Sustainable economic development: comparative analysis of Ukraine and European countries

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Abstract. The study analyzed key indicators of sustainable development of the economies of Ukraine and European countries. Despite the insignificant progress of Ukraine in comparison with European countries in key indicators, especially in the areas of energy efficiency and environmental protection, it is possible to note some aspects of social security in Ukraine, such as the level of education and access to medical services, show positive dynamics compared to a number of countries of the Central and Eastern Europe. Ukraine faces the challenges of war, destruction and inflation. It was determined that Ukraine remains the country with the lowest level of income per capita in Europe, with a GDP per capita of 32% of the average value of the European Union countries. The EU uses GDP indicators to allocate funds from structural funds, contributing to the development of less developed countries. Using purchasing power parity to estimate GDP helps unify the measurement of the economic potential of different countries. The study also emphasizes the importance of implementing integrated policies that would contribute to the balanced development of all three components of sustainability. In particular, the need for further integration of Ukraine into European economic and environmental initiatives is noted, which will help increase its economic competitiveness and promote sustainable development.

1 Introduction

The relevance of the study lies in the fact that the sustainable development of the economy is one of the key requirements of modern times, defined both by the global goals of the United Nations and by the European policy of the green course [1]. The issue of sustainable development becomes especially relevant in the context of global environmental challenges, climate change, the need for effective use of natural resources, ensuring social justice and economic sustainability.

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For Ukraine, as a country on the way to European integration, the issue of sustainable development becomes even more important in the context of adaptation to the standards and requirements of the European Union. A comparative analysis with European countries allows identifying key differences and common trends in approaches to sustainable development, identifying effective strategies and policies that can be adapted and implemented in Ukraine [2].

Special attention in the research is paid to the analysis of indicators of sustainable development, assessment of ecological, economic and social components, identification of challenges and opportunities for Ukraine on the way to sustainability [3]. It is also relevant to consider the experience of European countries in the implementation of green transition policies, energy efficiency, reduction of carbon dioxide emissions, development of renewable energy sources, which can serve as a useful example for Ukraine. Given the wide range of challenges faced by both Ukraine and European countries, such a comparative analysis is extremely important for the development of comprehensive sustainable development strategies that take into account the specifics of the regional and national levels, as well as global goals and constraints.

The purpose of the article is a comprehensive study and comparison of Ukraine's achievements in the field of sustainable economic development with the indicators of the countries of the European Union. The research is aimed at identifying key factors affecting the effectiveness of implementing sustainable development strategies, identifying gaps and opportunities for further improvement of economic policy and practices in Ukraine in comparison with European standards and achievements.

2 Literature review

The basis of the study is the statistical and analytical database of the European Commission [4]. The European Economic Forecast provides a comprehensive analysis and forecasts of economic indicators in the countries of the European Union, providing valuable comparative data for assessing the economic dynamics of Ukraine. Scientific work [5] examines economic developments and policies in European countries, providing important insights into regional trends and possible directions for sustainable economic growth. Research reports and policy documents from well-known research centers and national public institutions [3, 6] that specialize in economic development and European affairs can provide a variety of views and recommendations for promoting sustainable economic sustainability, and comparative analysis of the economy is essential [7]. It provides valuable theoretical frameworks and empirical data for understanding the challenges and opportunities facing Ukraine and European countries.

A review of these publications allows for a deeper comparative analysis of the economic development of Ukraine and European countries, taking into account the factors of sustainable development.

3 Results

With acquisition Ukraine's status as a candidate for EU membership raises the question of the position of modern Ukraine in the economic ranking of EU member states, in particular by such a criterion as GDP per capita. In the context of the war in Ukraine, which began in 2022, to ensure objectivity, the economic indicators of the EU and Ukraine should be analyzed until that date.

Also, in international economic comparisons, such as GDP per capita, it is important not only to convert the data into a common currency, but also to take into account the difference in price levels between countries. Failure to take this factor into account may lead to an overestimation of the GDP of countries with a higher level of prices compared to countries where these levels are lower [5].

The gross domestic product (GDP) serves as a key macroeconomic indicator that reflects the level of sustainable economic development of the country. Analyzing the dynamics of this indicator makes it possible to assess the main directions of growth or decline in the country's economy in conditions of peaceful life and during military conflicts. In fig. 1 presents the evolution of the GDP of Ukraine for the period from 2012 to 2023. The graph clearly shows that the economy of Ukraine showed a tendency towards gradual development, which is confirmed by a regular increase in GDP. For example, in 2021, the GDP index increased by UAH 5233.76 billion compared to 2002, which was an increase of 2317.77% [8].



Fig. 1. Dynamics of the GDP indicator of Ukraine in the period 2010-2023 [8].

A general tendency to increase the level of GDP was recorded, except for the case in 2009, when the indicator decreased due to the global financial and economic crisis. Since 2010, recovery and further growth of Ukraine's GDP has been observed. However, military actions initiated by Russia against Ukraine have significantly changed this dynamic. GDP per capita of Ukraine in 2023 amounted to 3900.5 USD [6].

Thus, in 2023, GDP per capita in EU countries, calculated according to purchasing power parity (PPP) standards, varied from 59% of the EU average in Bulgaria to 261% in Luxembourg. These data indicate a significant diversity in the levels of GDP per capita among EU member states (Figure 2).

Luxembourg stands out among the 27 countries of the European Union with the highest GDP per capita, which exceeds the EU average by 161%. The main reason for this indicator is the large number of foreign workers in the country, whose earnings (with) make a significant contribution to Luxembourg's GDP, while their expenses and consumption are included in the economies of their countries of permanent residence [6].

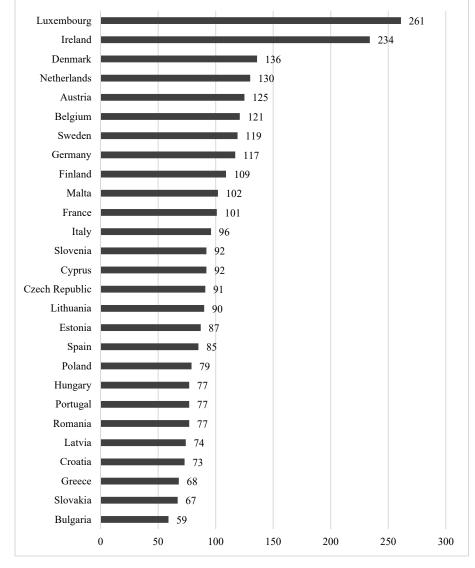


Fig. 2. The level of the GDP index per capita in the EU countries, according to the results of 2023 [1].

Ireland, occupying the second place in terms of GDP per capita among the EU countries, shows an indicator that is 134% higher than the EU average. Its high GDP can be attributed to the existence of several global corporations concentrated in the sphere of intellectual property, where a significant part of the profit from production is directed to the international owners of the companies [1, 10].

In 2023, the total volume of the gross domestic product of Ukraine reached UAH 5459.574 million at actual prices and UAH 4363,585 million at the prices of the previous year. GDP per person in the same year was UAH 131910.3 or USD 4,834.4 . USA, recorded with a population of 41,390 people. However, the fact that these indicators are not a record in the history of the country is striking. According to the World Bank, the average standard of living of Ukrainians is now approximately the same as it was 30 years ago.

Specifically, in 1991, GDP per capita was 3624 USD (at 2010 prices), and in 2021 - 3120 USD, which is 86% of the indicator 30 years ago. Similar trends are observed according to data that take into account purchasing power parity: 14,398 USD in 1991 compared to \$12380 in 2020, again 86% [11].

In 1991, according to information from the World Bank, the GDP of Ukraine amounted to 77.5 billion USD at current prices, which was more than in such countries as Israel (59.1 billion USD) and Singapore (45.6 billion USD). However, by 2016, Ukraine's economy had grown to only 93.3 billion USD, while Israel reached 318.6 billion USD, and Singapore - 296.8 billion USD. Despite this, even in 1991, Ukraine remained among relatively poor countries by world standards, having a GDP per capita of 3624 USD (at 2010 prices), which was approximately 50% of the world average (7170 USD) [11] (Fig. 3).

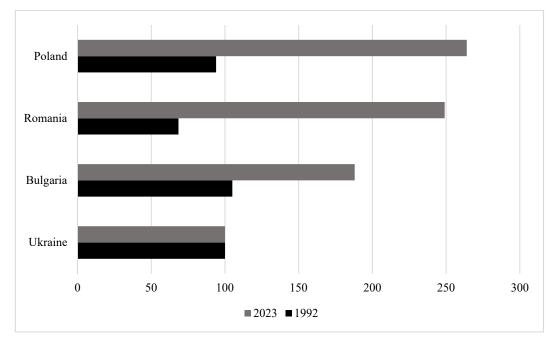


Fig. 3. Comparison of GDP per capita under the PCS of Ukraine and a number of EU countries in 1992 and 2023 [10].

This happened despite the fact that after the collapse of the USSR, Ukraine had one of the highest GDP per capita in terms of purchasing power parity among the former socialist countries, which can be seen when comparing the data for 2022 with 1992. Gross domestic product (GDP) as a composite indicator is often unable to adequately reflect the actual state of well-being of the population in the country, as its value may vary depending on the structure of the economy. It is noted, for example, that the share of household consumption in Ukraine from the total GDP increased from 54.0% in 1991 to 74.4% in 2020. At the same time, it should be taken into account that no statistical report will be able to accurately reflect the real GDP per capita, taking into account the share of the shadow economy that has always existed in the country [2, 12].

According to data from the State Statistics Service of Ukraine, the real GDP of the country in the fourth quarter of 2023 decreased by 4.7% compared to the previous quarter (taking into account the seasonal factor) and by 31.4% compared to the fourth quarter of 2022.

The Ukraine's GDP was down 30.3% in 2022, with the war as the main factor causing destruction, population migration and declining exports. Added to this was inflation, which, despite stabilizing at the end of 2022 after the destruction of infrastructure, missile strikes and disruptions in production chains, remained significant and amounted to 26.6% [4].

In the context of the European poverty rating, in 2018 Ukraine took 134th place in the world rating with GDP per person of 2656 USD, exchanging positions with Moldova, which rose to 133rd place with an indicator of 2701 USD. At the same time, Luxembourg topped the list with an indicator of more than 100 000 USD, which was several dozen times higher than the Ukrainian indicator, more than 17 times ahead of Germany and six times ahead of Poland.

Ukraine continues to be the country with the lowest per capita income in Europe. While the average GDP per capita in the world amounted to 11057 USD. In the USA, in Ukraine this figure is only 32% of this indicator, or 3652 USD. USA. This is almost ten times less compared to the average indicator of GDP per capita in the countries of the European Union, which reaches 34,048 USD. Thus, the economic level of Ukraine turns out to be lower not only compared to Poland (15653 USD), but also Moldova (4365 USD) [13].

However, the situation looks a little better if we analyze Ukraine's GDP by purchasing power parity (PPP). According to 2020 data, Ukraine ranks 91st with an indicator of 13097 USD, while in 1991 this figure was only 6900 USD. Although positive growth dynamics are observed, it lags far behind that of countries such as Poland, Hungary, and the Czech Republic, where GDP grew from 4 to 6 times over the same period [2].

The main purpose of using the PCS is to unify the measurement of the gross domestic product of different countries to comparative volumes, taking into account differences in price levels. The use of nominal exchange rates can distort GDP data by overstating the performance of countries with high prices compared to countries with lower prices. The use of PCS allows to ensure the same level of prices when estimating GDP, reflecting the real size of economies [14]. For the clarity of the position of Ukraine among the countries of the European Union in terms of GDP per capita, we offer data based on indicators before the war, for the year 2022, where specific numbers are not specified (Fig. 4.) [9].

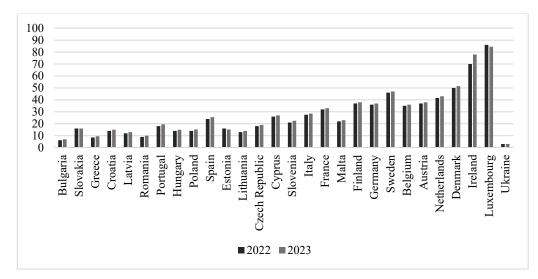


Fig. 4. Real GDP per capita in EU countries and Ukraine (thousands of euros) [9].

It is clear that Ukraine faces the task of accelerated development in order not only to catch up with the least developed countries on the list, but also to significantly increase the economic power of the country and the standard of living of its people. It is expected that significant progress in this direction will become possible, mainly after the end of the war and under the condition of active support from the states of the European Union [4].

Countries whose real GDP per capita is less than 75% of the EU average for three years are eligible for financial assistance from these funds. To determine these indicators, Eurostat calculates GDP at purchasing power parity for all 27 EU members, using the most up-to-date data on prices and national accounts [13].

Therefore, while Ukraine is on the way to EU membership, support from the Union member states, especially in the context of military operations, will be extremely important both in terms of the amount of aid and the duration of its provision in order to bring the economy and living standards of Ukraine closer to the European ones levels [15].

To determine the significance for both sides, both the shares of bilateral trade for various groups of goods in the total volume of trade between Ukraine and the EU, and their share in the total volume of EU trade with all third countries, were calculated. , respectively. The analysis covers the period from March to October 2022 (war period) and is compared with the same period in 2021 (pre-war period) to exclude the influence of seasonality (Table 1).

Group of goods	in Ukraine's exports to the EU, %, 2022- 2023	of goods exports in Ukraine's exports to the EU, %, 2023 compared to 2022	in the import of EU goods from third countries, %, 2022-2023	2022-2023
Meat and offal	1.38	0.63	6,195	1.05
Dairy products, eggs, honey and other food products of animal origin	1,029	0.63	8.61	4.62
Cereals	13.303	7.245	28.98	3.8
Products of flour milling and groats production, malt, starch, inulin, wheat gluten	0.1785	0.105	8.4	4.41
Oil crops, various grains, fruits, industrial or medicinal plants, straw and fodder	12.8415	7,035	16,485	6,195
Plant fibers, other plant products	0.1155	0	8,085	1.785
Animal fats, vegetable oil and their products, wax	11.697	2.94	13.8	-0.21
Sugar and confectionery	0.504	0.21	5.25	0.945
Non-metallic solid minerals, cement	0.6	-0.945	2.25	-4.62
Ores, slag and ash	10.6575	-3,465	8,19	-1.68
Mineral fuel and lubricants and products of their distillation, bituminous materials, mineral wax	5.691	2.94	0.21	0
Wood and its products, charcoal	8.0955	1,785	12.6	1,995
Cast iron and steel	9.135	-15.33	3.78	-7.56
Electrical equipment, audio and video equipment and parts for them	7.833	-0.21	0.525	-0.21
All goods	0	0	0.84	-0.315

 Table 1. Assessment of the structural transformation of types of exports of Ukrainian products to EU countries in 2022-2023 [6].

According to the data in Table 1, the main groups of goods exported from Ukraine to the EU are grain and oil crops, vegetable oil, ore, ferrous metals, wood, and products of the electrical industry. During the war, the importance of the export of grain and oil crops increased, while the importance of ferrous metallurgy decreased significantly (almost by half). With the help of the Herfindahl-Hirschman index , which assesses the level of diversification of exports by two-digit classifications of goods, it can be established that in the pre-war period the index was 990, and during the war it decreased to 780. This indicates an increase in the level of diversification of Ukraine's commodity exports to the EU against the background of destruction and violations in the normal activity of the metallurgical industry of Ukraine. At the same time, the total volume of bilateral exports to other product groups and directions to the EU [16].

Ukraine occupies a leading position in the European market as a supplier of such goods as grains, oilseeds, vegetable oil and wood, accounting for more than 10% of the total imports of these categories of goods into the EU. During the war, the role of Ukraine for the EU as a source of grain, oil crops and products of the agricultural sector increased, while its importance as an exporter of ferrous metals and non-metallic minerals decreased.

According to Table 2, the main product groups that the EU exports to Ukraine are fuel, vehicles, electronics and equipment. As the need for fuel and defense materials increased during wartime, the demand for imports of these goods increased, while the need for machinery and equipment decreased. At the same time, the total volume of bilateral imports remained almost unchanged.

Group of goods	The share of product imports in Ukraine's imports into the EU, %, 2023	import of	The share of Ukrainian imports in the export of EU goods to third countries, %, 2023	export of FU
Coffee, tea, spices	0.63	0.21	4,935	0.525
Mineral fuel and lubricants and distillation products, bituminous materials, mineral wax	22.869	12.705	3.36	0.525
Fertilizers	1.1	-0.735	3.57	-6.09
Headgear and their parts	0.2205	0.21	5.46	3.7
Nuclear reactors, boilers, machines, mechanical devices and their parts	7.875	-8.4	0.63	-0.735
Electrical equipment, audio and video equipment and parts for them	8.7045	-0.84	1,155	-0.315
Road vehicles and parts	11.025	0.21	1.26	-0.21
weapons, ammunition and their parts	4.116	3.99	19.74	18.9
All goods	0	0	1.155	-0.21

 Table 2. Assessment of the structural transformation of types of import of Ukrainian products to EU countries in 2022-2023 [6].

Ukraine has become an important market for European arms and ammunition exporters, accounting for one-ninth of all their exports to third countries, as well as for exports of headgear, coffee and tea. Arms exports from the EU to Ukraine increased 24 times, while the supply of fertilizers decreased by almost three times.

Reorganization of logistics routes for export and import of goods, especially through non-EU countries, is becoming a crucial aspect of Ukraine's trade relations with the European Union. The restriction of access to the Azov Sea since 2014, as well as the almost complete blockade of sea routes in the Black and Azov seas since 2022, along with the suspension of trade through Russian territory with the countries of Central Asia, have caused serious obstacles to Ukraine's international trade. Before the war, Black Sea ports were key for transporting 90% of Ukrainian grain exports, which in turn formed 20% of the country's annual income from all exports [17].

In response to wartime conditions, the EU Action Plan "Paths of Solidarity" was developed, presented on May 12, 2022, which provides for a number of measures to optimize logistics. The purpose of the plan is to increase the capacity of transport routes, create new logistics chains for export and import operations, establish new partnerships between Ukraine, the EU and third countries, as well as simplify procedures. In particular, the plan includes measures to expand cargo transportation through land and sea routes in the EU, development of transit and storage capabilities, as well as ensuring flexibility in the regulation of border checks [18].

This made it possible to export 14 million tons of Ukrainian grain using European logistics, as well as expand other import -export operations. In this context, platforms supported by the European Commission are also used to find partners and optimize logistics routes, such as the European Business Network, EU Cluster Support Ukraine and the NAZOVNI system of the Ministry of Foreign Affairs of Ukraine in Ukraine, which turned out to be very useful for Ukrainian exporters. In July, the European Commission approved, among other things, an updated schematic map of the trans-European transport network [19]:

- The Northern Corridor of the Baltic Sea was extended to Mariupol via Lviv and Kyiv;

- the Baltic Sea – Black Sea – Aegean Sea corridor was extended through Lviv and Chernivtsi (Romania and Moldova) to Odesa;

- the corridors Baltic Sea - Adriatic Sea and Rhine - Danube pass through Lviv.

An important part of Ukraine's economic relations with the EU is the Agreement on road freight transportation, signed in June for one year. The agreement cancels the need to obtain special permits for Ukrainian carriers and simplifies the procedure for approval of driver's licenses. During the first month after the occupation, Ukraine agreed with 12 EU member states to cancel permits. Previously, quotas and permits significantly limited the profits of Ukrainian transport companies and increased the cost of Ukrainian products on the EU market [15].

The war in Ukraine stimulated a reassessment of the basic principles of the concept of sustainable development. Analyzing individual indicators for the last two decades and the year of the war, it is difficult to fully assess the achievements of sustainable development due to military actions on the territory of the country, because usually five-year indicators are used for such analysis. At the same time, it became clear that the war created significant obstacles to the realization of such goals as eliminating poverty, providing quality education, overcoming hunger, providing quality medical services, achieving general wellbeing, and access to clean drinking water and energy. In addition, the war caused negative consequences for ecology, development of cities and communities, soil and water pollution, damage to the environment, negative impact on the health of future generations, which also complicates the achievement of other goals of sustainable development [20]. As discussions begin to rebuild the country and the economy, sustainable development goals should serve as a guide to ensure the most effective reconstruction of Ukraine.

Prior to the outbreak of the large-scale conflict in February, Ukraine was showing steady progress in meeting 15 of the 17 identified sustainable development goals, particularly in poverty reduction. According to the national survey of Ukraine in 2022, a decrease in the poverty level was recorded from 58.3% in 2015 to 43.2% in 2018 [19]. However, the situation is rapidly changing for the worse: according to UNDP estimates, up to 90% of Ukraine's population could be on the verge of poverty or become vulnerable to it if the conflict continues for another year.

Effective efforts in the reconstruction of Ukraine and the provision of humanitarian aid must be closely interconnected to ensure the preservation of national achievements of recent decades. Implementation of sustainable development goals in Ukraine is possible only if there is a strong national responsibility for compliance with the sustainable development program until 2030 and effective institutional mechanisms. It is important for Ukraine to use the recovery process as an opportunity to achieve the most effective reconstruction possible by implementing coordinated and sustainable measures to create a greener, more inclusive and fairer state.

4 Conclusions

It was determined that granting Ukraine the status of a candidate for joining the European Union was a significant step in the development of international relations and the country's economic integration process. This opens up new prospects for Ukraine in strengthening its European identity, while at the same time increasing responsibility for the implementation of a large number of internal tasks that still need to be implemented. Despite the stable growth of Ukraine's GDP in the period until 2022, the military actions initiated by Russia significantly affected the country's economic development. GDP per capita in 2023 amounted to only 3,900 USD, which shows the economic challenges that the country faced as a result of the conflict.

It has been proven that it is important for Ukraine to intensify its efforts in the direction of sustainable development, taking into account both national and international goals in this area. Such an approach requires a comprehensive reform of the economy, social policy and environmental strategy, which, in turn, will contribute to increasing the welfare of the population and ensuring the long-term perspective of the country's development.

Studies have shown that the war in Ukraine posed major challenges to the country in achieving the goals of sustainable development, particularly in the areas of poverty alleviation, education, health and ecology. Achieving these goals requires concerted efforts at the national and international levels. Effective post-war reconstruction of Ukraine requires the integration of sustainable development principles into the reconstruction strategy to ensure a green, inclusive and just future for the country.

The status of a candidate for EU membership and the further integration of Ukraine into the European community require active support from the EU countries, especially in the light of military challenges, in order to accelerate the processes of economic recovery and social development. Ukraine's success in achieving the goals of sustainable development depends on the presence of effective institutional mechanisms and strong national responsibility for their implementation.

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