* (2021), F. Morina & V. Misiri (2019). Their studies analysed the impact of corruption on the economic development of the Western Balkan countries, where they found a negative relationship of the impact of corruption, which can be devastating in the Western Balkans, but on the positive side they found benefits from economic freedom and urbanisation compared to the European Union countries. It was also noted that public debt has a weak but statistically significant negative impact on economic growth in the Western Balkan countries. The recommendations therefore accommodated the need for fiscal sustainability measures and effective debt management by governments in the region, since exceeding the threshold of 50.87% of gross domestic product (GDP) could adversely affect economic growth (Bexheti *et al.*, 2020).

When analysing the studies on economic development, innovative financing of goals related to financial integration in the Western Balkan countries, it was found that the I. Lukšić *et al.* (2022), S. Çitaku *et al.* (2020) focused on economic development through the use of bonds and investments designed to attract more financial resources to support the sustainable development goals of the six countries of the Western Balkans. The need to reduce the size of government to promote economic growth by reviewing tax and spending policies was also analysed (Bajra, 2021; Bajrami *et al.*, 2022). Therefore, it is important for the Western Balkan countries to have a prior knowledge and understanding of the institutional and functional development of the financial system in the European Union, specifically the banking arrangements.

The purpose of this study is to examine the role of effective public financial management in promoting sustainable economic development in the Western Balkan countries. To fulfil this purpose, several tasks should be accomplished: to analyse the current state of public financial management practices in the Western Balkan countries; to identify the key challenges and issues affecting the efficiency of public financial management in the region; to develop recommendations for improving public financial management systems in the Western Balkan countries to support sustainable economic growth.

Materials and Methods

The study employed a mixed-methods approach, combining quantitative and qualitative analysis techniques to examine the role of public financial management in promoting economic development in the Western Balkan countries. The qualitative analysis involved a comprehensive review of existing literature, policy documents, and reports related to public financial management and economic development in the Western Balkans. Academic journal articles, publications by international organizations, think-tank reports, and government policy papers were consulted to gain insights into the policy frameworks, institutional arrangements, and key issues affecting public financial management in each country. This literature review helped identify the critical aspects of public financial management systems, such as budgeting processes, expenditure management, revenue mobilization, debt sustainability, and financial transparency and accountability mechanisms.

To analyse the current state of public financial management, a structured assessment framework was developed based on internationally recognized principles and standards of good governance, such as those promoted by the International Monetary Fund (IMF), World Bank, and the Organization for Economic Cooperation and Development (OECD). This framework evaluated various dimensions of public financial management systems, including fiscal policy and budgeting, revenue administration, public expenditure management, accounting and reporting, and external audit and oversight.

The assessment involved examining the legal and regulatory frameworks governing public financial management in each country, as well as the institutional capacities and practices of relevant government agencies and ministries. Data was collected through desk research, analysis of official documents and reports, and consultations with experts and stakeholders when necessary.

To identify key challenges, the assessment results were compared against international best practices and benchmarks for effective public financial management. Gaps, weaknesses, and areas for improvement were identified through this comparative analysis. Additionally, potential risks and vulnerabilities arising from factors like corruption, political instability, or external shocks were also considered. The findings from the quantitative and qualitative analyses were synthesized to develop a comprehensive understanding of the state of public financial management in the Western Balkans and its impact on economic development. Based on this understanding, recommendations for strengthening public financial management systems were formulated, taking into account the specific contexts and needs of each country in the region.

The materials used in the study are significant information resources that have contributed to a thorough analysis of public financial management in the countries of the Western Balkans region. For the quantitative analysis, statistical data from official websites such as the Central Bank of Bosnia and Herzegovina (2023), the National Bank of the Republic of Macedonia (n.d.), the Statistical Office of Montenegro (n.d.), the Statistical Office of the Republic of Serbia (2023), the Croatian National Bank (2024), the official website of the Ministry of Finance of the Republic of Albania (2024), the Central Bank of the Republic of Kosovo (2024), Trading Economics (n.d.) and Take-profit.org (n.d.) were used. The study also used information from the Significance of Money (2023), D. Jajcanin (2024), and Montenegro Government Revenues (n.d.), providing additional context for understanding the management and current state of public resources in the countries of the Western Balkans region.

The recommendations focused on measures to enhance fiscal transparency, improve budget execution and expenditure control, mobilize domestic resources more effectively, ensure debt sustainability, and strengthen governance and accountability mechanisms. International best practices, successful reform experiences from other countries, and inputs from relevant stakeholders were taken into consideration while developing these recommendations.

Results

In modern world, where almost all transactions are made with money, its role in government regulation of the economy becomes critical. Thus, understanding and effective use of money becomes a key objective of government regulation of the economy. The role of money in modern conditions of economic regulation by the state is defined through several key aspects, which are presented in Figure 1.

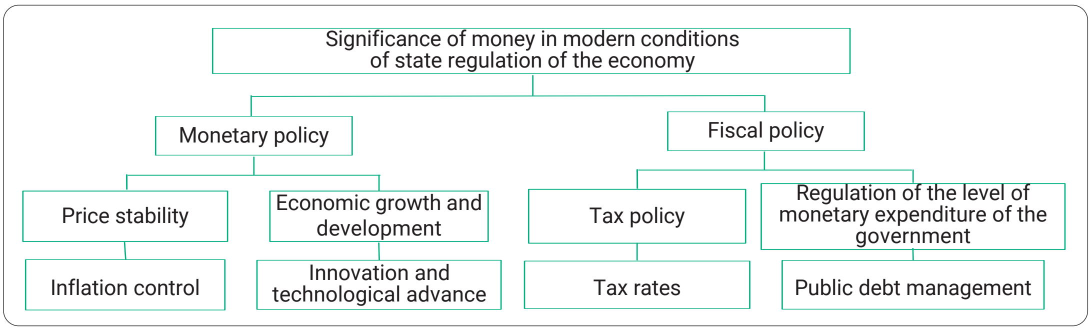

Figure 1. Role of money in modern conditions of state regulation of the economy
Source: developed by the authors based on Significance of Money (2023)

The value of money lies in monetary policy, which is managed by the central bank by regulating interest rates, the money supply, and liquidity. These policies ensure price stability, affecting purchasing power, business competitiveness, and overall economic stability. Stable prices allow consumers to predict spending and businesses to plan production accurately. To maintain stability, the government uses monetary measures to control money supply and interest rates. Inflation threatens economic stability by reducing the purchasing power and competitiveness of businesses. Government intervention controls inflation through monetary measures, building confidence and supporting economic growth. Growth depends on increased production and incomes, which helps create the conditions for technological innovation (Melnykova, 2023). Money provides funding for projects, infrastructure, research, and education, contributing to sustainable economic growth.

In a publicly regulated economy, investment in innovation and technology is vital to fostering economic growth and enhancing national competitiveness. Money is a key resource for financing research, development, and innovation projects, often surpassing the capabilities of the private sector. Governments contribute to this by implementing policies and initiatives to support research, technology development, and startups. In addition, money is an integral part of fiscal policy, which allows for the collection of taxes to fund various programs such as education, healthcare, and infrastructure. Fiscal policy regulates government spending on social programs, infrastructure, and education in order to promote growth and stability (Makohon, 2022). Tax policy, a component of fiscal policy, sets rates and rules to ensure that revenues are raised for public purposes, contributing to the distribution of wealth and reducing inequality. Public debt management is also part of fiscal policy and requires careful monitoring to avoid future financial crises. Ultimately, fiscal policy is the most important tool for achieving economic stability and promoting growth.

Various aspects of the role of money were examined in the modern economic context, including its significance in government regulation of the economy, fiscal policy, stimulating economic growth and investment. It was found that money affects price levels, interest rates, consumer opportunities, and the investment climate, making it a key element in the management of a country's economy. Using the Trading Economics (n.d.) and Take-profit.org (n.d.) websites, the current state of public money management in the Western Balkan countries was analysed. A comparative analysis of public financial management in the countries of the Western Balkans region is vital for understanding financial sustainability and governance effectiveness in this region. Therefore, Figure 2 presents a comparison of the state budget of the Western Balkan countries for 2021-2023.

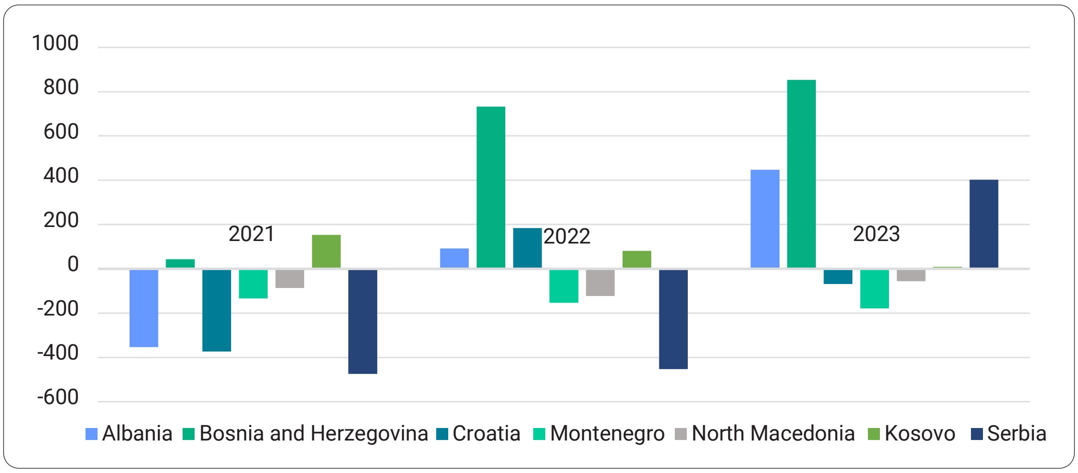

Figure 2. State budget dynamics in the countries of the Western Balkans region for 2019-2023, million EUR
Source: developed by the authors based on the Central Bank of Bosnia and Herzegovina (2023), the National Bank of the Republic of Macedonia (n.d.), the Statistical Office of Montenegro (n.d.), the Statistical Office of the Republic of Serbia (2023), the Croatian National Bank (2024), the official website of the Ministry of Finance of the Republic of Albania (2024), the Central Bank of the Republic of Kosovo (2024), Trading Economics (n.d.) and Take-profit.org (n.d.)

The budget balance analysis of Western Balkan countries from 2021 to 2023 reveals diverse fiscal trends. Albania showed significant improvement, transitioning from a deficit of -354.6 million EUR in 2021 to a surplus of 447.44 million EUR in 2023. Bosnia and Herzegovina demonstrated continuous growth, with an impressive increase from 43.98 million EUR in 2021 to 854.04 million EUR in 2023. Croatia experienced fluctuations, with a notable improvement in 2022 followed by a return to deficit in 2023. Montenegro faced persistent deficits, worsening from -133.1 million EUR in 2021 to -178.5 million EUR in 2023. North Macedonia maintained consistent deficits, though the negative balance reduced in 2023. Kosovo consistently showed positive values, though decreasing from 154 million EUR in 2021 to 8.5 million EUR in 2023. Serbia, which had a significant negative balance, improved to a surplus in 2023. Some countries have positive values, indicating economic improvement, while others have negative values, which may indicate financial problems. For instance, Bosnia and Herzegovina has considerable budget growth from 2021 to 2023, while Serbia has a large negative balance in 2021 but experiences an improvement in 2023. Countries with better governance and less corruption may have a more stable financial sector and the ability to more effectively attract and utilise financial resources for economic development. On the other hand, countries with less developed financial systems and higher levels of corruption may have limited opportunities to attract investment and create stable government budgets.

Figure 3 shows a comparison of the state income of the Western Balkan countries for 2021-2023.

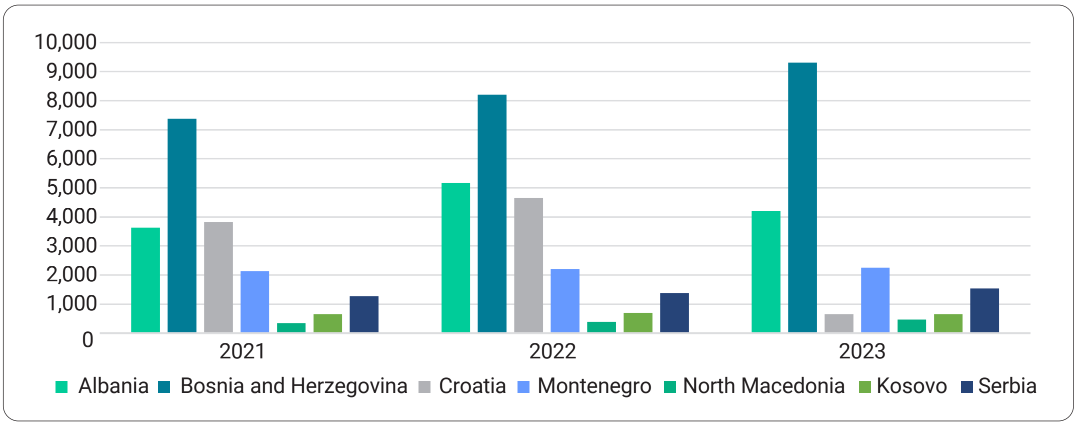

Figure 3. Public revenue dynamics in the countries of the Western Balkans region for 2019-2023, million EUR
Source: developed by the authors based on the Central Bank of Bosnia and Herzegovina (2023), the National Bank of the Republic of Macedonia (n.d.), the Statistical Office of Montenegro (n.d.), the Statistical Office of the Republic of Serbia (2023), the Croatian National Bank (2024), the official website of the Ministry of Finance of the Republic of Albania (2024), the Central Bank of the Republic of Kosovo (2024), Trading Economics (n.d.) and Take-profit.org (n.d.)

The analysis of public revenue in Western Balkan countries from 2021 to 2023 shows varied trends. Albania experienced a significant revenue increase in 2022 but a drop in 2023. Bosnia and Herzegovina demonstrated steady growth each year, reaching 9314.16 million EUR in 2023. Croatia saw a sharp decline in revenue in 2023 following a peak in 2022. Montenegro exhibited a gradual increase in revenues, while North Macedonia had a moderate revenue increase each year. Kosovo's revenues fluctuated slightly, with a slight decrease in 2023. Serbia consistently showed growth in revenues over the years.

Some trends in the dynamics of public revenues of the Western Balkan countries over the three years were observed. According to general indicators, most countries have experienced a year-on-year increase in government revenues. For instance, Bosnia and Herzegovina, Albania, Montenegro, and Serbia showed steady increases in revenues. However, there are countries with fluctuations in the level of government revenues. For example, Croatia has a considerable decrease in 2023 compared to 2022, which could be explained by economic or political factors. Some countries, such as Kosovo and North Macedonia, have lower revenues than other countries in the region. This may be due to economic hardship, political instability, or other factors.

Figure 4 shows the comparison of public expenditure of the Western Balkan countries for 2021-2023.

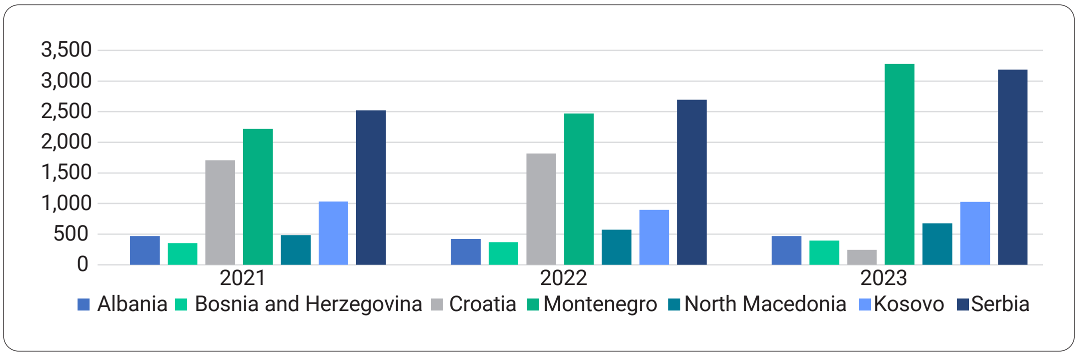

Figure 4. Dynamics of public expenditure in the countries of the Western Balkans region for 2019-2023, million EUR
Source: developed by the authors based on the Central Bank of Bosnia and Herzegovina (2023), the National Bank of the Republic of Macedonia (n.d.), the Statistical Office of Montenegro (n.d.), the Statistical Office of the Republic of Serbia (2023), the Croatian National Bank (2024), the official website of the Ministry of Finance of the Republic of Albania (2024), the Central Bank of the Republic of Kosovo (2024), Trading Economics (n.d.) and Take-profit.org (n.d.)

The analysis of public expenditure in Western Balkan countries from 2021 to 2023 highlights different spending patterns. Albania experienced slight fluctuations in expenditure, ending with a slight increase from 466.71 million EUR in 2021 to 468.93 million EUR in 2023. Bosnia and Herzegovina consistently increased their expenditure each year, from 352.2 million EUR in 2021 to 394.5 million EUR in 2023. Croatia saw a significant decrease in expenditure from 1,707.43 million EUR in 2021 to 242.81 million EUR in 2023. Montenegro had a sharp increase in spending from 2221 million EUR in 2021 to 3282 million EUR in 2023, likely due to infrastructure or social program investments. North Macedonia showed a steady increase in expenditure each year, from 486.66 million EUR in 2021 to 676.69 million EUR in 2023. Kosovo's expenditures fluctuated, with an increase from 1033 million EUR in 2021 to 1027 million EUR in 2023. Serbia demonstrated consistent growth in expenditure, with a notable increase from 2,521.85 million EUR in 2021 to 3,188.09 million EUR in 2023.

Croatia has a significant increase in spending in 2023 compared to previous years, which may be the result of reforms or new programmes. Montenegro also has a notable increase in spending in 2023, which may indicate an increase in social, infrastructure, or other programmes. Kosovo and Serbia are also characterised by rising costs over three years, which may be related to infrastructure development. Northern Macedonia has also experienced an increase in expenditure, but less significant compared to other countries. Albania, Bosnia, and Herzegovina have a slight decrease in expenditure in 2022, but then show an increase again in 2023. Overall, these data show different trends in the development of budget expenditures in the Western Balkan countries, which may be driven by economic conditions, political decisions, or social needs.

Analysis of data on budget balance, public revenues and public expenditures of Albania, Bosnia and Herzegovina, Croatia, Montenegro, North Macedonia, Kosovo and Serbia for the period from 2021 to 2023 reveals significant economic trends and fiscal management strategies. Albania's budget balance shows a marked improvement from a deficit of -9.8% in 2021 to a surplus of 11.8% in 2023. This significant turnaround coincides with fluctuations in government revenues and expenditures. Government revenues peaked at 72.0% of GDP in 2022 before falling slightly to 67.5% in 2023. At the same time, government spending showed a slight increase to 7.5% in 2023 after declining to 5.9% in 2022. This indicates a strategic approach to increase revenues while controlling expenditures, resulting in a positive budget balance.

Bosnia and Herzegovina has experienced a consistent budget surplus, with the largest increase coming in 2022 at 20.4 percent of GDP, rising slightly to 22.5 percent in 2023. Government revenues grew steadily to reach 90.6 percent of GDP in 2023, indicating effective revenue collection mechanisms. Public expenditures also increased slightly but remained relatively low compared to revenues, indicating prudent financial management supporting a budget surplus. Croatia's fiscal performance presents a mixed picture. The country moved from a large deficit of -9.7 percent in 2021 to a surplus of 4.8 percent in 2022, before returning to a small deficit of -1.8 percent in 2023. These fluctuations coincide with changes in government revenue, which rose to 69.1% of GDP in 2022 before falling to 10.3% in 2023. Government spending also changed significantly, peaking at 27.0% in 2022. The dramatic changes indicate instability in revenue sources and problems in expenditure management.

Montenegro faced a persistent budget deficit that increased from -6.2% in 2021 to -8.3% in 2023. Government revenues showed steady but modest growth, reaching 54.5% of GDP in 2023. However, public expenditure rose sharply to 78.8% of GDP in 2023, outpacing revenues and exacerbating the fiscal deficit. This picture is indicative of significant fiscal stress and potential problems with the effective management of public funds. North Macedonia's fiscal deficit has shown improvement, declining from -2.4 percent in 2021 to -1.5 percent in 2023. Government revenues grew steadily, reaching 19.0% of GDP in 2023, while government expenditures also increased to 27.7% of GDP in 2023. Despite the increase in expenditures, the growth rate has been kept relatively low, indicating a balanced approach to fiscal policy.

Kosovo shows a decline in its budget surplus from 7.5% in 2021 to 0.4% in 2023. Government revenues have remained relatively stable at around 30% of GDP, but public expenditures have increased significantly to 46.9% of GDP in 2023. The narrowing surplus reflects the challenges of managing rising expenditures while maintaining revenue levels. Serbia experienced significant fluctuations in fiscal performance, with high deficits of -12.1% in 2021 and -11.5% in 2022, followed by a large surplus of 10.2% in 2023. Government revenues grew steadily, reaching 27.2% of GDP in 2023, while government spending also grew, peaking at 56.9% in 2023. A sharp shift from deficit to surplus implies significant changes in fiscal policy or extraordinary sources of revenue in 2023.

The findings show a wide range of budgetary performance and strategies in the analysed countries. Albania, Bosnia and Herzegovina, and Serbia have made notable progress in improving their budget balances, while Montenegro and North Macedonia are experiencing difficulties in managing their expenditures. The declining surplus in Kosovo and the shifting budget balance in Croatia indicate instability and underscore the need to strengthen fiscal management. How any country manages its public revenues and expenditures is critical in determining its economic stability and growth potential.

The policies and management of economic resources of each of the countries in the Western Balkans region were then analysed. Albania's economic policy aims at reform and modernisation. The country is actively undertaking various measures to stimulate business and attract investment. One of the key strategies is to simplify the tax system and reduce tax burdens on business, which stimulates entrepreneurial activity and investment. Furthermore, the Albanian government is actively working on infrastructure development and support for small and medium-sized businesses. Infrastructure projects such as roads, airports, and tourism development contribute to economic growth and create new jobs. Specifically, Albania is actively developing tourism as one of the main areas of development. The attraction of foreign tourists and the development of tourism infrastructure contribute to the country's foreign exchange earnings and stimulate economic development.

However, Albania also faces internal challenges, such as corruption and an underdeveloped legal system, which can inhibit business and investment. Such problems need systemic reforms and a stronger fight against corruption to create a climate favourable to business and investment.

In the context of economic policy, Bosnia and Herzegovina is on the road to recovery and development after a war that severely damaged its economy. The country is taking various measures to stimulate economic growth and support businesses. One of the primary areas of economic policy is attraction of foreign investments and development of the export sphere. The government of Bosnia and Herzegovina is actively working to create a favourable business environment and improve the investment climate. The country is also focusing on infrastructure development, education, and innovation. Infrastructure projects such as roads, railways, and other facilities contribute to economic development and create new jobs. However, on the road to development, Bosnia and Herzegovina also faces significant internal challenges such as bureaucracy, corruption, and political instability. These factors could have a negative impact on the country's economic development and delay the implementation of necessary reforms. The government of Bosnia and Herzegovina should actively work on reforms to improve the business climate, fight corruption, and ensure legal stability to attract investment and stimulate economic growth.

Croatia, as a member of the European Union, faces specific challenges and opportunities for its economic policy. Accession to the European Union offers new opportunities for the country's development through access to the European market and financial support, but it also places demand on Croatia to implement reforms and achieve high standards of governance. One of the priorities of Croatia's economic policy is to attract foreign investment and stimulate exports. The country is actively developing and supporting the investment environment, as well as making efforts to develop the export sphere and expand international cooperation. Croatia is also focusing on the development of infrastructure, education, and science, which is an essential component of sustainable economic growth and increased competitiveness. Investments in technological development and innovation also play a vital role in the country's economic development strategy. However, Croatia also faces internal problems such as high unemployment, bureaucracy, and corruption. The national government should address these challenges by introducing effective reforms and policies to support entrepreneurship, reduce administrative obstacles, and increase transparency in governance. Such activities will help ensure sustainable economic development and an improved quality of life for Croatia.

Montenegro, as a small country with a small population and a developed tourism industry, faces unique challenges and opportunities in economic development (Montenegro Government Revenues, n.d.). One of the key areas of Montenegro's economic policy is the development of tourism and attraction of foreign investments in this sector. The government actively promotes the development of infrastructure for tourism, supports marketing activities, and creates favourable conditions for investors. Apart from tourism, Montenegro is also developing other sectors such as agriculture, energy, and infrastructure. Diversification of the economy is an essential aspect of a country's economic development strategy, as it helps to reduce dependence on individual sectors and ensure the permanence of economic growth. Establishing effective management of economic resources is another major aspect of Montenegro's economic policy. The government is actively working to improve the business climate, reduce bureaucratic obstacles, and fight corruption to attract investment and encourage entrepreneurship. There are also activities to support small and medium-sized businesses, which are a valuable source of jobs and economic development. Montenegro is actively cooperating with international organisations and other countries to ensure sustainable economic development and improve the living standards of its population. The development of effective mechanisms for managing economic resources is an essential condition for achieving these goals.

North Macedonia, as a country experiencing a transitional phase after the dissolution of the former Yugoslavia, faces complex economic challenges and opportunities. One of the priorities of the country's economic policy is to stimulate economic growth and attract foreign investment. In this context, the government is developing SME support programmes aimed at creating new jobs and supporting entrepreneurship. One of the key areas of the economy of North Macedonia is agriculture. The government is actively working to develop this sector by introducing innovative technologies, increasing productivity, and supporting rural farms. Furthermore, international trade agreements are being concluded and expanded to promote exports, particularly of agricultural products. Another notable aspect of the economic policy of North Macedonia is the creation of a favourable investment climate and infrastructure development. The government is actively implementing reforms to ensure the protection of investors' rights, simplify business processes, and create favourable conditions for foreign investment. Infrastructure development, specifically transport and energy infrastructure, is also an important focus of the country's economic development strategy. Furthermore, North Macedonia actively cooperates with international financial institutions and other countries to ensure sustainable economic development and improve the living standards of its population. Establishing effective management of economic resources and implementing strategic economic reforms are key to achieving these goals.

The Republic of Kosovo is a young state undergoing significant economic and social transformation since its Constitution of the Republic of Kosovo (2008). In this context, the main objective of economic policy is to stimulate sustainable economic growth, business development, and improvement of the living standards of the population. One of the key aspects of economic policy is to create a favourable investment climate and attract foreign investment.

The government of the Republic of Kosovo is implementing reforms to improve the business environment, simplify bureaucratic procedures, and ensure the protection of investors' rights. SME support programmes aimed at creating new jobs and supporting entrepreneurship are also being developed. Infrastructure development is another essential aspect. The government of the Republic of Kosovo is actively investing in the construction and development of transport, energy, and communications infrastructure. This contributes to improving the business environment, developing international trade, and attracting foreign investment. Furthermore, the Republic of Kosovo is working on the development of education and science, which is a prominent factor for economic competitiveness. The introduction of the latest technologies and innovative solutions helps to increase labour productivity and create new opportunities for business development and economic growth. In addition, the government of the Republic of Kosovo is actively cooperating with international financial institutions and other countries to ensure sustainable economic development and improve the living standards of the population. The implementation of effective economic policies and the management of economic resources are essential tasks to achieve these goals.

Serbia, as one of the key countries in the Western Balkans, is on its way towards stable economic development after severe economic difficulties associated with the breakup of the former Yugoslavia (Jajcanin, 2024). In recent years, the country has been actively working to improve the business climate, develop infrastructure, and attract investment to stimulate economic growth. One of the main priorities of the Serbian Government's economic policy is to attract investments. The country is actively working to create a favourable investment climate, improve the legal environment, and simplify procedures for business. The programme of privatisation of state-owned enterprises and reform of the tax system to attract foreign investors is ongoing. Infrastructure development also plays a major role in Serbia's economic development strategy. The government is actively investing in the construction and modernisation of transport, energy, and communication networks. This creates a favourable environment for business development, improves access to markets, and boosts exports. Furthermore, the Serbian Government is paying special attention to the development of education and innovation. Support programmes for start-ups and innovative enterprises contribute to the creation of new jobs and increase the competitiveness of the economy. Despite these positive developments, Serbia's economy faces challenges such as bureaucracy, corruption, and high unemployment. The government continues to improve the political system and combat these challenges to create a favourable environment for economic growth and improve the living standards of the population.

Next, the study considered the key problems and challenges faced by the Western Balkan countries in the field of public financial management (Fig. 5).

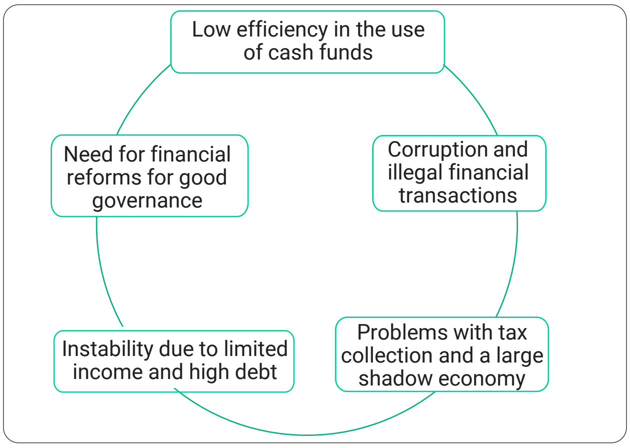

Figure 5. Key problems and challenges facing the Western Balkan countries in the field of public financial management
Source: developed by the authors

The low efficiency of cash utilisation in the Western Balkan countries is partly explained by a lack of transparency in financial processes, which makes it difficult to monitor and control expenditures. Furthermore, inefficient use of budgetary allocations can result from corruption schemes and lack of clear financial planning, which contributes to waste and misallocation of funds. Corruption and illegal financial transactions in the Western Balkans are a serious obstacle to financial sustainability and effective public financial management. Illicit financial transactions, such as money laundering and terrorist financing, can also undermine the financial stability of the region and undermine confidence in state institutions. Whereas problems with tax collection and the presence of a large shadow economy pose serious challenges to effective public financial management in the Western Balkans. Inefficiencies in the tax collection system can result in the shortfall of necessary funds for the operation of government programmes and services.

Problems with tax collection and the presence of a large shadow economy pose a serious challenge to effective public financial management in the Western Balkans region. Inefficiencies in the tax collection system can result in the shortfall of necessary funds to finance government programmes and services. The high level of shadow economy, often accompanied by tax evasion, exacerbates these problems and creates major losses for the state budget. Instability due to limited revenues and high debt is another significant challenge for public financial management in the Western Balkans region. Limited revenues can make it difficult to deliver public programmes and services, limiting the resources to fund them (Furmanchuk, 2023). The need for financial reforms for good governance is urgent in the context of the Western Balkan countries. Wide-ranging reforms should aim to improve the transparency, efficiency, and stability of public financial management. The Western Balkan countries face a range of complex challenges in public financial management, including a lack of transparency, high levels of corruption, problems with tax collection, a large shadow economy, and financial instability. The Western Balkans region faces considerable public financial management challenges that need to be addressed to ensure sustainable economic development. Developing an effective financial management strategy and implementing the necessary reforms are key challenges for the region's political and economic leaders.

Therefore, concrete recommendations were developed to improve the transparency, efficiency, and stability of public financial management and to promote the development of a sustainable economy. To ensure greater transparency in public financial management, governments should establish publicly accessible financial portals where information on budget estimates, expenditures and revenues can be published. These portals should be accessible to citizens and businesses. Organising public consultations is also important for involving the public in financial discussions and ensuring their involvement in decision-making. To strengthen fiscal discipline, it is important to take measures aimed at reducing the budget deficit and controlling debt levels (Nikitishin, 2022). One way is to rationalise costs by reviewing and streamlining social security and other expenditure programmes. It is also necessary to actively control the level of public expenditure, avoid excessive spending, especially in areas not prioritised, and consider opportunities to increase budget revenues by expanding the tax base and improving tax administration. This approach will help ensure financial sustainability and increase confidence in the country's financial management.

For greater development of the financial system, governments should actively engage in reforming the banking sector to ensure its stability and soundness. It is also important to promote the development of credit institutions, including microfinance organisations, which can provide access to financial services for the less well-off and small businesses. Furthermore, there is a need for an effective regulatory framework for financial technology that will foster innovation and make financial services more accessible to all groups in society. Human capital development can be achieved by investing in the education system, ensuring access to quality education at all levels and reducing barriers to education. In addition, it is important to encourage skills development and workplace training programmes to adapt the workforce to changes in today's labour market. By increasing transparency, fiscal discipline, developing the financial system and investing in human capital, the countries of the Western Balkans region can strengthen their financial resilience and create conditions for sustainable economic growth and improved living standards.

Discussion

The study of proper financial management in economic development is a crucial task of researchers in modern world. Analysing proper financial management helps in identifying the causes of financial crises, developing best strategies and tools for financial management, and therefore researchers have shown interest in considering and researching this topic.

L. Klapper & A. Lusardi (2019) noted that money plays a significant role in financial literacy and sustainability, as it underlies financial relations and affects the level of economic stability. Proper use and management of money can contribute to effective financial planning, saving, and investing. Consequently, proper management and understanding of the role of money contributes to financial literacy and sustainability both at the individual level and at the level of the economy as a whole. According to E. Berisha & G. Cotella (2021), the results of this study coincide with the preliminary findings, emphasising that effective management of financial resources can stimulate investment in infrastructure, business development, and support regional development. However, K. Böhme *et al.* (2019) point out that effective management of financial resources does not always lead to territorial development, since the effectiveness of such management can be hampered by corruption, instability of the political situation, and lack of transparency in budget spending. Thus, while some studies confirm the positive impact of effective financial resource management on territorial development, others emphasise the difficulties that may arise in implementing such policies.

The analysis results confirmed that the countries of the Western Balkans region have considerable potential for economic development, but face a range of challenges, such as insufficient infrastructure, high unemployment, and low competitiveness. The findings coincided with the those of M. Bonomi & M. Uvalic (2019), who noted that the countries that have not joined the European Union can have a significant impact on the economic development of the Western Balkans region. Specifically, this includes the participation of such countries in international trade agreements, cooperation in infrastructure projects and investments. However, there are opposing views indicating that the importance of such players may be limited due to their resources as well as economic constraints. At the same time, F. Bieber & N. Tzifakis (2019) emphasise the significance of independence and autonomy of countries that have not joined the EU in making their own economic decisions. They note the importance of developing domestic economic potential, attracting investment, and supporting small and medium-sized businesses. However, there are arguments that insufficient integration with the European Union may limit opportunities for economic growth and development. The findings of the study on the economic integration of the Western Balkans in the EU point to different perspectives and challenges. On the one hand, accession to the EU can provide countries in the region with access to a large market, investment, and technology, which will contribute to their economic growth and development. More trade with the EU can help attract investment and develop export-oriented industries (Monaienko *et al.*, 2024). In addition, the integration process may pose some challenges for the Western Balkan countries. These may include requirements for legislative harmonisation, justice and anti-corruption reforms, and economic competitiveness.

M. Uvalić (2019), R. Osbild & W. Bartlett (2019), M. Vulović (2023) state that accession to the European Union can have a positive impact on the economic development of the Western Balkan countries, which coincides with the findings of the present study. This process is expected to provide the countries of the region with an opportunity to converge with the high standards of living and economic development found in the European Union. Specifically, accession to the European Union can help create new export opportunities, increase investment flows, improve the availability of financial resources for development, and transfer advanced technologies and management practices. Such access to new markets and resources can increase the competitiveness of countries in the region and contribute to their sustainable economic growth in the future. However, some inconsistencies were found, which were highlighted in the studies of M. Kmezić (2020) and A. Hoxhaj (2021), especially in terms of the potential challenges and limitations of integration. The researchers point out that not all Western Balkan countries are economically, politically, and institutionally ready to join the European Union, and the process may require considerable reforms and adaptations. They also emphasise the potential negative effects of integration, such as increased competition, the risk of loss of national sovereignty and shortcomings in the internal development of the countries in the region. Furthermore, the study has made it possible to find out which countries in the Western Balkans region have the greatest potential for economic growth, as well as to identify the principal factors affecting their economies. The study found that Western Balkan countries such as Croatia and Serbia have the greatest potential for economic growth in the region. The key factors affecting their economies include the level of investment, infrastructure development, stability of the political and economic environment, and the availability of human capital and innovative technologies.

These findings coincide with those of G. Matković (2019), E. Durguti *et al.* (2020), and S. Weiss (2020), who examined the indicators of economic development of the Western Balkan countries and noted that a considerable part of studies confirms the positive impact of European integration on the economic development of the region. This includes access to new markets and investments, export promotion, and the transfer of advanced technologies, thus confirming that these benefits contribute to sustainable economic growth and improve the socio-economic status of the population. On the other hand, R. Zamfir (2020) and D. Mikulić (2021) point out potential risks and challenges associated with European integration, which slightly disagree with the results of the present study. These could be the financial obligations associated with accession to the European Union, as well as the need for a wide range of reforms in the internal sectors of the economy. Between these risk factors, the researchers noted the spread of the shadow economy, which poses a serious threat to economic stability and the efficient functioning of markets in the Western Balkan countries. The shadow economy, which includes informal and illegal economic transactions, can substantially undermine the economic base of countries in the region, making it more difficult to control finances and tax revenues (Spytska, 2023). Unlike other regions, the Western Balkan countries are an attractive investment destination because of their considerable potential in many sectors of the economy. This was identified as a consequence of a range of factors, including their strategic location, availability of natural resources, advanced infrastructure, and low labour costs.

V. Rant *et al.* (2020), D. Marjanović & M. Đukić (2020), E. Smolo (2021) confirm these findings by the fact that the Western Balkan countries have prominent potential for investment in sectors such as tourism, energy, information technology, and manufacturing. Their natural resources and strategic location make them important players in international trade and logistics. However, A. Shehaj (2020), O. Muharremi (2020) and M. Kmezić (2021) disagree with these findings, as there are certain risks and challenges associated with investing in the Western Balkan countries, such as underdeveloped business infrastructure, unpredictable political situation, and corruption. These factors can lead to instability and risks for investors, which should be considered when making investment decisions in the region. Thus, proceeding from the analysed sources, the study of economic growth in the financial sector is a crucial topic, especially for the Western Balkan countries, since each country has its specific economic and political features that affect public financial management in economic development.

Conclusions

A study of the importance of proper financial management in economic development compared to the Western Balkans found that good financial management plays a key role in ensuring sustainable economic growth and social prosperity in the region. In examining the role of money in the regulation of the economy by the state, it was found that proper management of public money plays a key role in ensuring sustainable economic development. It was also confirmed that efficient administration of financial resources contributes to increasing the efficiency of government programmes, attracting investment, and stimulating economic growth.

The study analysed the current state of public financial management in each country of the Western Balkans using Trading Economics and Take-profit.org websites, which provide statistical data on the state budget, public revenues, and expenditures of these countries. A comparative analysis was made between all countries in the Western Balkans region and it was confirmed that countries such as Bosnia and Herzegovina, Albania, Croatia, which have a system of effective financial management, also achieve more stable and progressive economic results compared to those where such a system is absent or ineffective. On the other hand, countries that have problems with effective financial management, such as the Republic of Kosovo, Serbia, North Macedonia, and Montenegro, face difficulties in achieving stable economic growth and social prosperity due to excessive levels of corruption and instability of the economic situation.

Using qualitative indicators, the study found that Western Balkan countries with developed financial management systems have higher levels of economic stability, lower levels of corruption, greater attractiveness to investors, and higher levels of social welfare. In addition, the analysis of the economic policy and economic resource management in the Western Balkan countries revealed that each of them has its development strategy aimed at solving concrete problems and challenges. For instance, some countries emphasise investment attraction and infrastructure development (Serbia and Montenegro), while others favour education and innovation (Albania). An essential element of economic policy is the fight against corruption and bureaucracy, as well as the development of infrastructure to create favourable conditions for business and attract investment. Furthermore, key issues and challenges facing them in public financial management were identified. Specifically, these countries were found to be experiencing great difficulties in maintaining financial stability and efficient use of budgetary resources, and these challenges posed major obstacles to their economic development.

Based on these findings, it is recommended to actively work on improving the transparency and efficiency of public financial management by creating publicly accessible financial portals and organising public consultations. It is also important to note the limitations of this study, which may include limited availability of statistical data or the volume of data, which may affect the level of detail and validity of the analysis. Furthermore, it is important to consider that some aspects of public financial management may be influenced by political or socio-cultural factors, which may also affect the findings of the study.

In the future, it is possible to improve the obtained findings by implementing a system of monitoring and evaluating the effectiveness of the proposed public financial management measures in the countries of the Western Balkans region.

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Conflict of Interest

None.

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Важливість належного управління державними фінансами для економічного розвитку

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Анотація. Метою цього дослідження було вивчення важливості належного управління державними фінансами для забезпечення економічного розвитку в країнах Західних Балкан. Дослідження ґрунтується на порівняльному аналізі фінансової політики та практики управління бюджетом у країнах регіону Західних Балкан, а саме: Албанії, Боснії і Герцеговині, Хорватії, Чорногорії, Північній Македонії, Республіці Косово, Сербії та Чорногорії. Методологічний підхід включав аналіз статистичних даних з офіційних сайтів та джерел. Ключовими висновками цього дослідження стали висвітлення ролі грошей у належному управлінні державними фінансами, а також аналіз економічної політики та управління економічними ресурсами кожної з країн Західних Балкан та порівняння динаміки державного бюджету, доходів і видатків за 2021-2023 роки всіх країн регіону Західних Балкан. На основі аналізу статистичних даних були визначені ключові аспекти, що впливають на ефективність управління державними фінансами в країнах Західних Балкан, такі як прозорість бюджетних процесів, результативність боротьби з корупцією та ефективність використання фінансових ресурсів. Унікальні та об'єктивні дані, отримані в ході дослідження, допомогли висвітлити специфіку управління фінансами в кожній з країн регіону та виявити фактори, що стримують або сприяють їх економічному розвитку. Висновки дослідження підкреслили необхідність реформ в управлінні державними фінансами на Західних Балканах для підтримки сталого економічного зростання та соціально-економічної стабільності в регіоні. Особлива увага до прозорості, ефективності та підзвітності бюджетних витрат може сприяти підвищенню довіри інвесторів та зміцненню економічної системи країни

Ключові слова: фінансова стійкість; бюджетний дефіцит; диверсифікація доходів; макроекономіка; ефективність управління

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Economic impact of military conflicts on energy markets and global energy security

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Abstract. In modern conditions, military conflicts are becoming more common, which makes it relevant to examine their impact on the country's economy in all possible ways. The purpose of this study was to investigate the situation in the energy industry in Ukraine and other countries of the world in connection with the beginning of a full-scale Russian invasion of Ukraine. The main methods used in the study were analysis, systematisation, and comparison. The paper showed the role of the energy sector in ensuring national and global stability. It was concluded that military conflicts have a significant impact on the stability of this sphere, both in the warring country and in other states that may not be directly involved in the conflict. At the moment, there is a limited amount of statistical data available that can be used to assess the impact of Russia's military actions on the energy sector of Ukraine. However, based on the available data, it was concluded that their impact is significant and can lead to major problems in the future if there is no decisive action at the moment. During the first attacks of 2022, this has already caused a shortage of energy and blackouts. As part of the study, quite a few approaches were proposed on how to overcome the consequences of military conflict in the global and national energy markets. In particular, the need to develop diversified energy supply routes, increase the use of renewable sources, ensure international cooperation and attract international investment in the industry was noted. The conclusions drawn in the framework of the study allow increasing the effectiveness of the national energy policy in Ukraine, given the military situation in which the country finds itself

Keywords: welfare; infrastructure; international cooperation; crisis phenomena; geopolitical tensions

Introduction

The importance of the energy sector is becoming clearer in the context of global crises or military conflicts. In the current context of Russia's full-scale invasion of Ukraine and the global energy crisis it has caused, it has become crucial to reform the energy systems in the world. In Ukraine, this problem also remains very urgent, especially due to the constant attacks on the energy system. Thus, conducting additional research on this topic is relevant.

Numerous researchers assessed the situation related to energy security in Ukraine and the world. Thus, global challenges related to the oil market and their impact on national security was considered by D.M. Donets *et al.* (2024). The researchers noted that the global oil market is currently experiencing a significant number of problems, primarily due to fluctuations in oil prices associated with geopolitical instability. They considered in sufficient detail the difficulties that arise in the oil products market, but paid little attention to the situation in Ukraine. N. Kravchuk & K. Badiuk (2023), in turn, also drew attention to the analysis of the geopolitical and geo-economic consequences of the armed forces and increased trade tensions due to the pandemic and conflicts, including in the energy and food markets. It was noted that the lack of agreed positions on the end of the war between Ukraine and Russia, as well as in the Gaza Strip, may lead to further deterioration of the current situation.

The role of Ukraine's energy security was emphasised by Yu. Kovalenko *et al.* (2024). They noted that this component is now extremely important for ensuring the country's security in general, and in particular, in the current military situation. The researchers recommended switching more actively to renewable energy sources to eliminate dependence on carbohydrates, which leads to significant negative economic and environmental consequences. However, their recommendations were rather superficial, and not detailed, which makes it difficult to imagine what this strategy should look like. The role of energy security was also discussed by V.P. Gorbatenko & O.V. Kukuruz (2023). They also noted that in modern conditions, despite all the crises that exist due to COVID-19 and Russia's full-scale invasion of Ukraine, there is still no single approach to ensuring energy security in the country. This component needs constant monitoring and reliable protection: this component should be considered from different angles, in particular, from the side of ecology, geopolitics, economics. I. Shchurov (2022) also drew attention to how the beginning of Russia's full-scale invasion of Ukraine affected the country's energy security. The researcher noted that solving such problems as reducing the effectiveness of global energy management, increasing uncertainty in the mechanisms of energy transition around the world, strengthening energy interdependence, can optimise the functioning of the energy system and support mechanisms. The author also called for different countries to join forces to form a more effective response to existing energy security problems, but did not form clear recommendations in this direction.

Thus, the above-mentioned papers have outlined the consequences of military conflicts and their impact on the energy sector in Ukraine, and have made some recommendations in this area. However, no work has been carried out to compare the impact of conflicts on the energy sector in different countries. Considering the above review and assessment of the importance of the energy sector, the purpose of the study was formulated, namely, to assess the consequences for the energy sector of Ukraine and other countries of the world associated with the beginning of a full-scale invasion of Russia. This would allow making recommendations for achieving better results in counteracting energy crises.

Materials and Methods

As part of the study, information from individual regulatory documents was used. One of them was the European Green Deal (2019). The European Green Deal is a European Union strategy aimed at moving towards sustainable and environmentally friendly development. It is an extensive action plan aimed at combating climate change, improving the quality of the environment, and ensuring the sustainability of the economy and society. Another document was Clean energy for All Europeans package (European Commission, 2019). The analysis of these documents was used to assess the prospects for the development of the energy sector of Ukraine in the conditions after the war, in the framework of post-war reconstruction.

Some sources of information that would characterise statistical data in the context of the state in the energy market were also used. The main source of statistical information was the reports of the Kyiv School of Economics (Report on Direct Infrastructure…, 2023), which characterised the losses received in Ukraine during a full-scale invasion both in general and in particular for infrastructure facilities. Thus, statistical information for the study of this topic in Ukraine was very limited, which affected the format of writing the paper and the results obtained. The study also assessed the dynamics of prices for WTI crude oil, and trading volumes for them. For this purpose, data were used from the statistical website Investing (Crude Oil WTI…, 2024), which provided access to a fairly extensive amount of information describing the situation in various international markets.

Separate scientific methods were also applied in the study. Thus, systematisation was used to formulate common principles for assessing the impact of military conflicts on the development of the economy of individual countries. The descriptive method was also used to characterise the main phenomena that were most actively considered in the framework of the study. The comparison was used to assess the impact of various conflicts on the global energy market, and the situation in different countries due to changes in it. The study also actively used a review of the literature of some Ukrainian and foreign researchers, with the help of which it was possible to better understand the situation in the country in the context of the state of the energy market. A detailed analysis of the news background related to military conflicts was also carried out to better understand its impact on the country. Normalisation, in turn, was used to simplify the analysis by avoiding the analysis of large amounts of small data. The graphical method was used to reflect the dynamics of the oil price and trade volumes, and further describe the trends shown. All the calculations were performed in the Microsoft Excel software suite.

Results

Energy security in general is a state where available energy resources ensure the efficient functioning of society and the economy without interruptions in the supply, use, and access to energy. This means that society has a reliable and stable supply of energy for its needs, including electricity, oil, natural gas, coal, and other energy sources (Isiksal, 2021; Gong, 2022). Its key aspects include a fairly significant number of components, among which it is worth considering (Nerlinger & Utz, 2022; LaBelle, 2023):

- availability of resources (availability of sufficient energy resources to meet the needs of the population and industry);
- stability of resource supply;
- security of energy infrastructure (impossibility of terrorist acts or any damage);
- development of alternative energy sources.

Military conflicts have a significant complex impact on the energy sector of the economy (San-Akca *et al.*, 2020). Thus, military actions lead to a decrease or cessation of energy production as a result of damage to energy infrastructure facilities, such as power plants, main gas and oil pipelines, energy networks. This can lead to a lack of energy and lead to a crisis in the energy markets. Oil, gas, coal, and other energy resources can become the target of military operations or be blocked due to lack of deliveries, which often happens, and therefore, this can lead to an increase in prices for these energy resources. In general, damage to energy infrastructure as a result of military or terrorist actions causes significant losses and requires significant recovery efforts. In general, the country then needs new investments and a gradual restoration of the energy infrastructure, including the repair of damaged facilities, and the creation of new technologies and safety methods. Thus, often the occurrence of a military conflict in one territory can lead to changes in energy security throughout the Earth.

The global oil products market is currently facing significant challenges and transformations due to economic and geopolitical factors (Motlagh *et al.*, 2020; Sulich & Sołoducho-Pelc, 2022). These include fluctuations in oil prices, changes in demand, and sustainability issues. Producers of all sizes are trying to adapt to this new energy landscape with geopolitical tensions, particularly Russia's aggression against Ukraine, causing chaos and uncertainty in the oil market. This situation increases risks to energy security and regional stability (Bogdanov *et al.*, 2021). Various participants participate in the market, including producing/exporting countries such as Saudi Arabia and the United States, importing countries such as China and Japan, international oil companies such as ExxonMobil and Shell, logistics/transportation companies, financial institutions, and end-users, including automotive and energy companies. The main characteristics of the global oil products market include high interdependence between countries, sensitivity to geopolitical events, cyclicity associated with economic activity and technological progress, a significant concentration of production among several countries, dependence on the geography of transportation and the impact of technological innovations on production and processing. Together, these factors shape the dynamics of the global oil products market, affecting the global economy and energy security.

The dynamics and challenges of the global oil market are shaped by various features, which make their analysis crucial for managing this strategic sector. Before Russia's full-scale invasion of Ukraine, the country supplied just under half of its oil products to the EU, but due to the existing ban on sea imports of Russian oil products, with the exception of some EU countries that face difficulties in finding an alternative, its fate has declined. Other countries can still buy Russian products, but under-price restrictions set by the EU, limiting their use of EU tankers, financial support, and transaction insurance. Nevertheless, in practice, this has led to the formation of "grey schemes" through which Russian oil, or part of it, still reaches consumers at the right prices. In 2022, there was a change in export directions: India became the largest market for Russian oil by sea, followed by China. Energy security is now a critical aspect of national security, driving strategies such as supply diversification, promoting renewable energy, improving efficiency, and promoting international partnerships (Papadis & Tsatsaronis, 2020). Currently, there are various impacts of challenges in the global oil products market on national security in several dimensions. Countries that are heavily dependent on oil production and exports face economic vulnerability due to market fluctuations, geopolitical conflicts, and environmental risks. Geopolitical tensions can lead to export freezes or economic losses, while environmental accidents pose a threat to public health and safety. In addition, infrastructure risks, such as terrorist attacks or cyber threats, can disrupt energy security.

In the pre-war period, the energy sector of Ukraine experienced a stable and gradual development of all types of energy production, with nuclear power plants taking the lead in electricity production. However, despite the overall increase in production, electricity exports to European countries declined from 2016 to 2021. The industry was positively affected by the implementation of renewable energy projects, which significantly reduced CO_2 emissions. Since the beginning of the war in February 2022, electricity production and exports have declined due to damage to energy infrastructure. The energy system is currently facing a significant capacity shortage, requiring military, economic, and consumer-oriented recovery and conservation strategies. Restructuring the energy market in accordance with European standards is crucial for competitiveness and transparency. The introduction of international experience in regulating these problems provides for the adaptation of socio-legal components and regulatory tools, taking into account internal priorities. This includes variable market dynamics related to the production, supply, distribution, and consumption of electricity. Effective energy development requires coordination between the state and market participants.

During the entire period of Russia's full-scale invasion of Ukraine, a significant number of attacks on critical infrastructure facilities have taken place. Significant attacks were carried out in the period from September 2022 to March 2023, and the largest attacks were observed in the autumn period. The total calculated number of targeted facilities for this period was 912, that is, an average of 53 facilities for each attack. Such a large number of missiles and other flying objects is really difficult to repel for air defence (air defence objects), so it is not surprising that such attacks caused significant damage to energy infrastructure facilities. The Ukrainian infrastructure is still being monitored regularly. So, this trend continues in 2024: in particular, on April 11, an attack occurred on energy infrastructure facilities in four regions of Ukraine, namely in Kharkiv, Zaporizhzhia, Lviv and Kyiv oblasts. In particular, these strikes led to a power outage in Kharkiv (Russian troops attack…, 2024). A massive attack also took place on March 22: it was noted that the target of this attack was to de-energise the power lines feeding the Zaporizhzhia Nuclear Power Plant (ZNPP) (Energy Ministry on the…, 2024). Thus, strikes on the energy infrastructure in Ukraine are still ongoing, despite the fact that sometimes there is a certain break between them.

Currently, there are no clear statistics that would allow assessing the country's losses due to the destruction caused by Russia's military aggression against Ukraine. This is conditioned by many reasons, including the fact that such statistics are quite difficult to collect and standardise. Almost the only institution that conducted such assessments was the Kyiv School of Economics (KSE). However, the Report on Direct Infrastructure Damage and Indirect Economic Losses from the Destruction Caused by Russia's Military Aggression against Ukraine (2023) and individual estimates in September 2023 (Total damage to Ukraine's…, 2023). Thus, as of June 2023, the country's losses reached the level of USD 150.5 billion, while infrastructure losses accounted for USD 36.6 billion. As of September 2023, the estimated losses were at USD 151.2 billion, while those related to infrastructure did not change, and remained at USD 36.6 billion. According to some other estimates, losses in the energy sector of Ukraine for the period from the beginning of the war to January 2024 reached the level of USD 12 billion (Vatman & Hart, 2024).

One possible approach to assessing the country's losses due to rocket attacks is based on lost productive time. In September 2022, 0.5% of productive time was lost, in October – 2.3%, and in November – 12%, and on some days of this month up to 55% of the working day was lost (Blinov & Diakov, 2023). It is worth noting, however, that this does not directly indicate that 12% of the gross domestic product (GDP) produced was lost in November, but it still indicates significant losses for the Ukrainian economy during this period. Some economists estimated losses from energy strikes at 6% of GDP in 2022 (Purig, 2022), although in fact the decline was not so significant due to the demonstrated stability of the energy system. In this regard, certain trends in the development of this area, in particular, renewable energy, including through the encouragement of foreign developers, have spread. The biomethane and clean hydrogen sectors have also been developed, with biomethane projects launched and plans to produce clean hydrogen using Ukraine's wind power potential. Much more emphasis has begun to form on decentralising the energy grid for protection and modernisation with regulatory support for energy storage and micro-grid projects; technologies for energy storage and further use have begun to develop more actively.

The energy market in Ukraine faces many problems, including due to the processes of globalisation, digitalisation, developing industrialisation, and problems with the environment, which leads to a decrease in capacity and problems of market regulation. Post-war reconstruction should prioritise innovation and environmental sustainability, focusing on renewable energy sources, carbon neutrality, and smart energy systems. Creating a regulatory framework that supports these areas is crucial to attract investment and align with European standards, in particular, the EU Clean Energy for All Europeans package (European Commission, 2019). The reforms are aimed at building an autonomous, decentralised and stable energy system, increasing market transparency and competitiveness, and fulfilling obligations under the European Green Deal (2019). The reforms to be implemented in the future should cover not only capacity recovery, but also solving problems with losses in the temporarily occupied territories for the single energy market. However, representatives of the state authorities must do a lot of work to ensure that such reforms or reconstructions can be carried out to ensure a more decent standard of living in the country.

The impact of large-scale conflicts on the energy market can be partially assessed by evaluating some data, namely energy prices and trade volumes. This is how the changes in the oil price that occurred in a certain period of time before and after the start of Russia's full-scale invasion of Ukraine should be assessed (Fig. 1).

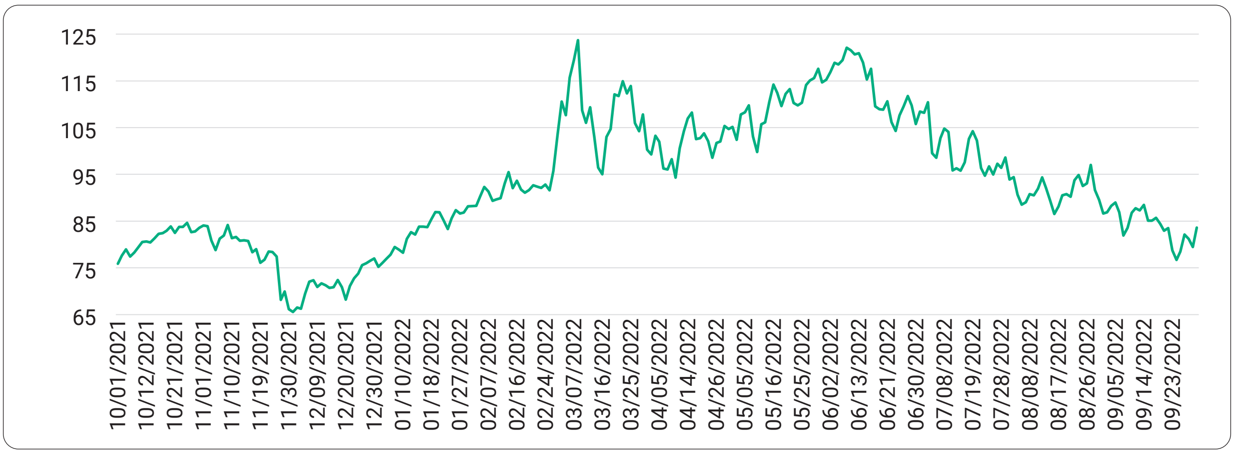

Figure 1. Price of WTI crude oil in the period from October 10, 2021 to October 10, 2022, USD
Source: compiled by the author based on Crude Oil WTI Futures – Jul 24 (CLN4) (2024)

Figure 1 shows that the price of WTI crude oil gradually increased with the beginning of the escalation (October-November 2021) and began to grow rapidly with the beginning of the invasion (from February 24, 2022) and began to decline only after achieving some stability in the summer of 2022. Next, the price of oil began to decline, in particular, due to the intention to set a price ceiling for this resource of Russian origin at USD 60 per barrel. The changes in average monthly trading volumes can also be estimated, as shown in Figure 2.

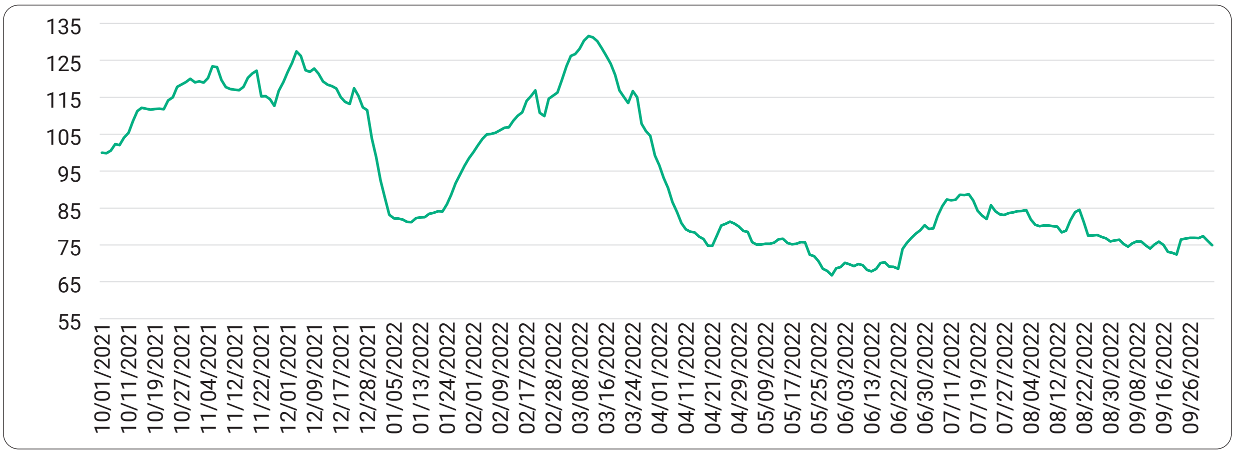

Figure 2. Change in the average monthly trading volume of WTI crude oil futures in the period from October 10, 2021 to October 10, 2022
Note: the value of 100 is equal to the average monthly trading volume of WTI futures as of October 1, 2021; future values are compared to this indicator
Source: compiled by the author based on Crude Oil WTI Futures – Jul 24 (CLN4) (2024)

According to Figure 2, the highest trading volumes occurred during the highest level of escalation, i.e., at the beginning of the invasion and before it. In the future, the market "adjusted" to such conditions and trading volumes fell to a lower level than in October 2021. Thus, it can be concluded that the escalation and the beginning of a full-scale invasion of the oil market had an impact on both prices and trading volumes. A similar assessment should be made for the conflict between Israel and Hamas. The dynamics of oil prices is shown in Figure 3.As can be seen from Figure 3, the price of oil increased significantly before the conflict began on October 7, 2023, but after the development of events, the price began to decline until the beginning of 2024. Changes in trading volumes should also be considered, as shown in Figure 4.

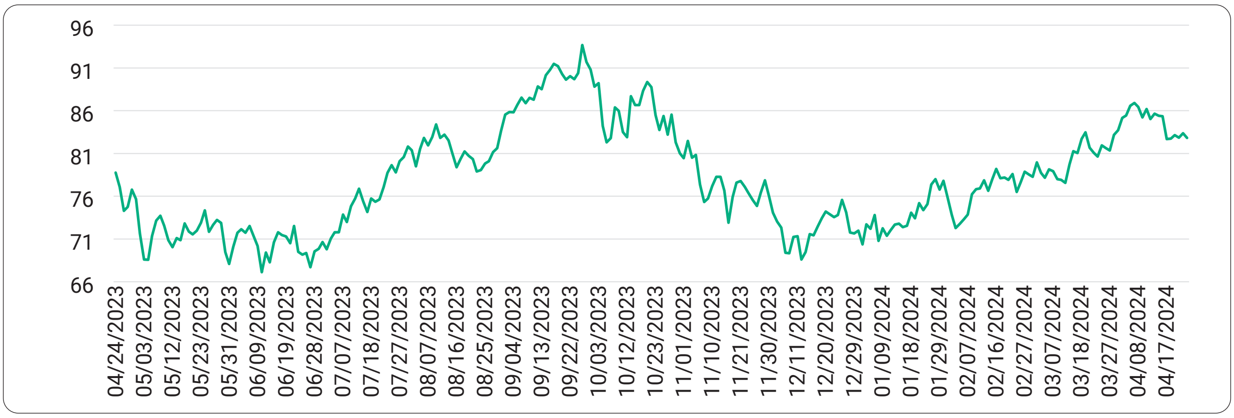

Figure 3. Price of WTI crude oil in the period from April 24, 2023 to April 24, 2024, USD
Source: compiled by the author based on Crude Oil WTI Futures – Jul 24 (CLN4) (2024)

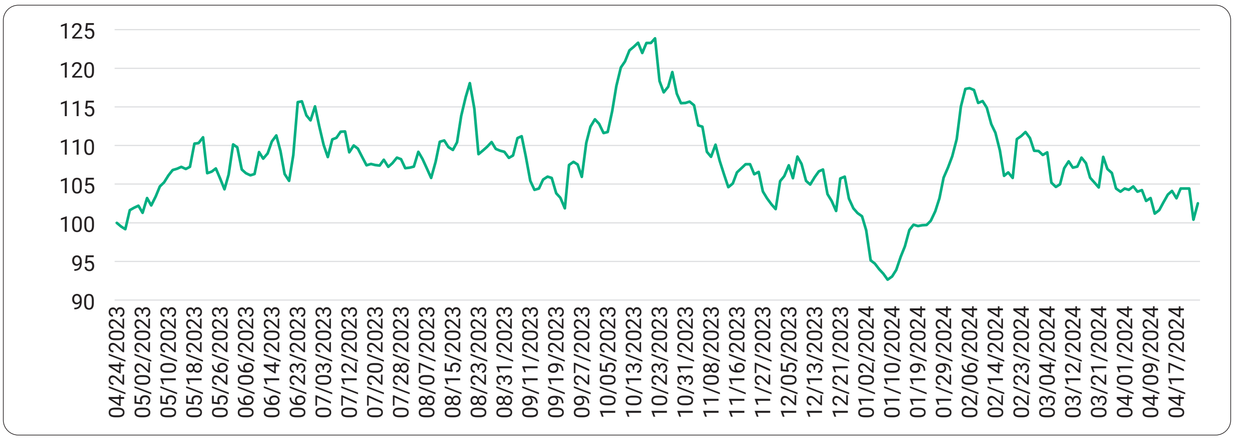

Figure 4. Change in the average monthly trading volume of WTI crude oil futures in the period from April 24, 2023 to April 24, 2024
Note: the value of 100 is equal to the average monthly trading volume of WTI futures as of April 24, 2023; future values are compared with this indicator
Source: compiled by the author based on Crude Oil WTI Futures – Jul 24 (CLN4) (2024)

As can be seen from Figure 4, it was in October 2023 that the largest volumes of oil futures trading were observed, which indicates the impact of the conflict on the global energy market, namely, an increase in instability on it, and an increase in demand for both the underlying asset and its derivatives.

In the international arena, the war also had a significant impact. This is how the flows of Russian oil and natural gas imports to Europe have changed significantly: they accounted for only about 25% of the pre-war period in 2023; at the same time, there has been a reorientation of Russian oil product exports to Asian markets, namely, to India and China, which are obliged to buy it at a price not exceeding USD 60 per barrel (Report on Direct Infrastructure…, 2023). Nevertheless, the Russian authorities manage to sell oil at a better price using various grey schemes, which makes the effectiveness of these approaches to restricting trade in Russian oil very limited. According to some estimates, the war in Ukraine in general and problems related to the energy sector in particular cost the European Union about 1% of GDP growth, and about half as much for the United States of America and China (Rojas-Romagosa, 2024).

One of the recent conflicts that has had a significant impact on the energy market is that between Israel and Palestine. The Middle East has significant oil and gas reserves, and any instability in the region can affect global markets. After the attack on Israel, oil prices rose due to concerns about potential supply disruptions, although there was no direct impact on oil flows at the time. The conflict also affected gas supplies: prices for LNG (liquefied natural gas) also increased, which is why some countries suspended agreements on its purchase (including due to the fact that Israel suspended gas production at the Tamar field). During the same period, trade disruptions began, and the freight rate increased by 600% (Mier, 2024). There were concerns that all this could lead to higher energy costs for many businesses around the world, which could lead to unintended consequences; the negative impact would extend to investment flows, and tourism (Shaarawy, 2023).

Further intensification of the conflict could lead to the destruction of important energy infrastructure, including pipelines, refineries, and export terminals, which would lead to even more serious problems in energy supply. The impact of the war in Syria, after which the price of oil increased significantly, was also indicative: in particular, this happened after the strikes of the United States, Great Britain, and France on Syria. There were protests by workers demanding higher wages in Libya, which also negatively affected the market price. There was a decline in gasoline stocks in the United States, which could also lead to negative consequences later. However, over time, oil prices began to decline (Crude Oil WTI…, 2024), which is why there were no serious negative consequences for the global economic system, although such a possibility existed.

Discussion

Based on the above information, various strategies can be implemented to increase energy security and reduce risks for countries. Thus, the development of alternative energy sources reduces dependence on oil, ensuring a sustainable energy balance and limiting vulnerability to market changes. In addition, the implementation of strategies related to economic diversification and energy resource revenues allows countries to overcome crises and maintain energy security. In addition, technological advances in oil production increase the efficiency of the industry, reducing the impact on the environment and improving the quality of products produced. Global cooperation in the energy segment between countries also helps to achieve these goals. In times of war, it is also important to develop alternative routes for the delivery of energy resources and diversify sources of supply to reduce dependence on specific regions or suppliers (Ostudimov & Kaminska, 2023). In addition, increasing the use of renewable energy sources, such as solar and wind, also helps to reduce dependence on conventional types of energy and reduce the impact of military conflicts on supplies (Sotiroski, 2023). This also includes the development of programmes and technologies aimed at reducing energy consumption and improving energy efficiency, and the development and maintenance of backup energy capacities and infrastructure to ensure the reliability of energy supply even in the event of conflicts or temporary obstacles. All these methods can be used by Ukraine to achieve better results in overcoming problems in the country's energy market. However, there are questions about how possible it is to implement such actions in war conditions, especially for Ukraine, which is very much dependent on the supply of money and weapons from the West. However, the state must find ways to achieve such goals, even in conditions of limited capacity to function.

The relationship between geopolitical risk and energy security from 2004 to 2022, revealing a bidirectional causal relationship between these indicators, was investigated by K. Khan *et al.* (2023). They noted that the interaction between the situation in geopolitics and energy security really exists, and geopolitical problems affect energy stability. The researchers noted the importance of considering these interdependencies for optimising energy systems and mitigating risks; they also noted the importance of considering the international impact of economic and other types of global crises. The current study provides a clear example of the impact of geopolitics on the energy sector, namely, the impact of a full-scale Russian invasion both on the Ukrainian economy as a whole and on the energy sector in particular. Other examples of the impact of international conflicts on this area were also described, in particular, through the Israeli – Palestinian conflict and the war in Syria. However, this link also exists between other countries, and in particular – EU members and Russia. This confirms the conclusions obtained by the researchers in the framework of the study regarding the relationship with geopolitics and energy.

Advice on the development of energy security in the country was provided by H. Banna *et al.* (2023). They noted that a country's energy security is strongly correlated with its inflation rate; such states also have higher production growth rates and economic stability. In this regard, the researchers concluded that governments should prioritise energy security, since it affects national and international security issues. Strategic energy issues should be addressed by various government agencies, including defence, to address macroeconomic challenges such as unemployment, hyperinflation, and economic stability. The role of ensuring international cooperation and ensuring effective actions of state leaders was noted. Indeed, problems in the economy are closely intertwined with problems in the energy sector, and therefore, it is not surprising that ensuring energy security is becoming one of the main ones for improving the country's economic condition (Stoiian, 2024). This is one of the important reasons why all countries should pay increased attention to this sector.

The international energy market and the spread of geopolitical risks were studied by X.L. Gong *et al.* (2023). The researchers noted that there is a significant effect of spreading risk in traditional energy markets compared to clean energy markets. In this context, Russia is the main one in terms of the spread of risk in the international crude oil market. Geopolitical conflicts are exacerbating the spread of risks in energy markets. The study also identifies systemically important economies such as the United States, Russia, and China in the energy market, emphasising the importance of energy security in national strategies and the need to investigate the overflow of risks and geopolitical risks against the backdrop of emergencies. As part of an up-to-date study, it was described in sufficient detail what dangers Russia can pose to the world, given its activities both in the international arena and in the framework of a full-scale invasion of Ukraine. Thus, the international community should form a policy that would isolate Russia's influence in the energy market, and in particular, on countries that depend on energy supplies from the country, namely European countries (Cui, 2022).

New hazards in the context of energy security were considered by L. Gitelman *et al.* (2023). They noted that the global energy market is experiencing intense competition and geopolitical tension between major players, which is associated with difficulties in the supply of fossil energy resources and rising costs, and in the transition to renewable energy sources. In this regard, researchers recommend harmonising energy and eco-climate security (to focus on this in the long term), while in the short term, more attention should be paid to energy security. Thus, despite the difficult conditions that have arisen due to the unfavourable situation in the world, countries must work to solve them and achieve a stable energy situation within their countries. It is worth noting that similar recommendations were given in the context of current research, namely, the wider use of renewable energy sources, and the harmonisation of energy and environmental policies. In Ukraine, the spread of such technologies is already taking place due to constant problems with energy supply caused by shelling from the aggressor country (Dunayev *et al*., 2024). It is expected that the wider use of these technologies in the future will allow for more effective response to such crises.

Dependence on Russian energy as an issue in socio-technical ideas of energy security in Finland, and general global trends in the context of maintaining energy stability, was considered by S. Höysniemi (2022). The researcher noted that modern approaches to ensuring energy sustainability are not deep enough, and therefore cannot provide a sufficiently effective approach to ensuring Finland's energy security. In particular, the researcher emphasised that the energy discourse rarely paid attention to the problems associated with Russia. With this in mind, current energy strategies require urgent review and additional consideration. Indeed, in modern conditions, national policy should change, considering new challenges that arise for countries: this also applies to those states that are not directly involved in the conflict (Baula & Urban, 2023). The current study described changes that should be used in the conditions of Ukraine, as a warring country, to achieve a better level of energy efficiency, but it is worth noting that they can also be applied to Finland.

Trends in the evolution of global energy security between 1995 and 2019 were investigated by G. Hu *et al.* (2022). They noted that during the selected period, the situation in the context of energy security improved. Attention was also drawn to the dynamic nature of global energy security, highlighting the need for sustainable energy policies, international cooperation, and addressing socio-economic challenges to ensure a sustainable and efficient energy system around the world. This is especially true now, in connection with Russia's full-scale invasion of Ukraine. The current study also highlighted that Ukraine should shape its energy saving policy in such a way as to ensure a high-quality standard of living of the population, social and economic well-being. However, difficulties arise due to the fact that the country as such is at war, and therefore does not have sufficient resources to achieve such goals. However, the state authorities should do everything possible to achieve success in this area, among other things.

Conclusions

Thus, the study has shown that energy security is a critical aspect of national and global stability that ensures the effective functioning of societies and economies. The impact of military conflicts on the energy sector is profound and multifaceted, as it leads to various disruptions in energy production, damage to infrastructure, supply shortages, and price fluctuations in energy markets. Russia's recent invasion of Ukraine has further highlighted the vulnerability of the energy industry during the war. It has caused considerable uncertainty, affecting energy security and regional stability. However, similar upheavals have occurred before, in particular, during the war in Syria, and more recently, as part of the outbreak of war between Israel and the Gaza Strip. Therefore, the study concluded that it is important for countries to interact with each other (international cooperation) in order to solve all such existing problems, and to change their policies to one that would allow them to more effectively resist such conflicts. The study also showed what changes have taken place in the international market of energy products in connection with the war in Ukraine and between Israel and the Gaza Strip. It was shown how the price of oil in the world changed, including the volume of trading in it within the framework of these conflicts.

Ukraine's energy sector has also experienced a significant number of problems due to the beginning of a full-scale Russian invasion. Damage to critical infrastructure as a result of massive missile strikes has led to power shortages and power outages. The emergence of such difficulties indicates the significant negative consequences that war has on the energy sector in a country at war. Nevertheless, Ukraine must overcome the negative consequences of conflicts. The paper proposed a significant number of approaches that can be used for this purpose: diversification of energy sources, promotion of the development of renewable sources, increasing the efficiency of energy use, developing more active links in the international arena, attracting investment in the industry. Although these approaches are indeed aimed at reducing dependence on traditional energy sources, they are quite difficult to implement in Ukraine, given the martial law. The country primarily cares about its own capabilities on the battlefield and in ensuring a decent level of social and economic prosperity: and although energy also remains an important component of the country's development, for which much attention needs to be paid, it is physically very difficult to achieve this. However, the state authorities should devote all available efforts and opportunities to this. Additional analysis of the situation in Ukraine, which concerns the consequences of the military conflict in Ukraine, but in other areas, is relevant for future research. In particular, it is important to consider the standard of living of Ukrainians, their level of psychological health.

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Conflict of Interest

None.

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Економічний вплив військових конфліктів на енергетичні ринки та глобальну енергетичну безпеку

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Анотація. У сучасних умовах військові конфлікти стають все більш поширеним явищем, що робить актуальним дослідження їх впливу на економіку країни всіма можливими способами. Метою даного дослідження було вивчення ситуації в енергетичній галузі України та інших країн світу у зв'язку з початком повномасштабного російського вторгнення в Україну. Основними методами дослідження були аналіз, систематизація та порівняння. У статті показано роль енергетичного сектору в забезпеченні національної та глобальної стабільності. Зроблено висновок, що військові конфлікти мають значний вплив на стабільність цієї сфери як у воюючій країні, так і в інших державах, які можуть бути безпосередньо не залучені до конфлікту. Наразі існує обмежена кількість статистичних даних, які можуть бути використані для оцінки впливу військових дій Росії на енергетичний сектор України. Однак на основі наявних даних було зроблено висновок, що їхній вплив є значним і може призвести до серйозних проблем у майбутньому, якщо не вжити рішучих заходів зараз. Під час перших атак 2022 року це вже спричинило дефіцит енергії та відключення електроенергії. В рамках дослідження було запропоновано чимало підходів щодо подолання наслідків військового конфлікту на світовому та національних енергетичних ринках. Зокрема, наголошувалося на необхідності розвитку диверсифікованих маршрутів енергопостачання, збільшення використання відновлюваних джерел, забезпечення міжнародної кооперації та залучення міжнародних інвестицій у галузь. Висновки, зроблені в рамках дослідження, дозволяють підвищити ефективність національної енергетичної політики в Україні, враховуючи військову ситуацію, в якій перебуває країна

Ключові слова: добробут; інфраструктура; міжнародне співробітництво; кризові явища; геополітична напруженість

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Modern vectors of development of the country's tax system: International experience

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Abstract. In the modern world, the development and improvement of tax systems is an important area of economic policy in many countries. The study of international experience in this field allows identifying the most effective strategies and vectors of development of the tax system to ensure sustainable economic growth and compliance with modern requirements of the tax system. This study is aimed at determining the vectors of development of the countries' tax systems and developing recommendations for the implementation of international experience in Kyrgyzstan. By analysing the data of the International Tax Competitiveness Index for the countries of the Organisation for Economic Cooperation and Development, the most effective tax regimes were identified. Using statistical methods such as the Wilcoxon T-test, the countries with the best tax system were identified. Then the key vectors influencing the effectiveness of tax systems were systematised, including digitalisation of tax administration, transparency of legislation, incentives for investors, etc. The study also analysed the features of the tax system of Kyrgyzstan and developed recommendations for the implementation of international experience in its tax system, such as: the introduction of low and competitive tax rates, ensuring simplicity and predictability of the tax system, the introduction of simplified administrative procedures, flexibility and adaptation to changes, a broad tax base, digitalisation of tax administration, the fight against tax evasion, increasing tax transparency, reducing the tax burden and stimulating investment, social justice, and progressive taxation. The recommendations resulting from this study suggest concrete steps to improve the efficiency of tax systems, which can help attract investment, stimulate economic growth, and ensure social justice

Keywords: transparency; corporate tax; digitalisation; tax evasion; bureaucratic procedures

Introduction

Each country chooses its own unique economic path (in particular, market-based or command-and-control), which reflects its specific features of economic development and the dynamics of economic processes. This, in turn, affects the development of various components of the overall economic system, including the tax system of the state. The tax system, being a part of the financial system, must constantly adapt to changes in society. For example, in market-based economies, there is often greater flexibility in tax policy, whereas command-and-control systems may have a more centralised approach to taxation. In addition, changes in the global economy and international relations may also require states to adjust their tax strategies to maintain competitiveness and stability (Sopronenkov *et al.*, 2023). International organisations such as the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF) play a key role in developing recommendations and standards for tax policy. Initiatives to share tax information and combat aggressive tax planning are aimed at creating a fairer and more transparent tax system at the global level.

In different countries of the world, tax systems differ in the type of construction, the number of taxes, the rates of tax payments, the method of their calculation, the type of collection, etc. and they are all based on general principles. One of the main ones is the stability of the legislative framework (Babayev *et al.*, 2022). However, it cannot remain unchanged for decades, and the basic provisions for paying taxes must remain stable for a long time. For example, in the UK, the procedure for introducing new taxes and mandatory payments is extremely complex and involves active communication with citizens. Tax rate increases should be carefully justified and carried out only in force majeure circumstances, when there is a need for a significant increase in budget revenues. Thus, the study of international experience allows countries to adapt best practices to their national circumstances, which contributes to the creation of effective and fair tax systems capable of ensuring stable tax revenue and supporting economic development.

Previous research on the topic has focused on various aspects of tax systems and their impact on the economy. Thus, the study by F. Alshubiri (2024) revealed the impact of foreign direct investment inflows on tax revenues in both developed and developing countries. O.A. Andrenko & S.M. Mordovtsev (2024) presented a methodological approach to assessing the competitiveness of the tax systems of European countries, which was carried out using the International Tax Competitiveness Index. B.R. Delalibera *et al.* (2024) analysed the impact of tax reforms on network effects in the economy. A.F. Vanova *et al.* (2024) compared the main indicators related to the tax pressure on personal income in the countries of the European Union. S. Maier & M. Ricci (2024) considered economic policy issues related to the impact of taxes and social programs on the distribution of income and wealth in society on consumption taxation in EU countries. O. Okunogbe & G. Tourek (2024) analysed ways to increase tax revenues in low-income countries through the use of technology, tax agents, and policies.

J. Pavel *et al.* (2020) assessed the tax factors influencing the distribution of foreign direct investment in post-socialist EU countries. M. Stachová & K. Ščerba (2024) conducted a cluster analysis of tax evasion in EU countries. Thus, recent research points to various aspects of modernising tax systems, including the introduction of digital technologies to improve tax administration and reduce tax evasion. They also draw attention to the importance of aligning tax policies with international standards to attract investment and ensure competitiveness on the global stage (Ismailova *et al.*, 2023). In addition, previous research highlights the importance of developing tax reforms that promote fair tax burden sharing and social justice (Arabaev *et al.*, 2021; Audi *et al.*, 2021; Jensen, 2022).

Despite the large number of studies on this topic, the identification of the main vectors of the development of the tax system of countries and the implementation of international experience for Kyrgyzstan remains open and needs further research and analysis. It is important to deeply investigate international experience in the field of the tax system and identify its applicability to the specific conditions and needs of Kyrgyzstan.

The purpose of the study was to identify modern vectors of development of the tax systems of the countries of the world and to develop recommendations for the implementation of international experience in the tax system of Kyrgyzstan. To achieve the goal, the following tasks were set in the research process:

1. Assess the tax systems of the OECD countries according to the International Tax Competitiveness Index.
2. Systematise the key development vectors that indicate the effectiveness of the countries' tax systems.
3. Consider the specifics of the tax system of Kyrgyzstan and develop recommendations for the implementation of international experience in the country's tax system.

Materials and Methods

The study was conducted according to the following algorithm. The first step was the collection of data on the International Tax Competitiveness Index (ITCI), which assesses how the country's tax system corresponds to two important areas of tax policy: competitiveness and neutrality. Data on OECD countries were collected, including the following indicators: overall rating, general assessment, corporate tax rating, individual tax rating, indirect tax rating, direct tax rating, and rating on the rules of taxation of cross-border transactions. The data was obtained from the report of the Tax Foundation, the world's leading non-profit organisation that researches and analyses tax policies and tax systems around the world (Centre for Global Tax Policy, 2023).

The Wilcoxon T-test was used to identify the most effective tax systems, which made it possible to compare the ranking of countries and determine statistically significant differences between them. In this context, it was used to compare the ranking positions of countries in various ITCI categories. This method was chosen because of its effectiveness in conditions where data distributions are not normal, which is often found in ratings and indexes. The application of the Wilcoxon T-test included the following steps: data conversion – indicators for each category (general rating, corporate tax, individual tax, etc.) were converted into ranks; pair comparison – rank differences were calculated for each pair of countries, which helped to identify differences in their positions in each category; significance analysis – based on the rank differences, a statistical criterion was calculated, which determined whether the differences between countries are statistically significant. Based on the results of this analysis, 15 of the most effective tax systems were selected. These countries have shown the best results in terms of a set of indicators, which indicates a high level of competitiveness and neutrality of their tax systems. Using the methods of analysis and description, the positive aspects of the tax systems of some countries were highlighted, including aspects such as tax rates, tax structure, and rules of cross-border taxation.

At the second stage, based on the analysed information, key development vectors were identified and systematised, which confirm the effectiveness of the countries' tax systems. This stage included the following steps:

- identification of successful practices, which implied an analysis of the features of the tax systems of the countries that took high positions in the ITCI rating, including the study of policies and strategies that enhance tax competitiveness and neutrality;
- systematisation of success factors, where factors contributing to the effective functioning of tax systems were identified and classified, such as transparency of tax legislation, tax flexibility, measures to prevent tax evasion, and incentives for investors.

In the third stage, the tax system of Kyrgyzstan was reviewed. At first, information was collected on the tax system of Kyrgyzstan. Next, the problems that hinder the development of an effective tax system of the country were highlighted. The most important part of this stage was the development of recommendations based on international experience on the implementation of successful practices. These recommendations were structured in such a way that their implementation would contribute to improving the competitiveness and neutrality of the tax system of Kyrgyzstan, which, in turn, should contribute to economic growth and sustainable development of the country.

Results

Analysis of tax systems of countries according to International Tax Competitiveness Index rating

An effective tax system plays a major role in ensuring stable economic growth, social justice, and financial stability of any country. Modern challenges of globalisation, technological progress, and economic integration require constant improvement of tax systems. The most common international rating that evaluates the tax systems of countries is the ITCI, which evaluates how well a country's tax system corresponds to two important areas of tax policy: competitiveness and neutrality.

ITCI was developed by the Centre for Global Tax Policy in collaboration with the Tax Foundation and is designed to evaluate and compare the tax systems of OECD countries. According to ITCI, the competitiveness of the tax system means that marginal tax rates remain low. It should be noted that in today's globalised world, capital is extremely mobile and modern entrepreneurs can choose to invest in any country in order to get the highest rate of return. This means that entrepreneurs will look for countries with lower tax rates for their investments in order to maximise their after-tax profits. If the tax rate in a country is high enough, this will lead to a redirection of investments to other countries, which subsequently leads to a slowdown in the country's economic growth. In addition, high marginal tax rates can discourage domestic investment and lead to tax evasion within the country.

The neutrality of the tax system assumes that taxes do not affect the economzic decisions of entrepreneurs. Neutrality is ensured by the same taxation of similar economic activities and the avoidance of tax benefits for certain groups or industries. Thus, ITCI helps to determine how much the country's tax system promotes investment, ensures economic neutrality, and supports stable economic growth. Figure 1 provides information on the rating of the OECD International Tax Competitiveness Index for 2023.

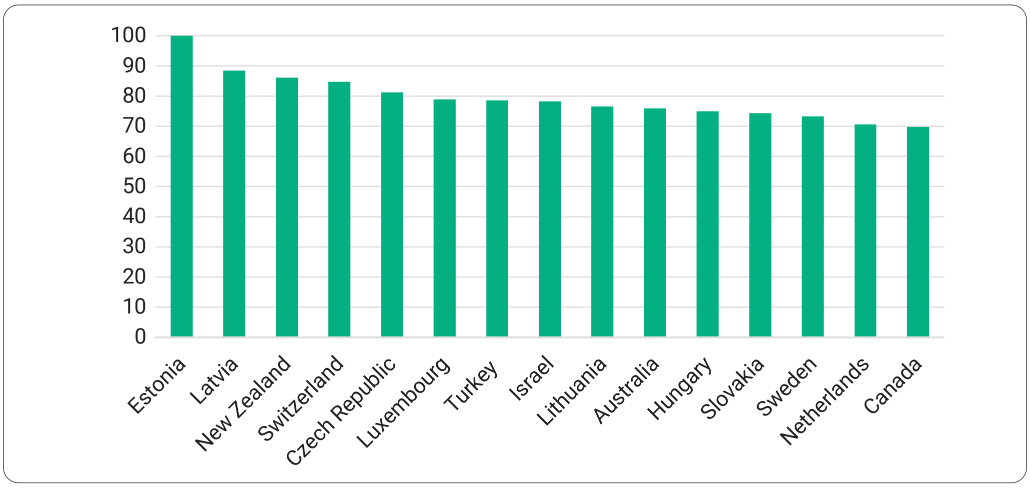

Figure 1. Top 15 OECD tax systems as of 2023
Source: developed by the authors based on Centre for Global Tax Policy (2023)

Thus, in the ITCI 2023 ranking, Estonia took the first place with the highest score due to its simplified and efficient tax system, which includes low corporate tax rates applied only to distributed profits and a simple personal income tax. Latvia, New Zealand, and Switzerland also received a large number of points due to their competitive tax rates and broad tax bases. Luxembourg, Turkey, and Israel have demonstrated effective international tax systems that help attract investment. Other high-performing countries include Lithuania, Australia, Hungary, and Slovakia, which are characterised by transparency and efficiency of tax administration, which contributes to economic growth and investment attraction.

It is important to note that Estonia's tax system is so competitive that it has been ranked first among OECD countries for the 10th year in a row due to four key characteristics. Firstly, Estonia has a corporate income tax rate of 20%, which applies only to distributed profits, which encourages reinvestment of profits. Secondly, the country has a single 20% tax on personal income, which does not apply to income from dividends, which simplifies the tax system and makes it predictable. Thirdly, property tax is levied only on the value of land, and not on the value of real estate or capital, which reduces the tax burden on real estate investments. Ultimately, Estonia applies a regional tax system that exempts 100% of foreign profits earned by domestic corporations from taxation, with minor restrictions, which makes the country attractive to international companies (Centre for Global Tax Policy, 2023).

Although Estonia's tax system is the most competitive in the OECD, the tax systems of other leading countries also received high marks in 2023 due to their performance in key tax categories. Latvia, which has adopted the Estonian corporate profit tax system, also has an effective income tax system (European Commission, 2023). In Latvia, the corporate tax rate on reinvested profits is 0%, meaning all retained corporate profits are tax-free.

New Zealand has a relatively low personal income tax, which largely exempts capital gains from taxation (the total maximum rate is 39%). In addition, there is a value added tax (VAT) in the country (the country introduced VAT in 1986 and taxes are levied on most goods and services at a rate of 15%), and taxes on inheritance, transfer of property, assets or financial transactions are not levied at all (Centre for Global Tax Policy, 2023). Switzerland has a relatively low corporate tax rate (19.7%), a low consumption tax, and an individual income tax, which partially exempts capital gains from taxation. The experience of these countries in the field of taxation and building an effective tax system shows that high performance can be achieved through various approaches to taxation, from low tax rates to a broad tax base and simplified administrative procedures.

Turkey implemented significant changes to its tax system in 2006, including a reduction in the corporate tax rate from 30% to 20% and a progressive personal income tax rate, which led to an increase in its rating from 10th in 2022 to 7th in 2023. It is also important to add that in recent years Turkey has been actively working to improve its tax administration and reduce bureaucratic procedures for businesses (Centre for Global Tax Policy, 2023). The introduction of a special preferential regime in Australia in 2022, which reduces the tax burden for international companies specialising in the development of patents, software and computer programmes, led to a decrease in its rating from 6th to 10th place. While such a measure is aimed at stimulating innovation and investment in research and development, it can also complicate the tax system and create opportunities for aggressive tax planning. In Australia, the taxation system includes VAT, which is 10% and applies to many goods and services. Thus, one of the strengths is the optimised taxation of real estate, where taxes are charged on the value of land, and not on real estate or improvements on it. An integrated approach to dividends in corporate and individual taxes eases the burden of double taxation of distributable income.

The Canadian tax system has its advantages and disadvantages. Among the strengths are low consumption taxes, although the consumption tax base is relatively narrow. In addition, Canada allows businesses to immediately amortise investments in equipment, and also does not levy taxes on wealth, property, or inheritance. However, there are disadvantages in the system, among which it is worth noting the high physical tax on dividends, which is 39.3%, which is significantly higher than the average according to the OECD (Centre for Global Tax Policy, 2023). Capital gains are also taxed at a rate of 26.76%, while the OECD average is lower at 19.26%. Corporate tax in Canada is 26.2%, which is higher than the average among OECD countries (23.6%) (Centre for Global Tax Policy, 2023; Organisation for Economic Co-operation and Development, 2023).

The Czech tax system has a number of strengths, including a relatively low corporate rate of 19%, which is below the OECD average, and minimum labour taxes that do not distort economic activity. In addition, the Czech Republic has a territorial tax system, which means that foreign dividends and capital received from other European countries are exempt from taxation. However, there are some disadvantages, including a high VAT threshold, limited time limits for transferring net operating losses, and strict capitalisation rules, which makes the Czech system one of the strictest in the OECD.

Identification and systematisation of key development vectors that confirm the effectiveness of countries' tax systems

Based on the information provided, it is advisable to identify and systematise the key vectors that affect the effectiveness of the tax systems of countries (Table 1).

Table 1. Key vectors of development of the tax systems of the countries

No.	Factors	Description
1	Digitalisation of tax administration	Digitalisation of tax administration is one of the most significant factors in improving the efficiency of tax systems. The introduction of information technologies allows automating the tax collection process, reduce the number of errors, and improving interaction between taxpayers and tax authorities. Examples of countries that have successfully implemented digitalisation include Estonia and Singapore, where the use of electronic tax systems has significantly reduced administrative costs and increased the level of voluntary compliance with tax legislation
2	Combating tax evasion	Effective mechanisms to combat tax evasion are critical to ensure the fairness of the tax system and increase tax revenues. International initiatives such as Base Erosion and Profit Shifting (BEPS)* are aimed at preventing aggressive tax planning and improving coordination between countries. The automatic exchange of tax information, implemented within the framework of the OECD standards, has significantly increased transparency and allowed for more effective detection of tax evasion
3	Increasing tax transparency	The transparency of the tax system helps to increase the confidence of taxpayers and increase the efficiency of tax administration. International tax transparency standards require countries to ensure the openness of tax information and disclosure of data on tax benefits and tax planning schemes. Countries that are actively implementing these standards, such as the Netherlands and the United Kingdom, demonstrate a higher level of tax discipline and tax collection.
4	Reducing the tax burden and stimulating investments	A competitive tax system characterised by low marginal tax rates helps attract investment and stimulate economic growth. In the context of global capital mobility, countries with lower taxation levels attract more investors, which has a positive effect on economic development. Examples of such countries include Ireland and Switzerland, which have successfully used tax incentives to attract international business and investment.
5	Social justice and progressive taxation	Social justice is an important aspect of an effective tax system. Progressive taxation, in which tax rates increase with income growth, contributes to the redistribution of wealth and the reduction of social inequality. Countries with highly developed social policies, such as Sweden and Norway, are successfully integrating progressive taxation to achieve a fair distribution of the tax burden

Note: *BEPS – the concept of "tax base erosion and profit shifting" refers to tax planning strategies that exploit deficiencies and discrepancies in national and international tax laws to artificially shift profits to low or zero tax territories where economic activity is limited or non-existent. This leads to a reduction or avoidance of income tax obligations. The practice of BEPS affects all countries, but it has a particularly big impact on developing economies due to their high dependence on corporate profit taxation, in particular, multinational corporations
Source: developed by the authors

Thus, the effectiveness of the tax system depends on an integrated approach that includes digitalisation, combating tax evasion, improving transparency, reducing the tax burden and ensuring social justice. International experience shows that the integration of these factors contributes to the creation of sustainable and fair tax systems capable of supporting economic development and the well-being of society.

Overview of the tax system of Kyrgyzstan and recommendations for the implementation of international experience

The tax system of Kyrgyzstan is regulated by the Tax Code, which establishes the taxation procedure in the country. The main types of direct taxes are income tax and profits tax. Income tax for legal entities and foreign companies is 10%, income tax for individuals is also 10%. In addition, there is a property tax, which includes taxes on real estate and vehicles, the rate of which depends on the value and type of property. Indirect taxes include VAT at a rate of 12%, which is levied on sales of goods and services within the country and on imported goods. Excise taxes are also levied on certain types of goods, such as alcohol, tobacco, gasoline and diesel fuel, with rates depending on the type of product. In addition to basic taxes, there are special taxes in Kyrgyzstan, such as the tax on the use of mineral resources, which is levied on companies engaged in mining, and import VAT on goods imported into the country. A patent taxation system is provided for small businesses, allowing entrepreneurs to pay a fixed amount of tax instead of an interest rate. Agricultural enterprises and farmers can benefit from a single tax on agricultural producers, the rate of which depends on the area of land used (Organisation for Economic Co-operation and Development, 2023; Mukimov, 2024). These features of the tax system are aimed at supporting various sectors of the economy and simplifying the tax burden for small businesses.

The administration and collection of taxes are carried out by the State Tax Service, which is responsible for compliance with tax legislation, collecting tax revenues and maintaining tax records. Kyrgyzstan has also signed agreements with a number of countries to avoid double taxation, which allows taxpayers to avoid double taxation of the same income when working in several jurisdictions. Thus, the tax system of Kyrgyzstan is a complex structure that includes direct and indirect taxes, special tax regimes and international cooperation measures to ensure government revenues and support economic activity in the country (Adamkulova & Tynaliev, 2023). Despite the low tax rates, the tax system of Kyrgyzstan faces a number of problems that hinder its development. Many businesses and individuals avoid paying taxes, which leads to significant losses for the state budget. The high level of the shadow economy and tax evasion remain serious problems that require increased control and measures to improve tax discipline. Frequent changes in tax legislation and complex and ambiguous regulations create additional difficulties for taxpayers. Small and medium-sized businesses are particularly affected by the difficulty in understanding and complying with tax requirements, which can lead to errors and penalties.

Despite the fact that Kyrgyzstan's digital transformation policy is defined in several strategic documents, such as the National Development Strategy of the Kyrgyz Republic for 2018-2040 (2018), the Programme of the Government of the Kyrgyz Republic "Unity. Trust. Creation" for 2018-2022 (2018) and the National Digital Transformation Programme "Digital Kyrgyzstan-2019-2023" (2019), the level of digitalisation remains extremely low (United Nations Development Programme, 2021). The main problems remain low digital literacy and the lack of a targeted investment plan for the development of digital human capital. Despite the dynamic development of the IT sector in Kyrgyzstan, the main barrier to its expansion is the lack of qualified IT specialists and the leakage of talented Kyrgyz developers abroad to foreign employers.

The Kyrgyz economy is characterised by a low tax base, which makes it difficult to collect sufficient tax revenues to finance government spending. In addition, uneven taxation between different sectors of the economy leads to an imbalance in tax revenues. Based on the principles of the success of the tax system presented in the table, the following recommendations can be formulated for Kyrgyzstan on borrowing international experience (Table 2). The implementation of these recommendations will allow Kyrgyzstan to improve the efficiency of its tax system, stimulate economic growth and ensure fair taxation.

Table 2. Recommendations for borrowing international experience in the field of successful development of tax systems for Kyrgyzstan

No.	Recommendations	Description	Country of borrowing
1	Introduction of low and competitive tax rates	Studying the experience of countries with low tax rates and adapting their models to attract investment and stimulate economic growth: 1. Adapt the tax rate model to attract investment and stimulate economic growth. 2. Consider introducing a low corporate tax rate applied only to distributed profits in order to encourage companies to reinvest income.	Estonia, New Zealand, Turkey
2	Ensuring the simplicity and predictability of the tax system	Studying the experience of countries with a simple and predictable tax system to increase taxpayer confidence and tax transparency: 1. Introduce a single tax on personal income, which does not apply to income from dividends, to simplify the tax system. 2. Ensure the predictability of tax changes and the stability of tax policy to increase the confidence of taxpayers.	Estonia

Table 2, Continued

No.	Recommendations	Description	Country of borrowing
3	Introduction of simplified administration procedures	Studying Estonian experience of efficient tax administration to reduce administrative costs and improve interaction with business: 1. Adapt the Estonian tax system to reduce the administrative costs of business and the state. 2. Introduce digital technologies to automate tax collection processes and improve interaction between taxpayers and tax authorities.	Estonia
4	Flexibility and adaptation to changes	Studying examples of successful adaptation of the tax system to changes in the economy to stimulate innovation and investment: 1. Study the Turkish experience in reducing corporate tax rates to adapt the tax system to changes in the economy. 2. Consider the introduction of measures that stimulate innovation and investment to support economic growth.	Turkey
5	Broad tax base	Studying the experience of broad-based taxation countries to reduce the tax burden and incentives for tax evasion: 1. Consider the introduction of value added tax (VAT) and the absence of taxes on inheritance, transfer of property, and financial transactions to reduce the tax burden on certain categories of taxpayers.	New Zealand, Latvia, Switzerland
6	Digitalisation of tax administration	Studying the experience of Estonia and Singapore in digitalising tax administration to automate the tax collection process and increase transparency: 1. Implement electronic tax systems to automate tax collection processes and increase transparency of the tax system. 2. Consider the possibility of creating electronic platforms to simplify interaction with tax authorities and improve the quality of services provided.	Estonia, Singapore
7	Combating tax evasion	Studying international initiatives such as BEPS to prevent tax evasion and improve tax collection: 1. Adopt international standards for tax transparency and information exchange to prevent tax evasion and increase tax collection. 2. Consider the introduction of mechanisms for the automatic exchange of tax information to improve tax transparency and efficiency.	
8	Increasing tax transparency	Studying the experience of the Netherlands and the United Kingdom in ensuring transparency of the tax system to increase taxpayer confidence: 1. Ensure the openness of tax information and disclosure of data on tax benefits and tax planning schemes to increase taxpayer confidence and tax collection. 2. Consider the implementation of international standards for tax transparency and reporting to comply with international requirements.	Netherlands, Great Britain, Australia, Slovakia, Hungary
9	Reducing the tax burden and stimulating investments	Studying the experience of countries with a competitive tax system to attract investors and stimulate economic growth: 1. Investigate models of a competitive tax system that attract investors and promote economic growth. 2. Consider the possibility of reducing marginal tax rates and introducing tax incentives to attract international business and investment.	Ireland, Switzerland
10	Social justice and progressive taxation	Studying the experience of Sweden and Norway on the application of progressive taxation to reduce social inequality and ensure equity: 1. Study the experience of applying progressive taxation to reduce social inequality and ensure a fair distribution of the tax burden. 2. Consider the possibility of introducing a progressive scale of taxation for a more equal distribution of tax payments among various categories of the population.	Sweden, Norway

Source: developed by the authors

Thus, the introduction of low and competitive tax rates, digitalisation of tax administration, combating tax evasion, ensuring transparency of the tax system, stimulating investment and social justice are key areas that Kyrgyzstan needs to actively adapt to improve the efficiency of its tax system, attract investment, stimulate economic growth, and ensure social justice in the country.

Discussion

The tax system is the main instrument of the state's economic policy, determining not only the amount of tax revenues, but also the establishment of social justice, stimulating investment and the development of the economy as a whole, which is confirmed by many objective studies, in particular V. Teremetsky *et al.* (2024) and S. Night & J. Bananuka (2019). In the light of global challenges in the global economy, the relevance and importance of this topic are becoming more and more obvious. The main vectors of development of the world's tax systems cover a wide range of aspects, including attracting investments, redistributive function, fair distribution of the tax burden, stimulating economic growth and innovation, combating tax evasion and inefficient use of tax resources, which is reflected in research R. Ramfol (2019) and J. Hájek & C. Olexová (2022). In the context of globalisation and digitalisation of the economy, tax policy must be adaptive and flexible to successfully respond to new challenges and support sustainable development. Effective tax systems contribute not only to economic growth, but also to social well-being, ensuring an equitable distribution of resources and reducing inequality (Asllani & Schneider, 2024). It is important that the tax policy is constantly improved, considering advanced international practices and innovative approaches to increase its effectiveness and competitiveness on the world stage. This requires constant monitoring and analysis of global trends in taxation and the rapid implementation of best practices. The use of new technologies and digital tools can significantly increase the transparency and efficiency of tax administration. Ultimately, a successful tax policy should contribute to the creation of a stable and predictable economic environment that encourages investment and innovation, and ensures long-term economic prosperity (de Vasconcelos Fernandes, 2024).

This study on the assessment of the tax systems of OECD countries using the international ITCI rating is a multi-stage process that includes the collection and analysis of data on various aspects of tax policy. One of the key results was the identification of the strengths and weaknesses of tax systems, their competitive advantages, and the determination of the effectiveness of tax systems in various countries. The analysis of the ITCI rating data and the comparison of indicators of various tax systems allowed forming an objective idea of the degree of attractiveness and effectiveness of these tax systems. These findings are supported by the study by J.M. Monyake *et al.* (2023), who also found that changes in tax policy significantly affect the investment decisions of enterprises in the post-Soviet region, which, in turn, affects economic growth and investment activity. Further, within the framework of this study, the key vectors of the development of tax systems that influence their effectiveness were systematised. During the analysis, aspects such as transparency of tax legislation, tax flexibility, measures to prevent tax evasion and incentives for investors were highlighted. In particular, it was found that transparency of tax legislation plays an important role in building trust in the tax system and creating a favourable business environment. This corresponds to the conclusions obtained by O. Okunogbe & G. Tourek (2024), who focused on the importance of using new information technologies to increase the transparency of the tax system and improve the administration of tax interventions, which leads to an increase in tax revenues in low-income countries.

It has been found that countries that actively implement modern technologies for monitoring and administering tax liabilities tend to achieve greater efficiency in tax collection and reducing tax evasion. This is also consistent with the conclusions of T. Belt *et al.* (2024), which showed that the use of information technology to identify taxpayers and verify tax obligations significantly improves tax collection in low-income countries. The introduction of such technologies not only increases the transparency of the tax system, but also strengthens the trust of taxpayers, which contributes to more sustainable economic development. Transparency of tax legislation contributes not only to reducing the level of tax evasion, but also to the development of social justice, which, in turn, strengthens public confidence in the tax system and the state as a whole. These findings correlate with the research by A.F. Alshirah *et al.* (2019) and P.B. Saptono *et al.* (2024), emphasising the importance of transparency and social justice in the tax system to stimulate sustainable economic growth. In addition, during this study, the main problems and shortcomings of the Kyrgyz tax system were identified, such as a complex taxation procedure, a high degree of bureaucratisation, insufficient transparency of tax legislation, and problems with the effectiveness of tax revenue collection. Based on the analysis of international experience and best practices in the field of taxation, recommendations were developed for the implementation of international experience in the tax system of Kyrgyzstan. These recommendations have the potential to significantly improve the Kyrgyz tax system, which can contribute to the development of the business environment, attract investment, and stimulate economic growth. This correlates with the research by V. Ahmadov & Z. Pashayev (2024), who studied the consequences of tax reform and the impact of the abolition of heterogeneity of tax rates on the economy, showing that such reforms can contribute to improving the economic situation and investment attractiveness. In addition, this study revealed that the rules of taxation of cross-border transactions play a critical role in the overall effectiveness of the tax systems of OECD countries. The analysis showed that countries with more transparent and well-regulated rules for cross-border transactions tend to show higher ITCI ratings (Tchiotashvili *et al.*, 2024).

The importance of these aspects was also noted by A. Erkeno *et al.* (2024), who emphasised the need to adapt tax systems to modern economic realities and challenges.

The use of innovative approaches and technologies in tax administration, as revealed in this study, plays a critical role in combating tax evasion and improving the efficiency of using tax resources. In addition, a study by A.F. Vanova *et al.* (2024) assessed the income tax burden in various EU member states and provided valuable information on how this tax burden has changed over time and how it differs between countries. This study, focusing on the analysis of successful tax systems in the world, also revealed that the effectiveness of tax systems depends on the ability to adapt to changes in the economic environment, which includes regular revision of tax rates and tax conditions. These findings confirm the importance of tax flexibility, which was also noted as a key factor contributing to the successful functioning of tax systems.

Thus, it can be noted that the advantages of this study lie in its comprehensive nature and practical significance for the development of an effective tax policy. The study identified optimal strategies based on the successful experience of tax systems in the world and offered recommendations for improving the tax system based on current trends. Therefore, it can be argued that this study is a valuable tool for making informed decisions in the field of tax policy for Kyrgyzstan, contributing to its economic development and social justice. In addition, the implementation of the proposed recommendations can significantly improve the competitiveness of the tax system of Kyrgyzstan in the international arena and create favourable conditions for attracting investment and business development.

Conclusions

The development of the tax systems of the countries is one of the important directions in the field of economic policy. An effective tax system contributes to sustainable economic growth, social justice, and financial stability of the state. In the context of globalisation and a dynamically changing economic environment, countries are actively exploring and adopting international experience to modernise and improve their tax systems.

The assessment of the OECD countries' tax systems using the ITCI international rating is a multi-stage process that includes the collection and analysis of data on various aspects of tax policy. During this stage, a comprehensive study of tax systems was carried out, covering the overall rating of the tax system, corporate and individual taxes, and the rules for taxation of cross-border transactions. The main purpose of this assessment was to determine the effectiveness of tax systems in various countries and identify trends in their development. By analysing the data on the ITCI rating and comparing the indicators of various tax systems, it was possible to form an objective idea of the degree of attractiveness and effectiveness of these systems. In the process, the strengths and weaknesses of tax systems and their competitive advantages were identified. Thus, the assessment of tax systems using the ITCI international rating is an important tool for analysing and comparing tax policies of different countries, which allows identifying common trends in the development of tax systems and determining the most attractive and effective approaches to taxation.

The second task was to systematise the key vectors of the development of tax systems that affect their effectiveness. Various aspects were considered during the analysis, including transparency of tax legislation, tax flexibility, measures to prevent tax evasion, and incentives for investors. Transparency of tax legislation plays an important role in building trust in the tax system and creating a favourable business environment. Tax legislation should be understandable and accessible to taxpayers, which helps to comply with tax obligations and reduce the risk of misconduct. Tax flexibility allows tax systems to adapt to changing economic conditions and business needs, which includes the possibility of regularly reviewing tax rates and tax conditions in accordance with the current economic situation.

The study also identified the main problems and shortcomings of the tax system of Kyrgyzstan, such as complex taxation procedure, high degree of bureaucratisation, lack of transparency of tax legislation, and problems with the efficiency of tax revenue collection. Based on the analysis of international experience and best practices in the field of taxation, recommendations were developed for the implementation of international experience in the tax system of Kyrgyzstan. The implementation of these recommendations has the potential to significantly improve the tax system of Kyrgyzstan, increase its efficiency and comply with modern standards and practices in the field of taxation. This, in turn, can contribute to the development of the business environment, attract investment, and stimulate economic growth and social development in the country. In the next study, it is relevant to focus on a comparative analysis of tax systems in developed and developing countries, evaluating the impact of digitalization on tax administration and its effectiveness in reducing tax evasion.

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Conflict of Interest

None.

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Анотація. У сучасному світі розробка та вдосконалення податкових систем є важливим напрямом економічної політики багатьох країн. Дослідження міжнародного досвіду в цій галузі дає змогу виявити найефективніші стратегії та вектори розвитку податкової системи для забезпечення сталого економічного зростання та відповідності сучасним вимогам податкової системи. Це дослідження спрямоване на визначення векторів розвитку податкових систем країн і розробку рекомендацій для імплементації міжнародного досвіду в Киргизстані. Шляхом аналізу даних Міжнародного індексу податкової конкурентоспроможності для країн Організації економічного співробітництва та розвитку було виявлено найефективніші податкові режими. За допомогою статистичних методів, таких як Т-критерій Вілкоксона, було визначено країни з найкращою податковою системою. Потім було систематизовано ключові вектори, що впливають на ефективність податкових систем, включно з цифровізацією податкового адміністрування, прозорістю законодавства, стимулами для інвесторів тощо. Також під час дослідження було проаналізовано особливості податкової системи Киргизстану та розроблено рекомендації для імплементації міжнародного досвіду в його податкову систему, як-от: запровадження низьких і конкурентоспроможних податкових ставок, забезпечення простоти й передбачуваності податкової системи, запровадження спрощених процедур адміністрування, гнучкість та адаптація до змін, широка база оподаткування, цифровізація податкового адміністрування, боротьба з ухиленням від сплати податків, підвищення податкової прозорості, зниження податкових тарифів та інфляції. Рекомендації, що випливають із цього дослідження, пропонують конкретні кроки для підвищення ефективності податкових систем, що може сприяти залученню інвестицій, стимулюванню економічного зростання та забезпеченню соціальної справедливості

Ключові слова: прозорість; корпоративний податок; цифровізація; ухилення від сплати; бюрократичні процедури; ухилення від сплати

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Institutional investors' distraction and audit fees: The mediating effect of ESG rating disagreement

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Abstract. The growing focus on sustainability and responsible corporate behaviour makes the analysis of the impact of institutional investors on audit fees extremely important to ensure the transparency and reliability of non-financial reporting in the current environment. The purpose of the study was to identify the degree of influence of institutional investors on the payment for audit services of Chinese companies based on environmental, social and governance (ESG) ratings. The study was conducted using the methods of sampling, observation, analysis, and description of statistical characteristics. The results indicate a significant relationship between institutional investor distraction and increased audit fees caused by discrepancies in ESG ratings. This highlights the critical role of investor oversight in maintaining audit quality and controlling costs. While divergent ESG ratings provide auditors with more information, thereby reducing audit workloads and fees, this effect is not sufficient to offset the overall increase in audit fees due to investor distraction. The effect is more pronounced for low-tech companies, companies with high environmental impacts, and companies with lower cash flow volatility, making them more vulnerable to increased audit scrutiny and higher fees. The various differences in ESG ratings, including environmental, social and governance aspects, serve as key mediating factors, highlighting the importance of taking these differences into account when assessing audit risk and setting fees. The results obtained in the course of the study can be used to improve the ESG rating methodology, namely to increase transparency and reduce information asymmetry in the stock market

Keywords: corporate governance; risk assessment; corporate governance; investor attention; sustainability

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Introduction

As shareholders of the company, institutional investors oversee actions of company executives that are detrimental to shareholders' interests, such as reducing excessive perquisites for management and dismissing chief executive officers with poor management capabilities. X. Ni *et al.* (2020) claim that the distraction of institutional investors leads to a decrease in internal regulatory pressure, resulting in an increased risk of stock price collapse for the company. A. Garel *et al.* (2021) emphasised that institutional investors' distraction can also lead to an increase in earnings management behaviour by the management of companies, resulting in greater financial risks for the enterprise. J. Yang *et al.* (2021) discovered that the diversion of attention by institutional investors results in higher audit fees and delays in audit reporting. Furthermore, it was discovered that the diversion of attention by institutional investors results in a rise in the amount of work for auditors. While previous studies have provided insight into the correlation between institutional investors› distraction and the rise in corporate misconduct, leading to increased operational risks and subsequently higher audit fees, there is limited research examining the influence of institutional investors› distraction on corporate audit fees specifically in relation to ESG rating disagreement. In addition, there is a scarcity of research that use Chinese listed businesses as samples to examine the correlation between institutional investors› diversion and audit fees.

Authors' findings confirm the conclusions of the research of J. Yang *et al.* (2021), which are also applicable to the Chinese financial market, namely, institutional investors' distraction leads to an increase in audit fees. It is increasingly becoming an important investment consideration for investors. D.C. Broadstock *et al.* (2020) argue that due to variations in the standards and weighting of criteria among ESG rating agencies, as well as differences in the information collected, ESG ratings exhibit disagreement. Different ESG ratings provided by various agencies serve as useful information to assist auditors in professional judgment, determining the scope of auditing work. Consequently, the workload for auditors may decrease to some extent, leading to reduced audit fees. Thus, the disagreement in ESG ratings can play a negative mediating role in the process whereby institutional investors' distraction leads to an increase in audit fees (Tkachenko *et al.*, 2023). The calculation method for ESG rating discrepancies follows the approach proposed by D. Avramov *et al.* (2022). The regression results of the authors indicate that the influence of institutional investors› distraction on ESG rating disagreement is both positive and statistically significant.

R. Gibson Brandon *et al.* (2021) argue that ESG rating disagreement creates confusion in market signals for investors, which is detrimental to stakeholders. With the perspective from the benefits of ESG rating disagreement, the authors suggest that ESG rating disagreement is advantageous for auditors to narrow down the scope of auditing, identify the focal points of auditing work, and provide more information of companies to auditors. Current study supplements the literature on the impact of institutional investors' distraction on audit fees. While previous research such as J. Yang *et al.* (2021) has examined this impact, it has not focused on Chinese financial market and Chinese listed firms. Third, authors contribute to the literature on auditing. Previous studies like D.K. Chan *et al.* (2021) have shown that institutional investors' distraction leads to reduced shareholders' oversight for companies, resulting in increased misconduct, heightened audit risks, and higher audit fees.

The purpose of the study is to investigate the extent to which institutional investors' distraction affects audit fees of Chinese companies, with a particular focus on the mediating role of discrepancies in ESG ratings.

Literature Review

J. Yang *et al.* (2021) have found that institutional investors' distraction could lead to an increase in audit fees. D.K. Chan *et al.* (2021) claim that institutional investors' distraction can also lead to the behaviours of corporate management sacrificing shareholders' interests for their own benefit, resulting in lower audit quality. For the increase in audit fees and the decrease in audit quality caused by institutional investors' distraction, it can be explained by the decrease in regulatory oversight for the company. As shareholders, institutional investors can play a regulatory role in deterring corporate misconduct. A. Garel *et al.* (2021) found that institutional investors' distraction leads to increased earnings management by companies. E. Kempf *et al.* (2017) found that it also leads to value-destructive acquisitions by corporate management. Based on that previous research, authors can conclude that institutional investors' distraction can impact companies' financial behaviours, thereby affecting auditors' workload. In this study, the authors investigate this concept by analysing a sample of Chinese listed firms from 2010 to 2023 in order to ascertain if this notion remains valid.

Researchers such as J.A. Cookson & M. Niessner (2019) and M. Billio *et al.* (2021) suggest that the divergence in ESG ratings arises from disparate data sources and varying interpretations of that data by distinct ESG rating agencies. The information collected by ESG rating agencies varies, and the rating criteria differ. Regarding whether the disagreement in ESG ratings is more advantageous than disadvantageous, different studies have different perspectives. D.C. Broadstock *et al.* (2021), from the view of the differing of ESG rating agencies, believed that the emergence of disagreement in ESG is due to the different focuses and standard of each rating agency. E. Escrig-Olmedo *et al.* (2019) argue that since most investors cannot understand a company's ESG disclosures and rely on ESG rating agencies, the ratings provided by different ESG rating agencies increase the understandability of corporate ESG disclosures. It could enrich the investment information available to investors. D.M. Christensen *et al.* (2021) argued that if companies disclose an increased amount of ESG information, it will lead to an increase in disagreement in ESG ratings. R. Gibson Brandon *et al.* (2021) conclude that while ESG ratings from various organisations improve the clarity of ESG information disclosure, discrepancies in these ratings due to differing interpretations of the same material can impact the assessments made by professional investors.

D.K. Chan *et al.* (2021) in their study stated the distraction of institutional investors can lead to a lack of control over corporate behaviour. If a particular unethical behaviour carries a significant weight in the rating criteria and this information happens to be collected by the ESG rating agency, the ESG rating score from the agency would tend to decrease. Conversely, if the weight in the rating criteria of this behaviour is small or if the information is not collected at all, the rating score from the agency would tend to increase. According to E. Kempf *et al.* (2017), under the influence of reduced regulation, companies may behave more unethically, which increases disagreement in ESG ratings because different rating agencies collect different information and their evaluation standards differ. As a result, the disagreement in ESG ratings will increase. Auditors, as one of the users of ESG rating information, will benefit from the expanded differences in ESG ratings, as it will provide them with more relevant information regarding ESG aspects. Auditors can directly utilize this information for auditing purposes, allowing for a narrower scope of auditing tasks and reduced auditing fees.

The subsequent conjectures are put out concerning corporate attributes. The authors propose that the correlation between institutional investors' diversion and audit fees may be influenced by certain firm attributes. Initially, the authors categorise the sample companies into two groups: high-tech enterprises and non-high-tech companies. Due to financing issues related to research and development funds, high-tech companies prioritize communication and disclosure with external stakeholders (Nakipova *et al.*, 2023). As a result, they receive more attention from external parties compared to non-high-tech companies. Therefore, the distraction of institutional investors does not lead to a significant decrease in external oversight for high-tech companies. Furthermore, due to the substantial proportion of research and development expenses in high-tech companies and the heightened scrutiny from shareholders on this aspect of expenses, the auditing workload and auditing scope of auditors do not undergo significant changes based on the level of distraction from institutional investors. High-tech businesses are more likely to engage in earnings management methods due to the unpredictability surrounding research and development outcomes (Liepert, 2024). As a result, auditors tend to focus more on these organisations. Thus, the anticipated impact of institutional investors' diversion on audit costs is predicted to be less pronounced for high-tech firms.

Authors then examine the extent to which institutional investors' distraction has a significant favourable effect on audit fees, specifically in relation to companies that are heavily-polluted. Heavily-polluted companies face more public pressure in this current era that emphasizes environmental protection. Moreover, media coverage of environmental pollution incidents brings significant public scrutiny to those companies. Fulfilling social responsibilities by heavily-polluted companies can demonstrate a positive corporate image and significantly improve the financial condition of the company. Those companies often face significant financing pressure due to industry characteristics and the companies with poor environmental performance would experience high financing costs (Novykova *et al.*, 2023). Because of those pressure, heavily-polluted companies have a greater incentive to engage in earnings management compared to non-heavily polluting companies. Therefore, after a decrease in attention from institutional investors who serve as shareholders, and such misconduct in financial fraud would increase among heavily-polluted companies, it will attract the attention of auditors, resulting in increased audit fees (Horbal & Makarova, 2023).

Finally, authors believe that the company's cash flow volatility would influence the strength of the positive impact of institutional investors' distraction on audit fees. J.L. Campbell *et al.* (2019) argue that large fluctuations in a company's operating cash flow are perceived by investors as volatile earnings. Heightened uncertainty in cash flows leads to a reduction in a company's resilience against risks, hindering its capacity to effectively control unforeseen events and operational risks associated with financial crises. Companies with high cash flow volatility are more likely to face financial distress, which in turn attracts more attention from external stakeholders. Institutional investors serve as shareholders overseeing companies. The distraction of institutional investors does not affect the behaviours of other stakeholders to the company. These companies with high cash flow volatility still receive sufficient attention from various stakeholders to curb misconduct. Therefore, audit fees are unlikely to undergo significant changes. Larger cash flow volatility often leads to companies engaging in earnings management practices. Regardless of whether institutional investors are distracted, these earnings management practices would always attract the attention of auditors.

Materials and Methods

Sample of the study includes all stock of listed companies from the main board of Shanghai and Shenzhen Stock Exchanges. The time frame of the sample data extends over 14 years, spanning from 2010 to 2023. The data related to companies' financial condition, management status, and investors' shareholding comes from the China Stock Market and Accounting Research Database (CSMAR) and the WIND database. The ESG rating data is sourced from six reputable ESG rating agencies with extensive knowledge of the Chinese financial market and Chinese listed firms: Bloomberg, Hexun, Huazheng, FTSE Russell, SynTao Green Finance and Wind. The data from these six ESG rating agencies are also utilized by many papers studying ESG-related aspects of Chinese listed enterprises, such as D.C. Broadstock *et al.* (2020) and H. Shen *et al.* (2023).

Authors use Stata17 for data organization, processing, and conducting regression analysis.

The authors in this study conducted data processing in the following manner: initially, they excluded observations from financial and insurance companies; subsequently, they excluded observations from companies listed under the category of "Special Treatment". Finally, the authors eliminated observations that had missing values for the variables. This resulted in a total of approximately 16 thousand firm-year observations of panel data. Monitoring activities by institutional shareholders benefit auditors by lowering audit risk. Audit fees can reflect the level of risk and workload faced by auditors. Following J. Yang *et al.* (2021), authors took the natural logarithm of the audit fees for the companies.

Following the approach of E. Kempf *et al.* (2017), authors calculate the variables measuring institutional investors' distraction. Institutional investors may be attracted by the performance of stocks from other industries in their own investment portfolios. The variable construction of $D_{i,q}$ suggests that distraction occurs when other industries experience extremely high or low returns. This formula suggests that institutional investor p of company i is likely to be distracted if company i does not belong to an industry that experiences extreme high or low returns, and this industry's stocks are significant in the portfolio of institutional investor p (1):

$$D_{i.q}=\sum_{p\in F_{q-1}}\sum_{IND\neq IND_f}W_{p,i,q-1} * W_{p,q-1}^{IND} * IS_q^{IND}, \quad (1)$$

where p – the investor; i represents the company; q – quarter q; $p\in F_{q-1}$ – at the end of quarter q-1, institutional investor p of company i; IND – the set of twelve Fama-French industries; INDf – the industries company i is affiliated to; $w_{p,q-1}^{IND}$ – the importance of industry IND in investor p's investment portfolio; IS_q^{IND} – an indicator variable.

When industries excluding the industry which company i belongs to experience the highest or lowest returns in quarter q, it equals 1; it takes the value of 0 when extreme returns are not observed in those other industries. A larger indicates that investor p takes more weight for company i. In this scenario, company i holds a larger portion in investor p's investment portfolio, and for company i, investor p is the shareholder with a larger stake. It is calculated as the following equation (2):

$$W_{p,i,q-1} = \frac{QPFweight_{p,i,q-1}+QPercOwn_{p,i,q-1}}{\sum_{p\in F_{q-1}}(QPFweight_{p,i,q-1}+QPercOwn_{p,i,q-1})}, \quad (2)$$

where: $PFweight_{p,i,q-1}$ – the significance of company i to investor p, reflecting the proportion of company i's market value in investor p's portfolio. $PercOwn_{p,i,q-1}$ – the percentage of stocks of company i owned by investor p.
Sort all stocks held by investor p into quintiles by $PFweight_{p,i,q-1}$, labelled $QPFweight_{p,i,q-1}$. Sort company i's all shareholders into quintiles by $PercOwn_{p,i,q-1}$ labelled $QPercOwn_{p.i.q-1}$. The denominator is set so that the sum of $w_{p,i,q-1}$ equals 1. Different rating agencies use different scales. In order to make the data from these different rating agencies comparable and computable, following D.C. Broadstock *et al.* (2020), all ESG rating are scaled from 1 to 10. Then, following the approach of D. Avramov *et al.* (2022), calculate the ESG rating disagreement between pairs of rating agencies with ratings standardized for the same year and company. For the six ESG rating agencies – Bloomberg, Hexun, Huazheng, FTSE Russell, SynTao Green Finance and Wind, a total of up to 15 pairs can be formed (3):

$$ERD\_pair_{i,t} = \frac{|ESG\_rating_{i,a,t}-ESG\_rating_{i,b,t}|}{\sqrt{2}}, \quad (3)$$

where: $ESG\_rating_{i,a,t}$ – the standardized ESG score for company i from agency a, and $ESG\_rating_{i,b,t}$ is the standardized ESG score for company i from agency b, both agency a and b come from the six ESG rating agencies; ERD – entities with reduced dimension; $ERD\_pair_{i,t}$ – the difference in ESG ratings between agency a and b for company i. According to this formula, calculate all $ERD\_pair_{i,t}$ between pairs of agencies that conducted ESG ratings for the company i in year t. Finally, calculate the arithmetic mean of all $ERD\_pair_{i,t}$ values as variable $ERD_{i,t}$ which represents the ESG rating disagreement of company i in year t.

The authors of this study, based on prior research conducted by D.C. Broadstock *et al.* (2020), have chosen the following control variables to include in their regression model. The BM ratio is a financial metric that represents the ratio of a business's book value to its market value. It provides insight into the value of the company in the financial market. TOP1 refers to the degree of ownership concentration of the largest shareholder, which is determined by dividing the number of shares held by the largest shareholder by the total number of shares available. The variable Opinion is an indicator variable, which takes the value of 1 when the company's financial report is issued an unqualified audit opinion. Its calculation involves taking the portion of intangible assets related to digitization as the digitized portion, and then dividing this digitized portion of intangible assets by the total proportion of all intangible assets, resulting in the degree of digitalization for the company. WW is the financial constraint index calculated according to the method of T.M. Whited & G. Wu (2006). It can reflect the level of financial constraint faced by the company. State-Owned Enterprise (SOE) reflects the ownership structure of the company and is also an indicator variable. The SOE of a state-owned enterprise is equal to 1, while the SOE of a private enterprise is equal to 0.

The average value of variable AuditFee is 13.8051, indicating that the average of natural logarithm of the audit fees paid by companies is 13.8051. The average value of D is 0.0064, indicating that on average, the level of distraction faced by a company from institutional investors is 0.0064 (Table 1).

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
AuditFee	16,500	13.8051	0.7192	11.5129	17.6758
D	16,500	0.0064	0.0116	0	0.0695
ERD	16,500	2.4793	0.8161	0	5.8341
BM ratio	16,500	0.6134	0.2597	0.0235	1.5592
TOP1	16,500	35.0007	15.027	2.4307	89.991
Opinion	16,500	0.9833	0.1283	0	1
digital	16,500	0.0003	0.0025	-0.0002	0.1199
WW	16,500	-1.3559	36.8995	-4712.1532	-0.7417
SOE	16,500	0.3864	0.4869	0	1

Source: created by the authors

The average value of ERD is 2.4793, indicating that on average, the standardized ESG rating disagreement received by a company is 2.4793. For other variables, an average company has the BM ratio of 0.6134, TOP1 of 35.0007, Opinion of 0.9833, digital of 0.0003, WW of -1.3559 and SOE of 0.3864.

According to the literature review, authors set the five hypotheses of this paper:

H1: Institutional investors' distraction would lead to an increase in audit fees.

H2: ESG rating disagreement plays a negative mediating role in the process where institutional investors' distraction leads to an increase in audit fees.

H3: The positive relationship between institutional investors' distraction and audit fees will be stronger in the non-high-tech companies.

H4: The positive relationship between institutional investors' distraction and audit fees will be stronger for heavily-polluted companies.

H5: The positive relationship between institutional investors' distraction and audit fees will be stronger in the companies with low cash flow volatility.

Results

This study seeks to investigate if the diversion of attention by institutional investors could influence audit fees. Analyse the panel data using Fixed Effects Model. To test hypothesis H1, the following model is designed. The model's design follows T. Chen *et al.* (2023), as they also employed Fixed Effects Model in their study. The reason for utilizing year fixed effects is to account for all unobservable factors that change over time and could impact audit fees, such as fluctuations in the macroeconomic environment and alterations in regulatory policies. Moreover, employing firm fixed effects enables the control of firm-specific heterogeneity factors like corporate governance structure and industry characteristics (4):

$$AuditFee_{i,t} = \beta_0 + \beta_1 D_{i,t} + \beta_2 BM_{ratio_{i,t}} + \beta_3 TOP1_{i,t} + \\ + \beta_4 Opinion_{i,t} + \beta_5 digital_{i,t} + \beta_6 WW_{i,t} + \beta_7 SOE_{i,t} + \\ + Year_{FE} + Firm_{FE} + \varepsilon_{i,t}. \quad (4)$$

Audit fee is the dependent variable, and D represents institutional investors' distraction which is the core explanatory variable. $Year_{FE}$ represents time fixed effects, which in this study is represented by years. $Firm_{FE}$ represents firm fixed effects, which in this paper is denoted by stock code of listed firms. In this model, the main focus is on the coefficient of D. According to hypothesis H1, it is expected that this coefficient is statistically significantly positive. Next, this paper investigates the mechanism through which institutional investors distraction affects audit fees. From the perspective of intermediary effects, authors consider ESG rating disagreement as the mediating variable. This model testing hypothesis H2 still incorporates time fixed effects and firm fixed effects (5, 6):

$$ERD_{i,t} = a_0 + a_1 D_{i,t} + a_2 BM_{ratio_{i,t}} + a_3 TOP1_{i,t} + \\ + a_4 Opinion_{i,t} + a_5 digital_{i,t} + a_6 WW_{i,t} + a_7 SOE_{i,t} + \\ + Year_{FE} + Firm_{FE} + \varepsilon_{i,t}, \quad (5)$$

$$AuditFee_{i,t} = \gamma_0 + \gamma_1 D_{i,t} + \gamma_2 ERD_{i,t} + \gamma_3 BM_{ratio_{i,t}} + \\ + \gamma_4 TOP1_{i,t} + \gamma_5 Opinion_{i,t} + \gamma_6 digital_{i,t} + \gamma_7 WW_{i,t} + \\ + \gamma_8 SOE_{i,t} + Year_{FE} + Firm_{FE} + \varepsilon_{i,t}. \quad (6)$$

Equation (4) serves as the first step in assessing the mediating effect, Equation (5) as the second step, and Equation (6) as the third step. If all coefficients β_1, a_1, and γ_2 are significant simultaneously, it indicates the presence of a mediating effect. If coefficient γ_1 is significant, it indicates partial mediating effect, whereas if coefficient γ_1 is not significant, it indicates complete mediating effect.

Table 2 displays the primary findings. The audit fees are the dependent variable in both columns. Column (1) incorporates year fixed effects and firm fixed effects, while excluding any control variables. Control variables are included in column (2). The coefficient estimates that are of greatest interest are those of variable D. According to hypothesis 1, it is expected that the coefficient of D will be both statistically significant and positive. The regression analysis supports hypothesis 1, which states that the distraction of institutional investors leads to a rise in audit fees. Prior to the incorporation of control variables, the impact of institutional investors' diversion on audit fees is positive but lacks statistical significance. In addition, when control variables are taken into account, the coefficient of D is 0.4167, and it is statistically significant at the 5% level. This suggests that the overall impact of institutional investors' distraction on audit fees is favourable. By incorporating control variables, the model for audit fees becomes more powerful in explaining the phenomenon. This is evident from the increase in the Adjusted R-squared value, which rises from 87.17% to 87.44%.

Table 2. Main results

	(1) AuditFee	(2) AuditFee
D	0.297 (0.2078)	0.4167** (0.2059)
BMratio		0.2269*** (0.0172)
TOP1		-0.0016*** (0.0004)
Opinion		-0.0912*** (0.0188)
digital		17.1255*** (2.8559)
WW		-0.0001 (0.0001)
SOE		0.1075*** (0.0191)
_cons	13.8113*** (0.0025)	13.769*** (0.0264)
$Year_{FE}$-s	YES	YES
$Firm_{FE}$-s	YES	YES
Observations	15925	15925
Adj.R-squared	0.8717	0.8744

Note: ***p < 0.01; **p < 0.05; *p < 0.1
Source: created by the authors

A study was done to examine the impact of investors' distraction on audit fees, as presented in Table 3. The mechanism by which the impact occurs is through the mediating effect of ESG rating dispute, specifically in relation to hypothesis H2. Since H2 consists of two equations, the intermediate variable ERD serves as the dependent variable for both Columns (1) and (2), while audit fees serve as the dependent variables for Columns (3) and (4). Columns (1) and (3) depict regressions conducted without control variables, while Columns (2) and (4) depict regressions conducted with control variables. The regressions in the last four columns incorporate year fixed effects and firm fixed effects.

Table 3. Mechanism analyses

	(1) ERD	(2) ERD	(3) AuditFee	(4) AuditFee
D	1.1412** (0.5119)	1.1158** (0.5123)	0.306 (0.2078)	0.4252** (0.2059)
ERD	-	-	-0.0079** (0.0035)	-0.0077** (0.0035)
BMratio		-0.0238 (0.0428)		0.2267*** (0.0172)
TOP1		-0.0005 (0.001)		-0.0016*** (0.0004)
Opinion		-0.0952** (0.0468)		-0.0919*** (0.0188)
digital		-18.765*** (7.1059)		16.9817*** (2.8562)
WW		0.0002 (0.0001)		-0.0001 (0.0001)
SOE		0.0402 (0.0476)		0.1078*** (0.0191)
_cons	2.4564*** (0.006)	2.5718*** (0.0656)	13.8307*** (0.009)	13.7887*** (0.0279)
$Year_{FE}$-s	YES	YES	YES	YES

Table 3, Continued

	(1) ERD	(2) ERD	(3) AuditFee	(4) AuditFee
$Firm_{FE}$-s	YES	YES	YES	YES
Observations	15,925	15,925	15,925	15,925
Adj. R-squared	0.3858	0.3862	0.8717	0.8744

Note: ***p < 0.01; **p < 0.05; *p < 0.1
Source: created by the authors

The writers primarily concentrate on the coefficient of D in Columns (1) and (2). The authors primarily concentrate on the coefficients of both D and ERD for Columns (3) and (4). The distraction of institutional investors has a statistically significant and beneficial impact on the level of disagreement in ESG ratings. This effect is statistically significant at a significance level of 5%. Upon introducing control variables in Column (4), the coefficient representing the direct influence of D on audit fees is 0.4252. This coefficient is statistically significant at the 5% level of significance. The regression coefficient for the effect of ERD on audit fees is -0.0077, which is statistically significant at the 5% level of significance. In addition, based on the previously described primary results, the overall effect coefficient of variable D on audit fees is 0.4167, and it is statistically significant at the 5% level of significance. The distraction of institutional investors directly increases audit fees, but their distraction, mediated via ESG rating disagreement, decreases audit fees. Nevertheless, the mediating effect is insufficient to fully counterbalance the direct favourable influence of institutional investors' preoccupation on audit fees. Hence, the overall impact is favourable, and the difference in ESG ratings partially mediates the relationship between institutional investors' attention and the increase in audit fees. The regression analysis confirms hypothesis H2, demonstrating the validity of the mediating role of ESG rating disagreement as an intermediate variable.

The following are a set of rigorous tests conducted to verify that the authors' primary findings remain valid while altering the model's parameters. Initially, authors modify the control variables of the model. The authors' objective is to verify that, following the manipulation of the control variables, the coefficient of the primary explanatory variable, institutional investors' distraction, stays positive and statistically significant. The new control variables are defined in the following manner. The acronym SA stands for the financial constraints index. TOBINQ_A is a financial metric that calculates a company's market value by dividing it by the entire value of its assets. Indep represents the ratio of independent directors, which is determined by dividing the number of independent directors by the total number of board members. DUVOL is a variable introduced by T. Cen (2023) to quantify the danger of a stock price drop. The variable "Employee" represents the natural logarithm of the total number of employees in the company. PV, short for-profit volatility, is a metric that can assess a company's ability to withstand and adapt to risks. Column (1) displays the regression outcome for the previous model, whereas Column (2) presents the regression outcome for the model that modifies the control variables (Table 4).

Upon modifying the control variables, the coefficient of the primary explanatory variable D is determined to be 0.3721, exhibiting statistical significance at the 5% level of significance. The ERD coefficient continues to be negative, but the significance level has now changed to 10%. This suggests that the statistically significant favourable impact of institutional investors' distraction on audit fees is unchanged after the adjustment of control variables. This implies that the main finding of this study is reliable and resistant to changes.

Table 4. Altering control variables

	Former Eq. (1) AuditFee		Altered Eq. (2) AuditFee
D	0.4252** (0.2059)	D	0.3721** (0.1877)
ERD	-0.0077** (0.0035)	ERD	-0.0062* (0.0032)
BM-ratio	0.2267*** (0.0172)	SA	-0.0132 (0.0376)
TOP1	-0.0016*** (0.0004)	TOBINQ_A	-0.016*** (0.0021)
Opinion	-0.0919*** (0.0188)	Indep	-0.0023*** (0.0006)
digital	16.9817*** (2.8562)	DUVOL	-0.0065 (0.0044)
WW	-0.0001 (0.0001)	Employee	0.2668*** (0.0051)

Table 4, Continued

	Former Eq. (1) AuditFee		Altered Eq. (2) AuditFee
SOE	0.1078*** (0.0191)	PV	0.4803*** (0.0625)
_cons	13.7887*** (0.0279)	_cons	11.7347*** (0.1516)
$Year_{FE}$-s	YES	Year FEs	YES
$Firm_{FE}$-s	YES	Firm FEs	YES
Observations	15,925	Observations	15,922
Adj. R-squared	0.8744	Adj. R-squared	0.8956

Note: ***$p<0.01$; **$p<0.05$; *$p<0.1$
Source: created by the authors

Considering the endogeneity issue arising from the bidirectional causal relationship between distraction and audit fees, i.e., whether institutional investors' distraction leads to increased misconduct, resulting in increased audit fees, or increased audit fees lead institutional investors to perceive increased audit quality, increased auditor attention, thus reducing their focus on the company (Rachwal-Mueller *et al.*, 2023). Therefore, lagging institutional investors' distraction is considered. The first column represents institutional investors' distraction without lag, the second column represents institutional investors' distraction lagged by one period, and the third column represents institutional investors' distraction lagged by two periods.

According to Table 5, as the lag order of D increases, the coefficient of the main explanatory variable D changes from 0.4252 to 0.4855, and subsequently to 0.595. Furthermore, all of them are statistically significant at the 5% level. The coefficient of ERD maintains a negative value, however, as the lag order of D increases, the coefficient of ERD gradually transitions from being statistically significant to statistically insignificant. This suggests that the primary research results of this study remain strong even after accounting for the problem of bidirectional causality.

Table 5. Changing the lag order of D

	(1) AuditFee	(2) AuditFee	(3) AuditFee
D	0.4252** (0.2059)		
D lagged one period		0.4855** (0.2226)	
D lagged two period			0.595*** (0.2178)
ERD	-0.0077** (0.0035)	-0.0063* (0.0037)	-0.0007 (0.0037)
BM-ratio	0.2267*** (0.0172)	0.1926*** (0.0193)	0.19*** (0.02)
TOP1	-0.0016*** (0.0004)	-0.0024*** (0.0005)	-0.0006 (0.0005)
Opinion	-0.0919*** (0.0188)	-0.0927*** (0.0211)	-0.0934*** (0.0212)
Digital	16.9817*** (2.8562)	12.0936*** (2.7678)	4.6393* (2.792)
WW	-0.0001 (0.0001)	0.0009* (0.0005)	0.0009* (0.0005)
SOE	0.1078*** (0.0191)	0.1394*** (0.0214)	0.1323*** (0.0215)
_cons	13.7887*** (0.0279)	13.9048*** (0.0313)	13.8757*** (0.0322)
$Year_{FE}$-s	YES	YES	YES
$Firm_{FE}$-s	YES	YES	YES
Observations	15,925	12,491	11,066
Adj. R-squared	0.8744	0.8930	0.9002

Note: ***$p<0.01$; **$p<0.05$; *$p<0.1$
Source: created by the authors

To assess the potential influence of the duration and specific years of the sample period on the primary outcome of this study, the authors performed regression analyses examining variations in the temporal span of the sample. The findings of the regression analysis are displayed in Table 6. The study's sample period covers a duration of 14 years, specifically from 2010 to 2023, as indicated in Column (1) of the regression results. The time span of column (2) is 8 years, ranging from 2010 to 2017. Column (3) represents a time period of 9 years, specifically from 2011 to 2019. Column (4) covers a duration of 5 years, specifically from 2014 to 2018. According to the results, when the time period is altered, all coefficients of D are positive and have a statistically significant impact at the 5% level. The coefficients of ERD exhibit a consistently negative trend throughout all time periods, with statistical significance observed in certain time spans while lacking statistical significance in others. Considering the differences between high-tech and non-high-tech companies, this study classifies the firms in the sample according to the method of Q. Shi *et al.* (2020). Regression results are shown in Column (1) and Column (2) of Table 7.

Table 6. Altering the time interval

	2010-2023 (1) AuditFee	2010-2017 (2) AuditFee	2011-2019 (3) AuditFee	2014-2018 (4) AuditFee
D	0.4252** (0.2059)	0.6576*** (0.2187)	0.4405** (.2226)	0.5024** (0.2532)
ERD	-0.0077** (0.0035)	-0.0063 (0.0039)	-0.0085** (0.0037)	-0.0027 (0.0041)
BM-ratio	0.2267*** (0.0172)	0.2693*** (0.022)	0.2772*** (0.0203)	0.3241*** (0.0269)
TOP1	-0.0016*** (0.0004)	-0.0027*** (0.0005)	-0.0016*** (0.0005)	0.0005 (0.0006)
Opinion	-0.0919*** (0.0188)	-0.0175 (0.0253)	-0.0841*** (0.0204)	-0.0359 (0.0242)
Digital	16.9817*** (2.8562)	12.0637*** (4.0879)	15.1938*** (3.4592)	18.2345*** (6.0091)
WW	-0.0001 (0.0001)	0 (0.0001)	-0.0001 (0.0001)	-0.0792*** (0.0203)
SOE	0.1078*** (0.0191)	-0.0099 (0.0304)	0.0912*** (0.0248)	0.1289*** (0.0352)
_cons	13.7887*** (0.0279)	13.6272*** (0.0376)	13.7116*** (0.0319)	13.4886*** (0.0434)
$Year_{FE}$-s	YES	YES	YES	YES
$Firm_{FE}$-s	YES	YES	YES	YES
Observations	15,925	10,080	12,124	7,487
Adj. R-squared	0.8744	0.8920	0.8876	0.9190

Note: ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$
Source: created by the authors

Table 7. Further research

	Non-High-Tech (1) AuditFee	High-Tech (2) AuditFee	Heavily-polluted (3) AuditFee	Non-heavily-polluted (4) AuditFee	Low-CFV (5) AuditFee	High-CFV (6) AuditFee
D	0.5076** (0.2558)	0.1438 (0.3154)	0.7842** (0.3132)	0.1887 (0.2614)	0.9597*** (0.308)	0.0952 (0.3049)
ERD	-0.0019 (0.0044)	-0.0134** (0.0052)	-0.0041 (0.0054)	-0.0073* (0.0044)	-0.0111** (0.0052)	-0.0058 (0.0052)
BM-ratio	0.1661*** (0.0221)	0.2774*** (0.026)	0.1619*** (0.0284)	0.2145*** (0.0213)	0.2072*** (0.0257)	0.2125*** (0.0265)
TOP1	-0.0019*** (0.0005)	-0.0017*** (0.0006)	0.0018*** (0.0007)	-0.0038*** (0.0005)	-0.003*** (0.0007)	0.0002 (0.0006)
Opinion	-0.0761*** (0.0244)	-0.1132*** (0.0281)	-0.0811*** (0.0306)	-0.105*** (0.0233)	-0.0707** (0.0327)	-0.0727*** (0.0255)
Digital	36.9642*** (5.0792)	-0.6694 (3.276)	32.7162*** (9.0408)	10.6926*** (2.9932)	3.898 (3.0141)	51.7648*** (8.6298)
WW	0 (0.0001)	-0.6716*** (0.0611)	-0.4871*** (0.0507)	-0.0001 (0.0001)	-0.0001 (0.0001)	0.0008 (0.0005)

Table 7, Continued

	Non-High-Tech	High-Tech	Heavily-polluted	Non-heavily-polluted	Low-CFV	High-CFV
	(1) AuditFee	(2) AuditFee	(3) AuditFee	(4) AuditFee	(5) AuditFee	(6) AuditFee
SOE	0.0232 (0.0252)	0.2401*** (0.0285)	0.2235*** (0.0357)	0.0548** (0.0224)	0.1033*** (0.0285)	0.1016*** (0.0293)
_cons	13.9092*** (0.0374)	12.9893*** (0.0713)	13.1029*** (0.0665)	13.9169*** (0.0346)	13.9135*** (0.047)	13.6623*** (0.039)
Year FEs	YES	YES	YES	YES	YES	YES
Firm FEs	YES	YES	YES	YES	YES	YES
Observations	9,106	6,701	5,341	10,500	7,357	7,630
Adj. R-squared	0.8929	0.8654	0.8831	0.8800	0.9068	0.8535

Note: ***p<0.01; **p<0.05; *p<0.1; CFV – compression force variation
Source: created by the authors

The influence of D on audit fees is both statistically significant and favourable for non-high-tech organisations. On the other hand, although ERD has a negative impact on audit fees, it is not statistically significant. The influence of ERD on audit fees for high-tech enterprises is both statistically significant and negative, whereas the influence of D on audit fees is not statistically significant but positive. High-tech firms, with their increased scrutiny from auditors and external stakeholders, as well as their high level of financial transparency, are not greatly influenced by the distraction of institutional investors. Therefore, the coefficient of D is not statistically significant. For enterprises that are not in the high-tech industry, the situation is quite different. This outcome validates hypothesis H3.

Table 8 displays the regression outcomes for enterprises that are heavily-polluted and non-heavily-polluted in columns (3) and (4) accordingly. The regressions were performed to evaluate hypothesis H4. The companies in the sample are categorised into heavily-polluted and non-heavily-polluted groups. Both heavily-polluted and non-heavily-polluted enterprises exhibit a negative coefficient of ERD, however there are variations in the significance levels. The effect of variable D on audit fees for heavy industry companies is 0.7842, and this effect is statistically significant at a significance level of 5%. This outcome validates hypothesis H4. The statement suggests that when institutional investors are preoccupied with heavily-polluted enterprises, it results in higher audit fees. This phenomenon may occur in companies that are extensively contaminated, as a result of the specific characteristics of the industry. In such cases, the attention of investors plays a crucial role in overseeing and influencing the decision-making and behaviour of these companies. When the level of supervision falls, individuals are more prone to engaging in unethical activities such as earning management and value-destructive acquisitions. This, in turn, results in higher audit costs.

The calculation of cash flow volatility allows for the assessment of a company's level of risk resilience. Cash flow volatility refers to the fluctuation in cash flow throughout a certain time period. It is measured by the three-year volatility of the ratio of operating net cash flow to total assets. Cash flow volatility is characterised as a dynamic standard deviation. The authors' sample has a median CFV value of 0.03212. Authors utilise this method to partition the observations in the sample into distinct categories. A corporation is classified as part of the High-CFV group if its CFV exceeds 0.03212. Conversely, a company is classified as part of the Low-CFV group if its CFV does not exceed 0.03212. Column (5) displays the regression outcomes for the Low-CFV group, while Column (6) exhibits the results for the High-CFV group. Regardless of whether it is the High-CFV group or the Low-CFV group, the coefficient of D is positive and the coefficient of ERD is negative. In the low-CFV group, the main explanatory variable D has a coefficient of 0.9597 on audit fees. This coefficient is statistically significant at the 1% level of significance. This proves that hypothesis H5 is valid. Institutional investors typically act as shareholders to supervise and ensure the normal financial condition of companies. For companies with high CFV, they already attract more attention from investors and auditors due to greater operational uncertainty. Therefore, whether institutional investors' attention decreases or not may not significantly impact the companies' behaviours.

However, for companies with low CFV, the low cash flow volatility may create an illusion of good corporate performance for investors. If institutional investors' attention decreases and certain actions taken by the company lead to increased operational risks, auditors may need to increase audit workload to oversee these additional risks.

Discussion

In the scientific doctrine, there are different approaches and positions regarding the study of the activity of institutional investors, including taking into account the ESG rating. For example, in their study, R.A. Zahid *et al.* (2022) clarified the importance of audit quality in the correlation between ESG indicators. Therefore, this study also examined the mentioned indicators and determined the correlation between them. The researchers conducted the study by analysing the actions of companies in Western Europe, which revealed significant characteristics in the data obtained. The research confirmed a direct correlation between ESG indicators and financial performance of organizations. This is because organizations with better ESG indicators show higher profitability, efficiency and market capitalization. Thus, this finding is prevalent in both studies. In addition, it was emphasized that audit quality enhances the favourable impact of ESG performance on organizations' financial performance. Taking this into account, it was found that high audit quality contributes to greater credibility and transparency of non-financial reporting, which helps investors better assess the company's risks and prospects (Berest & Sablina, 2024). Common between the findings in both studies is the evidence of the priority role of audit quality for large companies and companies with high institutional ownership, since the need for high-quality independent control is more critical in these entities. It was separately emphasized that among the various elements of audit quality, the specific industry expertise of the audit firm has the greatest impact on strengthening the ESG-finance connection. Thus, the results in both studies highlight the importance of engaging high-quality audit firms to ensure proper verification and validation of ESG reporting, which will help investors make more informed decisions.

In a study conducted by P. Velte (2023), it was discovered that various categories of institutional investors exert distinct influences on the sustainable progress of organisations. It is worth noting that this result is similar to what was obtained during the conduct of this study. In this case, it should be noted that the main drivers of institutional investors to promote corporate sustainability are financial considerations, compliance with regulatory requirements and pressure from the investors' beneficiaries/clients. Comparing the results of this study and the conclusions of the researcher, it can be established that the influence of institutional investors on the sustainability of companies occurs through various mechanisms, such as voting at shareholder meetings, direct dialogue with management, and threats of divestment. Based on this, the strength of influence of institutional investors on corporate sustainability depends on their size, concentration of ownership and investment horizon. The findings of both studies reveal gaps in the performance of some types of institutional investors, especially hedge funds, in their impact on environmental and social aspects of sustainable development. This indicates the need to improve relationships between such entities and specific practices of corporate sustainability.

J.M. Asamoah *et al.* (2022) examined how institutional investors' distractions impact the capital structure decisions of enterprises in Great Britain. The researchers discovered a direct correlation between the diversion of institutional investors and the amount of debt held by enterprises. In particular, if institutional investors pay less attention to monitoring companies due to other events in their portfolio, then managers are more inclined to accumulate debt. This conclusion is common to both studies. In particular, this study highlighted that the distraction effect of institutional investors is more pronounced for companies with weaker corporate governance mechanisms, such as fewer independent boards of directors and lower audit quality. Based on this, the distraction of institutional investors leads to the growth of both secured and unsecured debt of companies, which indicates the abuse of various types of debt instruments by managers. Both studies found no evidence that displacing institutional investors encourages companies to accumulate debt to finance future growth or investment. Thus, the common findings are that higher levels of debt during investor distraction are likely to be the result of weaker monitoring and opportunistic behaviour by managers seeking private control benefits.

A. Afzali *et al.* (2024) examined the influence of auditors› diversions on their audit efforts and the accuracy of accounting data in organisations. As a result, a negative relationship between auditor distraction (when they are involved in several important tasks at the same time) and audit effort invested in a specific audit was revealed. This was also mentioned during the conduct of this study, in particular, it was established that the reduction of audit efforts due to the distraction of auditors leads to the deterioration of the quality of accounting data, which is manifested in the increase of discretionary charges. A common finding among the studies is that the effect of auditor distraction is particularly pronounced for clients with a high degree of risk, such as companies with financial difficulties, high business uncertainty or complex transactions.

According to S. El Ghoul *et al.* (2023), the presence of specialized industry knowledge in the audit team also helps to reduce the negative effects of auditor distraction. Thus, the results of both studies allow us to emphasize the importance of the proper allocation of audit resources and attention, as well as the need for industry expertise to ensure a quality audit. It should be noted that the common conclusion is that the distraction of auditors can threaten the quality of the audit and the reliability of the financial statements of companies, especially for high-risk clients. That is why special attention was paid to revealing the importance of intelligent management of audit resources and focusing the activities of auditors on the risks of individual clients.

Y. Liu *et al.* (2023) investigated the impact of mutual fund diversion as institutional investors on the gap between companies' ESG performance claims and actual ESG performance in China. It is worth emphasizing that the experience of China was also used during this study, which caused similar results to be obtained. In particular, both studies revealed a positive relationship between mutual fund diversion and the ESG gap (the difference between stated and actual ESG performance) in portfolio companies. It has been found that when mutual funds are distracted by important events in other portfolio companies, this weakens their monitoring of ESG practices, allowing companies to overstate ESG claims relative to actual performance. Common among studies is the conclusion that such an effect is most pronounced in companies with weaker corporate governance, less transparency, and lower audit quality. Thus, excessive discrepancies in ESG reporting during periods of investor distraction are associated with worse long-term financial performance for companies.

The results of the aforementioned study emphasize the importance of active surveillance and institutional investor engagement to ensure that companies' non-financial reporting is transparent and credible. In addition, they emphasize that distracting mutual funds from scrutinizing ESG practices can lead corporations to falsely boost sustainability performance, deceive investors, and potentially undermine market confidence.

Conclusions

Institutional investors' distraction often leads to activities that may result in value destruction behaviours of companies, increasing the scrutiny task for auditors and consequently raising audit fees. As ESG ratings increasingly become one of the crucial factors for investors in assessing the investment value of companies, the ESG rating disagreement due to different rating agency standards have also garnered considerable attention. This paper focus on the advantages of ESG rating disagreement, which indicates the differing standards among rating companies and the varying information collected from corporate disclosures. Companies graded by different ESG rating agencies experience an improvement in financial transparency to some extent. The main exploration of this paper is about whether the disagreement in ESG rating can play an intermediary role in the pathway leading from institutional investors' distraction to increased audit fees.

The findings of the study can be summarized in the following areas. First, institutional investor distraction leads to higher audit fees. Moreover, disagreement in ESG estimates negatively mediates the relationship between institutional investor distraction and subsequent increases in audit fees. In organizations that are not high-tech, do not pollute the environment to a large extent, and have low cash flow volatility, the impact of institutional investor concerns on audit fee increases is more pronounced. The primary result of this study remains statistically significant after a number of rigorous checks to ensure its reliability.

This paper contends that the ESG rating disagreement indicates that different ESG rating agencies can evaluate companies from various perspectives. Moreover, through the rating process, they provide a certain level of oversight on a company's commitment to environmental protection and social responsibility. Therefore, the increase in auditor workload due to institutional investors' distraction would be mitigated by the mediating effect of ESG rating disagreement. The study concludes that ESG rating disagreement helps to provide auditors with ESG-related information, which is beneficial in reducing auditing workload and lowering audit fees of companies.

Future research can examine the long-term effects of institutional investor distraction on various financial and operational aspects of firms other than audit fees, such as corporate governance practices and overall financial performance. In addition, studying the role of different types of institutional investors such as hedge funds and pension funds in moderating the effect of distraction can provide deeper insights. Comparative studies across different markets and regions can also shed light on how cultural and regulatory environments influence these dynamics. Examining the effectiveness of specific ESG rating methodologies in different contexts can deepen understanding of their role in corporate transparency and accountability.

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Conflict of Interest

None.

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Відволікання уваги інституційних інвесторів та витрати на аудит: посередницький ефект розбіжностей в ESG-рейтингах

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Анотація. Зростаюча увага до питань сталого розвитку та відповідальної корпоративної поведінки робить аналіз впливу інституційних інвесторів на оплату аудиторських послуг надзвичайно важливим для забезпечення прозорості та достовірності нефінансової звітності компаній у сучасних умовах. Метою дослідження було виявити ступінь впливу інституційних інвесторів на оплату аудиторських послуг китайських компаній на основі екологічних, соціальних та управлінських (ESG) рейтингів. Для проведення дослідження було використано метод вибірки, спостереження, аналізу, опису статистичних характеристик. Результати свідчать про значний зв'язок між відволіканням уваги інституційних інвесторів та збільшенням плати за аудит, спричиненим розбіжностями в ESG-рейтингах. Це підкреслює критичну роль нагляду з боку інвесторів у підтримці якості аудиту та контролі витрат. Хоча розбіжності в ESG-рейтингах надають аудиторам більше інформації, тим самим зменшуючи аудиторське навантаження та гонорари, цього ефекту недостатньо, щоб компенсувати загальне зростання гонорарів за аудит через відволікання уваги інвесторів. Ефект є більш вираженим для низькотехнологічних компаній, компаній, що сильно забруднюють довкілля, та компаній з меншою волатильністю грошових потоків, що робить їх більш вразливими до посиленої аудиторської перевірки та вищих гонорарів. Різні відмінності в ESG-рейтингах, включаючи екологічні, соціальні та управлінські аспекти, слугують ключовими факторами-посередниками, що підкреслює важливість врахування цих відмінностей при оцінці аудиторського ризику та визначенні гонорарів. Результати, отримані в ході роботи, можуть бути використані для вдосконалення методології ESG-рейтингу, а саме для підвищення прозорості та зменшення інформаційної асиметрії на фондовому ринку

Ключові слова: корпоративне управління; оцінка ризиків; корпоративне управління; увага інвесторів; сталий розвиток

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Innovative risk management in the hotel and restaurant business: Scientific and practical aspect

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Abstract. Effective risk management is essential for success in the dynamic development of the hotel and restaurant business. Amid increasing competition and market instability, there is a need to develop innovative risk management strategies. The purpose of the study is to develop and test methods for assessing and minimising risks aimed at strengthening and sustainable development of enterprises in the hotel and restaurant business. Using abstract-logical analysis and a systematic approach, the study classifies enterprises depending on the level of risk. The results of this study demonstrate a comprehensive understanding of innovative management methods in the hotel and restaurant industry. The findings indicate that enterprises from the initial cluster are less vulnerable to risks, confirming the effectiveness of cluster analysis in assessing risks in the hotel and restaurant sector. In conditions of economic and political instability, systematic analysis and risk management became important. Internal risk management strategies, including innovative methods, were successfully used to reduce potential threats to the hotel and restaurant business, considering the specifics of this industry. The development and support of a dynamic information system became a key element, facilitating effective risk management and enhancing the competitiveness of enterprises. The mentioned enterprises, remaining within the lowest level of risk, confirmed the importance of using cluster analysis for identifying and managing risks in the hotel and restaurant sector. This study introduces innovative approaches to risk management in the hotel and restaurant sphere, providing specific strategies that can be used by companies to increase resilience and adapt to market competition challenges

Keywords: strategic adaptation; group organisation association; economic-mathematical modelling; internal risk minimisation system; forecasting analysis

Introduction

Hotel and restaurant enterprises, as open systems, are subject to various influences that can significantly impact their operations, stability, and overall competitiveness. These influences encompass a wide range of factors, including economic fluctuations, technological advancements, changes in consumer preferences, regulatory requirements, and unforeseen events such as natural disasters or pandemics. Each of these factors introduces specific risks that, if not properly managed, can lead to substantial financial losses, operational disruptions, and a decline in customer satisfaction and reputation. Insufficient management of these risks can result in various negative outcomes. Financial losses may arise from decreased revenue, increased operational costs, or liability claims. Operational disruptions can affect service quality and customer experience, leading to a loss of market share. A decline in reputation can further exacerbate these issues by reducing customer loyalty and attracting negative publicity.

Given the dynamic and interconnected nature of the hospitality industry, traditional risk management approaches may no longer suffice (Dashchuk, 2023). The adoption of innovative risk management methods becomes critically important. These methods can include the implementation of advanced technologies for real-time risk monitoring and assessment, the development of flexible and adaptive management strategies, and the integration of comprehensive training programs for staff to handle emerging risks effectively. Innovative risk management methods not only help in identifying and mitigating potential threats but also in seizing opportunities that arise from change (Gavrysh *et al.*, 2024). For instance, leveraging data analytics and artificial intelligence can provide insights into consumer behavior and market trends, allowing businesses to adapt proactively (Ierko, 2023). Implementing sustainable practices can mitigate environmental risks and appeal to eco-conscious customers. Developing robust contingency plans and enhancing communication channels can ensure resilience in the face of crises. Thus, the relevance of this study lies in its focus on developing and testing effective methods for assessing and minimizing risks in the hotel and restaurant industry. By doing so, it aims to contribute to the strengthening and sustainable development of enterprises in this sector, ensuring they remain competitive and resilient in an ever-evolving market landscape.

In the study by N. Sereda & I. Piiurenko (2023), focused on innovation activity in the hotel and restaurant business, technological, organisational, and marketing innovations are considered. Nevertheless, important aspects such as the impact of innovations on different market segments, cultural and social factors, and the interaction between innovative processes and risk management strategies are not explored. The study by H. Hrebeniuk *et al.* (2021) highlights current development strategies for the tourism and hospitality industry in Ukraine, focusing on the challenges facing the industry during economic difficulties. The study addresses changes caused by crisis conditions but lacks a focus on risk management. The research by O. Yakushev (2020) focuses on the use of innovative technologies in the management of business processes in the hotel, restaurant, and tourism sectors. The main emphasis of the study is on the importance of technological innovations in improving management processes in these industries.

The study conducted by N.S. Pryimak & O.A. Nikolaychuk (2023) is aimed at a deep analysis of the essence and organisational approaches to management in the hotel and restaurant sector. The paper focuses on key aspects of management in this industry, in particular, on defining strategies, methods, and effective practices. The study is aimed at identifying optimal organisational approaches that will allow hotels and restaurants to ensure efficiency in their activities. In the study by A. Dyakonova *et al.* (2023), an analysis of the impact of innovative technologies on the quality management strategy in the hotel and restaurant business is conducted. The authors discuss the importance of automation, digital marketing strategies, and intelligent management systems, as well as highlight the challenges associated with the integration of these technologies, including costs and the need for staff training.

The analysis of a number of studies in the hotel and restaurant business field indicates that innovative strategies and risk management are not always considered together. It was determined that some aspects, such as the impact of innovations on different market segments, cultural and social factors, as well as a detailed study of the risks associated with the introduction of new technologies, remain insufficiently explored in previous studies. The purpose of this study is to develop and test effective methods for assessing and minimising risks, which will contribute to the strengthening and sustainable development of enterprises in the hotel and restaurant business sector.

Materials and Methods

Various methods of innovative management strategies in the hotel and restaurant industry were applied in this study. The study integrated various scientific methods, providing an understanding of innovations in this sector. Academic sources thoroughly analyse approaches to minimising the impact of risks on the activities of these companies, as reflected in the studies of authors such as A. de Palma *et al.* (2009), O. Davydova & V. Protsenko (2019), N. Havlovska *et al.* (2019), I. Litvinova *et al.* (2022).

The use of the abstract-logical method was key in identifying and defining the main components of innovative management. This allowed for a deep examination of the theoretical foundations and principles underlying innovative practices, thereby preparing the groundwork for a more in-depth analysis of the subject. The study used a systematic approach. This created a context within which the interrelationships and interactions between different components of innovative management could be investigated. It also offered a view of the structural and functional dynamics of the innovation system, highlighting how different elements work together to stimulate innovations in the hospitality sector. A historical-economic analysis was conducted to trace the evolution of innovative management methods. This method highlighted the impact of historical development and economic trends on the adoption and adaptation of innovative strategies in the hotel and restaurant business. Understanding the historical context and economic consequences provided a deeper understanding of the forces shaping innovations in this field. The study also included taxonomy as a method of classification and evaluation of various aspects of innovative management. The use of this method allowed for a quantitative assessment of different dimensions of innovation, facilitating a structured understanding of the innovation landscape in the hospitality industry. In addition to these methods, extrapolation was used to forecast future trends and the development of innovative management methods. This method was crucial for predicting the areas in which innovations could develop, offering an understanding of possible future scenarios in the hospitality sector.

Graphical methods were used to visually display the results and facilitate their clarity and interpretation. This facilitated the summarisation of the findings, making them more accessible and understandable, and allowed for the clear expression of complex information discovered during the study. The study carefully selected various types of materials, including theoretical works, statistical data, and financial reports, ensuring comprehensive and reliable research on innovative risk management in the hotel and restaurant business. This meticulous material selection process contributed to a comprehensive understanding of the subject and bridged the gap between theory and practice. The study used a range of criteria to assess and select management strategies. Some of the key criteria included:

1. Laplace balance criterion:

$$Ft^*=opti\{n1j=1\sum n\Psi(A_{ij},S_j)\}, \qquad (1)$$

where: $\Psi(A_{ij},S_j)$ – utility function of action A_{ij} in state S_j; n – number of nature states.

2. The mixed Hurwicz selection criterion:

$$Ft{-}=opti\{\alpha^*j_{max}\Psi(A_{ij},S_j)+(1\text{-}\alpha)^*j_{min}\Psi(A_{ij},S_j)\}, \qquad (2)$$

where: α – optimism parameter; $j_{max}\{\Psi(A_{ij},S_j)\}$ and $j_{min}\{\Psi(A_{ij},S_j)\}$ – maximum and minimum value of the function over j.

3. Savage cautious criterion:

$$Rt^*=opti\{\Psi(A_{is},S_s)\text{-}\Psi(A_{ij},S_j)\}, \qquad (3)$$

where: $\Psi(A_{is},S_s)$ and $\Psi(A_{ij},S_j)$ – functions that reflect the relationship between the elements of matrix A and vector S for specific and general values respectively.

These criterions were used to assess the effectiveness of management strategies in the context of the study. The formulations of these criteria were used for calculations and comparisons during data analysis.

Results

Intense competition in the hospitality and restaurant sector encourages management to create innovative strategies. This necessitates the use of a comprehensive method for a deep analysis of potential threats and a focus on high quality and performance implementation. Effective risk management in the hotel and restaurant sector requires the comprehensive application of various methods for predicting and neutralising potential challenges. In the context of current market changes, the application of accurate and efficient risk assessment methods in the implementation of new projects is important. For adequate risk management in this industry, it is necessary to first identify the main risks, conduct their objective quantitative assessment, and then develop an effective method to reduce their impact. The risk assessment procedure includes the selection of potential solutions, the evaluation of possible consequences of their application, and a comprehensive analysis of risks that takes into account both qualitative and quantitative factors. Key approaches to analysing the impact of risks on the functioning of the hospitality and restaurant sector are identified in academic sources, including statistical methods, cost feasibility assessment, expert assessments, analytical methods, and comparison methods (de Palma, 2009; Litvinova *et al.*, 2022;).

Thus, existing approaches to risk analysis in the hotel and restaurant industry focus on comprehensive measures that include identifying decision options, determining potential consequences of their use, and a comprehensive risk assessment, considering both qualitative and quantitative parameters. Therewith, there is a universal approach to risk assessment, which is divided into two main dimensions: the degree of risk and the temporal aspects of risks. When assessing the level of risk for hotel and restaurant businesses, regardless of the method used, the key element is the variability of results from the application of a particular decision. Risk assessment is conducted by analysing the relationship between potential losses and the total value of the company's assets and the probability of these losses occurring (Davydova & Protsenko, 2019).

The rational application of risk assessment techniques contributes to ensuring sustainable development in the hotel and restaurant sector, increases the rationale for making innovative management decisions in high-risk situations, and improves financial efficiency through activity optimisation. The development of an integrated scientific and practical approach to assessing the impact and reducing risks associated with innovative management in the hotel and restaurant industry involves identifying the causes of risks, classifying potential threats, analysing the probability of risks in the context of innovation management, and selecting approaches to assessing their impact (Table 1). The key tasks in risk management in the hotel and restaurant industry cover a wide range of aspects. The establishment of a comprehensive risk assessment system in an enterprise includes not only identifying potential threats but also their detailed analysis, as well as assessing the company's ability to cope with these risks and determining the rationale for the anticipated benefit. The results of this assessment indicate the accuracy of the analyses conducted. In the case of positive results, innovative management strategies are developed for the development of the hotel and restaurant business, and effective management decisions are taken to minimise risks in this area. If there is insufficient information for risk assessment, further data search is conducted. The information obtained is used to develop principles and make balanced management decisions for effective risk control in this industry. Risk management in the hotel and restaurant sector through innovation involves a set of methods and principles for forecasting, minimising, assessing, and eliminating the potentially harmful effects of threats on the company's economic and financial indicators, taking into account current market trends, requirements, new technologies, and other key aspects.

Table 1. A holistic scientific and practical method for assessing the impact and reducing risks associated with innovative management in the development of the hotel and restaurant business

<table>
<tr><th colspan="7">Establishment of the factors leading to risks in innovative management practices for hotel and restaurant business development</th></tr>
<tr><td>Economic instability within the nation</td><td>Inflation rate</td><td>Political instability</td><td rowspan="2">Government regulation of the discount banking rate</td><td rowspan="2">Competitive struggle (significantly increased under conditions of WTO accession)</td><td rowspan="2">Price fluctuations in the world market</td><td rowspan="2">Inefficient management of the financial policies of industrial enterprises</td></tr>
<tr><td>Increasing costs of industrial enterprises</td><td>Currency rates fluctuations</td><td>Economic instability</td></tr>
<tr><th colspan="7">Identification of varieties of risk in pioneering leadership for the advancement of hospitality and dining establishments</th></tr>
<tr><th colspan="7">Examination of new risks associated with the innovative growth strategies in the hotel and restaurant sector management</th></tr>
<tr><th colspan="6">Qualitative analysis</th><th>Quantitative analysis</th></tr>
<tr><td colspan="3">The necessity to evaluate the anticipated beneficial outcomes against potential financial, societal, and additional impacts, both current and prospective</td><td rowspan="2">Identification of the relationship of interdependence (correlation) between key arguments (risk factors)</td><td rowspan="2">Creation of a predictive model to estimate the value of significant performance metrics of the subject</td><td rowspan="2">Production of stochastic scenarios grounded on a set of agreed assumptions about the potential values of critical elements</td><td>Building a collection of likely estimates for principal variables (risk elements)</td></tr>
<tr><td colspan="3">Establishment of the impact of decisions made under conditions of uncertainty on interests of economic life subjects</td><td>Selection of principal variables (risk elements) for the object under analysis</td></tr>
</table>

Table 1, Continued

Selection of methods to assess the degree of risk impact linked with inventive administration in the advancement of the hospitality and restaurant industry. enterprises					
Statistical method	Cost expediency method	Expert evaluation method	Analytical method	Analogues method	Statistical analysis of simulation results. Interpretation of analysis results

Appropriate assessment of the risk impact level connected with innovative approaches in the development of enterprises in the hotel and restaurant sector has been carried out

Establishment of guidelines for managing innovative risks in hotel and restaurant business enterprises			
Awareness of risk acceptance	Accounting of the possibility of risk transfer	Manageability of risks	Cost-effectiveness of risk management
Autonomous handling of separate risks	Contrasting the degree of risk with the profitability margins of financial operations.	Incorporation of the temporal element in the management of risks Incorporation of the business strategic approach into the management procedures	Comparison of the level of risk to the financial capacity of the enterprise

Production and making of effective, innovative management decisions to mitigate risks for hotel and restaurant business enterprises

Source: compiled by the authors

Risks are characterised by a mathematically significant probability of loss, which can be statistically determined and calculated with high accuracy. To formulate effective strategies for managing potential risk scenarios in business, it is important to use economic-mathematical models. These models help localise and mitigate the negative effects of risks. Various criteria are included, such as Laplace Bayes, Savage, Wald, Hurwicz, Hodges-Lehmann. Using data from 2011-2020, an integrated index for innovation management in the hotel and restaurant sector was calculated (Dyakonova *et al.*, 2023). Using Statistica software version 6 and its cluster analysis module, a hierarchical dendrogram was created, showing the association of 20 operating hotel and restaurant businesses from different regions of Ukraine based on integrated innovation management indicators. From this dendrogram, it was concluded that these enterprises can be divided into three different clusters. The average value was calculated to determine the leading enterprises in each cluster. The selection of the least risky enterprise in the hotel and restaurant sector was conducted using various methods, focusing on the last three years of analysis (Table 2).

Table 2. Calculation of the least risky hotel and restaurant business by cluster

Name	2018	2019	2020	Laplace (2018-2020)	Hurwicz (2018-2020)	Savage (2018-2020)
"Savoy" JSC	0.704	-	-	0.762	0.548	0
"Vinnytsia Hotels" JSC	-	0.783	-	0.435	0.348	0.309
"Podillia" JSC	-	-	0.799	0.446	0.315	-
"Premier Palace" JSC	0.384	-	-	0.309	0.498	-

Source: compiled by the authors

Using formula (1), the Laplace equilibrium criterion (Ft∗) was determined, which allowed evaluating the optimality of decisions based on the average value of the $\Psi(A_{ij},S_j)$ function for each element. According to formulas (2), the mixed Hurwicz selection criterion (Ft-) was applied, combining the maximum and minimum values of the $\Psi(A_{ij},S_j)$ function with the weighting parameter α. In addition, using formula (3), the Savage cautiousness criterion (Rt∗) was implemented, which considers the difference between specific and general values of the $\Psi(A_{ij},S_j)$ function.

The average probability value includes calculating the average probabilities by summing them up and dividing by the total number of cases. This provides an indicator of the overall probability of various risk scenarios occurring. The weighted choice of maximum and minimum involves calculating using the coefficient α (alpha) considering the weighted evaluation of optimistic and pessimistic scenarios. This method allows for considering different impacts of extreme results, providing a more balanced perspective. The maximum loss deviation focuses on the difference between the worst-case scenario and the selected result. It highlights possible deviations from maximum loss, providing an idea of the seriousness of risks and aiding in decision-making. The three decision-making stability assessment methods include the Laplace equilibrium criterion, the mixed Hurwicz selection criterion, and the Savage cautiousness criterion. The Laplace equilibrium criterion uses the average value of the $\Psi(A_{ij},S_j)$ function for all alternatives. The mixed Hurwicz selection criterion depends on a weighted combination of the maximum and minimum values of this function using the parameter αα. The Savage cautiousness criterion is determined by the difference between the value of the $\Psi(A_{is},S_s)$ function for the best alternative and the value of this function for each other alternative.

Analytical results obtained based on the established criteria demonstrate that the lowest level of risk characterises enterprises grouped in the initial cluster. This fact serves as a reliable confirmation of the effectiveness and feasibility of using cluster analysis methodology in the context of risk assessment. Modern enterprises operating in the hotel and restaurant sector face the need to constantly analyse and assess risks affecting various aspects of their activities (Romaniuk *et al.*, 2022). This becomes particularly relevant during periods of unstable economic and political conditions, which can be observed both in individual countries and globally. These conditions lead to an increase in the intensity of risks, requiring businesses to adapt and be flexible in decision-making. To reduce the risks faced by hotel and restaurant enterprises, comprehensive internal risk reduction strategies are used. The development and implementation of such risk reduction strategies form the basis of an innovative management system in these enterprises. The strategies encompass a wide range of measures implemented internally to minimise potential threats. Modern hotel and restaurant businesses must effectively identify the main causes of risks, their scale, potential losses, and develop a set of measures to prevent and mitigate them. The specifics of operations in the hotel and restaurant industry significantly influence the choice of factors and methods that underlie internal risk reduction strategies. This is due to the nature of such businesses, which involves interaction with a large number of stakeholders, market volatility, and the need to comply with high standards of service quality. An important aspect of risk management strategies in the hotel and restaurant business is the creation and continuous updating of a dynamic information system (Matviichuk *et al.*, 2023). Such a system allows for collecting and analysing detailed data not only on the current state of specific hotel and restaurant establishments but also on changes in the legislative and regulatory environment, which can have a significant impact on their development and successful operation.

Table 3 illustrates the developed method for improving the innovation risk management system in the hotel and restaurant business sector. According to this scheme, the risk associated with innovation development in this industry is divided into basic components: primary risks, classified as compatible and incompatible. Each of these types of risks is analysed, considering the factors that cause them. Typically, all acceptable risks, a significant portion of critical risks, and dangerous, catastrophic risks that do not threaten life are borne by hotel and restaurant enterprises out of objective necessity and become the main subject of internal risk reduction mechanisms. These strategies include various approaches and methods aimed at identifying, assessing, and minimising potential risks. They may involve measures such as staff training, the introduction of new technologies, strengthening internal control and audit processes, and the development of effective crisis management plans. Therefore, the use of a comprehensive approach to risk management, which includes both strategic planning and operational response to current challenges, is crucial for maintaining the stability and development of hotel and restaurant enterprises. Innovations in risk management, focusing on the individual needs of each enterprise and continuously updating information systems, allow achieving a high level of efficiency and competitiveness in this dynamic industry.

Table 3. System for improving approaches to innovation risk management in hospitality and restaurant companies

System of internal risk management mechanisms of hotel and restaurant business enterprises and their characteristics	
Risk avoidance	This field of risk mitigation is the most radical. It aims to develop such internal measures that completely eliminate a specific type of risk
Risk concentration limitation	The approach to curtail the aggregation of risks is typically employed for scenarios that exceed acceptable thresholds, particularly for economic activities in zones of significant or extreme risk. This reduction is achieved by establishing suitable in-house benchmarks within the company during the execution of diverse economic operations
Hedging	Mitigating risks through the execution of corresponding derivative transactions is an efficacious method for lessening possible financial detriment in the event of risk manifestation. Although there are associated expenses such as brokerage fees and options premiums, these are generally less substantial than the costs associated with external risk insurance policies. A range of risk hedging techniques has been widely adopted in the realm of domestic risk management practices
Diversification	The strategy of diversification is primarily applied to alleviate the adverse financial effects of non-systematic (unique) risk types. Primarily, it serves to reduce the risks associated with a portfolio
Risk sharing	This financial risk mitigation technique involves partially transferring risk to partners involved in certain business dealings. In this arrangement, partners assume a share of the risks, for which they are better equipped to minimise potential adverse outcomes and possess more efficient means of internal insurance safeguards

Table 3, Continued

System of internal risk management mechanisms of hotel and restaurant business enterprises and their characteristics		
Self-insurance	This method of financial risk reduction relies on an enterprise setting aside a portion of its funds, enabling it to counteract the negative financial impacts of business operations that are unrelated to actions of third parties	
Other method of neutralisation of internal risks	Allocation of an extra layer of the risk premium for business operational activities to secure certain assurances, curtailing the scope of force majeure conditions and guaranteeing restitution for potential risk-induced losses through an established framework of penalties	
Enhancement of the innovative approach to risk management within the hospitality and dining sector enterprises		
Implementation of effective analytical and early warning techniques	Integration of risk assessment into strategic and operational processes	Improvement of risk measurement and monitoring
Identification of risks at the business process level leads to more informed, innovative management decisions	With the integration of risk management into the operational strategy, leaders grow more cautious in their approach to making decisions related to innovative administration	Risk reports will facilitate the exchange of knowledge regarding various aspects of the innovative management system

Source: compiled by the authors

Table 3 presents a system that includes key elements for effective management of innovative risks in the hospitality and restaurant business. This system is based on the integration of advanced risk management practices and considers the specifics of the industry. Using this approach allows companies not only to minimise potential risks but also to respond effectively to rapid changes in the market environment, which is critical to ensuring their competitiveness.

Effective risk management involves identifying key risks, conducting quantitative assessments, and developing strategies to mitigate their impact, using approaches like statistical and cost feasibility assessments. Integrating risk assessment into strategic and operational processes allows enterprises to make informed, innovative decisions. Techniques like the Laplace, Hurwicz, and Savage criteria, along with cluster analysis, aid in evaluating and mitigating risks, helping identify low-risk enterprises for better decision-making. Continuous risk analysis and adaptation are crucial, especially in unstable economic and political climates. Internal risk reduction strategies, such as staff training, technological advancements, and robust crisis management plans, are vital for maintaining stability and sustainable growth. A dynamic information system for data collection and analysis on regulatory changes and market conditions is essential for effective risk management. In essence, a comprehensive approach to risk management, combining strategic planning and operational responses, enhances efficiency and competitiveness in this dynamic industry. Innovations tailored to the specific needs of each enterprise, coupled with continuous information updates, significantly bolster their resilience and success.

Discussion

In the hospitality and restaurant service sector, managing innovative risks is a key topic that requires careful study. In the modern world, where the business environment is changing rapidly, the hotel and restaurant sector faces various challenges and risks. These risks may be related to market fluctuations, technological innovations, changes in consumer preferences, political uncertainty, and even global crises, such as the COVID-19 pandemic. In this context, innovative risk management becomes crucial for ensuring the sustainable development and competitiveness of enterprises (Havlovska, 2019; Novykova *et al.*, 2023).

M. Breier *et al.* (2021) emphasize the importance of business model innovation (BMI) in helping the hospitality industry recover from the COVID-19 crisis. Their study reveals that firms adopting BMI were able to create new revenue streams and improve liquidity. This aligns with the current study's findings, which highlight the necessity of innovative risk management to maintain stability and competitiveness. The integration of new business models, as suggested by M. Breier *et al.* complements the comprehensive risk assessment methods identified in this study, showcasing the critical interplay between innovation and risk management.

Authors explore the relationship between strategic agility, BMI, and firm performance. Their findings indicate that strategic agility enhances the adoption of BMI, particularly in turbulent environments. The current study corroborates this by demonstrating that effective risk management requires agility and adaptability to mitigate potential challenges. The positive impact of value creation and value proposition BMIs on firm performance, as noted by T. Clauss *et al.*, parallels the emphasis on high-quality performance and innovative strategies in the hotel and restaurant sector discussed here (Clauss *et al.*, 2021).

M. Mazurek (2020) provides a critical discussion on tourism disaster management, highlighting the importance of proactive risk management models. This study extends M. Mazurek's work by applying these principles to the hospitality sector, demonstrating that comprehensive internal risk reduction strategies, such as staff training and technological advancements, are vital for sustainable growth. The creation of dynamic information systems, as recommended by M. Mazurek, is also echoed in the current study, reinforcing the need for continuous data collection and analysis to adapt to changing market conditions.

A. Salamzadeh *et al.* (2023) investigate the effect of BMI on crisis management, emphasizing the mediating roles of entrepreneurial capability, resilience, and business performance. The current study supports these findings by illustrating that innovative risk management not only mitigates risks but also enhances overall business performance. The inclusion of entrepreneurial capability and resilience as key factors aligns with the comprehensive approach to risk management advocated here, which includes strategic planning and operational responses.

Also it was discussed turnaround management through business process reengineering in the hospitality sector. Their research highlights the importance of rethinking and redesigning management processes to overcome crises. This is consistent with the current study's focus on innovative management strategies to mitigate risks. The application of economic-mathematical models and cluster analysis in this study provides a structured approach to identifying and managing risks, supporting the need for continuous improvement and adaptation in management practices (Stefani & Priatmodjo, 2021).

F. Musiello-Neto *et al.* (2021) assess the relationship between open innovation and competitive advantage, mediated by organizational strategy. Their findings highlight that open innovation and strategic planning are crucial for maintaining competitiveness. The current study extends this by demonstrating that integrating risk assessment into strategic processes enhances decision-making and business performance. The emphasis on organizational strategy as a mediator supports the idea that innovative risk management must be embedded in the overall business strategy.

S. Sardar *et al.* (2022) examine the socio-economic impacts of COVID-19 on the restaurant business in Bangladesh, highlighting the challenges faced by restaurant owners, such as increased operational costs and the need for financial support. This aligns with the current study's identification of economic instability and increased costs as major risk factors. The call for government assistance and financial support in S. Sardar *et al.*'s study underscores the importance of external support mechanisms, which complement the internal risk management strategies discussed here.

These studies underscore that innovative risk management is an integral part of successful hotel and restaurant business management. They point to the need for flexibility, adaptation, and continuous innovative development to ensure resilience and success in this industry. The importance of these aspects is particularly pronounced in the face of changing market conditions, technological innovations, and global challenges such as the COVID-19 pandemic. The main goal of risk management in this industry is not only to minimise potential losses but also to use opportunities for innovative development and the creation of new competitive advantages.

Conclusions

The results of the study indicate the importance of developing and implementing effective risk management mechanisms in the hotel and restaurant business. Determining the level of riskiness of enterprises in this sector is a priority task that requires an adequate assessment of possible losses, the probability of their occurrence, and the impact of individual factors on the overall risk of innovative development.

The findings of this study indicate that a risk management strategy based on risk minimisation involves implementing innovative management decisions based on comparing financial-mathematical models of different scenarios to determine the scenario with the lowest risk level. However, in conditions of market uncertainty, the existence of an absolutely risk-free scenario is problematic. In some cases, the risks of innovative management cannot be offset by internal financial stabilisation mechanisms, and then it is advisable for the management of hotel and restaurant enterprises to turn to insurance services. Risk impact analysis techniques for hospitality and restaurant companies focus on comprehensive actions: developing possible problem-solving options, assessing the potential consequences of choosing a particular solution, and a comprehensive risk assessment that combines both quantitative and qualitative elements. There is a tendency to assess risk in two areas: risk level and time risk. When determining the level of risk for enterprises in the hotel and restaurant business, the main criterion is the instability of the results of a specific decision. Risk analysis is presented in the form of a ratio between projected losses and the total value of the organisation's assets, including an assessment of the probability of such losses. Effective and deliberate application of risk analysis methods contributes to ensuring the stable development of hotel and restaurant sector enterprises, strengthening the validity of innovative management decisions in high-risk situations and improving the financial condition due to various aspects of their activities.

In further research, it is important to focus on a detailed analysis of the impact of external factors on the hotel and restaurant business, the development of adaptive risk management models, the study of the impact of innovative technologies such as artificial intelligence and big data on risk reduction, as well as the analysis of cultural and regional characteristics in risk management strategies. A comparative analysis of different approaches to risk management and an assessment of the impact of training and staff development on the effectiveness of these strategies are also important, as this will help to enhance the resilience and sustainable development of hotel and restaurant enterprises.

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Conflict of Interest

None.

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Інноваційне управління ризиками на підприємствах готельно-ресторанного бізнесу: науково-практичний аспект

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Анотація. Ефективне управління ризиками необхідне для успіху динамічного розвитку готельно-ресторанного бізнесу. В умовах зростання конкуренції та нестабільності ринку існує потреба в розробці інноваційних стратегій управління ризиками. Метою дослідження є розробка та апробація методів оцінки та мінімізації ризиків, спрямованих на зміцнення та сталий розвиток підприємств готельно-ресторанного бізнесу. За допомогою абстрактно-логічного аналізу та системного підходу проведено класифікацію підприємств залежно від рівня ризику. Результати цього дослідження демонструють комплексне розуміння інноваційних методів менеджменту в готельно-ресторанному господарстві. Отримані дані свідчать про те, що підприємства початкового кластеру менш вразливі до ризиків, що підтверджує ефективність кластерного аналізу в оцінці ризиків у готельно-ресторанному секторі. В умовах економічної та політичної нестабільності системний аналіз та управління ризиками стали важливими. Внутрішні стратегії управління ризиками, в тому числі інноваційні методи, були успішно використані для зниження потенційних загроз для готельно-ресторанного бізнесу з урахуванням специфіки цієї галузі. Розробка та підтримка динамічної інформаційної системи стала ключовим елементом, що сприяє ефективному управлінню ризиками та підвищенню конкурентоспроможності підприємств. Зазначені підприємства, залишаючись у межах найнижчого рівня ризику, підтвердили важливість використання кластерного аналізу для ідентифікації та управління ризиками в готельно-ресторанному секторі. Це дослідження представляє інноваційні підходи до управління ризиками в готельній та ресторанній сфері, надаючи конкретні стратегії, які можуть бути використані компаніями для підвищення стійкості та адаптації до викликів ринкової конкуренції

Ключові слова: стратегічна адаптація; об’єднання групових організацій; економіко-математичне моделювання; внутрішня система мінімізації ризиків; прогнозний аналіз

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