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Socio-Economic Development of European Countries in Times of Crisis: Ups and Downs

Dariusz Krawczyk [1,*], Viktoriya Martynets [2], Yuliia Opanasiuk [2] and Ihor Rekunenko [2]

[1] Department of Applied Social Sciences, Faculty of Organization and Management, Silesian University of Technology, 41-800 Zabrze, Poland
[2] Oleg Balazkiy Department of Management, Academic and Research Institute of Business, Economics and Management, Sumy State University, 39 Soborna Street, 40000 Sumy, Sumy Region, Ukraine; v.martynets@management.sumdu.edu.ua (V.M.); yu.opanasiuk@management.sumdu.edu.ua (Y.O.); i.rekunenko@biem.sumdu.edu.ua (I.R.)
* Correspondence: djkrawczyk@polsl.pl

Abstract: This article analyzes the dynamics of the changes in indicators of socio-economic development under conditions of financial and economic crises and their negative consequences. The study proves that financial crises are associated with severe and prolonged downturns in economic activity. The socio-economic development of European countries in times of crises was analyzed. The cyclical nature of the onset of crises was confirmed via the study of the dynamics of socio-economic development indicators. The main emphasis was on the financial crisis of 2008–2009 and the COVID-19 crisis (2020–2021). The main indicators characterizing the crises were identified based on an analysis of literary sources. Their classification was developed according to the following groups: leading indicators, lagging indicators, and client leading indicators of expansion. Based on the correlation analysis, indicators that have a significant impact on socio-economic development and are predictors of crisis onset were identified. The authors suggest considering such leading indicators as increases in the private credit in the GDP, budget deficit, balance of payment deficit, and real interest rate. The major lagging indicators that have strong correlations with the GDP, such as the employment rate, general government debt, stock price volatility, and investment, were identified. Client leading indicators of expansion include unemployment, an increase in the number of new enterprises, an increase in purchasing power, etc. Some indicators, such as unemployment, can be both lagging indicators and client leading indicators of expansion. The negative consequences of the crisis are caused by the crisis itself as well as by the imbalances preceding the crisis. Therefore, the study of the predictors of crisis onset is relevant for timely decision making in order to prevent the negative consequences of the crisis. Based on the identified lagging indicators, the 2008–2009 crisis and the COVID-19 crisis were studied. To study the development processes of these crises, the authors analyzed by quarters the dynamics of the development of the following macroeconomic indicators: the GDP, employment, and investment levels. The similarities and discrepancies were identified in the natures of the emergences and courses of the 2008–2009 crisis and the COVID-19 crisis using the comparison method. The case study of the Eurozone and individual EU countries (Germany, France, Italy, and Spain) was used. Considering the similar courses of the crises, the forecast of the socio-economic development was made using the analyzed indicators during the COVID-19 crisis based on the 2008–2009 crisis data. The forecast approximation indicators were calculated, and a method for constructing further forecasts was selected. Based on retrospective data, the GDP forecast was developed via the use of the extrapolation method for 2023–2024. It is necessary to consider that while forecasting crises caused by unforeseen events and external influences, it is advisable to use qualitative analysis along with quantitative analysis. This article will be useful to researchers, political elites, experts, and financial analysts when developing programs for the socio-economic development of countries.

Keywords: financial crisis; GDP; pandemic; economic development; business cycles

Citation: Krawczyk, D.; Martynets, V.; Opanasiuk, Y.; Rekunenko, I. Socio-Economic Development of European Countries in Times of Crisis: Ups and Downs. *Sustainability* **2023**, *15*, 14820. https://doi.org/10.3390/su152014820

Academic Editor: Cristina Raluca Gh. Popescu

Received: 13 August 2023
Revised: 2 October 2023
Accepted: 6 October 2023
Published: 12 October 2023

1. Introduction

A characteristic feature of socio-economic development is the crises caused by external and internal factors. Crises can lead to negative consequences in the economy, as well as become an impetus to significant positive shifts in socio-economic development. Crises have a systemic and comprehensive nature and occur at different levels of management. The banking system, the labor market, public debt, exchange rate collapse, and inflation often intersect and turn into conglomerate crises connected with economic depressions.

Let us consider in more detail the major world crises. In the early 1980s, financial and sovereign debt crises began, and the world economy went into deep recession. But until 1983, the United States and other advanced economies did not feel the effects of these crises, and these countries experienced robust growth along with declining inflation.

The global financial crisis of 2007–2009 had a negative impact on advanced economies. As the USA and Europe fell into recession, China was actively growing and raising world commodity prices [1].

In 2019, the COVID-19 crisis began. In the beginning, this crisis did not have negative consequences for the economy. However, it gradually turned into a financial crisis due to the governments' decisions to enforce lockdowns, which led to a halt in production, the termination of supply chains, increased unemployment, increased inflation, etc. Thus, this crisis is comparable to financial crises.

According to the theory of economic cycles, financial crises occur after prolonged increases in economic activity. Growth is often followed by the intensity of lending and the growth of leverage [2–4]. The COVID-19 crisis does not correspond to the historical rise-and-fall pattern, as there was no observed economic growth before it [4]. The financial consequences of the pandemic did not depend on a country's income level or geographic location. However, the countries with middle and low levels of income became more vulnerable to the consequences of the crisis caused by the pandemic [5].

During the crisis and the post-crisis period, decisions at all levels of management are, to some extent, made under conditions of uncertainty. Consideration of the peculiarities of crisis processes, which have different natures of course, accumulates experience for making effective managerial decisions while shaping fiscal and monetary policy and ensuring macroeconomic stability. For instance, the driving down of the interest rate by the US Federal Reserve and other measures on increasing liquidity under conditions of the COVID-19 pandemic have prevented new sovereign defaults [6].

Scientists study the nature of a crisis's occurrence, the unfolding of the crisis, and their impact on the socio-economic development of countries. C.M. Reinhart [1] argues that countries' individual crises transit into conglomerates. He suggests that crises have affected the form and speed of economic renewal. M.D. Borde, C.M. Meissner [2], M. Schularick, and A.M. Taylor [4] studied the early warning indicators of crises and discovered that a wide range of variables are potential predictors. However, these authors consider that the major indicator is the credit boom. This study focuses on the major indicator, (i.e., the credit boom), and other indicators that may be crisis predictors are not considered.

In addition, different scientists study some types of crises and do not bond them. This study attempts to compare the world's largest crises, and to identify and classify such indicators as crisis predictors, lagging indicators, or client leading indicators of expansion. For example, Choudhry, M. T., Marelli, E., and Signorelli, M. [7] proved the impact of financial crises on youth unemployment beyond the influence of changes in the GDP. Sobotka, T., Skirbekk, V., and Philipov, D. [8] considered the impact of economic downturns on birth rates in the developed countries of the world.

Considering the wide range of studies concerning the effects of crisis processes on the socio-economic development of countries, this issue is still relevant. Due to the influence of exogenous and endogenous factors in the socio-economic development of countries, the nature of the crisis is changing. Therefore, there is a need for further research on the indicators of macroeconomic stability in the pre-crisis, crisis, and post-crisis periods.

The study puts forward the hypothesis that studying the experience of the nature of the occurrences of crises and the nature of the courses of crises can be partially used in the forecasting and prevention of future crises.

The purpose of the article is to analyze the socio-economic development of the EU countries in times of financial and economic crises in order to determine the natures of the crises and to choose a more accurate forecasting method.

2. Materials and Methods

After reviewing the literary sources by using the Scopus database, the main predictors of the onset of the crises were identified. Regression and correlation analyses determined the strengths of the links between these predictors and the GDPs for the Eurozone and four major countries (Germany, France, Italy, and Spain).

In the second stage, the similarities and discrepancies in the periods of crises were determined via the comparison method using the case study of the 2008–2009 crisis and the COVID-19 crisis.

In the third stage, GDP forecasting for these countries was performed using the extrapolation method using the linear stochastic model of GDP dynamics. The model y = f (GDP) was used.

The research algorithm is given in Figure 1.

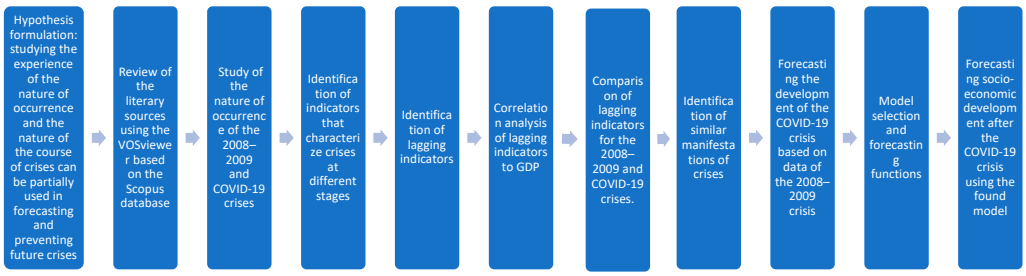


Figure 1. The algorithm of the research conducted.

3. Results

Literature Review

A literature analysis of 3057 results was carried out using the Scopus database using the keywords "crisis" and "Gross Domestics Product". The analysis showed that interest in the research topic has been intensifying since 2008. This was especially observed during the period of crisis process exacerbation (Figure 2).

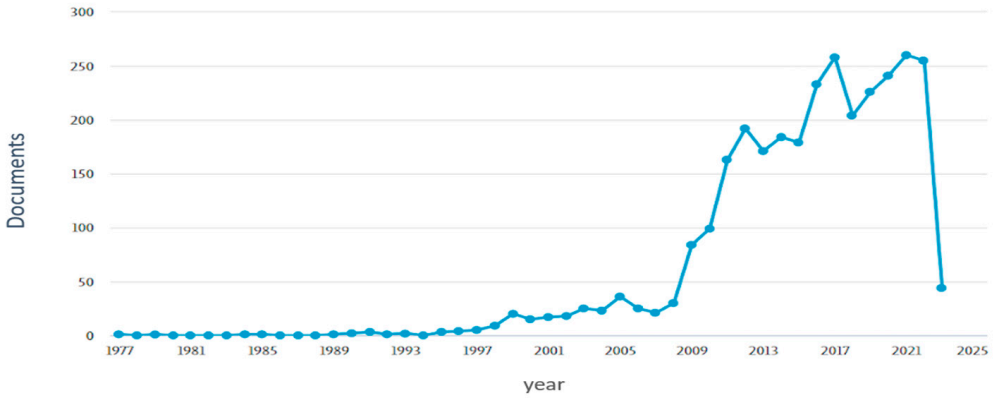


Figure 2. Analysis of number of studies using the keywords "crisis" and "Gross Domestics Product" according to the Scopus database for the period 1977–2023 (compiled by the authors).

The problem of the crisis has been considered in different fields of knowledge. In the period 1977–2023, most research on crisis processes in the economy occurred in the

following areas of knowledge: economics, econometrics, and finance (47.6%); social sciences (23.1%); business, management, and accounting (22.2%) (Figure 3).

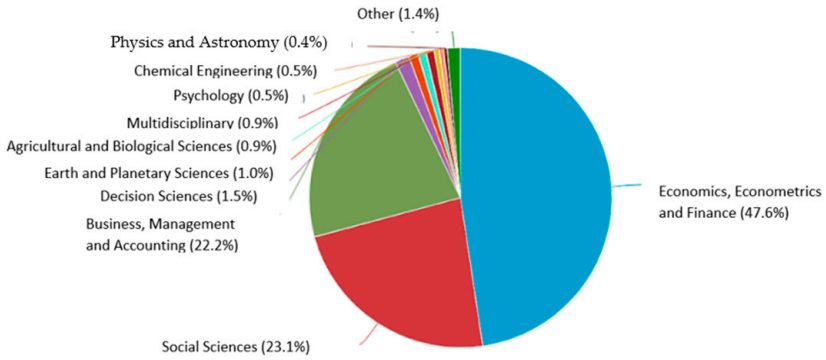


Figure 3. Research by field of knowledge using the keywords "crisis" and "Gross Domestics Product" according to the Scopus database for the period 1977–2023 (compiled by the authors).

It is possible to distinguish the following countries in which the crisis processes in the economy and their effect on the GDP are the most studied: the United States (457 documents), the United Kingdom (257), Germany (183), Italy (172), Spain (126), France (122), India (117), China (112), and Greece (92) (Figure 4).

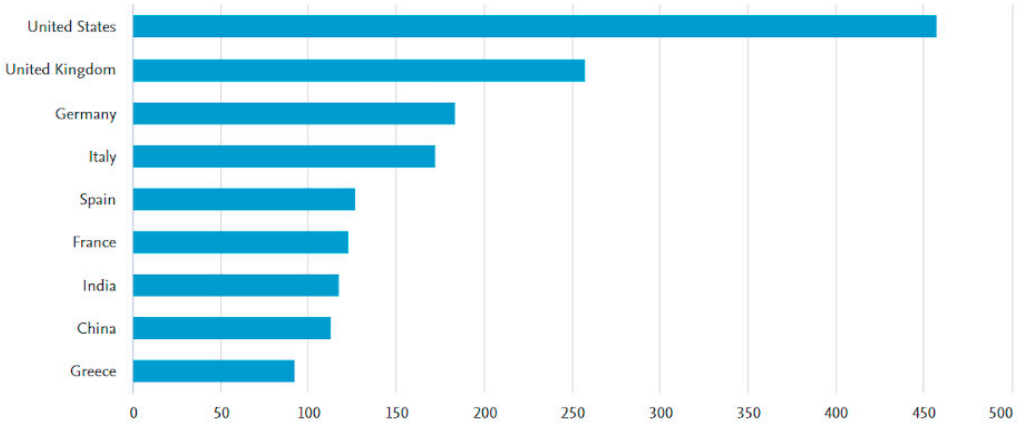


Figure 4. The numbers of studies by country and territory using the keywords "crisis" and "Gross Domestics Product" according to the Scopus database for the period 1977–2023 (compiled by the authors).

The conducted analysis of the studies on the effect of crisis processes on the GDP confirms the relevance of this topic.

The search was carried out using the Scopus database using the VOSviewer program (version 1.6.16). The search resulted in 564 documents. The terms used for the software are given in Table 1.

Table 1. Terms used for the analysis of literature sources based on Scopus database and VOSviewer.

Research (in Article Title, Abstract, and Keywords)	Results Filtered	Number of Clusters
"Crisis" and "Gross Domestics Product"	564	5

The results were filtered by document type, year, source type, subject area, and keywords. Five research clusters were identified during the bibliographic analysis. Publications in economics and social sciences were chosen as the major filter. The results of the analysis are given in Table 2, and the visualization is shown in Figure 5.

Table 2. Major clusters of studied literature sources based on Scopus database and VOSviewer.

Cluster	Number of Items	Keywords
First cluster: red	222	GDP, financial crisis, economic growth, fiscal policy, monetary policy, export, import, Europe, macroeconomics
Second cluster: green	152	Economics, economic development, regression analysis, economic and social effect
Third cluster: blue	101	Economic crisis, human, unemployment, economic recession
Fourth cluster: yellow	422	COVID-19, pandemic, crisis management
Fifth cluster: purple	26	Economic policy, economic cycle, public sector
Sixth cluster: orange	21	Study of the macroeconomic crises in different countries

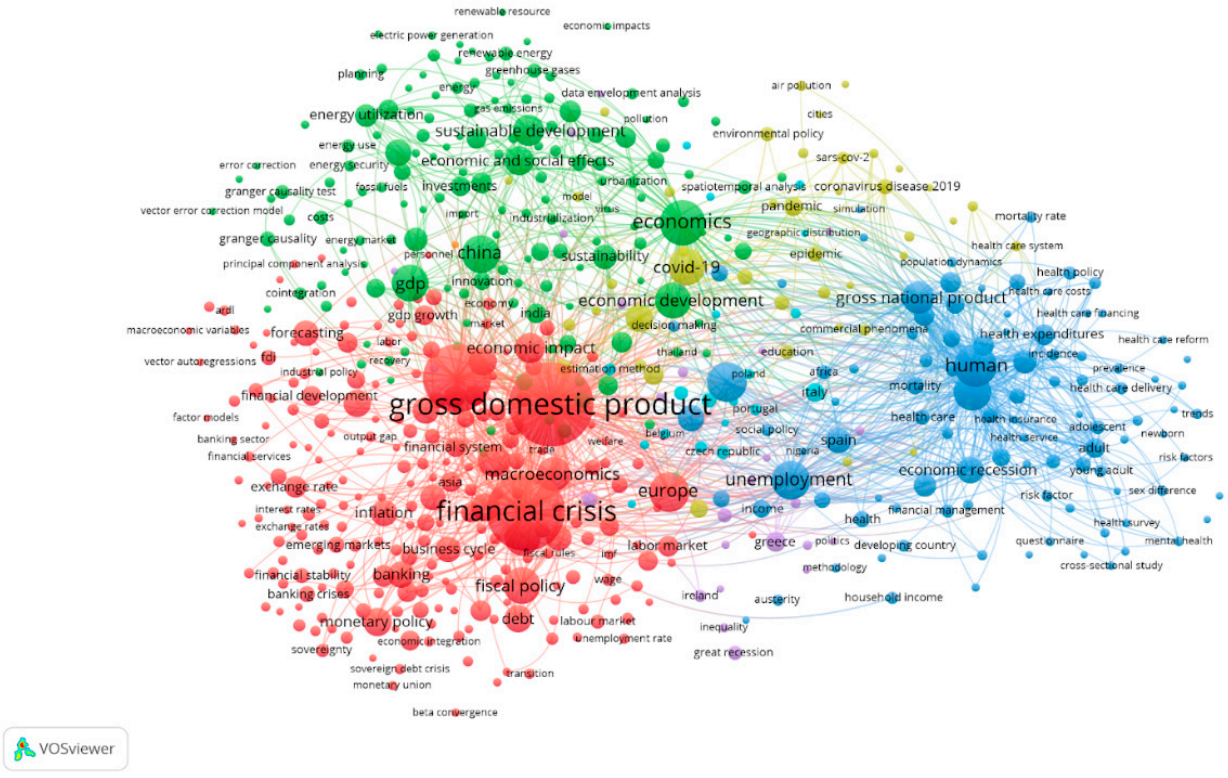


Figure 5. Cluster analysis of literature sources using keywords "crisis" and "Gross Domestics Product" (compiled by the authors using the Scopus database based on the use of the VOSviewer program (version 1.6.16)).

Further, a detailed analysis of literary sources was carried out within the red cluster. The major publications are devoted to studying the impact of various crises on macroeconomic development. The impact of financial crises on the youth unemployment rate was considered by Choudhry M.T., Marelli E., and Signorelli M. [7]. The authors confirm that financial crises affect the youth unemployment rate for five years after the onset of the crisis, but the most favorable effects are observed in the second and third years after the financial crisis.

Schneider, F., Kallis, G., and Martinez-Alier, J. consider economic crises as the beginning of new opportunities [9]. The study analyzes the conditions under which economic degrowth is desirable and undesirable. Bardy, R. and Rubens, A. provide multiple opportunities for economic redevelopment after a crisis. The authors consider crises as

opportunities not only to solve the problem of the deficit of infrastructure and social systems, but also to develop political priorities towards a "green economy" [10].

Huang, B. N., Hwang, M. J., and Yang, C. W. consider another type of crisis: the energy crisis. In their research, the authors used panel data on the energy consumption and GDPs of 82 countries from 1972 to 2002 and identified causal relationships between energy consumption and economic growth [11]. Li, C.C. and Chang, C.P. studied 22 developed and 18 developing countries and identified a dynamic interaction between the energy consumption per capita (LEC) and the real GDP per capita (LRY). The study reveals that energy crises significantly impacted both the LEC and LRY in all the countries in the sample [12].

Some authors have studied economic development during the stages of economic downturns. In particular, Arcand, J.L., Berkes, E., and Panizza, U. studied the impact of financial depth on economic development. Using various empirical approaches, the authors proved that financial depth has a negative impact on production growth [13].

In their turn, Sobotka, T., Skirbekk, V., and Philipov, D. studied the impact of economic downturns on the birth rates in the world's developed countries. The indicators that measure economic downturns, such as declining GDP levels, falling consumer confidence, and rising unemployment, and their impacts on the birth rate were studied. The authors identified a strong relationship between recessions and birth rates [8].

Other authors have studied the development of the economy at the stage of growth. Dell'Ariccia, G., Detragiache, E., and Rajan, R. analyzed the impact of the banking crisis on the growth of industrial sectors [14].

Shen, C.H. and Lee, C.C. identified a relationship between financial development and real GDP per capita growth. The research proves that "only stock marketing development has positive effects on growth and that banking developments have an inefficient effect" [15]. In their research, Baum, A., Checherita-Westphal, C., and Rother, P. revealed the relationship between public debt and economic growth for 12 countries of the Eurozone [16]. It was proved that "for high debt-to-GDP ratios (up to 95%), additional debt has a negative impact on economic activity the long-term interest rate is subject to increased pressure when the public debt-to-GDP ratio is above 70%".

4. Research

4.1. Research of the Nature of Crisis Occurrence

The COVID-19 pandemic has drawn the attention of scientists to the vulnerability of countries to sudden crises. Crises are a characteristic feature of socio-economic development, and they have a cyclical nature. The cyclicity is connected with fluctuations in economic activity—economic expansion and recession (crises).

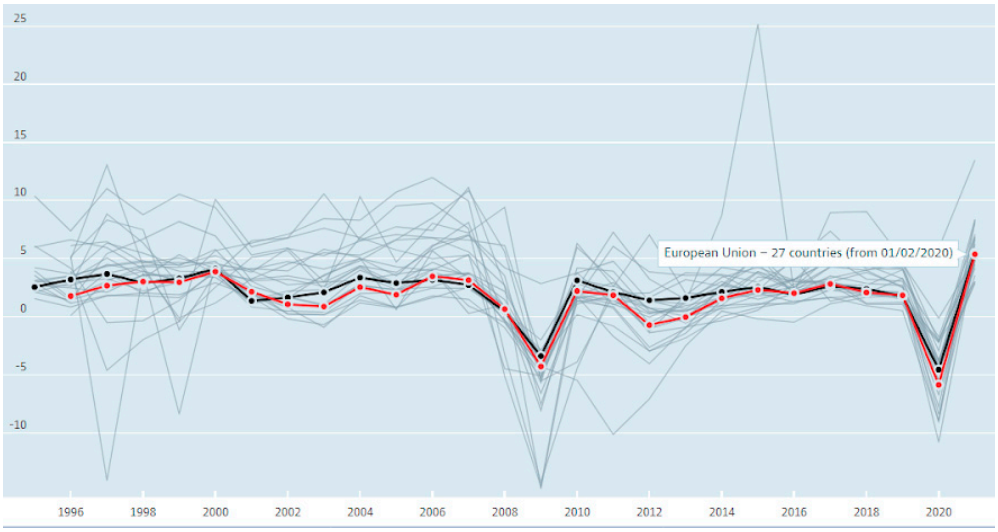
The crisis of 1997–1998 was one of the crisis periods in the world. This crisis began in 1997 in the countries of South and East Asia.

In 2007–2008, the global economic crisis ("great recession") occurred. It began with a subprime mortgage crisis in the United States. One of the causes of this crisis was incorrect pricing in the credit default swap market [17]. In April 2008, there was a decrease in the liquidity of real estate in the United States, with a decrease in prices of 10–15%. According to the IMF estimates, the securities market for American subprime mortgages experienced a decrease in their value in the amount of USD 450 billion during the year, while the total volume of the securities market was approximately USD 1.5 trillion [18]. The subprime mortgage crisis turned into a financial one in summer 2007. In 2008, the crisis acquired a global nature and caused a decrease in production volumes and the liquidity of companies, a decrease in the demand and prices for raw materials, and an increase in employment [19]. This period is characterized by the downward phase of the fifth Kondratieff long wave, which led to a protracted economic recovery [20]. The shock resistance of the sustainable functioning of the financial sector is determined not only by fluctuations in the economy, but also, to some extent, by imbalances in the processes of the financial sector itself [21].

In addition, this financial crisis was complicated by the spread of the global epidemic of H1N1 influenza [22].

The year of 2020 was associated with the spread of the coronavirus infection, which caused crises in many countries. It caused crises for public health in the first place [23], but the actions related to enforcing the lockdowns led to the deep economic crises that we are still experiencing. In the economies of the countries of the world, the following effects were observed: declines in the GDPs, increases in unemployment and underemployment, losses of jobs and income by businesses (especially in the most affected sectors), closures of small- and medium-sized enterprises, disruptions in supply chains, increases in social inequality, etc. [24].

Due to these facts and the prevailing high uncertainty, in March 2020, some key financial indicators fell to levels similar to those seen during the Great Recession of 2008–2009 (Figure 6) [25].



Red line—European Union – 27 countries (from 1 February 2020)
Black line—OECD – Total (2010)
Gray line—data for each of the 27 EU countries

Figure 6. Quarterly GDP, total, and percentage changes for 1995–2020 (compiled by the authors based on the data [26]).

The figure shows that there were declines in the GDPs in 1999, 2009, and 2020. The crisis of 1997 is especially typical for Bulgaria (GDP decline: 14.1%) and Romania (GDP decline: 4.6%). Thus, in 2009, the decline in the GDP in the European Union was by 4.3%, but the largest drops in the GDPs were in such countries as Lithuania (−14.8%), Latvia (−14.2%), and Estonia (−14, 6%). All countries of the European Union were affected by the crisis of 2020, especially Italy (GDP drop: 9%), Spain (GDP drop: 10.8%), and Portugal (GDP drop: 8.4%). In addition to the impact of global crises, it is advisable to take into account internal crises. In this study, the impact of such crises is leveled.

4.2. Identification of Indicators Characterizing Crises at Different Stages

When analyzing financial crises, scientists identify the different indicators that characterize them. Based on the research of Palasca, S. and Jaba, E., the authors of this article suggest a scientific approach to the classification of indicators that characterizes the crisis at different stages of its manifestation (Figure 7) [27].

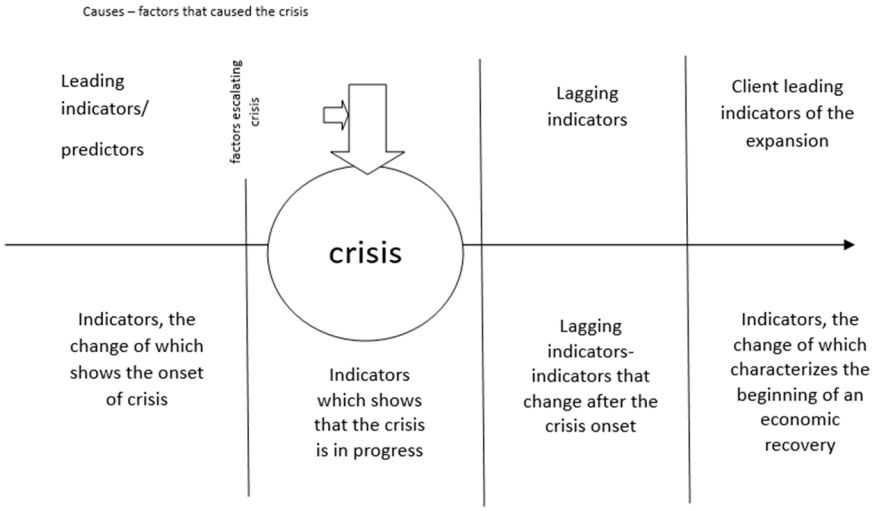


Figure 7. Indicators characterizing a crisis at different stages (compiled by the authors).

Under the reasons, the authors consider the factors that led to the crisis. Allen, F. and Carletti, E. argue that, in the USA and some other countries, there was a bubble in the real estate prices, which was *caused* by a combination of cheap loans and the easy availability of funds, which led to the crisis. *Factors* such as subprime mortgages, weak regulatory structures, and high leverage in the banking sector *exacerbated the crisis* [28].

Stockhammer, E. considers the inefficient functioning of the financial sector to be the cause of the global crisis that began in the summer of 2007. In particular, the securitization of mortgage loans contributed to the rapid growth of credit and the destruction of credit standards, and this fueled a property bubble [29].

In his research, Jickling, M. identified a number of factors that were determined as the causes of the crisis: imprudent mortgage lending, securitization, a lack of transparency and accountability in mortgage finance, deregulatory legislation, shadow banking systems, the failure of the system, the relaxed regulation of leverage, credit default swaps, over-the-counter derivatives, fragmented regulation, no systemic risk regulator, etc. [30].

According to the authors, the concept of *leading indicators/predictors* of economic crises implies the indicators that show negative social and economic development in advance. Thanks to these indicators, it is possible to identify the pre-crisis development of the economy. Chen, T. H., Lee, C. C., and Shen, C. H. consider the liquidity ratio (LiqR), liquidity creation (LiqC), and net stable funding difference (NSFD) as the early warning signals (predictors) for distressed banks [31].

Frankel, J. and Saravelos, G. studied more than 80 indicators that could have been predictors of the crisis and singled out two main ones: central bank reserves and past movements in the real exchange rate. The authors also name other predictors of the crisis: credit growth, current account deficits, the saving rate, and external and short-term debt [32].

Lane, P. R. and Milesi-Ferretti, G. M. identify the following indicators that help to determine that a crisis is coming: increases in the ratio of private credit to the GDP, current account deficits, and openness to trade [33].

Frankel, Jeffrey A. and George Saravelos suggest 30 predictors of economic crises. The main ones are as follows: reserves, short-term debt, the bank liquid reserve-to-bank asset ratio, the trade balance, inflation, the real interest rate, etc. [32].

Crisis predictors are indicators that have negative trends of change, which indicate the presence of a crisis. Antohi, V. M. et al. consider the changes in expenditure and revenue structures and deficits in the budget to be the major indicators that change during economic crises [34].

Lagging indicators are indicators that change after the onset of a crisis. At this stage of the crisis, it is too late to take measures to counter it. Palasca, S. and Jaba, E. identify

such lagging indicators as the GDP, unemployment, and the price of gold [27]. The price of gold is a financial index, a leading indicator due to the fact that most economic crises start in the financial market. Unemployment can also characterize negative economic fluctuations, but its effect is seen after the crisis. Despite this fact, unemployment is also a client leading indicator of expansion. *Client leading indicators of expansion* are indicators in which change characterizes the beginning of an economic recovery. A growing economy needs a workforce, and so a drop in the unemployment rate is clear evidence of an economic recovery. It is observed at least one–two quarters before the results are reflected in the GDP.

Sinaga, A.P. argues that the inflation variable, interest rates, and the trade balance affect economic growth through an increase in the balance of payments. These macroeconomic indicators can accelerate economic recovery [35].

After facing such a large-scale and fast economic crisis caused by the COVID-19 pandemic, Shin, J.H. et al. insist on using "fast indicators". These indicators are as follows: data from payment systems (such as debit and credit card transactions), cash withdrawals from ATMs, data from fintech apps, such as Money Dashboard, and Google searches for the term "unemployment benefit, price effects of shortages", which allow for tracking price inflation and consumer spending [36].

The following types of indicators are commonly used to assess the macroeconomic stability: price inflation, growth in the real GDP, changes in employment/unemployment, current account volatility, the health of government finances, interest rate volatility (and government bond yields), and the exchange rate stability [37].

The European Union defines macroeconomic stability according to the Maastricht Treaty. Thus, macroeconomic stability consists of four criteria and five indicators: low and stable inflation, low long-term interest rates, low national debt relative to the GDP, low deficits, and currency stability [38].

4.3. Assessment of Macroeconomic Stability Indicators

Taking into account previous research, the authors suggest assessing the macroeconomic stability by using the following indicators: the GDP, the employment rate, inflation (CPI), general government debt, the FDI flow outward, long-term interest rates, short-term interest rates, exchange rates, the bank return on assets, the bank return on equity, the real interest rate, non-performing loans as a percent of all bank loans, the bank cost-to-income ratio, the stock market return, the stock market turnover ratio, stock price volatility, crude oil import prices, and investment.

The major indicator of the social and economic development of countries is the GDP, which characterizes the presence of a crisis. Therefore, we carried out a correlation analysis of other indicators specifically for the GDP indicator. The results of the calculation are given in Table 3. For the correlation analysis, the average values of the indicators for the EU (27 countries) for the years 2000–2021 were taken. Separate calculations were conducted to verify the results for the countries France, Spain, Germany, and Italy. The countries were selected according to the contributions of the member countries to the EU budget.

As can be seen from Table 3, the indicators that have strong relationships with GDP growth are as follows: the employment rate (K = 0.863574), general government debt (K = −0.84313), stock price volatility (K = −0.84663), and investment (K = 0.977859). Thus, the revival of economic activity leads to an increase in employment, which, in turn, has a positive effect on the GDP. The inflow of investments into a country contributes to economic growth. The increase in general government debt has a negative effect on the GDP. Stock market volatility is a measure of how much the overall value of a stock market fluctuates up and down. The lower the stock price fluctuations, the more stable the country's economic system.

Indicators that have moderate correlations are as follows: the FDI flow outward (K = 0.510918), long-term interest rates (K = 0.587721), short-term interest rates (K = 0.533842), non-performing loans (K = −0.62499), and crude oil import prices (K = 0.585104).

Table 3. Correlation analysis between GDP and indicators of macroeconomic stability.

No.	Indicator of Macroeconomic Stability	Unit of Measurement	Correlation Coefficient
1	Employment rate	% of labor force	0.863574
2	Inflation (CPI), annual growth rate	%	−0.24084
3	General government debt	% of GDP	−0.84313
4	FDI flow outward	USD million	0.510918
5	Long-term interest rates	% per annum	0.587721
6	Short-term interest rates	% per annum	0.533842
7	Exchange rates	National currency units/USD dollar	−0.24084
8	Bank return on assets	%	0.009853
9	Bank return on equity	%	0.270194
10	Real interest rate: bank lending rate minus inflation	%	−0.07278
11	Non-performing loans	% of all bank loans	−0.62499
12	Bank cost-to-income ratio	%	−0.31303
13	Stock market return	%	−0.40343
14	Stock market turnover ratio	%	0.223056
15	Stock price volatility	%	−0.84663
16	Crude oil import prices	USD dollars/barrel	0.585104
17	Investment (GFCF)	USD million	0.977859

The stock price volatility index is the 360-day standard deviation of the return on the national stock market index (calculated by the authors based on [39]).

For further research, the following four indicators of macroeconomic stability with the highest correlations with GDP growth were selected. The authors developed crisis development scenarios to classify these indicators into the following groups: crisis predictors, lagging indicators, and client leading indicators of expansion.

4.4. Comparison of Macroeconomic Stability Indicators during the Financial Crisis and the COVID-19 Crisis

Researchers often attempt to compare the expected economic consequences of the COVID-19 pandemic with the global financial and economic crisis of 2008–2009. To support this hypothesis, the authors analyzed the economic indicators that describe the economic changes during the coronavirus crisis and the financial market crisis.

For this purpose, the onset of the coronavirus-related recession in the first quarter of 2020 is compared to the onset of the financial market crisis in the second quarter of 2008. To confirm the hypothesis, we compared the increase in the GDP from the first quarter of 2008 to the fourth quarter of 2010 and from the first quarter of 2020 to the first quarter of 2022. Figures 2 and 3 show the GDP growth for the Eurozone and individual EU countries (Germany, France, Italy, and Spain). The consequences of the financial crisis on the socio-economic development of the EU countries were felt after six months after the onset of the crisis, while the coronavirus crisis manifested itself immediately. To compare the data, we superimposed the graphs of the GDP growth from the third quarter of 2008 to the fourth quarter of 2010 and from the second quarter of 2019 to the second quarter of 2021.

As can be seen in Figure 8, the development cycles of the crises coincide.

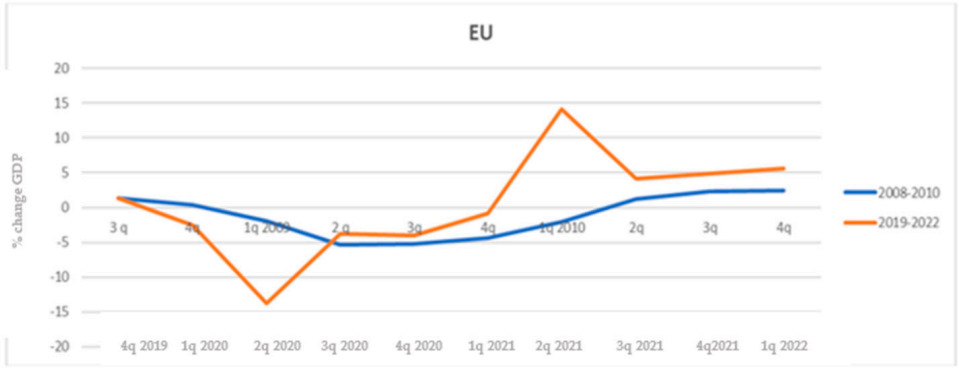


Figure 8. Comparison of fluctuations in the average GDPs of the countries of the European Union (27 countries) during the financial crisis (2008–2012) and the coronavirus crisis (2019–2022) (compiled by the authors).

The financial crisis was prolonged; thus, there was a gradual decline in the GDPs. At the same time, the coronavirus crisis is characterized by sharp fluctuations in the GDPs: a sharp fall in the third quarter of 2020 due to the implementation of lockdowns around the world, and a sharp rise in the second quarter of 2021 due to their removal.

As shown in Figure 9, the development cycles of the GDP growth coincide both for the EU countries as a whole and for the individual analyzed countries. Therefore, in further studies, the average values of the indicators for 27 EU countries will be taken.

Figure 9. Comparison of fluctuations in the average values of the GDPs in individual countries (Germany, France, Italy, and Spain) during the financial crisis (2008–2012) and the coronavirus crisis (2019–2022) (compiled by the authors).

We also compared the fluctuations in the employment levels (Figure 10) in the countries of the European Union (27 countries) during the financial crisis (2008–2012) and the coronavirus crisis (2019–2022). As illustrated in Figure 4, during the crisis of 2008–2012, there was a slow decline in employment in the first quarter of 2009, and there has been a gradual increase in employment since the first quarter of 2011. During the coronavirus crisis, a decline in employment was observed in the second quarter of 2020, but a slow increase in employment since the second quarter of 2021 has been observed.

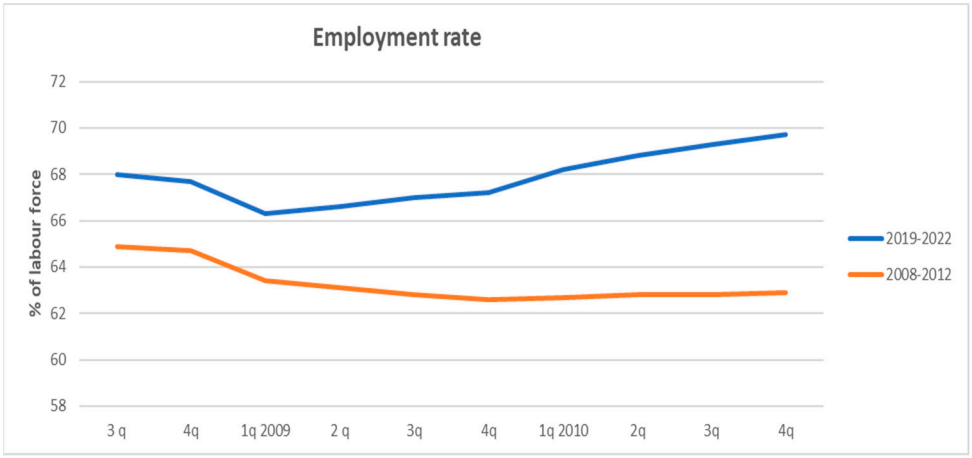


Figure 10. Comparison of fluctuations in the average values of employment in countries of the European Union (27 countries) during the financial crisis (2008–2012) and the coronavirus crisis (2019–2022) (compiled by the authors).

After analyzing the investment activity during the financial crisis and the coronavirus crisis, it can be stated that the crisis of 2020 was much deeper than the crisis of 2008, but the resumption of investment activity occurred immediately after the lockdowns were lifted (Figure 11). Figure 11 shows that the decrease in the investment rate occurred in the first quarter of 2009 and that there was growth in the second quarter. As for the crises of 2019–2022, a fall in investment was observed in the second quarter of 2020, while a sharp increase occurred in the third quarter of 2020.

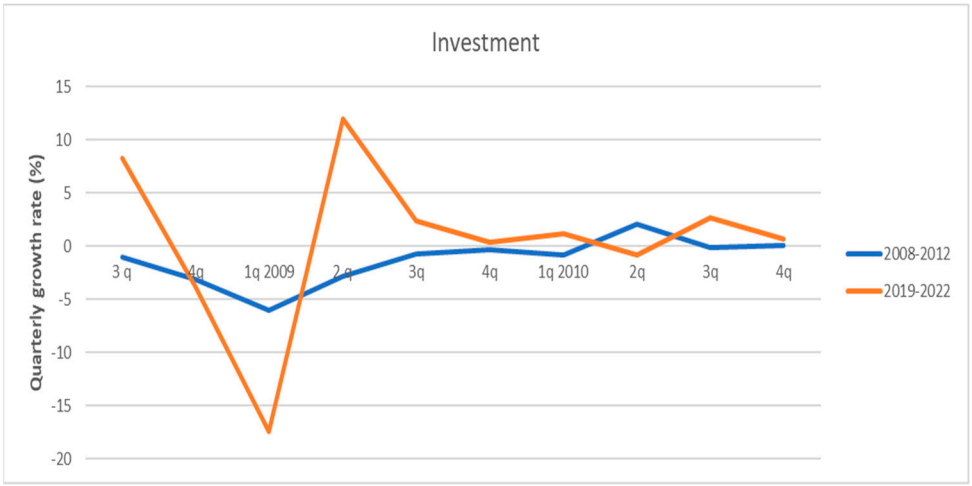


Figure 11. Comparison of fluctuations in the average values of investment in countries of the European Union (27 countries) during the financial crisis (2008–2012) and the coronavirus crisis (2019–2022) (compiled by the authors).

4.5. Forecasting the Consequences of the COVID-19 Crisis

It is necessary to take into account the forecast data of indicators of socio-economic development to prevent and avoid the manifestation of the negative consequences of the crisis. The algorithm of the forecast construction is given in Figure 12.

The following models can be used in forecasting: linear regression, extrapolation smoothing, and autoregressive (AR) models, moving-average (MA) models, autoregressive–moving-average (ARMA) models, seasonal autoregressive–integrated–moving-average (SARIMA) models, and neural networks. At this stage, the forecast errors (MARE, MAE, MSE, R2) are calculated and the model with the lowest error is selected. In the case of the evolutionary development of the economy, the forecast results are obtained at the next

stage. To forecast crisis periods, it is also necessary to carry out a qualitative analysis to take into account unforeseen events and external influences. Financial crises can be caused by unforeseen events and external influences, such as economic crises in other countries, natural disasters, political instability, etc. If such events are not correctly taken into account in the forecast, then this could lead to inaccuracies.

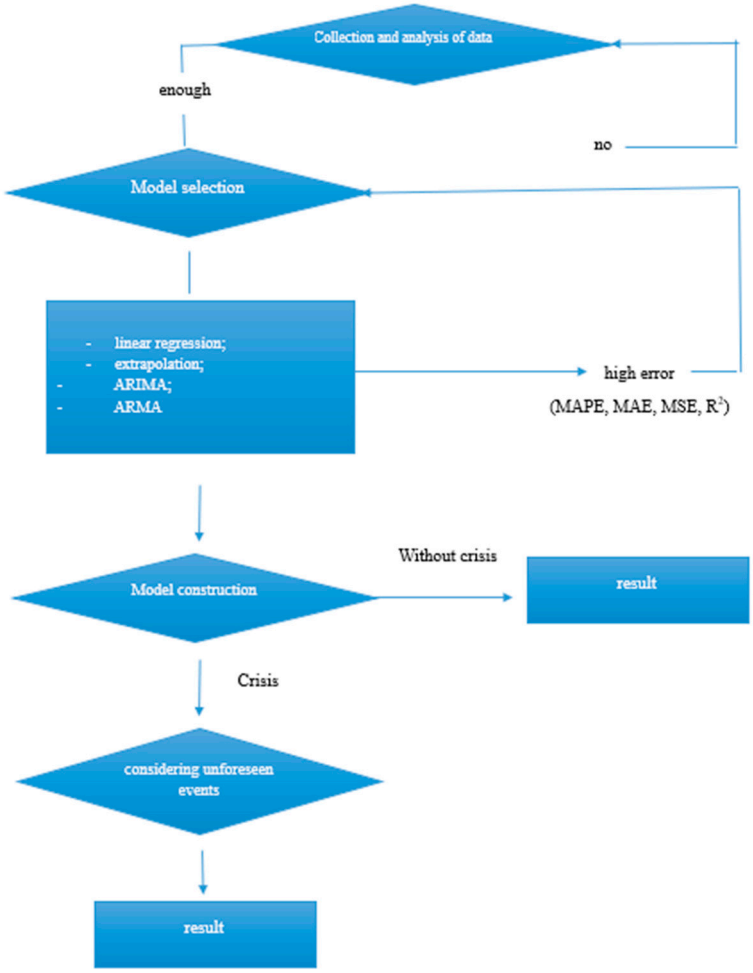


Figure 12. Algorithm of forecast construction (developed by the authors).

The authors approximated the forecast using the extrapolation method in order to make a forecast for the main economic indicator—the GDP. For this purpose, a forecast for 2016–2021 was made on the basis of retrospective data from 2000–2015. The authors used the moving-average method. An assessment of the forecast realism was conducted via such coefficients as the RMSE and MAPE, using the coefficients for the qualitative assessment of the forecasting models. The results are given in Table 4.

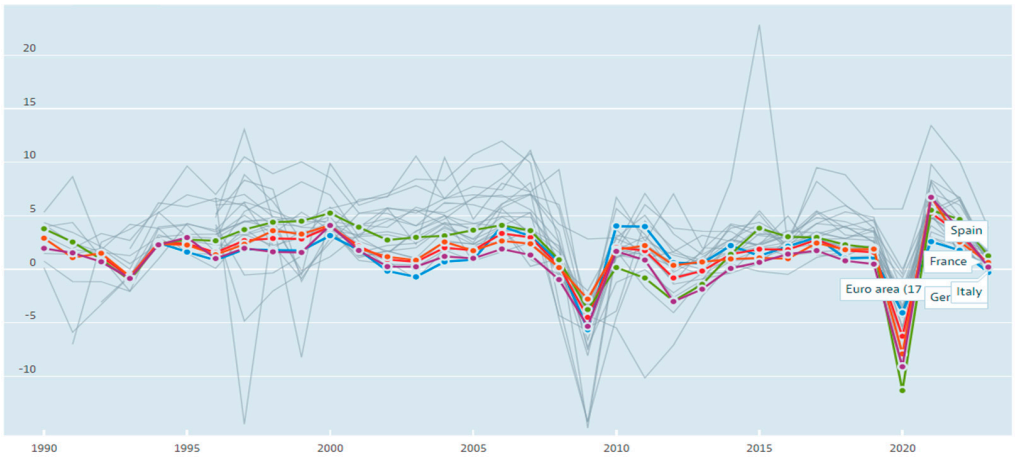
Table 4. Coefficients of qualitative assessment of forecasting models.

Country	RMSE	MAPE	Standard Value of RMSE, MAPE	Forecast Accuracy
France	8.10%	6.66%	Less than 10%	High
Italy	0.44%	4.17%	Less than 10%	High
Spain	0.63%	4.82%	Less than 10%	High
Germany	0.49%	2.63%	Less than 10%	High
European Union	6.21%	5.34%	Less than 10%	High

The results of the forecasting model given in the table show the high accuracy of the forecast, but, despite this, the extrapolation method is more effective under conditions of the evolutionary development of the economy. For the more accurate forecasting of the crisis, it is necessary to conduct a qualitative analysis that takes into account unforeseen events.

Based on the suggested model, a forecast of the socio-economic development in the post-crisis period (2023–2024) was created using the extrapolation method for the EU countries. The studied countries are highlighted by color (Spain, France, Italy, and Germany). Red colors highlight the average GDPs for the 27 EU countries.

Figure 13 shows the forecast of the real GDPs until 2024 for the countries of the European Union.



Red line – European Union – 27 countries (from 1 February 2020)
Blue line – Italy
Green line – Germany
Purple line – Spain
Orange line – France
Gray line - data for other 27 EU countries

Figure 13. GDP forecast for 2023–2024 based on retrospective data (compiled by the authors).

Figure 13 shows the similarity of the flows of the studied crises. It is seen that the recession began the year after the crisis. Then, the indicators of socio-economic development declined during the following two years. This forecast can be used for making managerial decisions to mitigate the consequences of the crisis.

5. Discussion

Even before the onset of the COVID-19 crisis, the achievement of the sustainable development goals was slow [40]. The authors considered the peculiarities of the COVID-19 crisis, and its negative consequences on the economic, social, and energy parameters of the sustainable development of the EU countries were discovered [41,42]. This is confirmed by the forecast of the development of the countries' economies for the next 3 years [43]. As of today, there is a possibility that most of the 169 Sustainable Development Goals will not be achieved by 2030. The rapid restoration of the parameters of sustainable development is possible due to the effective interaction of the institutions of government, business, and society. New threats (cyber threats) have also appeared, which have become a permanent part of the development landscape [44].

Further research will focus on analyzing the predictors of the crisis unfolding and assessing the risks of the decline in socio-economic development.

One of the unforeseen events of 2022–2023 could become the military aggression of Russia against Ukraine, which, in the long run, could cause a crisis. The preconditions for the crisis may be as follows: the refusal to use Russian energy resources, the termination of logistics links, the growth of migration flows (refugees who need to be supported), and military and financial assistance to Ukraine. The consequences of the military conflict in

Ukraine for the EU countries may be obstacles to economic growth, an increase in prices for raw materials, and an increase in inflation. Researchers Verwey, M., Bardone, L., Orsini, K., Reinhart, C. M., and Rogoff, K. S. [45,46], in their study, proved that the baseline EU growth outlook was revised downward, taking into account the conditions of uncertainty and risks. In order to overcome the crisis, it is also necessary to revise the social policies of both the EU countries and Ukraine separately. One of the urgent problems is the reform of the medical sector. Sheliemina, N. proves that one of the factors of economic stability is the quality of the medical field [47].

The psychological aspect of recovery after a war crisis is also a cause for concern. Based on the results of a study on various societies during the post-war period, Hakobyan, N., Dabaghyan, A., and Khachatryan, A. identified strategies for overcoming social anomie in the spheres of social interactions and business. The formation of strategies for overcoming socio-psychological crises and the impact on the economic development of the post-war period may become the next direction of our research [48].

6. Conclusions

1. Financial crises can be caused by unforeseen events and external influences, such as economic crises in other countries, natural disasters, political instability, etc. If such events are not correctly taken into account in the forecast, then this could lead to inaccuracies. During the crisis and the post-crisis period, decisions at all levels of government are, to some extent, made under conditions of uncertainty. Considering the course of crises as one of the phases of the economic cycle accumulates the experience for making effective anti-crisis decisions.

The article considers the main crises beginning in 1980 and ending with the COVID-2019 crisis, which arose suddenly as a pandemic and gradually developed into a financial crisis;

2. The study analyzed the main indicators that characterize crises and conditionally divided them into the following groups: leading indicators, lagging indicators, and client leading indicators of expansion;

3. The study carried out a correlation analysis of the GDP indicator via the main indicators of macroeconomic stability: the employment rate, inflation (CPI), general government debt, the FDI flow outward, long-term interest rates, short-term interest rates, exchange rates, the bank return on assets, the bank return on equity, the real interest rate, non-performing loans as a percent of all bank loans, the bank cost-to-income ratio, the stock market return, the stock market turnover ratio, stock price volatility, crude oil import prices, and investment. According to the results of the correlation analysis, four leading indicators that have the greatest impacts on GDP growth were identified. They are as follows: the employment rate (K = 0.863574), general government debt (K = −0.84313), stock price volatility (K = −0.84663), and investment (K = 0.977859). Monitoring these indicators makes it possible to promptly prevent the onset of a crisis, taking into account the cyclical nature of economic development and unforeseen events.

Thus, according to the cycle of Kondratiev, the macroeconomic growth should have occurred in 2020 according to the sixth big cycle. However, the COVID-19 pandemic has changed the trajectory of the global economy;

4. The authors compared the COVID-19 crisis and the financial crisis of 2008–2009 by quarters in order to study the development of the crisis. The hypothesis of the same courses of crises was confirmed, but it should be noted that the COVID-19 crisis had large fluctuations. In the case study of the Eurozone and individual EU countries (Germany, France, Italy, and Spain), the dynamics of the development of macroeconomic indicators, such as the GDP, employment levels, and investment levels, were analyzed. Thus, in terms of the GDP indicator, the periods of falls and rises coincided, but there were large fluctuations in this indicator. Thus, it can be argued that the study of previous crises can be the basis for forecasting future crises;

5. When forecasting a crisis, it should be taken into account that the quality of the forecast depends on the influence of unforeseen events and external influences. The authors made a forecast of the main economic indicator—the GDP—using the extrapolation method and determined its accuracy. It is expedient to use the extrapolation method while forecasting crises caused by the cyclical development of the economy. It is advisable to carry out qualitative analysis along with other forecasting methods to predict crises that are caused by unforeseen events and external influences.

During the crisis and the post-crisis period, decisions at all levels of government are, to some extent, made under conditions of uncertainty. Studying the features of the course of the crisis processes helps management at different managerial levels to accumulate experience in making effective management decisions aimed at socio-economic development.

Author Contributions: Conceptualization, D.K., V.M. and Y.O.; methodology, V.M. and Y.O.; software, V.M. and I.R.; validation, Y.O. and I.R.; formal analysis, V.M. and Y.O. resources, V.M., Y.O. and I.R.; visualization, Y.O.; writing—original draft, V.M., Y.O. and I.R.; writing—review and editing, V.M., Y.O., I.R. and D.K.; supervision, D.K.; project administration I.R. and D.K. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded under the research subsidy of the Faculty of Organization and Management of the Silesian University of Technology in Poland for the year 2023 (13/990/BK_23/0178).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data used in the study are available from the corresponding author upon request.

Conflicts of Interest: The authors declare no conflict of interest.

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