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TRENDS IN CORRUPTION AND SHADOW ECONOMY IN EUROPEAN COUNTRIES

Corruption and the shadow economy are among the most pressing issues facing European countries. These phenomena significantly impact the socio-economic development, political stability, and legal systems of states. The purpose of the paper is to analyze the trends of corruption and the shadow economy in 34 European countries over the period from 2010 to 2022. The research employed tools such as grouping, comparison and generalization methods, time series analysis, and descriptive statistics calculations. Calculations were based on World Bank data using StataSE 18 software. Analyzing the standard deviation, minimum, and maximum values of corruption and shadow economy indicators identifies the most variable indicators: the indicator of primary government expenditures as initially approved budgets and the corruption perception index. It was found that despite the implementation of numerous anti-corruption reforms and regulatory measures, countries such as Albania, Moldova, Ukraine, and Bulgaria continue to face high levels of corruption, as evidenced by their low corruption perception index levels. The main reasons for this included weak enforcement mechanisms, gaps in accountability, and low levels of transparency in public administration. The least corrupt European countries were Denmark, Norway, Finland, Switzerland, and Sweden. This research observed high levels of the shadow economy in Ukraine, Cyprus, and Moldova, while Denmark, Norway, and Sweden demonstrated the lowest levels. The results of the study can be used to develop organisational and economic measures to combat corruption and the shadow economy by public authorities, business entities and other economic agents, which is important for the economic growth of European countries.

Keywords: corruption, shadow economy, economic growth, corruption perception index, descriptive statistics

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INTRODUCTION

Corruption and the shadow economy are complex, disincentivising landscapes for economic growth, influenced by various socio-economic and political factors. Corruption can be defined as the abuse of entrusted power for personal gain through bribery or embezzlement. It is the unfair distribution of public resources under the influence of private interests [2]. The shadow economy, as another disincentive to economic growth, encompasses all economic activities that are not reported or reported incompletely to avoid taxation or regulation, including such key elements as undeclared employment and illegal trade. The first element of the shadow economy refers to wages that employees do not declare to avoid taxes or labour market regulation. The second element is represented by businesses that underreport their income to reduce their tax burden. It is worth noting that the level of the shadow economy is lower in high-income European countries in 2022: Austria – 8.4% of GDP, Ireland – 10.1%, Switzerland – 5.6%, and Sweden – 10.8%. In contrast, lower-middle-income countries have a higher level of shadow economy (Ukraine – 44.2%) [1]. According to a study by the International Transparency Agency, as of the end of 2017, almost one in four people worldwide said they had paid a bribe when accessing public services in the past 12 months [11].

In recent years, under the influence of globalisation, technological progress, the COVID-19 pandemic and geopolitical events in European countries, there have been changes in the forms (models) of corruption and the shadow economy, reflecting both internal and external pressures,

including the following:

- facilitation payments are relatively small amounts of money paid outside of official fees to speed up the provision of certain services;
- giving gifts to public officials that contradicts the principles of impartiality, dignity and professionalism;
- influence peddling is a form of corruption in which a person exchanges potential or actual influence on decision-making in public authorities for an unlawful benefit (unlike bribery, influence peddling involves an «intermediary»);
- cronyism is a biased attitude towards individuals (relatives, friends) in the distribution of positions and financial resources;
- patronage is a form of support of an influential and wealthy «guardian» of a person for his/her appointment to public office and promotion [3].

A number of concepts have been developed in the modern scientific literature to study the problems of corruption and shadow economy and their main trends. Foreign and Ukrainian researches define different approaches to defining the essence of the concepts of «corruption» and «shadow economy», and formulate systems of indicators of these phenomena. The International Transparency Organisation defines corruption as the abuse of public office for private gain [4]. It is noted that corruption undermines trust, weakens democracy, hinders economic development and deepens social inequality and poverty.

Most foreign scholars, including O. Fjeldstam [5], D. Treisman [6], H. Virta [7], focus on bribery or private benefits received by entrepreneurs to avoid taxation and

regulation when studying corruption and the shadow economy. Ukrainian researchers: M. Melnyk [8], V. Sevruck [9], S. Teleshun [10] considered the trends of corruption and shadow economy in the context of the social theoretical essence, fluctuations and consequences of these phenomena. However, the processes of corruption and shadowing of the economy have not been sufficiently studied in terms of analysing trends in their key indicators and require a more in-depth study. Accordingly, characterising the trends of corruption and shadow economy is crucial for politicians, academics and citizens, as these factors have a negative impact on economic development and public trust in the country.

MATERIALS AND METHODS

The following tools were used in the study:

- grouping methods use for identifying European countries, developing a system of corruption and shadowing indicators;

- comparison and generalisation, time series analysis use for analysing the corruption and shadowing indicators of 34 European countries;

- calculation of descriptive statistics use for determining the most appropriate indicators.

The research is based on the following stages:

1. Determination of the input statistical data of 34 European countries: Albania, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Germany, Ireland, Iceland, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine and United Kingdom for the period 2010-2022.

2. Calculation of descriptive statistics (standard deviation, minimum and maximum values) of corruption and shadow economy indicators.

3. Analysis of the most variant indicators of corruption and shadow economy in European countries in 2010-2022.

Calculations are based on the World Bank data using StataSE 18 software.

The **PURPOSE** of the study is to analyse the trends of corruption and shadow economy in 34 European countries in 2010-2022.

Governance structures, legal frameworks, enforcement mechanisms, budget planning and implementation have a profound impact on the prevalence and persistence of corruption and the shadow economy. On the other hand, economic conditions, including unemployment, income inequality and tax policy, also play a significant role in shaping these phenomena. Accordingly, a comprehensive study of the trends, drivers and consequences of corruption and the shadow economy in European countries is an important aspect of the research.

The study of trends in corruption and shadow economy indicators will contribute to the development of an effective system for exposing corruption and bringing corrupt officials to justice, which is possible when the mechanism of corrupt actions and systems is understood.

RESULTS

Despite the progress in anti-corruption measures in European countries, challenges remain on the way to effectively fighting corruption and the shadow economy, inclu-

ding weak enforcement mechanisms, lack of political will, insufficient transparency in public procurement and gaps in whistleblower protection. Addressing these challenges requires a sustained commitment from governments, civil society organisations, businesses and citizens to promote integrity, accountability and transparency in public and private affairs. In order to develop an effective system to counteract the spread of corruption and shadow processes, it is necessary to conduct a continuous analysis of trends in their main indicators, including indicators of productivity and transparency of both public authorities and business entities.

In Table 1 indicators of corruption and shadow economy are shown.

To identify trends, presents descriptive statistics, including average, minimum and maximum values, deviations and correlations between corruption and shadow economy indicators are shown on Figure 1.

Taking into account the obtained values of descriptive statistics, in particular, the standard deviation, the most variable are the indicators of primary public expenditures as initially approved budgets (EXPEND) and the corruption perception index (CORRPERC), 19.52 and 18 respectively. The wide deviation of the data is explained by the minimum and maximum values of these indicators, which range from 7.93% to 143.15% for the volume of primary public expenditures and from 23 to 94 for the corruption perception index.

A close direct relationship, characterized by the correlation index r , is observed between the corruption perception index (CORRPERC) and the corruption control index (CORRCONTR), which is 0.986. It is worth noting that with the strengthening of state control over corruption processes, the level of perception of corruption by business entities also increases, which characterizes the awareness of negative, non-transparent and "pocket" actions by citizens and other persons. The political stability indicator (POLITSTAB) has a moderate direct relationship with the corruption perception index and the corruption control index, with a value of 0.670 and 0.692, respectively. The role of the law (LAW) and regulatory quality (QUALITY) also have a strong direct relationship with the corruption perception index and the corruption control index.

Accordingly, let's consider in more detail the dynamics of changes in the volume of primary public expenditures as a share of the initially approved budget (Fig. 2).

The average level of this indicator was 99.3% of GDP. The level of primary public expenditures fluctuated around 19.5 % in 34 European countries in 2010-2022. The maximum values were observed in Lithuania in 2018 (143.1 %), Slovakia in 2020 (141.5 %), and the Czech Republic in 2021 (133.7 %), and the minimum values were observed in Lithuania in 2012 (7.9 %). For other European countries, the level of public spending exceeded 90 %.

One of the key indicators of corruption is the Corruption Perceptions Index, which is confirmed by the variability of the standard deviation and the correlation matrix. This index measures the level of perceived corruption in the public sector according to experts and internationally respected organizations. It is scored from 0 (very high level of corruption perception) to 100 (very low level of corruption perception). The dynamics of changes in this indicator is shown on Figure 3.

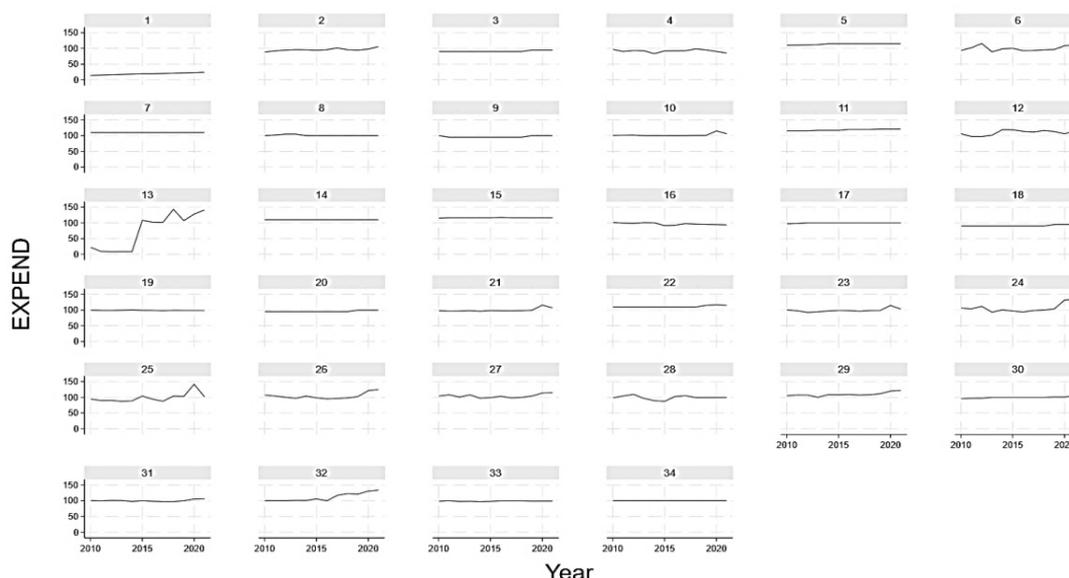
Table 1 – Characteristics of corruption and shadow economy indicators (author's development)

Sphere	Indicator	Designation	Characteristics	Units
Corruption	Primary government expenditures as a share of the initially approved budget	EXPEND	The overall outcome of budget expenditures, which reflects the originally approved amount as defined in government budget documents and fiscal reports.	%
	Corruption Perceptions Index	CORRPERC	A measure of the perception of corruption in the public sector.	score
	Control corruption	CORRCONTR	The extent to which state power is used for private gain, including both petty and grand corruption and elite capture of the state.	units
	Political stability and absence of violence/terrorism	POLITSTAB	Measures the perceived likelihood of political instability and/or politically motivated violence, including terrorism.	units
Shadow economy	Regulatory quality	QUALITY	An indicator of the government's ability to formulate and implement effective policies and regulations that enable and promote private sector development.	units
	Shadow economy (% of GDP)	SHADOW	Share of both illegal activities and informal legal and unregistered activities.	%
	Role of law	LAW	The extent to which agents trust and follow the rules of society, the quality of contract enforcement, property rights, police and courts, and the likelihood of crime and violence.	units

Variable	Obs	Mean	Std. dev.	Min	Max								
expend	408	99.27733	19.52239	7.93	143.15	expend	1.0000						
corrperc	408	62.62745	18.0016	23	94	corrperc	-0.0132	1.0000					
control	408	.923652	.9457816	-1.18	2.4	control	-0.0026	0.9868	1.0000				
politstab	408	.6690441	.5422673	-2.02	1.64	politstab	-0.0110	0.6709	0.6921	1.0000			
law	408	1.01973	.7775411	-.86	2.12	law	-0.0505	0.9557	0.9678	0.7512	1.0000		
quality	408	1.08076	.5953923	-.6	2.05	quality	-0.0206	0.9123	0.9247	0.7251	0.9435	1.0000	
shadow	408	17.83922	8.506077	6.19	43.8	shadow	0.1198	-0.7190	-0.7173	-0.6806	-0.7536	-0.7624	1.0000

Note: strong or close correlation strength at $|\tau| \geq 0.7$; medium at $0.5 \leq |\tau| < 0.7$; moderate at $0.3 \leq |\tau| < 0.5$; weak at $0.2 \leq |\tau| < 0.3$; very weak at $|\tau| < 0.2$.

Fig. 1. Descriptive statistics and correlations between corruption and shadow economy indicators in European countries in 2010-2022 (author's development based on [1])



Notes: 1 - Austria, 2 - Albania, 3 - Belgium, 4 - Bulgaria, 5 - Denmark, 6 - Estonia, 7 - Ireland, 8 - Iceland, 9 - Spain, 10 - Italy, 11 - Cyprus, 12 - Latvia, 13 - Lithuania, 14 - Luxembourg, 15 - Malta, 16 - Moldova, 17 - the Netherlands, 18 - Germany, 19 - Norway, 20 - United Kingdom (UK), 21 - Poland, 22 - Portugal, 23 - Romania, 24 - Serbia, 25 - Slovakia, 26 - Slovenia, 27 - Hungary, 28 - Ukraine, 29 - Finland, 30 - France, 31 - Croatia, 32 - Czech Republic, 33 - Switzerland, 34 - Sweden.

Fig. 2. Trends in primary public expenditures in European countries in 2010-2022, % of GDP (author's development based on [1])

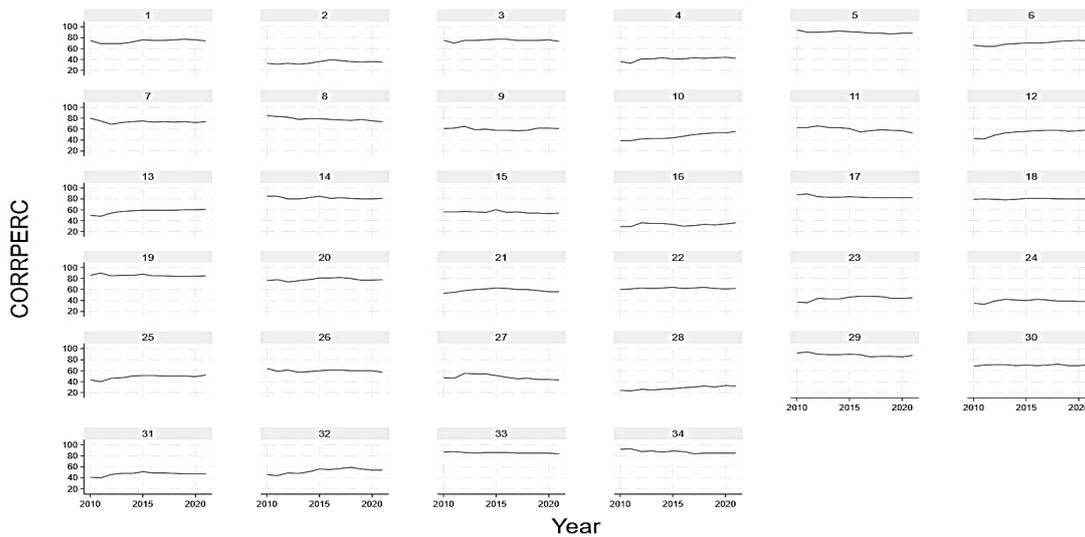


Fig. 3. Trends in the Corruption Perceptions Index in European countries in 2010-2022 (author's development based on [1])

The average level of the Corruption Perceptions Index in the surveyed countries was 62 points, meaning that European countries are perceived as less corrupt to a greater extent (> 50 points). The highest values of the index are observed in Denmark in 2021 (98 points), Norway in 2015 (88 points), Finland in 2021 (88 points), Switzerland in 2016 (86 points) and Sweden in 2015 (86 points), meaning that these countries are the least corrupt. The lowest values of the index are typical for Albania in 2013 (31 points), Bulgaria in 2011 (33 points), Moldova in 2019 (32 points), Serbia in 2011 (33 points) and Ukraine in 2021 (32 points), i.e. these countries are the most corrupt.

Trends in the level of the shadow economy as a key indicator of economic growth are shown on Figure 4.

The average shadow economy level in the surveyed countries was 17.8 % of GDP. This figure fluctuated between 8.5 % in 2010-2022. Since the end of 2015, most European countries have seen a decline in the level of the shadow economy. The maximum values were recorded in Ukraine in 2020 (43.6 %), Cyprus in 202 (32.5 %), and Mol-

dova in 2015 (39.6 %). The minimum level of the shadow economy is observed in Austria in 2020 (8.9 %), Denmark in 2021 (12.9 %), Ireland in 2021 (6.9 %), Iceland in 2021 (10.4%), Luxembourg in 2020 (10.4%), Norway in 2014 (13, 3%), Switzerland in 2021 (6.1%) and Sweden in 2019 (12%), meaning that these countries have more transparent and clear market entry rules, high regulatory quality and a prevalence of the role of law.

After analyzing the main trends in corruption and shadowing of European economies, it is worth paying attention to measures that will reduce their negative impact and promote national economic growth, including:

- digitalization and technology: digital platforms and electronic transactions will increase the transparency and accountability of government agencies and business entities;
- anti-corruption reforms: legal reforms, institutional strengthening and public awareness campaigns;
- cross-border cooperation: European countries strengthening cooperation within international organizations such as the European Union, Interpol and the United Nations.

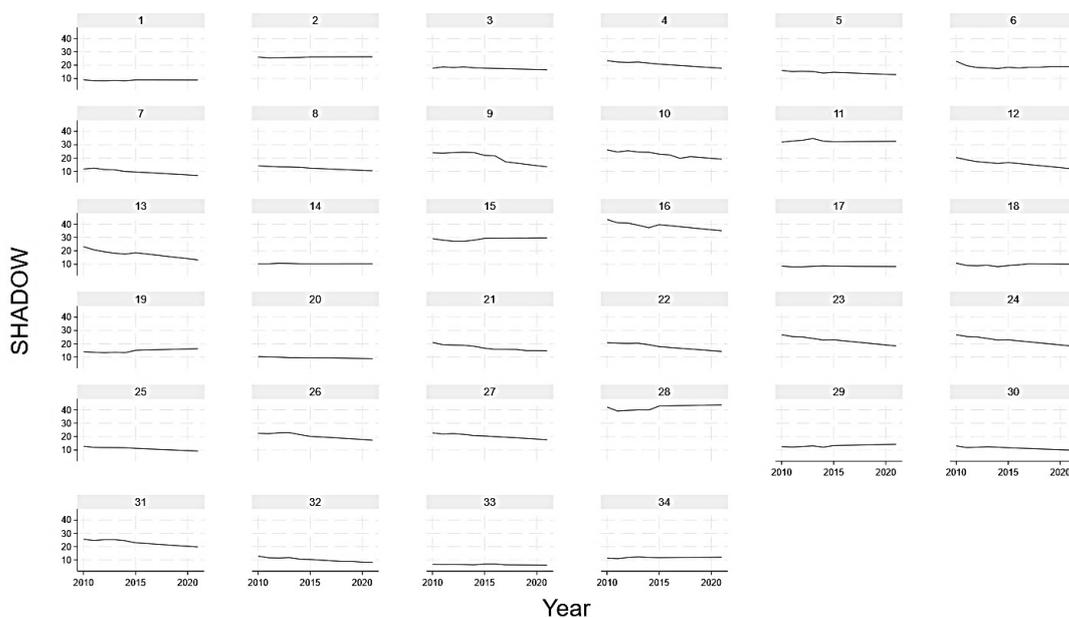


Fig. 4. Trends in the level of the shadow economy in European countries in 2010-2022, % of GDP (author's development based on [1])

These measures are being actively implemented by the countries with the lowest corruption and shadow economy indicators – Denmark, Ireland, Iceland, Luxembourg, Norway, Sweden, Switzerland and the United Kingdom. The organizational and economic tools for fighting corruption in Europe include a combination of legal reforms, institutional strengthening, law enforcement and public awareness campaigns. International cooperation through organizations such as the European Union, Interpol and the Council of Europe helps to coordinate anti-corruption initiatives, facilitate information exchange and support capacity building efforts. Thus, the analysis of corruption and shadow economy trends in European countries contributes to the development of more effective strategies to promote transparency, integrity and accountability at various levels of government.

CONCLUSION

An analysis of trends in corruption and shadow economy indicators in European countries shows their volatility under the influence of socio-economic, political and legal challenges. Despite anti-corruption reforms and regulatory measures, corruption remains a widespread problem in many European countries, including Albania, Moldova, Ukraine, and Bulgaria. Deep-rooted systemic corruption, weak law enforcement mechanisms and accountability gaps contribute to the persistence of corrupt practices in various sectors of the European economy. In the course of achieving this goal, the most variable indicators were identified, including the indicator of primary public expenditures as initially approved budgets and the corruption perception index, which had the highest values of standard deviations, minimum and maximum levels. A close direct correlation (r) between the corruption perception index and the corruption control index of 0.986 was found, which leads to the following

pattern: with the strengthening of state control over corruption processes, the level of corruption perception by business entities increases. There is also a close direct link between the role of law indicator and regulatory quality: the prevalence of the rule of law ensures clarity, fairness and consistent implementation of regulations, which, as a result, improves the quality of regulation.

Based on the analysis of the indicator of primary public expenditures, the maximum values observed in Lithuania, Slovakia and the Czech Republic and the minimum values were determined. The highest values of the Corruption Perceptions Index, indicating a low level of corruption in the country, were observed in Denmark, Finland, Norway, Sweden, Switzerland and Switzerland in 2015 (about 90 points), and the lowest values of the index were observed in Albania, Bulgaria, Moldova, Serbia and Ukraine in 2021 (about 33 points), which characterizes these countries as the most corrupt. The average level of the shadow economy in the European countries studied is 17.8% of GDP. The maximum values for 2010-2022 were found in Ukraine (43.6 %), Cyprus (32.5 %) and Moldova (39.6 %). Austria, Denmark, Ireland, Iceland, Luxembourg, Norway, Sweden, Switzerland, and the United Kingdom have the lowest levels of shadow economy, which is due to transparent rules for entering and exiting the market and high regulatory quality.

The research findings in the context of the analysis of corruption and shadowing trends in European economies and the identified organizational and economic measures to counter their spread can be used by government agencies, business entities, analysts and citizens to assess the spread of corruption and shadow processes and develop effective tools to combat them.

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ТЕНДЕНЦІЇ КОРУМПІЗАЦІЇ ТА ТІНІЗАЦІЇ ЕКОНОМІКИ В ЄВРОПЕЙСЬКИХ КРАЇНАХ

Корупція та тіньова економіка є одними з найбільш актуальних проблем, з якими стикаються країни Європи. Ці явища значно впливають на соціально-економічний розвиток, політичну стабільність та правову систему держав. Метою дослідження є аналіз тенденцій корупції та тіннізації економіки у 34 європейських країнах протягом 2010-2022 рр. У ході дослідження застосовано такі інструменти: методи групування, порівняння та узагальнення, аналіз часових рядів, розрахунок описових статистик. Розрахунки проведено на основі даних Світового банку за допомогою програмного забезпечення StataSE 18. Проаналізувавши середньоквадратичне відхилення, мінімальні та максимальні значення показників корупції та тіннізації, виявлено найбільш варіативні індикатори: показник первинних державних видатків як початково затверджених бюджетів та індекс сприйняття корупції. Визначено, що, попри впровадження численних антикорупційних реформ та регуляторних заходів, такі країни, як Албанія, Молдова, Україна та Болгарія, продовжують стикатися з високими рівнями корупції, що підтверджується низькими рівнями індексу сприйняття корупції. Основними причинами цього є слабкі механізми правозастосування, прогалини у підзвітності та низький рівень прозорості у державному управлінні. Найменш корумпованими європейськими країнами є Данія, Норвегія, Фінляндія, Швейцарія та Швеція. Високі рівні тіньової економіки спостерігаються в Україні, на Кіпрі та у Молдові, тоді такі країни, як Данія, Норвегія та Швеція демонструють найнижчі показники. Отримані результати дослідження може бути застосовано для розроблення організаційно-економічних заходів протидії корупції та тіньовій економіці органами державної влади, суб'єктами господарювання та іншими економічними агентами, що є важливим для економічного зростання європейських країн.

Ключові слова: корупція, тіньова економіка, економічне зростання, індекс сприйняття корупції, описові статистики