Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Master's Thesis

Stabilization of Financial Conditions of European Countries during Financial Crisis in the EU

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

BSc. Kamil Zakirov

Economics and Management

Thesis title

Stabilization of financial conditions of European countries during financial crisis in EU

Objectives of thesis

1.Main goal – assessing the impact of the Eurozone crisis that broke out in 2009 and lasted for a number of subsequent years approximately until the year 2012, when the period of stagnation and recession was successfully overcome.
2.Partial goals – to perform a pertinent statistical, econometric and economic analysis.
3.Basic content : As content I suppose to consider examples of European countries during crises 2008

Methodology

In Introduction there will be described information regarding financial crisis and impact on the economy of European union with short facts about global financial crisis 2008.

In Objectives and Methodology part main and partial goals will be explained. Methodology of diploma thesis will include key economic parameters analysis of European countries before crisis, during crisis and after it. The sense of it is to show that implemented measures had significant positive effect on economies of European countries.

In literature review part information sources will be listed with short descriptions.

Practical part will include seasonality analysis (for the real GDP variable and unemployment – both for the Eurozone), linear regression analysis (for the dependent variable of the real GDP for the Eurozone and finally, trend analysis for variables of unemployment and real GDP in the Eurozone.

In Result and Discussion part author compares his findings with relevant findings of author authors and comes to a relevant conclusion reflecting on the matter from an unbiased perspective relying solely on comparison with author authors' findings and results of the empirical analysis performed by the author.

In conclusion results of diploma thesis will be explained with reference to main and partial goals.

The proposed extent of the thesis

60 – 90 pages

Keywords

Financial crisis 2008, Anti-crisis measures, Financial crisis in European Union

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Recommended information sources

Anjan V. Thakor “The Financial Crisis of 2007–2009: Why Did It Happen and What Did We Learn?”

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Expected date of thesis defence

2022/23 SS – FEM

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Prague on 29. 03. 2023

Declaration

I declare that I have worked on my diploma thesis titled "Stabilization of Financial Conditions of Countries During Financial Crisis in the EU" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break any copyrights.

In Prague on 31.03.2023 _____

Acknowledgement

I would like to thank Bc. Ing. Jiří Čermák, Ph.D. and all other persons, for their advice and support during my work on this thesis.

Stabilization of Financial Conditions of European Countries during Financial Crisis in the EU

Abstract

The following study assesses the effect of the 2009 Eurozone crisis, which lasted until 2012, when stagnation and recession ended. The author describes the recession's evolution and its primary reasons. The author also conducts statistical, econometric, and economic analyses to discover those reasons and write a narrative that lists those probable causes and key effects. The author's main methodology is empirical research based on secondary data from FRED and The World Bank in 2023, where time series quarterly data will be analysed according to seasonality analysis (for the Eurozone's real GDP variable and unemployment), linear regression analysis (for the dependent variable of real GDP), and trend analysis. Thus, the author compares his findings with relevant findings of author authors and arrives to a relevant conclusion from an impartial viewpoint based entirely on comparison and outcomes of the empirical study undertaken by the author. In his conclusion, the author suggests that the main factors that made the fight against the crisis complicated were seasonality of the Eurozone’s economies real output, inappropriate level of institutions, such as banking system and incredibly high effect of unemployment for the formation of the real GDP of the Eurozone.

Keywords: Financial Crisis of 2008, Anti-crisis measures, Financial Crisis in the European Union, Eurozone, Great Recession, Debt crisis

Stabilizace finančních podmínek evropských zemí během finanční krize v EU

Abstrakt

Následující studie hodnotí dopad krize eurozóny v roce 2009, která trvala až do roku 2012, kdy skončila stagnace a recese. Autor popisuje vývoj recese a její hlavní důvody. Autor také provádí statistické, ekonometrické a ekonomické analýzy, aby zjistil tyto důvody a napsal příběh, který uvádí tyto pravděpodobné příčiny a klíčové účinky. Hlavní metodikou autora je empirický výzkum založený na sekundárních datech FRED a Světové banky v roce 2023, kde budou čtvrtletní data časových řad analyzována podle analýzy sezónnosti (pro proměnnou reálného HDP eurozóny a nezaměstnanost), lineární regresní analýzy (pro závislou proměnnou reálného HDP) a analýzy trendů. Autor tedy porovnává svá zjištění s relevantními poznatky autorů a dospívá k relevantnímu závěru z nestranného hlediska založeného výhradně na srovnání a výsledcích empirické studie provedené autorem. Ve svém závěru autor naznačuje, že hlavními faktory, které způsobily, že boj proti krizi komplikovaly, byla sezónnost ekonomik eurozóny reálný výkon, nevhodná úroveň institucí, jako je bankovní systém a neuvěřitelně vysoký vliv nezaměstnanosti na tvorbu reálného HDP eurozóny

Klíčová slova: Finanční krize roku 2008, protikrizová opatření, finanční krize v Evropské unii, eurozóna, Velká recese, dluhová krize

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List of abbreviations

BLUE	Best Linear Unbiased Estimator
EU	The European Union
GDP	Gross Domestic Product
OLS	Ordinary least squares method

1 Introduction

Crises in the economy often have a negative impact on the financial systems of nations as well as groupings of nations that are joined by a common policy. For example, the European Union and the Eurozone have both experienced this kind of devastation. The severity of the damage done to the economy is proportional to the magnitude of the economic crisis, the response to the crisis, and a variety of other variables, both internal and external. They often need a quick and all-encompassing reaction from policymakers, massive shifts in both the financial sector and fiscal policy, and in certain cases, the coordination of policies on a worldwide scale. During the financial crisis that began in 2007, also known as the Great Recession, the policy responses of governments focused on repairing the banking system to assist in re-establishing the flow of credit to the economy and implementing fiscal and monetary stimulus packages to maintain aggregate demand and prevent a downward spiral of output. Both of these were done in an effort to stop the economy from going into a downward spiral of production.

During the crisis of COVID 19 Economies throughout the world are now contending with a double whammy: falling utilization of labour resources and falling output both contribute to falling demand for goods and services. At the same time, adjustments are being made to the current pricing structure, which may eventually result in structural inflation. By making a variety of payments to the people out of the budget and providing assistance for employment, the fiscal policy that many nations are pursuing in the present environment is intended to sustain both demand and supply (support for enterprises and the introduction of tax deferrals). The backing of the less economically secure segments of the public is of greater significance (due to additional payments from the budget, and the introduction of mortgage vacations in a number of developed countries).

Everyone, regardless of their financial situation or where they live, is impacted when there is a crisis in the economy. The only issue that remains is how severe an effect the crisis will have on different entities, such as states, businesses, and ordinary people. It is mostly dependent on the current state of the facility's finances as well as its capacity to rapidly free up and redistribute resources in order to mitigate the negative effects the crisis will have on the facility's economy.

It was determined that in order to assess the efficacy of fiscal policy during times of economic crisis, particular actions that EU nations took during the global financial crisis of 2008 would be taken into consideration. After doing research and performing analysis on certain instances of fiscal policy, it will be feasible to determine which state crisis mitigation strategies are the most successful. The examination of European nations was not a random selection since these nations have developed economies and adequate resources for a rapid and efficient reaction to crisis situations. In addition to that, the main motivation of the author to select such an interesting topic lies in two main factors – the author himself went through a relatively complicated economic period during the Great Recession of 2008 and subsequent economic crisis and the second one, the author's current place of residency is a country in the Central Europe, which is expected to become a member of the Eurozone, so it is downright interesting to observe the action of the Eurozone towards the crisis, as well as the development of the crisis itself.

2 Objectives and Methodology

2.1 Objectives

The main objective of the following work lies in assessing the impact of the Eurozone crisis that broke out in 2009 and lasted for a number of subsequent years approximately until the year 2012, when the period of stagnation and recession was successfully overcome. The author aims at describing the development of the recession and the main causes that might have made the given recession such a serious problem for the economies of the Eurozone countries. In order to identify those causes and provide a narrative whose main conclusion will lie in listing down those potential causes and main consequences, the author also aims to perform a pertinent statistical, econometric and economic analysis.

2.2 Methodology

The main methodology of the author is based on the empirical research based on the secondary data obtained from FRED and The World Bank in 2023, where time series quarterly data will be analyzed according to seasonality analysis (for the real GDP variable and unemployment – both for the Eurozone), linear regression analysis (for the dependent variable of the real GDP for the Eurozone and finally, trend analysis for variables of unemployment and real GDP in the Eurozone. Consequently, the author compares his findings with relevant findings of author authors and comes to a relevant conclusion reflecting on the matter from an unbiased perspective relying solely on comparison with author authors' findings and results of the empirical analysis performed by the author. Seasonality and trend analysis use quarters as observations and 1995-2021 as the period window. The regression analysis uses quarters as observations and 2010–2021 as the period window. **Full datasets can be found in the appendix.**

The author, in addition to the relevant empirical research conducted in the practical part, also focuses on describing relevant scientific framework behind the topic selected by him for his analysis.

Every academic study or scholarly endeavor will must include a literature review as one of its components. In the context of a given study subject or research question, it refers to an

examination and assessment of the current literature, research, and academic works connected to that topic or issue. A study of the relevant literature is necessary for a number of reasons:

In the first place, a literature review might assist in identifying areas where further study is needed. Researchers are able to discover areas in which there is a paucity of study or topics that need additional inquiry by conducting a critical analysis of the current body of published literature. This assists in identifying the research topic as well as the research goals, both of which are essential for performing a research study that is focused and successful. Effectively, doing a literature study assists in better comprehending the pre-existing information and ideas connected to the subject of the research. This not only assists in the process of formulating hypotheses or research questions, but also offers a theoretical underpinning for the research study. Researchers are able to recognize the important ideas and variables that are pertinent to their research study if they have a solid comprehension of the prior knowledge and theories in the field. Lastly, doing a literature study may assist in the process of choosing relevant research methodologies and procedures. Researchers are able to determine the research procedures and techniques that have been utilized in studies that are comparable to their own by doing an analysis of the previously conducted research studies. This helps them pick the research approach and strategy that is best suited for their particular topic.

3 Literature Review

3.1 Financial Crisis – Definition and Essence

"The Chinese use two brush strokes to write the word 'crisis.' One brush stroke stands for danger: the other for opportunity. In a crisis, be aware of the danger--but recognize the opportunity."

John F. Kennedy

In scientific research there is no single approach to the concept of "financial crisis" and the causes of its occurrence. In addition, there is no clear understanding of the difference between such phenomena as "economic crisis", "financial crisis", "financial and economic crisis", "economic recession", "recession", "stagnation". It is generally accepted that the expression "crisis" comes from the Greek word "krisis", which means "a turning point, a reversal, a decisive time of transition, a sentence, a decision on any issue, or in a doubtful situation." Most often this term was used in medicine. A crisis denoted a decisive stage in the development of the disease, after which either an improvement occurred, either the disease passed into another disease, or even ended in death. In the 17th-18th centuries, the concept of crisis began to be applied to the processes taking place in society. The terms "political crisis, military crisis. In the nineteenth century, for the first time, this term was used in the economy and the concept of "economic crisis" appeared. Later, both in the literature and in the media, the term "financial crisis" or even "financial and economic crisis" began to be used. Although there is no clear separation between these two concepts (Baily, 2008).

Thakor says that the financial crisis of 2007–2009 was the culmination of a credit crunch that began in the summer of 2006 and continued into 2007. He says that the crisis is a sharp deterioration in the economic condition of the state (Thakor, 2015). The crisis manifests itself in the depreciation of the national currency, in the reduction of production, in the growth of unemployment and inflation, in the sharp decline in the value of financial assets, in the decline in the standard of living of the population and the bankruptcy of enterprises. The crisis manifests itself in the deterioration of the main macroeconomic indicators (inflation, production rates, unemployment, etc.), while the financial crisis

primarily affects financial assets (currency, securities, banking deposits, etc.). But in practice, it is almost impossible to separate one from the other. The real and financial sectors are so interconnected and interdependent that it is often simply impossible to say what was the root cause of the crisis - problems in the inefficient organization and structure of production, or the revaluation of financial assets. The economic crisis itself is a natural process which is the next stage of the economic cycle. The emergence and development of financial crises is due to many factors. Sometimes it is difficult to determine the causes of a crisis. Economic crises are quite dynamic. Their causes, structure and specific manifestations are different, but there are some general patterns that allow us to systematize the experience of past centuries and classify economic crises and their causes. Economic crises can be global, national and sectoral.

Mishkin, (1992) describes two views of financial crisis: those associated with the monetarists, and the more eclectic views put forward by Charles Kindleberger and Hyman Minsky. Monetarists since Friedman and Schwartz (1963) have linked financial crises to banking panics. They emphasize the importance of the banking panic, as they see it as the main source of the contraction in the money supply, which in turn led to a serious contraction in the aggregate economic activity in the United States. Monetarists do not consider a real financial crisis to be events in which, despite a sharp drop in asset prices and an increase in the number of business bankruptcies, there is no opportunity for a banking panic and the associated sharp reduction in the money supply.

3.2 Great Recession

Mian, (2010) writes that the global financial crisis, also called the great recession, began in the second half of 2008. The negative effects of this crisis were aggravated by the fact that national governments and international economic organizations were not ready to develop and propose measures to resolve the consequences as soon as possible. In the time preceding the great recession, there was an economic recovery based on an increase in production efficiency, labor productivity, which in turn affected the profits of companies and household incomes. This trend changed in 2007-2008. The main source of this crisis was the US banking sector. US banks issued mortgages and loans to the public without proper credit history checks. This led to the fact that the population began to live "in debt", which is not able to repay.

First, the author would like to describe how mortgages work in the US. A citizen or family chooses a home, saves money for a down payment and turns to a mortgage broker. The latter brings clients together with a mortgage lender who gives a mortgage loan. For each such transaction, the broker receives a commission. After that, the citizens become the owners of the house. For them, this is beneficial, since housing prices are rising, and they have already fixed a sum of money for themselves, which they will be obliged to gradually pay. Investment banks began to make money on this: the income from one such transaction (when a respectable citizen successfully pays off a mortgage) is stable and has a high degree of reliability, which means that the income from a thousand such transactions will be very large, and most importantly, practically guaranteed. So the banks do the following: they buy thousands of bonds from mortgage lenders. Although the mortgage broker initially screens each potential client, the risk of non-payment on individual transactions still remains. Therefore, banks insure themselves: they collect all obligations in one “box” and, with the help of experts, distribute them into three “trays”. These are safe, normal and risky obligations (safe obligations, okay obligations, risky obligations). This whole “box” is called: **Collateralized Debt Obligations (CDO).**

From that moment on, obligations that turn into bonds become a full-fledged banking product that various organizations can buy - in other words, invest in mortgage transactions, hoping for income. For the purchase of risky bonds, a higher interest rate is offered - 10%, for the purchase of normal - 7% and safe - 4%. Safe "AAA" bonds are usually bought by pension funds that hope to generate income with minimal risk (after all, retirees' savings are at stake). Normal "BBB" bonds are bought by other banks. And risky people buy hedge funds, that is, investment funds managed by professional financiers in the interests of investors. At this stage, each participant receives a profit. Investors are asking to increase the number of bonds in order to get even more profit. The request for all links is transferred to mortgage brokers working with ordinary citizens. However, they are running out of reliable customers and looking for dubious ones in order to earn extra money. To make life easier for brokers, mortgage lenders are lowering their requirements for borrowers: now you can get a mortgage without a down payment, without confirmation of a permanent income, without documents. Such loans are called "Sub-prime mortage" - "subprime loans". And there are more and more of them.

This moment can be called the beginning of the collapse. Everything is going according to the previous scheme, but now everyone is at risk, because the number of unreliable obligations is increasing. Unscrupulous borrowers who bought real estate on a mortgage stop paying and their housing goes to banks, which begin to sell this housing on the real estate market. Thus, the number of houses for sale on the market increases and supply begins to exceed demand. As a result, the price of real estate starts to fall. Citizens whose housing is in a mortgage understand that real estate is starting to become cheaper than before, i.e. less than their mortgage obligations. For this reason, some % of the population stops paying mortgage payments, because it becomes extremely unprofitable, their housing will go to banks and real estate prices fall even more (Blankenburg, 2009). The investment bank thus becomes the owner of a large number of cheap houses.

Blankenburg, (2009) claims that financial bubble bursts after a period of economic growth. The scale of this problem was so severe that some of the largest financial institutions in the world went bankrupt. Others have been bought out by their competitors at low prices, and in other cases, the governments of the world's richest countries have resorted to massive bailout and rescue packages for the remaining major banks and financial institutions. Some of the anti-crisis measures raised a lot of questions, because were associated with the privatization of the profits of the rescued institution, which, in turn, dragged the world economy into a state of crisis. For small businesses and poorer people, such relief and rescue options are rarely available when they find themselves in a crisis. There is a perception that when larger banks show signs of a crisis, not only the rich will suffer, but everyone will suffer due to a ripple effect that will lead to problems throughout the economy. The stock market crash wiped out 33% of company value, $14.5 trillion. Taxpayers will bail out their banks and financial institutions with large sums of money. US taxpayers alone will spend about $9.7 trillion on bailout packages and plans. The UK and other European countries have also spent about $2 trillion on rescue and aid packages. More expected. A lot more. Such numbers, readily available, are enough to write off the mortgages of many people or pay off the debts of third world countries many times over. Even high military spending figures are eclipsed by rescue plans to date. This problem could be prevented (theoretically), because people have been pointing out these issues for decades.

According to Verick (2010), a lot of people believed that, in comparison to the economy in the United States, the economy in Europe would be more resistant to the effects of any bad financial shocks. This was in contrast to the belief that the economy in the United States would be more vulnerable to the effects of any bad financial shocks. The assumption that, in spite of a broad slowdown, the actual economy was really doing pretty well thanks to robust fundamentals such as rising exports and stable personal and corporate finances provided support for this view. The real economy was really performing rather well due to good fundamentals, notwithstanding the broad downturn that was taking place. This mindset emerged in September 2008 as a response to the collapse of Lehman Brothers, the bailouts of Fannie Mae and Freddy Mac, and the anxieties of the insurance industry, which is a behemoth.

The American International Group (AIG), which was later bailed out by the government, was the culprit in the collapse of a number of large financial institutions located throughout the United States and Europe. Investors flocked to the few safe havens that were still available (such as government bonds), and the prospect of a complete collapse of the financial system became a very real possibility as the stock markets reached their lowest levels in history. In addition, the market for valuing financial institutions dried up. Because of this, the severity of the crisis grew as a direct result of its own consequences, which included the following chain of events: banks tightened credit, economic activity decreased, loan portfolios deteriorated, banks tightened credit even more, and so on. As a direct result of this, the severity of the crisis grew as a direct consequence of its own consequences. The decline in the value of assets on the global market happened very quickly and spread quickly around the globe. As a direct consequence of the collapse in international commerce, industrial enterprises witnessed a reduction in their revenues and an increase in the quantities of inventory that they had on hand. This was a direct outcome of the inaccessibility of affordable trade financing. Confidence in both consumers and businesses has fallen to an all-time low.

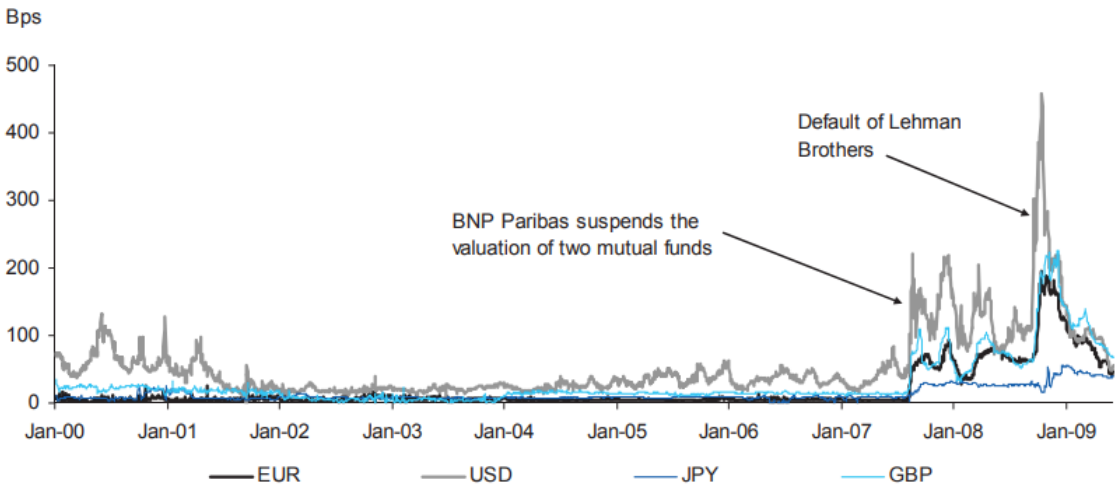
IKB Deutsche Industriebank was one of several European banks to suffer major financial losses owing to mortgage-related concerns, and in August 2007, the German government was required to offer financial support to the bank, according to Hodson, (2009). The French financial powerhouse BNP Paribas, which operates three investment funds, took

the decision to terminate their activities within a couple of days. A "total absence of liquidity in some areas of the US securitization market" was cited as the cause (BNP Paribas, 2007). The European Central Bank (ECB) reacted within hours, providing around 100 billion euros in emergency bank credit. This was the first move in a sequence of emergency measures adopted by the ECB and other monetary authorities across the world to boost liquidity. Even at this early stage of Europe's continuing global financial crisis, Northern Rock had to make a considerable sacrifice. Due to severe liquidity issues on September 13, 2007, this British mortgage firm, which had previously depended mainly on wholesale money markets as its source of financing, applied for emergency financial help from the Bank of England. The firm received funding from the Bank of England. As a result, in February of 2008, Northern Rock was nationalized, marking the first run on a British bank since the Great Depression in 1866.

During 2008, tensions in the United States' banking industry continued to rise. As a result of a deal brokered by the Federal Reserve in March, the American investment bank J.P. Morgan was able to acquire the assets of its faltering rival Bear Stearns. Failure to identify such a remedy led to the bankruptcy of financial giant Lehman Brothers in September of 2008. When member state after member state felt obligated to bail out banks to maintain confidence in the financial system, the destabilizing effects of this disaster were instantly apparent across the EU. During a period when the Federal Reserve was the largest insurance provider, these effects were heightened. The liquidity issues at the Dublin branch of Depfa Bank had a chilling effect on Munich-based lender Hypo Real Estate. For instance, the German government bailed out the financial firm. Bradford & Bingley's mortgage division was nationalized, and the government of the United Kingdom bailed out the Royal Bank of Scotland, Lloyds TSB, and HBOS.

In the summer of 2007, BNP Paribas halted payments on three investment funds, claiming its inability to evaluate structured goods, revealing the EU's considerable vulnerability to the US subprime crisis, according to Brunnermeier (2009). This showed that many EU nations were exposed to the US subprime crisis. This has raised bank counterparty risk, as indicated by the sharp rise in short-term loan interest rates (as shown by spreads in the chart that follows).

Figure 1, month interbank spreads vs T-bills or OIS



Source: Brunnermeier, 2009

Following the failure of major financial institutions such as Bear Stearns, Northern Rock, and Landesbank Sachsen in the spring of two thousand eight, analysts began to become concerned about the possibility of a systemic collapse. After another six months, several major financial institutions, including Lehman Brothers, Fannie May and others were on the verge of going bankrupt. The various efforts that were made by the authorities to save people stopped the disaster from becoming catastrophic.

The number of bank mergers that took place in the years leading up to the global financial crisis added a layer of complexity to the efforts that were made to save European banks. The journey that Fortis took is a perfect example of this type of thing. After having successfully completed the acquisition of ABN AMRO in the Netherlands in 2007, the bank came into difficulties in 2008 (fall) due to the large amounts of debt it had accumulated. The authorities in Belgium and Luxembourg were unable to come to an agreement on a rescue strategy for the bank and hence were unable to take any of the essential steps to save it. As

a result, the bank was forced to shut. It is important to point out that this bank was formerly regarded as the most reputable institution in both Belgium and Luxembourg. Since Iceland's assets and liabilities are both denominated in foreign currencies, the Icelandic economy is very exposed to currency fluctuations. Glitnir, Landsbanki, and Kaupthing are the three biggest banks in Iceland, and in October of 2008, the Icelandic government acquired full control of all three of these institutions. Since it was obvious that the government would want help from the International Monetary Fund (IMF) in order to preserve the banks, it was forced to make the challenging choice to submit an application for a loan in the amount of $2.1 billion. Also, the government of Hungary submitted an application for a loan on the condition that its institutions be brought up to standard. It has been suggested that this is due to excessive debt as well as an over-reliance on loans from other countries.

3.2.1 Government Response during the Eurozone Crisis

There is widespread agreement that the economic slump experienced by the sixteen countries that make up the Eurozone is the worst since the conclusion of the Second World War. So, in 2009-2010, authorities spent more than ever on emergency measures to combat the economic crisis. In all, the EU spent at least two percent of GDP on tackling the crisis. These broad categories may be used to describe the main moves taken by the governments of the major Euro Area countries. In September-November of 2008, stabilizing the financial system was an absolute need (although many measures to revive lending to the real sector are still relevant). Second, measures to keep people employed and increase domestic demand in the face of a weakening "export engine." Many initiatives were implemented simultaneously to address the dual challenges of increasing economic activity and decreasing social tensions. The overall policies for all countries in the euro region are set apart by the European Central Bank's (ECB) accounting and interest rate monetary policy, which has consistently decreased the refinancing rate. As of the beginning of 2009, it has been at the level of one percent. (European Commission, 2009)

The European Central Bank is ramping up its efforts to revive and restore order to the market for lending by implementing a growing number of measures. Because of this, the total yearly loan amount obtained by more than thousand European banks in summer of 2009 reached approximately five hundred billion euros. In addition to that, the implementation of a strategy to repay debt obligations is now under way (at a cost of sixty billion Euros). The

problem of low growth rates of lending to enterprises and individuals is exacerbated by the fact that commercial banks continue to place excessively stringent conditions on borrowers while simultaneously seeking for new ways to use the money granted by the ECB. The whole amount of financial assistance that was approved for the banking sector in 2009 was equivalent to approximately thirty percent of GDP (DG ECFIN, 2009).

Every member state of the Eurozone has significant procedures of its own. As a direct consequence of this, Germany took a series of actions in autumn 2008 to restore stability to the financial market. However, businesses were only eligible for assistance if they had their own strategy for overcoming the crisis and were willing to adhere strictly to the terms established by the state. These terms included not paying bonuses to top executives, capping employee salaries, and not paying dividends, among other restrictions. It is important to keep in mind that the Federal Ministry of Finance established a Financial Market Stabilization Fund (FFin) with the capacity to absorb losses in the amount of EUR 500 billion (as a result of the state's attraction of resources from the capital market), that the federal government guaranteed loans in the interbank market with a maximum value of EUR 400 billion, with EUR 20 billion set aside for potential payments from the Stabilization Fund, and that the government assumed risk by allowing banks to hold on to toxic assets (Hoffmann, 2016).

Businesses with a strategic focus that got direct assistance from big financial institutions were seen as a rescue (while in industry direct support to companies was provided in 2009 on a limited scale). The only mortgage bank in Germany, Hypo Real Estate, was the one that needed the greatest assistance to be spared from near bankruptcy. Many land banks, notably the Bayren Bank and the market-leading KB, received large guarantees from the government. Notwithstanding the help provided by banks and other attempts to stimulate growth in the financial sector, the problem of providing loans to the real sector was not completely overcome. In addition to this, the financial crisis increased the gap between the profitability of government borrowing and the price of resources for enterprises (the peak of the gap that occurred at the end of 2008 has been passed). In the autumn of 2008, France and Germany collaborated to develop a crisis prevention plan for the financial sector. The objective of this strategy was to distribute loans to the big banks in an attempt to restore stability to the stock market. It was decided that in order to put the plan into action, new

organizations would need to be established. This approach included, but was not limited to, increasing lending to enterprises and individuals.

The French Banking Commission is in charge of managing the refinancing business, which is held by banks to the tune of around seventy percent and the state to the tune of around thirty percent. It was created so that the government could guarantee financial institutions. A holding company that is controlled by the state was established in order to facilitate reinvestment in the country's various financial institutions. At the same time, financial institutions began charging a fee for the use of services that were guaranteed by the state. There was a total of thirteen financial institutions that received loans amounting to more than two billion. Several financial institutions received monetary assistance in the form of guarantees so that they might regain both their trustworthiness and their liquidity. In autumn of 2008, each of France's six largest banks received ten billion euros in deposits. In comparison to its neighbours in the Eurozone, France's economy is the most diversified since, unlike Germany, it is less dependent on revenue from outside sales, and the country's strong public sector helps to maintain economic stability (Berardi, 2015).

Restoring financial stability was the primary emphasis of Italy's first reaction to the crisis, just as it was for other key states in the Eurozone. In autumn of 2008, a formal decree titled "Urgent Measures to Safeguard the Stability of the Credit System" was approved and put into effect. There is a possibility that the Ministry of Economics and Finance may guarantee increases in bank capital. The Bank of Italy must provide its approval before any bank in Italy that serves the public interest may continue to pay dividends or adhere to a stabilization plan. The Bank of Italy must also sustain dividend payments. In the event of a severe shortage of liquid assets, the Italian Ministry of Economics and Finance has the authority to provide a guarantee for loans extended by the Bank of Italy to Italian banks as well as Italian branches of international banks. It is also essential to be aware that the EU has a mechanism in place to safeguard deposits, and that this program protects deposits of at least fifty thousand euro and up to one hundred euro. In autumn of 2008, a new decree-law was enacted, with the same overarching aim of increasing liquidity and simplifying the process of refinancing. Because of government guarantees, there was no credit crisis. These guarantees kept money accessible to small and medium-sized firms, which prevented the catastrophe (Cellini, 2015).

Consequently, the author can suggest the following: The European Union (EU) must prioritize the resolution of economic crises for a number of reasons, including the following:

1) Stability and expansion: A healthy and stable economy is essential for sustained economic development, the creation of new jobs, and the maintenance of social stability. The European Union is able to preserve economic stability and foster prosperity over the long run if it takes action to overcome economic crises.

2) Citizens need to be protected against the potentially catastrophic effects that economic crises may have on their well-being, which can include the loss of jobs, decreased earnings, and rising levels of poverty. The European Union is in a position to safeguard its people and guarantee that their fundamental requirements are satisfied if it takes active measures to lessen the impact of economic crises.

3) Protecting the European project Cohesion and stability of the European Union (EU) as a political project are susceptible to being undermined by economic crises. The European Union (EU) can show its potential to find solutions to challenges and build the link between its member states if it focuses on resolving economic crises.

4) Increasing competitiveness Economic crises may lead to a loss in competitiveness and productivity in the EU, which may undermine the EU's capacity to compete on the global market. Increasing competitiveness can help prevent this drop. It is possible for the EU to establish an atmosphere that encourages innovation and development if it takes steps to solve the current economic issues. This would increase the EU's competitiveness.

5) Assuring financial stability Economic crises may also pose a danger to financial stability, which can have a domino effect throughout the whole economy. Hence, it is important to take these risks seriously. The European Union has the potential to prevent the spread of financial contagion and guarantee the stability of the financial system by handling economic crises.

Apart from that, based on information from European Commission (2009), these are the list of the most important measures taken by the European Union in order to tackle the ongoing crisis:

October 2008. ECB in Frankfurt decreases the interest rate to just 3 ¾ %. The same is also done by other Central Banks of the member-states of Eurozone. In addition to that, the commission continues to provide assistance and support to other European institutions. Finally, one of the most important propositions of the Commission was the proposed increase of minimum bank deposit to 100,000 euro, which later on was described in the action plan proposed by the ECB.

November 2008. In November of 2008, the European Council provides its agreement on significant financial and institutional changes and this discussion took place right before the G20 meeting, where one of the main agendas were the ongoing financial crisis. Simultaneously, Commission suggests that credit ratings should be implemented for different banks and related institutions. In parallel, the EU confirms its intention to provide financial assistance to Hungary approximately equal to 6.5 billion euro. Consequently, the European Recovery Plan is adopted with countries focused on cohersion and cooperation between each other in order to tackle the ongoing economic crisis. Finally, ECB sets the interest rate to 3 ¼ %.

December 2008. Once again, the Central Bank decides to cut the interest rate to 2 ½ %. Consequently, the European Council approves the European Economic Recovery Plan. This almost perfectly illustrates that European institutions were really not hesitating when tackling the ongoing economic crisis.

January 2009. For the sake of better supervisory cooperation and convergence across Member States and to strengthen financial stability, the Commission has adopted directives to expand the competence of the supervisory committees for EU financial markets. A more transparent operating framework and more streamlined decision-making procedures will be advantageous for securities, banking, and insurance sector oversight under the new laws. The European Central Bank (ECB) has once again lowered interest rates, this time to 2%.

February of 2009. With an estimated 1.5 billion euro in direct aid, Latvia becomes the second EU member to get such funding after the start of the Great Recession. Initiative group suggests establishing credit rating and integrating a specific rulebook for monitoring the situation in the financial sector. The automotive sector was hit hard by the economic crisis, and the commission has proposed steps to help it recover.

March 2009. The most recent communication from the Commission encourages EU leaders to move swiftly on financial sector reform and exhibit global leadership at the G20 conference in April. These suggestions proposed by de Larosière have received support from this communication. The European Central Bank (ECB) decreased its refinancing rate, often known as the Refi rate, by fifty basis points, bringing it down to one point two percent. Spring The European Council is now discussing the EU's proposal for fiscal stimulus, which is anticipated to reach more than 400 billion euros (more than 3% of GDP). Ahead of the G20 summit in London, leaders of the world's leading countries work together on establishing specific measures that will provide a collective response to the crisis.

April 2009. The EU discusses the topic of safeguarding tax revenues in order not to find themselves entangled in high budget deficit. The suggested alterations are made to better the European Union's (EU's) and the world's tax competitiveness, as well as tax transparency, information sharing, and fair tax competitiveness. The European Central Bank has determined that the interest rate will remain unchanged at 1.25 percent.

April 2009. In a Communication from the Commission, the topic of the significance of national governments protecting tax revenues is discussed. The policies that are being suggested have the intention of increasing tax transparency, information sharing, and equitable competitiveness within the EU and beyond. The European Central Bank has decided to maintain the same benchmark interest rate of 1.25 percent for the foreseeable future.

July 2009. The Commission proposes further modifications to banking law in order to further strengthen limitations on bank capital and on remuneration in the banking sector. The Commission has suggested simplifying the administration of subsidies provided by the European Union in order to provide more assistance to regions that are struggling to recover

from the economic crisis. Credit default swaps (CDS) involving European companies will now begin to be settled by central counterparties that are supervised by the EU. The German asset relief package, which aims to handle distressed investments, receives approval from the Commission.

According to the European Commission (2009), in the aftermath of the events that occurred in September 2008, a number of countries attempted to rescue their systemically important financial institutions. Since October 2008, the Commission has given the green light for government relief measures totaling more than $3.5 trillion, which accounts for roughly a third of GDP. The already-utilized 1.5 trillion euros (13% of GDP) have helped in a number of ways, including as debt guaranteeing, company recapitalization, liquidity assistance, and the write-off of damaged assets. There are permitted measures totaling 2.9 trillion Euros, or 25% of EU GDP, to guarantee bank liabilities. Yet, only 1 trillion euros, or 8% of GDP, has been distributed thus far. The greatest financial investment is made in this kind of aid item. These efforts, which surfaced rapidly in reaction to a decline in confidence in the early stages of the crisis caused by a shortage of liquidity in the interbank market, sought to mitigate both the deficit itself and the ripple effects it was having on the economy. The deficit and its broader repercussions were both addressed, and the goal was reached. Several member states guarantee financial institutions for short periods of time via temporary national programs.

It is possible that enormous sums of money will be transferred between member states in an effort to find the highest possible level of protection. This could have unintended consequences and could reduce the effectiveness of the measures that are being taken. This is one of the major risks associated with such policies. The requirements that any state guarantee on bank liabilities must follow to avoid such arbitrage were defined in the Banking Message from October and the European Central Bank's recommendations on the pricing of government guarantees. The price of government guarantees depends on these variables. They may cover commitments longer than three months for a period of up to three years (later extended to five years); they must utilize a standard pricing structure; they are open to all banks without discrimination, including branches of foreign banks established in a Member State; and they must cover commitments longer than three months. While banks have begun the process of deleveraging their balance sheets, it is now more vital than ever

to ensure that the non-financial sector has enough access to credit. European Commission 2008c), which gave direction to Member States on how to approach bank recapitalization, was promptly followed up on by the Commission. European Commission 2008d) also provided recommendations to Member States. The price that the beneficiary must pay for public capital (which varies depending on the risk profile of the bank and the seniority of the instrument used) and the subsequent actions that are required from the bank are the primary principles that limit the distortion of competition caused by these structural and long-term interventions (which range from an exit strategy from dependence on state capital for fundamentally sound banks to deep restructuring or liquidation of troubled banks). The agreed-upon amount for government recapitalization was €300 billion, which is equivalent to 212% of the GDP of the EU. To far, €170 billion, which is equivalent to 112% of the GDP of the EU, has been provided. Public capital has historically been provided either through a national program or through the recapitalization of individual banks on an ad hoc basis. Historically, public capital has taken the form of either common or preferred shares, with the latter having loss-absorbing properties that make them suitable for Tier 1 capital. Investor confidence continued to take a hit as a result of the lack of clarity on the placement and scope of asset impairment losses on banks' balance sheets. As a result, it became abundantly clear that this underlying root of the crisis needed to be addressed. The amount of pricing, which included an increase, was decided by state assistance laws in order to motivate banks to buy back state capital when the market circumstances were favorable to do so. On February 25, 2009, the Commission established procedures for dealing with investments in difficult circumstances. Asset release measures, regardless of whether they are purchase-based, guarantee-based, or a hybrid of the two, need to have reasonable valuations of impaired assets based on their real economic value as in base. as well as in stressful scenarios, and they need full transparency and disclosure from beneficiary banks. In addition, reasonable valuations of impaired assets based on their real economic value as in base. as well as in stressful scenarios. Assistance for defective assets to the tune of €50 billion (0.5% of EU GDP) has been allowed and effectively used up to this point; nevertheless, far bigger additional measures have been suggested, are now being implemented, and are presently being examined by the Commission. There are significant holes in the coverage of the various monetary assistance programs offered by Member States. Since it has a GDP that is more than twice as big as the GDP of the country that is geographically nearest to it, Ireland has been able to save its banks without having to rely on the assistance of any other nation.

The United Kingdom and the countries of the Benelux are examples of countries that fall into the second tier of nations in terms of the proportion of their GDP that is contributed by their governments in the form of effective aid. These variations are the result of a wide variety of one-of-a-kind causes, such as the relative size of banking sectors in various countries (e.g., the United Kingdom, Ireland, and Luxembourg), the likelihood of experiencing an impairment of assets of American origin in various countries (e.g., the United Kingdom and Germany), and the frequency with which local real estate markets fail. For example, the relative size of banking sectors in the United Kingdom, Ireland, and Luxembourg (Sweden, Finland, Austria, Greece, Belgium, the Netherlands). The nations of Central and Eastern Europe have depended on the actions taken to assist parent banks in their countries rather than taking efforts to assist their very own offshore banks. This is because the table. This is made very evident by the setting of the table. Yet, the number of foreign banks present in each EU member state and each country's susceptibility to crises in the financial sectors of other EU member states are not identical in any of the countries that make up the EU. Since the third quarter of 2008, when the bank rescue packages were initially put into effect, there has been a significant improvement in the balance sheets of EU banks, with the number of capital injections significantly outnumbering the number of write-offs. The actions taken by the government to increase and maintain capital levels in the banking sector may be credited for much of the progress that has taken place recently. Because of this, the total capital and reserves held by banks in the Eurozone saw a rise of 4% between July 2008 and March 2009, putting them in a stronger financial position overall. As a consequence of the issue of government-guaranteed debt, the conditions for bank debt financing have also been greatly improved as a result of this development. In addition, there is very no evidence to indicate that other forms of financial arrangements will be replaced by debt that is guaranteed by the government. On the other hand, the trust of the market was reestablished via the use of government loan guarantees. Alterations in the spread between the interest rates provided by different financial institutions are yet another leading indicator that the market is beginning to return to normal. Prices on other financial markets have, for the most part, been able to accurately reflect the temporal profile of interest rate spreads between interbank institutions. This pointed to a steady decline in risk aversion and counterparty risk as well as a modest rebound in bank profitability expectations, which in turn further strengthened the trend towards a more normal functioning of the financial industry. From around the middle of March, there has been a considerable rise in the cost of

bank capital. This trend started about the same time. This is a direct reflection of the market's expectation of more earnings and enhanced profitability in the future. Efforts to build and maintain capital levels in the banking system were met with success as a consequence of enhanced investor confidence and a stronger readiness to take on risk as a direct result of lower market risk. This led to a rise in overall equity prices. Even with all of these different kinds of financial assistance, the balance sheets of banks are still in a dangerous state, and the banking sector has not yet completed the process of repairing the damage to its balance sheets. It is reasonable to be worried about the overall health of banks' balance sheets due to the ongoing concerns over the quality of the assets held by financial institutions. Improving visibility, assessing the fair market value of damaged assets, and ensuring that indicators from diverse jurisdictions are equivalent are the immediate priorities of the effort. The restructuring of failed banks and restoring their financial viability are the aims for the medium term, and it is imperative that progress be maintained in these areas (McCauley, 2018).

The economic blueprint that was proposed by the Hungarian government in October of 2008 made Hungary eligible for financial help from the EU over the medium term (up to 6.5 billion euros, Council resolution of November 4, 2008). The assistance was financed via the utilization of loans obtained from the International Monetary Fund (€12.5 billion) and the World Bank (€8.2 billion) (1 billion euros). The plan's goal is to win back the confidence of those who have provided financial support. In addition to maintaining a healthy budget, the program seeks to strengthen the local banking sector, improve financial regulation and monitoring in conformity with EU norms, notably in the field of state aid, and preserve the country's overall fiscal health. The first three payments were made in December 2008, March 2009, and July 2009, respectively, after the completion of an in-depth analysis of the program and the subsequent reaching of an agreement with new limitations and conditions. The third evaluation trip conducted by the IMF took place during the first two weeks of September. This tour made use of the services supplied by the Commission (no EU payments were foreseen). The Mission and the authorities at the staff level have reached an agreement to extend the current policies and programs for an additional six months, until October 2010, in order to accommodate changes in the external financial situation, the election season, and the transition to a new administration. This decision was reached due to changes in the external financial situation. In the meanwhile, the government of Hungary has reached an

agreement to distribute the remaining EU cash throughout the first, second, and third quarters of 2009, respectively, in the form of three separate payments (Brzezinski, 2018)).

That year (2009), the European Union provided financial assistance to Latvia on a medium-term basis in the amount of up to 3.1 billion Euros, per a resolution passed by the Council on January 20, 2009, in order to support the "Program for Economic Stabilization and Growth Revival," which was established by the government of Latvia on December 12, 2008. It has been decided to provide up to 7.5 billion euros in foreign assistance, which would include support for various community development initiatives. The program's objectives are to increase public and private trust in the financial system, bring inflation under control, restore cost competitiveness, boost the economy's growth potential, and pave the way for Latvia to sustainably converge and join the Eurozone as quickly as possible. All of these objectives are to be accomplished while maintaining the fixed exchange rate. February and July of 2009 saw the release of the first two issues, respectively. Over the whole of the program, the policy parameters were revised to accommodate new structural improvements and cost-cutting measures, and the trajectory of the fiscal situation was drastically changed. Staff from the Commission met with officials from Latvia on the first IMF review visit in July and were able to strike an agreement with them (no payments from the EU). Due to the fact that the need for extra funding is not as as urgent as it was in the past, the third and fourth payments due from the EU have been delayed by one quarter (until the end of 2009 and the beginning of 2010, respectively). (Jenkins, 2008)).

The amount of loans from the International Monetary Fund (13 billion euros), the World Bank (1 billion euros), the European Investment Bank and the European Bank for Reconstruction and Development (EBRD) (1 billion euros) are subsidized by the European Union. The program had many objectives, one of which was to assist the economy in resolving its short-term liquidity issues, another was to boost competitiveness over the medium term, and a third objective was to promote the orderly adjustment of imbalances over time. In May of 2009, Romania became the third EU country to get help from its own nation's balance of payments (up to 5 billion euros, based on the decision from the 5th May). A complete economic policy program has to be prepared in order to be eligible for financial support from the European Union. It was in the month of July when the first payment was sent in. A political agreement between the government and the IMF was struck in the month

of August. This agreement includes stricter fiscal austerity as well as amended program criteria in other areas. The goals of this program should be to improve fiscal management, change the public pension system, increase transparency in public payment systems, and reform public pensions (including the adoption of a mandatory medium-term budgetary framework). Nevertheless, EU contributions were not included in the deal (Braun, 2015).

3.2.2 Numbers behind the Crisis

The decline in income relative to GDP in 2008 was the primary cause of the deteriorating fiscal position in the Euro Area. The 2008 financial crisis was largely responsible for this. The rising value of social benefits and transfers was largely responsible for the small increase in the ratio of expenditures to GDP. Taxes on imports and production, as well as taxes on income and property, all had a negative impact on revenue, with the latter being caused in no little part by the precipitous decline in corporate income tax. Estate taxes and other similar levies had little impact. This illustrates that there was a significant revenue shortfall in addition to a significant nominal cost overrun compared to the projections made in the 2007 Stability and Convergence Updates. Nominal growth that is much lower than expected highlights these changes in the spending-to-GDP ratio. When considering the European Union as a whole, a similar picture emerges. According to the Commission's services forecast for spring 2009, the main source of the worsening in structural balance sheets over the projected horizon in the majority of Member States is the substantial deterioration in the main expenditure side of the budget. This is what is expected with regards to Commission services. Investments that boost economic development are on the rise, in part because of the government's plans to spend more money (European Commission, 2010).

Figure 2, Government revenue and expenditure (% of GDP)

	Revenue				Expenditure			
	2007	2008	2009	2010	2007	2008	2009	2010
BE	48.1	48.4	48.5	48.2	48.3	49.8	52.9	54.3
DE	43.9	43.7	43.5	42.3	44.2	43.9	48.2	49.0
IE	35.7	33.7	33.7	33.9	35.7	41.0	45.8	49.1
EL	40.0	39.9	40.8	40.0	43.7	44.9	45.3	45.2
ES	41.0	36.8	36.4	36.9	38.8	40.5	45.2	47.1
FR	49.7	49.6	49.4	49.9	52.3	52.7	55.6	56.4
IT	46.6	46.4	46.5	46.5	47.9	48.8	51.2	51.1
LU	41.0	43.6	44.0	42.9	37.2	40.7	44.2	45.7
NL	45.6	46.8	46.1	45.6	45.3	45.4	48.3	50.2
AT	47.9	47.6	47.0	47.3	48.5	48.6	51.6	52.1
PT	43.1	44.2	42.6	42.4	45.7	45.9	48.9	48.7
SI	42.9	41.6	41.7	41.6	42.4	43.6	47.7	48.6
FI	52.6	52.3	52.0	51.3	47.3	48.3	52.8	54.3
MT	40.4	40.7	41.1	41.2	42.6	45.3	44.4	44.8
CY	46.4	45.6	44.1	44.1	42.9	44.0	44.4	45.0
SK	32.7	32.1	32.2	32.1	34.4	34.9	38.3	39.4
EA-16	45.5	44.8	44.7	44.4	46.1	46.6	50.1	51.0
BG	41.6	41.4	40.8	40.9	41.5	37.4	39.5	39.3
CZ	41.6	40.7	40.7	41.1	42.6	42.4	45.9	47.6
DK	55.4	54.8	52.8	53.4	50.9	51.8	55.0	57.0
EE	38.2	36.5	38.2	38.4	35.5	40.9	45.0	47.3
LV	37.6	36.0	34.1	34.7	35.9	39.5	46.8	49.8
LT	33.9	33.9	34.8	36.0	34.9	37.2	39.5	42.7
HU	44.9	45.5	46.1	46.4	49.7	49.9	50.8	52.0
PL	40.0	39.6	40.2	40.3	42.1	43.1	46.1	46.8
RO	34.0	32.7	32.2	32.5	36.6	38.5	38.5	38.9
SE	56.4	55.1	53.0	52.7	52.5	53.1	56.6	57.3
UK	42.6	41.8	41.4	41.6	44.0	47.7	50.5	52.4
EU-27	45.1	44.5	44.3	44.1	45.7	46.8	50.1	51.1

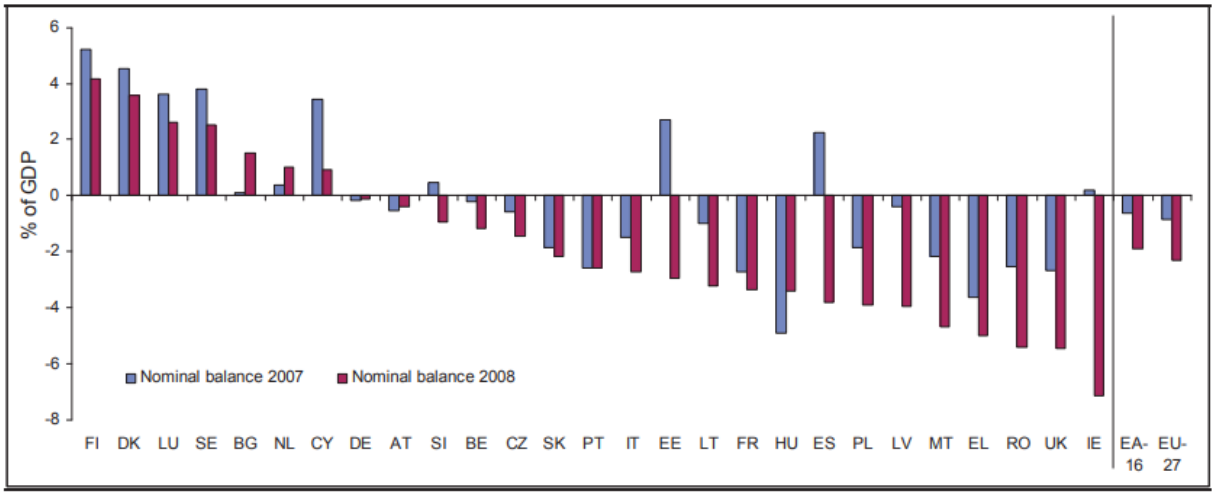
Source: Commission services.

Source: European Commission, 2010

In 2008, the average nominal budget deficit grew by 1.3 percentage points of GDP in the euro area and by 1.5 percentage points of GDP in the EU as a whole, bringing them to 1.9% and 2.3% of GDP, respectively, according to European Economy, (2009). The economy had been deteriorating rapidly at the time, thus this was occurring in that context (see figure 3). This is a significant result in light of the fact that it runs counter to the average stabilization forecast in the most recent updates for both the Euro Area and the EU-27. This discrepancy arose, in turn, because actual GDP growth was around 1.5% lower than forecasted in earlier revisions. The average structural deficit in the euro region and the EU is projected to have grown by around one percentage point of GDP in 2008, rising to 2.4% and 3% of GDP, respectively. Nonetheless, this is the case despite the fact that production gaps have been generally closing recently and are mostly still in the positive zone. In contrast, the structural balances from the previous revisions were not changed. The setting against which these updates were conceived was one of consistent and, on average, almost gapless deliveries. The proportion of Member States expecting a poorer budget balance in 2008 than was projected for 2007 and the proportion of Member States planning an

improvement were almost identical when looking at the results for 2008, which were provided in the updates for 2007. Despite this, most member states witnessed a deterioration of their state budget balances in 2008 compared to 2007. (for illustration, check the diagram below). Only in Bulgaria, the Netherlands, Hungary, and (to a lesser extent) Austria and Germany have there been reports of progress. With the exception of Bulgaria, all of these countries did better in 2008 in terms of their national budget than was predicted in the previous revision. According to the European Central Bank, 2008 was a particularly bad year for nominal balances in Ireland and Spain (7.3 and 6 percentage points of GDP, respectively). Countries including France, Latvia, Malta, Greece, Hungary, and the United Kingdom, along with Romania, Poland, and Lithuania, all had deficits in 2008 that were more than 3% of GDP. The Treaty's GDP criterion did not take effect until after it was initially announced in 2009.

Figure 3, Government balances in 2007 and 2008 (% of GDP)

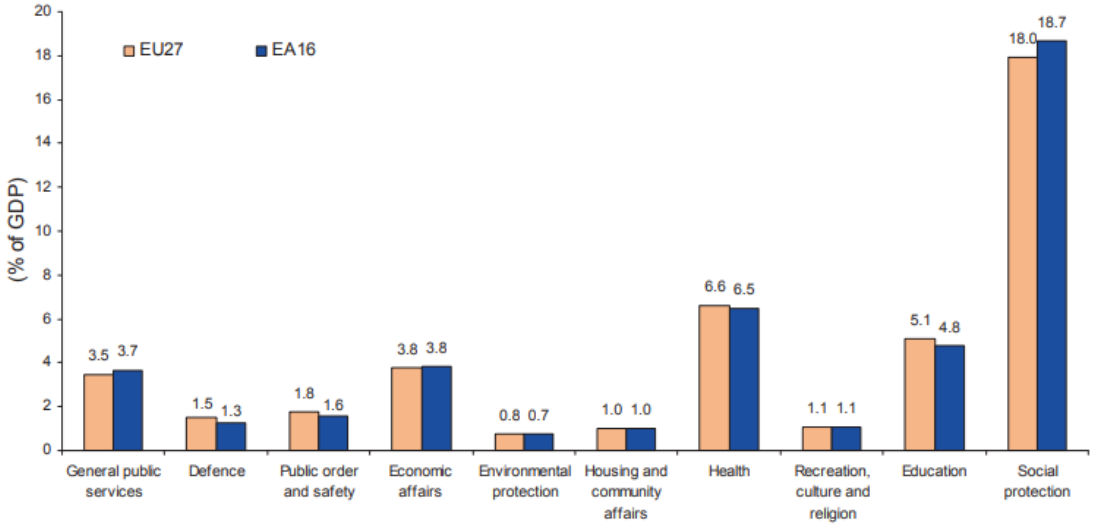


Source: European Commission, 2010

According to GDP weightings, in 2007, public primary spending on social security in the EU-27 and the euro area amounted to 18.0% and 18.7% of GDP, respectively. These totals reflect the typical expenditures made in these areas. Education and healthcare are also quite important, contributing 5.1% and 4.8% to GDP, respectively. Spending on the economy amounted to about 4% of GDP, with the EU27 and the euro region both receiving 3.8% of GDP. Overall public services received 3.5% of primary expenditures in the EU27 and 3.7% in the euro region. Less than two percent of GDP is allocated annually to public order and safety, defense, recreation, culture and religion, housing and community services, and environmental preservation (see the Figure 4). Figure 5 shows that across the board, all

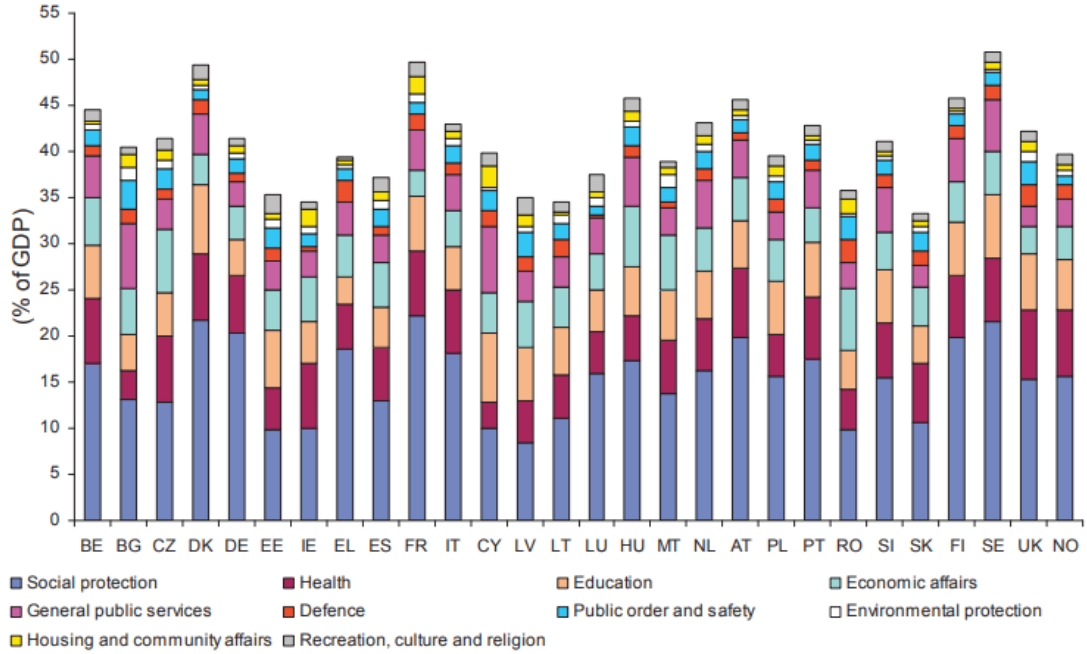
countries prioritize expenditure on social safety. For example, in 2007, the share of GDP devoted to social security varied from almost or more than 22% in France, Denmark, and Sweden to 10% or less in Ireland, Cyprus, Romania, Estonia, and Latvia (with the lowest amount being 8.4% of GDP). Health care spending will be a top two priority for just over half of the Member States and Norway. Expenditures that account for more than 3 percent of GDP include retirement and health care, child and family support, medical care, transportation, early childhood education, secondary schooling, and general services. The organizational framework of government expenditure in every Member State may provide this insight. This clustering is broken down into five subgroups, three of which deal with social security and other public services, two with education, and one with health and the economy. Healthcare for the aged is the largest category of expenses, accounting for 2.9% of GDP in Ireland and 12.7% of GDP in Greece in 2007. In 2007, the government spent 4.9% of its GDP on its senior population, second only to Norway, which commits a bigger share of its public spending to other purposes (sickness and disability; 5.9% of GDP).

Figure 4, structure of the EU's and euro area's government expenditure by COFOG I function, 2007



Source: European Commission, 2010

Figure 5, Structure of the EU's and euro area's government expenditure by COFOG I function, 2007



Source; European Commission, 2010

3.3 Crisis Prevention

Gelpern (2008) contends that the worldwide financial crisis of 2008 provided conclusive evidence of the need of a unified and well-coordinated structure for crisis management and prevention. It is required to include the following steps: administration of a crisis with the goal of preventing a recurrence of the situation. This should be reflected in the group's study of the crisis's core causes and suggested changes to policies on macroeconomics, regulatory oversight, and supervisory oversight to assist avoid a repeat of the crisis. Measures that improve prospective economic development and competitiveness have the potential to also strengthen resilience to future crises if they are executed correctly. It is necessary that the crisis be controlled, and its effects reduced, in order to decrease the impact that the recession is having on society as a whole. This may be accomplished by the prevention of widespread bank failures, the reduction of production losses, and the reduction of unemployment. As a result, the primary objective is to gradually bring both the actual economy and the financial system back to a state of stability. Cooperation throughout the EU is necessary in order to achieve the optimal outcome in terms of striking a balance

between conflicting national interests and the unintended repercussions for other nations. Also included in this is a plan to reorganize sectors. In addition to finding a solution to the crisis, it is essential to formulate a plan for a methodical pullback from expansionary macroeconomic policies. The fundamental components of such a system are beginning to take shape as a result of the combination of recently launched initiatives and established institutions. Nonetheless, it is well knowledge that European politicians did not have much of an option except to adhere to the customs and standards that were already in place. It seems that the system that was supposed to be established to prevent financial crises was not developed to its full potential; if it had been, the crisis very certainly would not have occurred.

In spite of the initial EU premise that a license in one member nation should readily convert into a "passport" to do business in other countries within the Union, Pauly (2008) indicates that this may be the case because some banks have decided to organize locally as fully funded subsidiaries. This is the case despite the fact that Pauly (2008) indicates that this may be the case because some banks have decided to organize locally as fully funded subsidiaries. It would be smart for the headquarters of the bank to have some form of contingency planning in place in order to protect itself against losses in the portfolios of such subsidiaries. The authorities in charge of regulating financial institutions like these should put their attention squarely on problems such as the worth of the collateral held by such subsidiaries. But, they should also consider the actions that their headquarters could take in the event that a problem in one area spreads to other regions. They can either flee, putting their global reputations at risk in the process, or they can provide liquidity and even equity support, putting pressure on their consolidated balance sheets, work with other competitors who are in a similar position, or they can rely on their home states and the states in which they are hosting operations to come up with arrangements that are mutually acceptable.

Krambia-Kapardis, (2016) describes that in the European Union, central securities depositories (CSDs) are subject to uniform European regulation56. Article 26 of Regulation 909/2014 requires CSDs to implement effective policies and procedures to ensure compliance with said regulation, maintain and use effective written organizational and administrative measures to identify and manage any potential conflict of interest, and to

conduct independent audits. The regulation calls for a high degree of transparency, and CSD internal governance and business rules will be reviewed. In addition, article 27 of the regulation requires that the remuneration of the board of the CSD be independent of the organization's performance. In the United Kingdom, the financial services regulatory framework that has evolved over the course of the 20th century has been described as “complex and fragmented”58. the governing legislation and regulatory requirements have been embodied in various laws, codes and regulations; and in general, consumers and practitioners were confused. In order to improve prudential and supervisory mechanisms, the Financial Services Act 201259 replaced the FSA with the creation of the Prudential Supervisory Authority (PRA) and the Consumer Protection and Markets Authority (CPMA). The PRA is part of the Bank of England for the purpose of overseeing macroprudential policy, while the CPMA is responsible for "regulating the conduct of business for both retail and wholesale firms". (2013), after the financial crisis, structural measures were introduced in several countries to separate “commercial” and “investment” banks.61 These measures were aimed at minimizing the contagion effect from risky activities and decisions within and between banking institutions, also to protect certain categories of financial activities that are considered vital to the national economy or significant in terms of protecting consumers or savers from riskier but less significant activities. In the United States, the Volcker Rule, since 2012, has allowed market-creating activities on behalf of clients, but has done away with private trading while providing several exceptions for transactions in instruments such as the US Treasury and agency securities. However, it restricts such trading and banking activities in different subsidiaries of the same group. The Volcker Rule also prohibits banks from investing in and sponsoring organizations that trade hedge funds and private equity funds, as this exposes them to the same risk as these organizations.

McCoy, (2013) describes crisis prevention on example of USA. He writes about foreclosure prevention to break the negative feedback loop between falling property values and foreclosure by keeping borrowers in their homes and restoring their current status on their loans. Since 2007, the federal government has used three main models to prevent foreclosures. The first model was to convene market participants to coordinate and facilitate foreclosure prevention in the private sector. Second, the government offered subsidies to prevent foreclosure. Third, the government has taken concrete action to increase the cost to market participants of unnecessary foreclosure. For the most part, during the recent

economic crisis, the federal government stuck to the first and second models, sparingly using the third. At any given point in the crisis, the choice of model depended on the primary goal—refinancing or credit modification—and the administration in power. The federal government's foreclosure policy evolved with the diagnosis of the underlying problem. Initially, policymakers were mainly concerned about the payment shock from the upcoming rate cuts on hybrid ARMs, interest-bearing ARMs, and options ARM2. After falling ARM indices such as the London Interbank Offered Rate (LIBOR) in the autumn of 2008, however, concerns about a payment shock eased, and attention turned to rising unemployment and its contribution to rising arrears. Since the end of 2010, heated debates have flared up about the role of negative capital in default decisions and the best way to deal with this problem. A. Refinancing programs for delinquent borrowers In the summer of 2007, the private label mortgage-backed securities (RMBS) market collapsed, setting the stage for a tsunami of foreclosures. Once private label financing disappeared, many struggling borrowers could no longer refinance their loans. The lack of refinancing options has been particularly severe for borrowers with delinquent or unpaid loans. Unable to avoid the impending reset on their ARMs or cut their household spending by selling their homes and paying off their mortgages, millions of households soon found themselves in default. After private label financing was no longer an option, the federal government first sought to prevent foreclosures by refinancing some delinquent mortgages into FHA-insured loans. The first major refinancing program was FHASecure launched by the George W. Bush administration in August 2007. interest loans. Servicer participation was voluntary, but servicers avoided the program because in order for borrowers to qualify, the servicer had to write off 3% or 10%, as the case may be. Eventually, after only about 4,200 borrowers were eligible, the federal government closed the program at the end of 2008. In October 2008, the Bush administration launched another refinancing program called Home to Homeowners ("H4H"). The H4H was designed to refinance delinquent submarine borrowers into FHA insured mortgages. Again, under H4H, the servicers were required to first write off the principal, this time no more than 96.5% (originally 90%) of the appraised value. In addition, service companies were required to pay a 3% FHA down payment and waive prepayment penalties and late fees. Borrowers were required to share with the FHA any future resale value of the property. Like FHASecure, these terms were no more attractive to service personnel than foreclosure. The program was a complete failure: by May 2009, only one borrower had been refinanced into an H4H loan. These refinancing programs were a major

instance in which the Bush administration offered subsidies28 to help prevent foreclosures. However, both programs had an unfortunate track record, as they depended on the cooperation of service companies on unattractive terms. In both programs, the government unsuccessfully tried to achieve competing goals. For example, the government introduced write-off requirements to avoid rewarding creditors for overcharging loans. But with voluntary participation, the servicers were unwilling to swallow large and definite write-offs rather than bet on foreclosure. Similarly, the government forced servicers, not borrowers, to pay FHA premiums on the usually correct assumption that troubled borrowers didn't have that kind of cash. This huge bonus, as well as the mandatory waiver prepayment fees and late fees were an additional reason why servicers avoided refinancing H4H. The government had every reason to insist on these tough conditions. As home values continued to decline, refinancing submarine loans at full appraisal cost would eventually expose the government to unwanted losses while rewarding lenders and investors to create inflated loans. However, nothing required service companies and investors to swallow the required write-offs, and they refused to do so. Given the mortgage industry's resistance to reducing principal, any future government refinancing program will face a difficult choice. Alternatively, the government could force service companies to sell loans to the government at a mandatory discount and then refinance some or all of those loans into new FHA loans. This type of coercion did not find support. In 2009, the Federal Housing Finance Agency ("FHFA") introduced a new refinancing program called the Affordable Home Refinance Program ("HARP"). HARP targeted working borrowers Fannie Mae and Freddie Mac who didn't have enough capital to qualify for traditional refinancing (deRitis, 2010).

4 Practical Part

4.1 Seasonality Analysis

In order to properly address the financial crisis that happened in the European Union and to be more precise, in the Eurozone, which is the main focus of the author of the following thesis, it is first essential to take an insight into the development of two essential indicators that help analysts and researchers to assess almost any economic recession – real GDP and unemployment. Since the author's main focus is pointed not just on one country but on a particular region or to put it more correctly, an economic union, it is wise to say that countries belonging to the union of most highly developed economies are more likely to have similar structures of economies in terms of their value-added and stratification of economies into sectors. In the case of the European Union, the EU countries and to be more particular, countries of the Eurozone are the ones that produce goods with incredibly high value-added, almost one of the highest in the world and the main economic sector for them is the tertiary one, being the sector service. Yet, for some countries of the Eurozone, the industrial sector also presents significant importance. All in all, the idea of conducting a seasonality analysis for the GDP lies in understanding the average performance of the Eurozone's economic output.

On the other hand, the second variable chosen for the seasonality analysis is the one that is traditionally regarded as a periodic one, since unemployment itself can be split into numerous categories seasonal, structural, frictional, etc. Notably, the seasonal kind of unemployment is usually the one that tends to cause periodicity for the variable. All in all, seasonality analysis is an inevitable part of the analysis that will be performed by the author in his work since it will help to properly create trends and assess the degree of the negative effect of the Eurozone crisis on both variables.

The seasonality analysis itself presents a calculation of a seasonality factor that indicates percentual deviation relative to each selected period from the average, so this seasonality index can, later on, be adjusted to the trend estimated by the author. Apart from that, it is wise to mention the formula used by the author for the computation of the seasonality index:

$$Seasonality\ Index = \frac{Seasonal\ Average}{Grand\ Average} * 100 \quad (1)$$

When it comes to the particular case of the author's analysis, the author focuses on computing those indices for quarters with a total of 4 quarters per year.

4.1.1 GDP

In order to properly address the fluctuations and general development, as well as the seasonality of the Eurozone's GDP, it is essential to properly define the price level selected to measure the variable. In his analysis, the author considers the real GDP and to be more particular, the price level selected by him is expressed in millions of chained 2010 Euros not adjusted seasonally. A snapshot from the original dataset used for the author's calculation is presented below:

Figure 6, a part of the dataset used for the seasonality analysis for the GDP variable (1995-1998)

Date	Quarter	GDP, millions of 2010 chained Euros
1995-01-01	Q1	1810746.7000
1995-04-01	Q2	1848573.9000
1995-07-01	Q3	1826530.6000
1995-10-01	Q4	1908505.0000
1996-01-01	Q1	1830207.0000
1996-04-01	Q2	1875019.9000
1996-07-01	Q3	1865336.3000
1996-10-01	Q4	1943270.5000
1997-01-01	Q1	1847506.4000
1997-04-01	Q2	1932632.0000
1997-07-01	Q3	1917612.2000
1997-10-01	Q4	2013415.5000
1998-01-01	Q1	1929260.8000
1998-04-01	Q2	1982457.1000
1998-07-01	Q3	1974274.5000
1998-10-01	Q4	2055474.4000

Source: Fred, 2022

Consequently, the author applies the formula mentioned earlier and comes to the following seasonality factors corresponding to each quarter:

Figure 7, seasonal indices for quarterly GDP

Averages	
Q1	2262896.2963
Q2	2311386.8111
Q3	2310210.4519
Q4	2388039.9444
Grand Average	2318133.376

Seasonality index	
Q1	0.976171742
Q2	0.997089656
Q3	0.996582197
Q4	1.030156405

Source: own processing based on FRED data

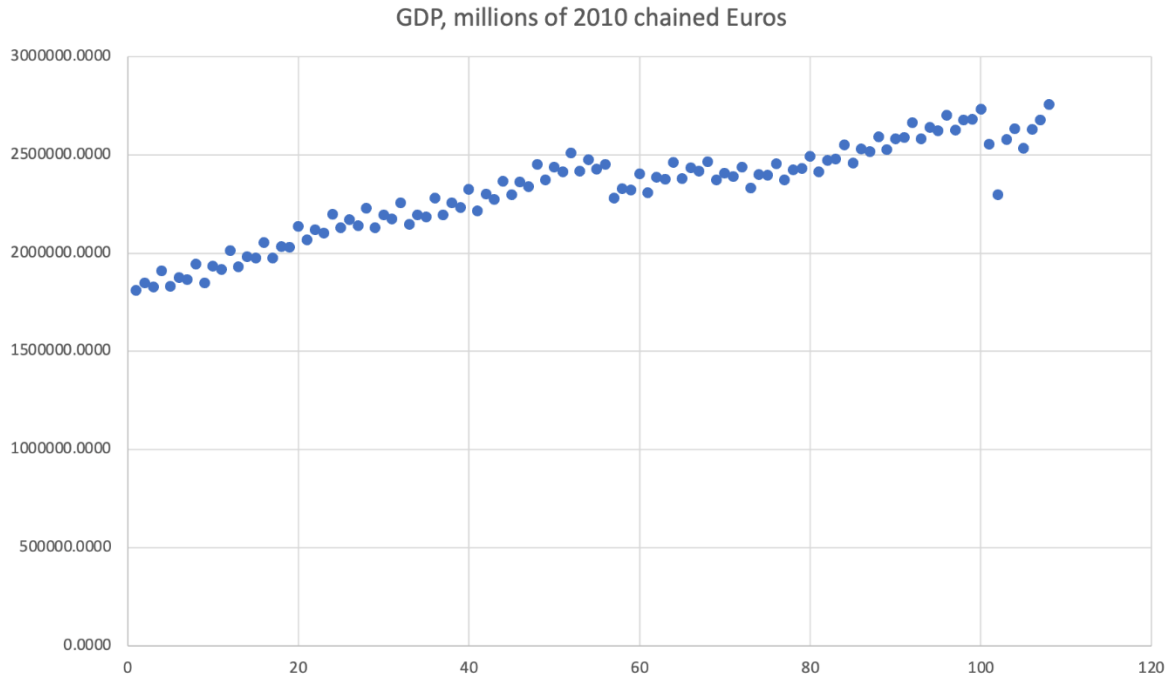
Based on the final output of the seasonality analysis for the GDP variable, the author achieved the following seasonal factors per each quarter:

- *The real output of the Eurozone economies in the first quarter trends to be 2.6% lower.*
- *The real output of the Eurozone economies in the second quarter trends to be 0.03% lower.*
- *The real output of the Eurozone economies in the third quarter trends to be 0.04% lower.*
- *The real output of the Eurozone economies in the fourth quarter tends to be 3.01% higher.*

Thus, the most productive quarter for the economy of the Eurozone is the fourth one with a real GDP higher at 3.01% on average, while the worst one is the first one with a 2.6% real output lower on average.

Scatterplot of the real GDP is presented below:

Figure 8, scatterplot of real GDP (1995-2021)



Source: own processing based on FRED Data

Clearly, the periodicity quantified by the author earlier is visible on the scatterplot of the variable.

4.1.2 Unemployment

Then, it is possible to continue to the second variable selected by the author for his analysis – unemployment in the Eurozone. The following picture presents a brief glimpse of the data used by the author for his analysis:

Figure 9, a part of the dataset used for the seasonality analysis for the unemployment variable (1995-1999)

Date	Quarter	Unemployment, %
1995-01-01	Q1	10.66666666666670
1995-04-01	Q2	10.60000000000000
1995-07-01	Q3	10.63333333333330
1995-10-01	Q4	10.70000000000000
1996-01-01	Q1	10.76666666666670
1996-04-01	Q2	10.80000000000000
1996-07-01	Q3	10.80000000000000
1996-10-01	Q4	10.80000000000000
1997-01-01	Q1	10.83333333333330
1997-04-01	Q2	10.83333333333330
1997-07-01	Q3	10.70000000000000
1997-10-01	Q4	10.63333333333330
1998-01-01	Q1	10.50000000000000
1998-04-01	Q2	10.56666666666670
1998-07-01	Q3	10.43333333333330
1998-10-01	Q4	10.26666666666670
1999-01-01	Q1	10.00000000000000
1999-04-01	Q2	9.86666666666667

Source: FRED, 2023

Consequently, the author computes seasonality indices for the variable of unemployment:

Figure 10, seasonal indices for quarterly GDP

Averages	
Q1	9.5778
Q2	9.5395
Q3	9.4864
Q4	9.4667
Grand Average	9.517592593

Seasonality index	
Q1	1.006
Q2	1.002
Q3	0.997
Q4	0.995

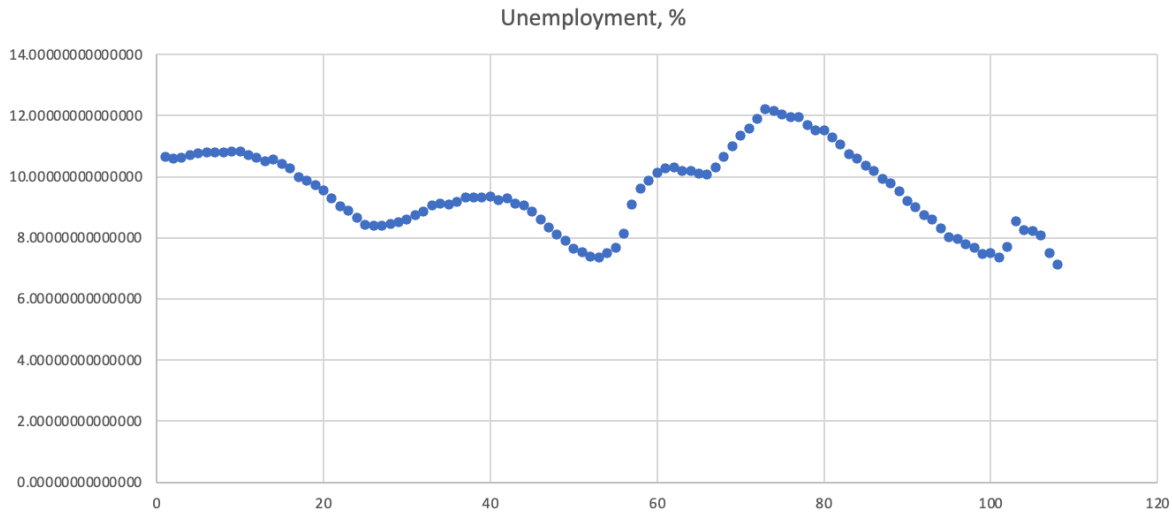
Source: own processing based on FRED data

Based on the final output of the seasonality analysis for the unemployment variable, the author achieved the following seasonal factors per each quarter:

- *Unemployment for Eurozone in the first quarter trends to be 0.006% higher in the first quarter.*
- *Unemployment for Eurozone in the second quarter trends to be 0.002% higher in the second quarter.*
- *Unemployment for Eurozone in the third quarter trends to be 0.003% lower in the third quarter.*
- *Unemployment for Eurozone in the fourth quarter tends to be 0.005% lower in the fourth quarter.*

The worst quarter for unemployment in the Eurozone is the first one with 0.006% higher values for unemployment, while the best one is the fourth one with 0.005% lower values for unemployment.

Figure 11, scatterplot of unemployment (1995-2021)



Source: own processing based on FRED data

Clearly, there is a presence of a periodical pattern in the unemployment variable, but it is pretty evident that compared to the first variable of the real GDP, the periodicity is less visible, for what the author was able to find evidence earlier.

4.2 Trend Analysis

After computing seasonality factors per each quarter, the author proceeds to the trend estimation, where the author will be aiming at creating trends that will have the following characteristics:

$\boldsymbol{y = ß0 + ß1t + \varepsilon i,}$ *where:*

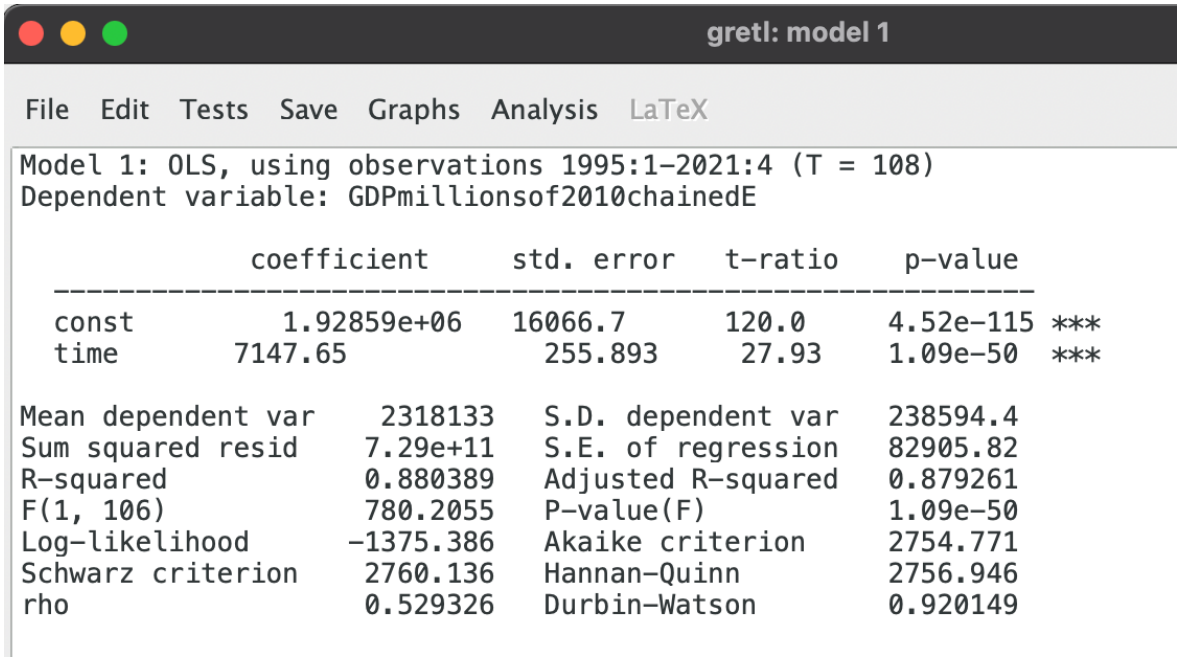
- *Y represents the variable for which the trend estimation is being performed (real GDP in the first case and unemployment in the second case)*
- $ß_0$ *represents the intercept term.*
- $ß_1$ *represents the quarterly increment.*
- *T represents the time vector of 1 quarter.*
- S_i *represents the seasonality factor calculated earlier.*
- E_i *represents irregularity or the error term.*

Estimation is performed with the help of Gretl based on the same time intervals from the first chapter of the practical part – from the 1st of January 1995 until the 1st of October 2021.

4.2.1 GDP

The following figures present the parameters for the first trend describing the development of the real GDP:

Figure 12, parameters of the first trend



Source: own processing

Based on the estimated parameters, the author is able to conclude the following trend:

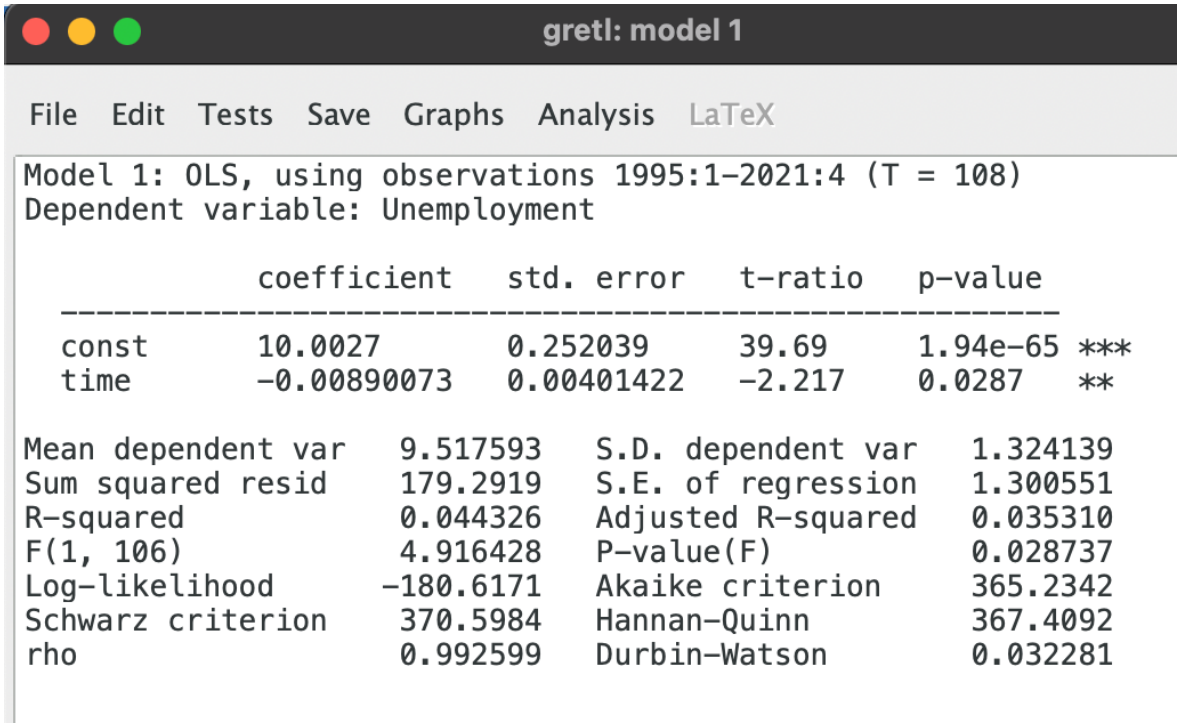
$$\boldsymbol{y = 1\,920\,859 + 7\,147.65t + \varepsilon i}$$

Hence, it is possible to come to the conclusion that the real GDP of the Eurozone was increasing by 7 147.65 million 2010 chained Euros. The accuracy of the model, according to the coefficient of determination is 0.879 or 87.9% of the variation in the real GDP is explained by the trend. Further on, this trend will be used by the author to estimate the effect of the Eurozone crisis on the economic performance of the Eurozone.

4.2.2 Unemployment

Then, the author goes for Gretl once more and he is able to estimate the parameters available in the following figure:

Figure 13, parameters for the second trend



Source: own processing

Based on the estimated parameters, the author is able to conclude the following trend:

$$\boldsymbol{y = 10.0027 - 0.0089t + \varepsilon i}$$

According to the parameters of the trend, the unemployment rate for the Eurozone was diminishing by 0.0089% per quarter, so the general tendency was a downward-pointed curve, which is generally good. Yet, the quality of the model is poor with just 3.53% of the variation in the dependent variable explained by the model.

4.3 Linear Regression Analysis

Figure 14, dataset used for linear trend estimation

Date	GDP in trillions of chained 2010 EUR	Bank Lending weighted average rate	Government deficit, % to GDP	Public debt, % to GDP	Unemployment, %
Q1 2010	2.355	2.98	-6.643	82.03	22.16666667
Q2 2010	2.378	3.18	-6.463	83.317	22.26666667
Q3 2010	2.388	2.72	-6.59	83.398	21.9
Q4 2010	2.402	3.11	-6.28	85.741	21.76666667
Q1 2011	2.423	2.99	-5.606	86.419	21.73333333
Q2 2011	2.423	2.97	-5.258	87.189	21.63333333
Q3 2011	2.427	2.92	-4.518	87.102	21.9
Q4 2011	2.416	2.26	-4.246	87.639	22.43333333
Q1 2012	2.411	2.5	-4.13	88.44	23.23333333
Q2 2012	2.405	3.07	-4.066	90.044	23.73333333
Q3 2012	2.402	2.83	-3.885	90.106	24.33333333
Q4 2012	2.392	3.01	-3.802	91.05	24.96666667
Q1 2013	2.384	3.1	-3.833	93.003	25.16666667
Q2 2013	2.396	3.05	-3.593	93.942	24.83333333
Q3 2013	2.403	3.08	-3.504	93.227	24.86666667
Q4 2013	2.410	3.12	-3.071	93.041	24.83333333
Q1 2014	2.420	3.17	-2.81	93.921	24.9
Q2 2014	2.425	3.32	-2.676	94.426	24.16666667
Q3 2014	2.437	3.21	-2.559	93.646	23.93333333
Q4 2014	2.446	3.16	-2.488	93.203	23.73333333
Q1 2015	2.461	3.15	-2.398	93.934	23.33333333
Q2 2015	2.473	3.44	-2.33	93.21	22.9
Q3 2015	2.483	3.16	-2.097	92.453	22.66666667
Q4 2015	2.494	2.99	-1.987	91.302	22.53333333
Q1 2016	2.508	3.23	-1.832	92.498	22

Source: FRED, 2022 and The World Bank, 2022

For the linear regression analysis, the author considers a slightly changed dataset that covers a slightly different time period, compared to the first two. Thus, the author creates a linear regression for the time series quarterly data from the 1st quarter of 2010 until the 4th quarter of 2021 and the reason for switching to another dataset lies in constraints created by the lack of relevant data available for all four variables incorporated into the model:

$$\boldsymbol{yt = ß0 + ß1X1t + ß2X2t + ß3X3t + ß4X4t + \varepsilon i}, \text{ where:} \quad (2)$$

- *Y represents the real GDP of the Eurozone in trillion 2010 chained Euros.*
- *$ß_0$ represents the intercept term.*
- *$ß_{1,2,3,4}$ represent parameters of independent variables.*
- *T represents the time vector representing 1 quarter.*
- *E_i represents irregularity or the error term.*
- *X_1 represents the bank lending weighted average rate.*
- *X_2 represents the government deficit expressed in percentual terms to nominal GDP.*
- *X_3 represents public debt expressed in percentual terms to nominal GDP.*
- *X_4 represents unemployment in %*

Apart from estimating the linear regression, the author also verifies it according to fundamentals of econometric estimation that require models to have the following assumptions followed:

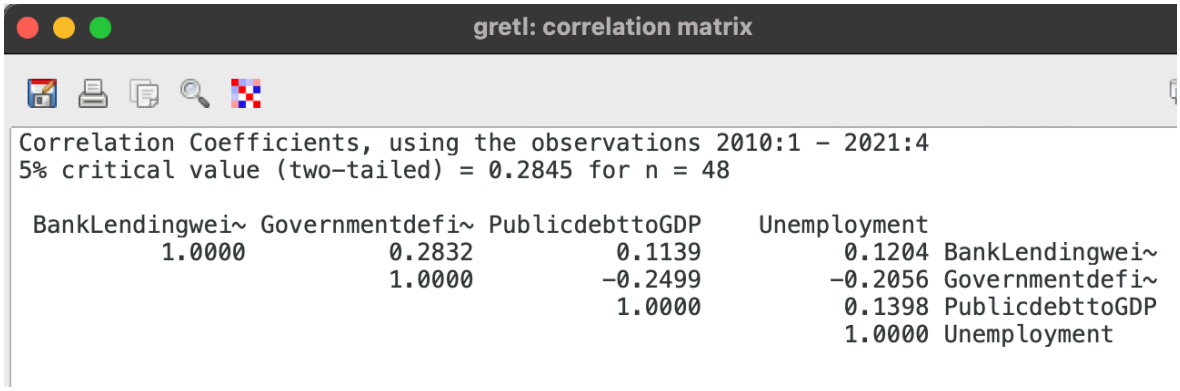
- *Absence of multicollinearity, i.e., high collinearity between independent variables. For the analysis, the author sets 0.8 as the ceiling.*
- *Absence of autocorrelation, i.e., repeated residuals over periods of time.*
- *Absence of heteroscedasticity, i.e., dependent or biased residuals.*
- *Presence of normality, i.e., residuals distributed according to the normal distribution.*
- *Linear parameters.*

After verifying the model and testing its compliance with the fundamentals listed above, the author will conclude whether the model created by him can be categorized as BLUE – Best Linear Unbiased Estimator.

In addition to that, the author also verifies the statistical significance of the parameters of four regressors.

The first step of linear estimation is to check the presence of multicollinearity, which will be done with the help of a correlation matrix created in Gretl:

Figure 15, correlation matrix



Source: own processing

Based on the correlation matrix available above, it can be concluded that there is no multicollinearity in this dataset which leads to the failure of rejection of the assumption about no multicollinearity, which is surely enough a good start for the linear regression analysis. After the correlation check, the author will proceed to the estimation of linear parameters for the model.

Figure 16, estimated parameters of the model

gretl: model 1

File Edit Tests Save Graphs Analysis LaTeX

```
Model 1: OLS, using observations 2010:1-2021:4 (T = 48)
Dependent variable: GDPintrillionsofchained201

                     coefficient  std. error  t-ratio  p-value
  ---------------------------------------------------------------
  const                2.57855     0.168865     15.27   5.65e-19 ***
  BankLendingweigh~    0.0666285   0.0336110     1.982  0.0539   *
  Governmentdefici~    0.0129184   0.00358688    3.602  0.0008   ***
  PublicdebttoGDP      0.00449774  0.00173283    2.596  0.0129   **
  Unemployment        -0.0306502   0.00236420  -12.96   1.88e-16 ***

Mean dependent var   2.509038   S.D. dependent var   0.111622
Sum squared resid    0.096885   S.E. of regression   0.047467
R-squared            0.834552   Adjusted R-squared   0.819161
F(4, 43)             54.22504   P-value(F)           3.01e-16
Log-likelihood       80.82135   Akaike criterion    -151.6427
Schwarz criterion   -142.2867   Hannan-Quinn        -148.1070
rho                  0.075356   Durbin-Watson        1.841115
```

Source: own processing

Based on the parameters estimated using the OLS method in Gretl, the author created the following model:

$$\boldsymbol{yt = 2.57 + 0.06X1t + 0.01X2t + 0.00449X3t - 0.03X4t + \varepsilon i}$$

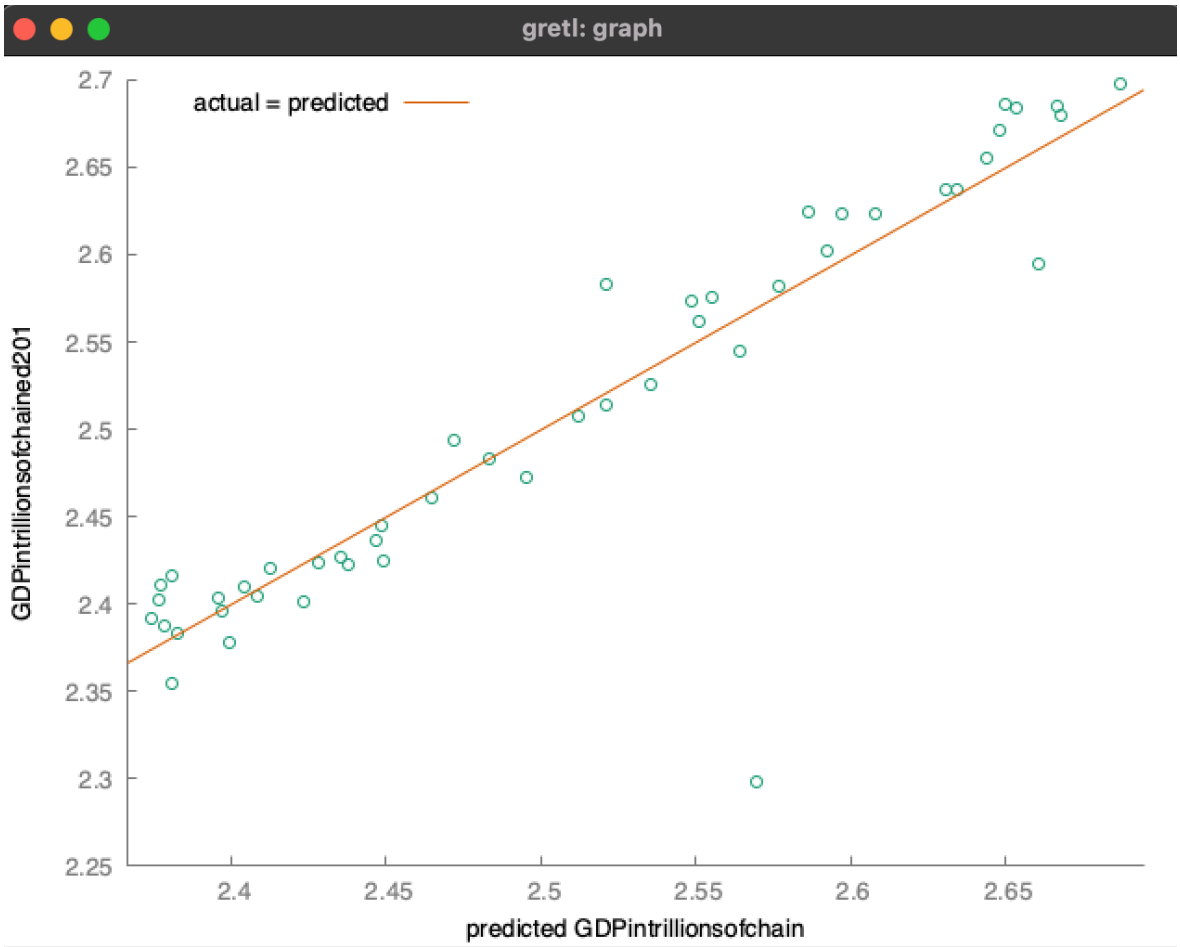
Based on that, the following interpretation can be done:

- *Whenever the bank lending weighted average rate increases by 1%, the real GDP increases by 0.066 trillion 2010 chained Euros.*
- *Whenever the government deficit increases by 1% of GDP, the real GDP increases by 0.0129 trillion 2010 chained Euros.*

- *Whenever public debt increases by 1% of GDP, the real GDP increases by 0.0044 trillion 2010 chained Euros.*
- *Whenever unemployment increases by 1% the real GDP decreases by 0.03 trillion 2010 chained Euros.*

All in all, the very first aspect that comes to the author's mind is the fact that Eurozone countries have adjusted to living on debt so that they can achieve long-term economic growth at the expense of ever-accumulating public debt, which is rather interesting. Yet, further reflections will be done by the author in the **Results and Discussion** chapter. Also, the author offers a scatterplot that compares the fitted values with the observed ones:

Figure 17, actual vs. predicted scatterplot



Source: own processing

Now, the author will first interpret the statistical parameters of the model by starting with the adjusted coefficient of determination, which is equal to 0.819 technically meaning that 81.9% of the variation in the real GDP of the Eurozone is explained by the set of 5

regressors selected by the author for the analysis, which is not a perfect result, but a relatively good one.

According to the F test, the model is significant at the null hypothesis about statistical insignificance being rejected at alpha equal to 5% ($0.001 < 0.05$).

According to t-tests for individual variables, the author can conclude that on the level of significance level equal to 5%, all variables are considered to have a significance impact on the dependent variable apart from the first variable – bank weighted average lending rate, which could have been classified as significant if the author has selected a slightly higher significance level. From the statistical point of view, the model is really good.

From the economic point of view, the author is still missing evidence in order to categorize the model as BLUE, so the author conducts a series of econometric tests in the same software, whose output is presented below:

Figure 18, econometric testing

```
White's test for heteroskedasticity -
  Null hypothesis: heteroskedasticity not present
  Test statistic: LM = 26.2104
  with p-value = P(Chi-square(14) > 26.2104) = 0.024337

Test for normality of residual -
  Null hypothesis: error is normally distributed
  Test statistic: Chi-square(2) = 215.755
  with p-value = 1.4105e-47

LM test for autocorrelation up to order 4 -
  Null hypothesis: no autocorrelation
  Test statistic: LMF = 0.730236
  with p-value = P(F(4, 39) > 0.730236) = 0.576805
```

Source: own processing

According to the output of the econometric testing, the model cannot be classified as BLUE because there is a presence of heteroscedasticity and an absence of normality, which

is not good. Yet, the model can still be used for making general conclusions despite missing out on those aspects.

The final step of the linear regression analysis will be a calculation of elasticities for each variable on the selected time period by calculating averages for all variables and dependent fitted as well as observed variables.

Figure 19, estimated elasticities

Bank Lending weighted average rate	Government deficit, % to GDP	Public debt, % to GDP	Unemployment, %
0.07229863	-0.012783453	0.161893277	-0.248269138

Source: own processing

Based on the elasticity computation, the author is able to conclude that the variable that has the biggest effect on the real GDP of the Eurozone is the unemployment rate, where a 1% increase in that variable caused a 0.24% decrease in the number of real GDP in 2010 chained Euros for Eurozone on the time interval between the first quarter of 2010 until the fourth quarter of 2021.

4.4 Model Application

Now, the author will estimate the potential effect of the Eurozone crisis on the real GDP of the zone using two trends estimated by the author. The results of linear regression analysis will be elaborated on later on in the **Results and Discussion** chapter.

One of the easiest ways to grasp the effect of the Eurozone crisis that happened at the beginning of 2009 and continued until approximately mid-2012, would be estimating fitted values for the real GDP variable for the selected time period and comparing it with the observed values affected by the crisis and then finding the residual value that will be classified as a projected effect of the crisis.

The following chart contains a glimpse into the comparison of observed versus fitted trend values, seasonally adjusted for the real GDP variable:

Figure 20, calculation of residual value

Date	Time Vector	Quarter	Observed	Fitted	Fitted adjusted	Residual
1995-01-01	1.00	Q1	1810746.7000	1928006.65	1973947.689	-163200.9894
1995-04-01	2.00	Q2	1848573.9000	1935154.3	1940786.264	-92212.3641
1995-07-01	3.00	Q3	1826530.6000	1942301.95	1948940.356	-122409.7562
1995-10-01	4.00	Q4	1908505.0000	1949449.6	1890661.209	17843.7913
1996-01-01	5.00	Q1	1830207.0000	1956597.25	2003219.554	-173012.5536
1996-04-01	6.00	Q2	1875019.9000	1963744.9	1969460.073	-94440.1726
1996-07-01	7.00	Q3	1865336.3000	1970892.55	1977628.673	-112292.3732
1996-10-01	8.00	Q4	1943270.5000	1978040.2	1918389.619	24880.8810
1997-01-01	9.00	Q1	1847506.4000	1985187.85	2032491.418	-184985.0178
1997-04-01	10.00	Q2	1932632.0000	1992335.5	1998133.881	-65501.8810
1997-07-01	11.00	Q3	1917612.2000	1999483.15	2005302.333	-87690.1331
1997-10-01	12.00	Q4	2013415.5000	2006630.8	2013489.07	-73.5695
1998-01-01	13.00	Q1	1929260.8000	2013778.45	1953050.132	-23789.3318
1998-04-01	14.00	Q2	1982457.1000	2020926.1	2069081.248	-86624.1480
1998-07-01	15.00	Q3	1974274.5000	2028073.75	2033976.142	-59701.6416
1998-10-01	16.00	Q4	2055474.4000	2035221.4	2042177.387	13297.0134

Source: own processing

Consequently, the author computes the average residual before the crisis, during the crisis and after the crisis:

Figure 21, average residual per period

Average residual before the Eurocrisis, millions	Average residual during the Eurocrisis, millions	Average residual after the Eurocrisis, millions
€ 22,678.91	*€ 4,220.88*	*-€ 30,064.60*

Source: own processing

According to the trend estimated by the author for the real GDP variable and comparison of the adjusted fitted with the observed (observed minus fitted), it becomes obvious that according to the trend covering the whole period, the economy of the EU was somewhat performing better than expected in the years predeceasing the crisis and during the crisis (yet, slightly), but the economy of the zone was performing significantly worse after the crisis than before. What is more, after additionally constructing trends for time periods before, during the crisis and after the crisis, it strikes as obvious that the crisis did really stop the Eurozone's economy from continuing its quick and rapid expansion – charts are available in the appendix of the following thesis. However, the most important piece of information for the analysis is the quarterly increment – before the crisis, it was equal to 11 749 million euros in real output per quarter, during the crisis it became 7 721.7 million euros and after the crisis, it was 7 661.1, which is actually darkened by another crisis – the coronavirus pandemic, which took even a bigger toll than the Great Recession and subsequent Eurozone debt crisis.

5 Results and Discussion

To begin the process of expanding on the findings of the study, it is prudent to state that whenever discussing financial crises, there is always an exit from them. Generally speaking, the degree to which this exit is effective and the time period of exiting from any crisis invariably depend on the strategy that was selected by a particular government. This is because the degree to which this exit is effective and the time period of exiting from any crisis invariably depend on the strategy that was selected. The real crisis in the Eurozone lasted from approximately the first quarter of 2009 until the second quarter of 2012, when the economic growth was halted and unemployment started to increase sharply reaching two-digit values. These values are somewhat comparable to the values that existed during the early stages of the European Union – the middle of the 1990s. As the author has observed and evaluated, the real crisis in the Eurozone lasted for approximately three years. Because of this, it is now feasible to claim that the economic downturn in the EU lasted for almost three years. This suggests that the actions made by the administration of the EU were either insufficient or that the crisis itself was so unprecedented that there was no way to resolve it swiftly. According to the author's analysis as well as the author's own reflections, the author adheres to the second option, where he believes that the primary cause of such a long period of fighting the crisis is a lack of any significant expansion or quick recovery. This belief is based on the author's belief that the main cause of such a long period of fighting the crisis is without Hall, 2012 comes to the same conclusion as the author, believing that the main cause of the financial crisis in the Eurozone happening right after the Great Recession is also the inability of European financial institutions and most notably, banks, to come to grips with the number of problems that they had to address during the ongoing crisis. The author believes that the main cause of the financial crisis in the Eurozone happening right after the Great Recession is also the inability of European financial institutions to come to grips with the number of problems that they had to According to Frieden (2017) and Beker (2014), the crisis itself, despite having an obvious series of negative consequences, helped to stabilize and strengthen the European economy by creating and developing a series of initiatives, such as the Banking Union and setting up safe financial conditions for the environment, where an economic expansion would be made possible. This occurred despite the fact that the crisis itself had an obvious series of negative consequences. The author of this diploma thesis is in agreement with the aforementioned author, for which he found a plethora of evidence related

primarily to the performance of the economy of the Eurozone after the crisis – the real GDP started to increase rather rapidly with just one major contretemps in 2020-2021 caused by the pandemic of the coronavirus, which can be observed in the trend analysis of the author. In other words, the author of this diploma thesis believes that the author of the aforementioned article is correct Aside from this, it is still prudent to assert that the coronavirus pandemic could not have been stopped in any way, shape, or form since it was caused by a component that was not directly related to economic factors. However, the author believes that the actions taken by the European Union during and after the economic crisis of the Eurozone lead to better management of the next major crisis, which is the pandemic coronavirus. Prior to this major crisis, the financial situation of the Eurozone and the whole European Union was more or less stable, with the exception of just a few states that have serious problems with their debts.

Then, continuing on with the management and fighting with the crisis itself, it is wise to understand that as the author identified in his linear regression estimation, the most important factor influencing the real GDP of the Eurozone is actually the unemployment rate, whose effect is totaling approximately 0.24% less in the number of real GDP for each one percent increase in unemployment. This is something that should be understood because it is wise to understand that the most important factor influencing the real GDP of the Eurozone is actually the unemployment rate. As the author mentioned earlier, one of the most significant issues relating to the analyzed crisis was a surge in unemployment, which was one of the primary factors explaining the inability of the Eurozone to deal with the problem and enter into the expansionary stage, as a high number of people were unable to find work and continue on with the production of output for the economies of the Eurozone. This was one of the main reasons why the Eurozone was unable to tackle the problem and enter into the expansionary stage. However, it is of the utmost importance to be aware of the fact that unemployment would never have reached such high levels if it weren't for the extremely high interest rates that were implemented in the Eurozone immediately after the devastating effects of the Great Recession were felt across almost all economies in the European Union and the Eurozone specifically. It should come as no surprise that an increase in interest rates is expected to be a consequence of the Great Recession. During this time, it became apparent that banks whose integrity was not normally called into question were building their financial empires on speculative assets, or to put it another way, rubbish assets,

as the phenomenon is referred to in Stiglitz, 2010's article. As a consequence of this, it was anticipated that surroundings with a greater risk would involve a higher risk, for which depositors should be paid with higher interest rates. Yet, the breakdown of the banking system and the gradual increase in interest rates, quite logically leads to an increase in the rate of unemployment. This is because businesses were sometimes unable to offer themselves to afford high-interest rates, so people were quite often left without jobs. In addition to this, a bunch of startups was destined to never be launched due to businessmen's inability to cope with just interest rates. As a result, the author is of the opinion that in spite of the fact that it took a relatively long time to fight against the crisis and its consequences, the Eurozone, European Institutions, and Central Banks did an excellent job because they addressed the most vulnerable component that was responsible for the economy reaching its lowest point, which was banks. Although the European Union and the economies of the Eurozone can't be criticized for the response they gave to the ongoing crisis, as Nolke (2016) points out, the European Union itself can be criticized, as can the financial situation in terms of control and verification of banks' operations. However, the Eurozone economies cannot be criticized for their response. The author believes that the foundation for relatively peaceful economic times in the EU and Eurozone from 2012 until 2020 was laid back in the days when all European institutions were fighting the crisis. He agrees with the statement that was made by another academic and he believes that this foundation was laid back in the days when all European institutions were fighting the crisis.

In addition to this, the author is of the opinion that the cyclical nature of the economy in the Eurozone may have been another factor that contributed to the difficulty of combating the crisis and mitigating its effects. There is evidently a lagged effect of the crisis, which somewhat recalls what occurred during the times of the Great Depression when European economies were hit shortly after the start of the crisis in the United States. According to authors cited throughout the text, the crisis began at the beginning of 2009, which technically means the first quarter of 2009. This is in contrast to the Great Recession itself, which began slightly earlier in 2007-2008 in the United States. Nevertheless, the lagged effect, according to macroeconomic analysis, kicked in during the first quarter of 2009. This is technically the quarter with the worst performance for the economies of the Eurozone, according to the seasonality analysis carried out by the author. According to this analysis, the real GDP for

the first quarter tends to be 2.4% lower than average figures. The crisis itself came out during the quarter that had the weakest performance, which considerably aggravated the situation with the economic production and unemployment and delayed until the fourth quarter the ability of the Eurozone economy to respond rapidly with their economic initiatives. When looking back at the first year of the debt crisis, it is still apparent that the fourth quarter of 2009 was the one in which the Eurozone outperformed the rest of the year with values that were significantly higher than in the first, second, and third quarters of the year. This can be seen by comparing the values of the first, second, and third quarters to the values of the fourth quarter. Accordingly, the author is of the opinion that traditionally high economic performance in the fourth quarter is one of the factors that did not allow those economies to come to terms with the crisis any faster. This is due to the fact that the economy had underperformed for three quarters in a row, with the first quarter having terrible figures, and then outperformed in the fourth quarter with 3% higher real GDP than average figures. Borisov (2022) who comes to the conclusion that the Eurozone is a somewhat particular economic environment, where seasonality plays a crucial role when setting long-term economic objectives and strategies, is where the author finds evidence for seasonality. Borisov (2022) also comes to the conclusion that the Eurozone is a somewhat particular economic environment.

6 Conclusion

In conclusion, the author is in a position to characterize the response of the Eurozone to the financial crisis that occurred in 2009 and subsequent years based on the pertinent statistical, econometric, and economic analysis that he performed himself and compared with the analyses performed by other authors researching the same topic:

The rise in unemployment, which has been shown to have the most significant cumulative effect on the Eurozone's real GDP, was one of the primary contributors to the economic crisis that hit the Eurozone in 2009 and the years that followed. This was also one of the most obvious reasons for the crisis. According to the author's findings, a one percent rise in unemployment results in a reduction of 0.24% in the real GDP of the countries that are part of the Eurozone. This is a very high figure. As a result, when the European Central Bank had to raise the interest rate and when banks were no longer considered to be safe havens, this increase in interest rate had a negative impact on firms and businessmen. Some of these businessmen were forced to close their firms, and others were forced to postpone their plans for expansion. This culminated in an increase in the rate of unemployment throughout the Eurozone, which ultimately prevented the economy from expanding further.

When compared to crises caused by external forces, such as the pandemic of the coronavirus that broke out in 2020 and partial recovery was made possible by the economies of the EU even in 2021 under a series of ongoing restrictions and bans, crises caused by purely economic reasons are more difficult to overcome than those caused by crises caused by external forces. Another reason behind the inability to tackle the crisis relatively quickly comes from the nature of the crisis. Due to the fact that the crisis that occurred in 2009 was an economic one, it would have been impossible to combat the crisis without first resolving a series of structural problems, the majority of which were related to banks. As a result, the long recovery period and the period of stagnation were both caused by the need for structural changes, such as the creation of the Banking Union and other financial regulations, which ensured peaceful and relatively convenient conditions for the economic expansion that occurred for almost 8 years – right during this time.

The author believes that one of the fundamental reasons for such a long period of fighting and stagnation for the Eurozone was the bad timing of the lagged effect of the Great Recession on the Eurozone. It is estimated that the lagged effect began in the first quarter of 2009, which was the worst-performing quarter for the economies of the Eurozone, with approximately 2.4% less output produced in the first quarter. Finally, the author believes that one of the fundamental reasons for such a long period of fighting and stagnation for the Eurozone was cyclical nature of the economy in the Eurozone. Aside from that, the author is of the opinion that the seasonality pattern of the Eurozone, in which the group of countries underperforms in the first three quarters and then significantly overperforms in the fourth quarter, is not a healthy pattern and it has complicated the fight against the ongoing financial crisis.

In the end, the author is of the opinion that the passage of time has shown that the aforementioned crises only serve to make the Eurozone and the EU stronger by preparing them for other crises and strengthening the economies of the member states and nations that use the Euro. The author suggests undertaking a similar research on the economic downturn that was brought on by the pandemic of coronavirus as well as the economic downturn that was brought on by the commencement of the Russian-Ukrainian war in 2022.

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8 Appendix

Figure 22, database for the real GDP

Date	Quarter	GDP, millions of 2010 chained Euros
1995-01-01	Q1	1810746.7000
1995-04-01	Q2	1848573.9000
1995-07-01	Q3	1826530.6000
1995-10-01	Q4	1908505.0000
1996-01-01	Q1	1830207.0000
1996-04-01	Q2	1875019.9000
1996-07-01	Q3	1865336.3000
1996-10-01	Q4	1943270.5000
1997-01-01	Q1	1847506.4000
1997-04-01	Q2	1932632.0000
1997-07-01	Q3	1917612.2000
1997-10-01	Q4	2013415.5000
1998-01-01	Q1	1929260.8000
1998-04-01	Q2	1982457.1000
1998-07-01	Q3	1974274.5000
1998-10-01	Q4	2055474.4000
1999-01-01	Q1	1973317.0000
1999-04-01	Q2	2033558.8000
1999-07-01	Q3	2029636.5000
1999-10-01	Q4	2137654.2000
2000-01-01	Q1	2066453.3000
2000-04-01	Q2	2120238.0000
2000-07-01	Q3	2101037.2000
2000-10-01	Q4	2198618.7000
2001-01-01	Q1	2130045.1000
2001-04-01	Q2	2169909.1000
2001-07-01	Q3	2140791.1000
2001-10-01	Q4	2229774.2000
2002-01-01	Q1	2128470.8000
2002-04-01	Q2	2192775.3000
2002-07-01	Q3	2173122.8000
2002-10-01	Q4	2254786.7000
2003-01-01	Q1	2147319.5000
2003-04-01	Q2	2195825.9000
2003-07-01	Q3	2183493.4000
2003-10-01	Q4	2279046.6000
2004-01-01	Q1	2193794.1000
2004-04-01	Q2	2256032.6000
2004-07-01	Q3	2231278.0000
2004-10-01	Q4	2325124.6000
2005-01-01	Q1	2215128.1000
2005-04-01	Q2	2300968.6000
2005-07-01	Q3	2272483.0000
2005-10-01	Q4	2367379.0000
2006-01-01	Q1	2296175.6000

2006-04-01	Q2	2363339.7000
2006-07-01	Q3	2339967.0000
2006-10-01	Q4	2451272.6000
2007-01-01	Q1	2373433.4000
2007-04-01	Q2	2437422.7000
2007-07-01	Q3	2412325.6000
2007-10-01	Q4	2509869.8000
2008-01-01	Q1	2416311.3000
2008-04-01	Q2	2477453.0000
2008-07-01	Q3	2426322.2000
2008-10-01	Q4	2453187.0000
2009-01-01	Q1	2278834.1000
2009-04-01	Q2	2329285.5000
2009-07-01	Q3	2322362.8000
2009-10-01	Q4	2403495.7000
2010-01-01	Q1	2306810.3000
2010-04-01	Q2	2388284.8000
2010-07-01	Q3	2377976.8000
2010-10-01	Q4	2460464.6000
2011-01-01	Q1	2378409.8000
2011-04-01	Q2	2434100.7000
2011-07-01	Q3	2416209.6000
2011-10-01	Q4	2465405.3000
2012-01-01	Q1	2373958.7000
2012-04-01	Q2	2407214.4000
2012-07-01	Q3	2388639.0000
2012-10-01	Q4	2439598.7000
2013-01-01	Q1	2332346.0000
2013-04-01	Q2	2401874.0000
2013-07-01	Q3	2398378.2000
2013-10-01	Q4	2454473.7000
2014-01-01	Q1	2371724.4000
2014-04-01	Q2	2425292.9000
2014-07-01	Q3	2431019.4000
2014-10-01	Q4	2492280.6000
2015-01-01	Q1	2414114.6000
2015-04-01	Q2	2473526.1000
2015-07-01	Q3	2479534.2000
2015-10-01	Q4	2549576.2000
2016-01-01	Q1	2459309.0000
2016-04-01	Q2	2531870.5000
2016-07-01	Q3	2517952.8000
2016-10-01	Q4	2592469.3000
2017-01-01	Q1	2528371.3000
2017-04-01	Q2	2583621.4000
2017-07-01	Q3	2588159.2000
2017-10-01	Q4	2665835.5000
2018-01-01	Q1	2581004.9000
2018-04-01	Q2	2641942.8000
2018-07-01	Q3	2624069.2000

2018-10-01	Q4	2703677.5000
2019-01-01	Q1	2625472.9000
2019-04-01	Q2	2678707.2000
2019-07-01	Q3	2680185.1000
2019-10-01	Q4	2733274.1000
2020-01-01	Q1	2555761.1000
2020-04-01	Q2	2296638.0000
2020-07-01	Q3	2578006.0000
2020-10-01	Q4	2633678.5000
2021-01-01	Q1	2533913.8000
2021-04-01	Q2	2628879.0000
2021-07-01	Q3	2678979.5000
2021-10-01	Q4	2755470.0000

Source: FRED, 2023

Figure 23, database for unemployment

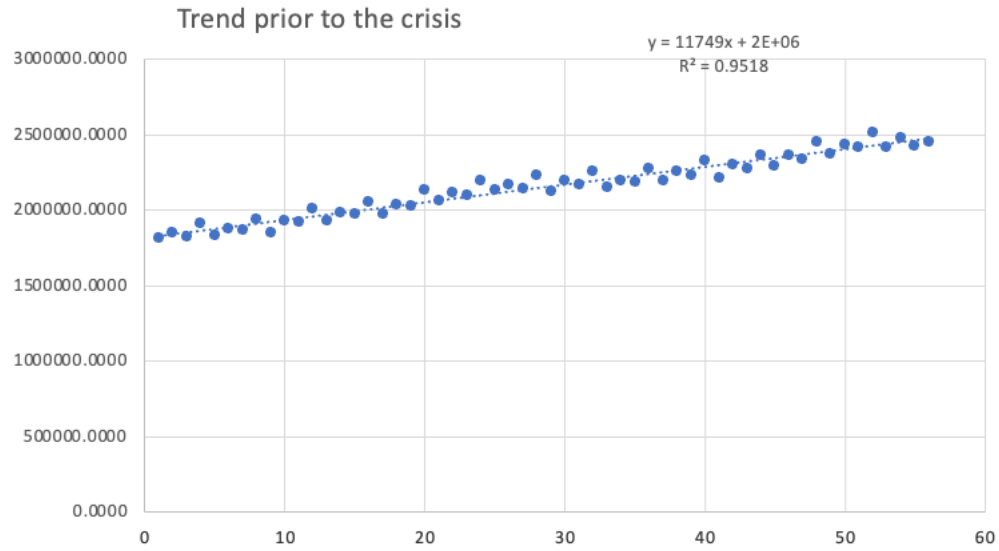
Date	Quarter	Unemployment, %
1995-01-01	Q1	10.66666666666670
1995-04-01	Q2	10.60000000000000
1995-07-01	Q3	10.63333333333330
1995-10-01	Q4	10.70000000000000
1996-01-01	Q1	10.76666666666670
1996-04-01	Q2	10.80000000000000
1996-07-01	Q3	10.80000000000000
1996-10-01	Q4	10.80000000000000
1997-01-01	Q1	10.83333333333330
1997-04-01	Q2	10.83333333333330
1997-07-01	Q3	10.70000000000000
1997-10-01	Q4	10.63333333333330
1998-01-01	Q1	10.50000000000000
1998-04-01	Q2	10.56666666666670
1998-07-01	Q3	10.43333333333330
1998-10-01	Q4	10.26666666666670
1999-01-01	Q1	10.00000000000000
1999-04-01	Q2	9.86666666666667
1999-07-01	Q3	9.73333333333333
1999-10-01	Q4	9.56666666666667
2000-01-01	Q1	9.30000000000000
2000-04-01	Q2	9.03333333333333
2000-07-01	Q3	8.90000000000000
2000-10-01	Q4	8.66666666666667
2001-01-01	Q1	8.43333333333333
2001-04-01	Q2	8.40000000000000
2001-07-01	Q3	8.40000000000000
2001-10-01	Q4	8.46666666666667
2002-01-01	Q1	8.50000000000000
2002-04-01	Q2	8.60000000000000
2002-07-01	Q3	8.73333333333333

2002-10-01	Q4	8.86666666666667
2003-01-01	Q1	9.06666666666667
2003-04-01	Q2	9.13333333333333
2003-07-01	Q3	9.10000000000000
2003-10-01	Q4	9.16666666666667
2004-01-01	Q1	9.33333333333333
2004-04-01	Q2	9.33333333333333
2004-07-01	Q3	9.33333333333333
2004-10-01	Q4	9.36666666666667
2005-01-01	Q1	9.23333333333333
2005-04-01	Q2	9.30000000000000
2005-07-01	Q3	9.13333333333333
2005-10-01	Q4	9.06666666666667
2006-01-01	Q1	8.86666666666667
2006-04-01	Q2	8.60000000000000
2006-07-01	Q3	8.33333333333333
2006-10-01	Q4	8.10000000000000
2007-01-01	Q1	7.90000000000000
2007-04-01	Q2	7.63333333333333
2007-07-01	Q3	7.53333333333333
2007-10-01	Q4	7.40000000000000
2008-01-01	Q1	7.36666666666667
2008-04-01	Q2	7.50000000000000
2008-07-01	Q3	7.66666666666667
2008-10-01	Q4	8.13333333333333
2009-01-01	Q1	9.10000000000000
2009-04-01	Q2	9.60000000000000
2009-07-01	Q3	9.86666666666667
2009-10-01	Q4	10.13333333333330
2010-01-01	Q1	10.26666666666670
2010-04-01	Q2	10.30000000000000
2010-07-01	Q3	10.20000000000000
2010-10-01	Q4	10.20000000000000
2011-01-01	Q1	10.10000000000000
2011-04-01	Q2	10.06666666666670
2011-07-01	Q3	10.30000000000000
2011-10-01	Q4	10.66666666666670
2012-01-01	Q1	11.00000000000000
2012-04-01	Q2	11.33333333333330
2012-07-01	Q3	11.56666666666670
2012-10-01	Q4	11.90000000000000
2013-01-01	Q1	12.20000000000000
2013-04-01	Q2	12.16666666666670
2013-07-01	Q3	12.03333333333330
2013-10-01	Q4	11.96666666666670
2014-01-01	Q1	11.96666666666670
2014-04-01	Q2	11.70000000000000
2014-07-01	Q3	11.53333333333330
2014-10-01	Q4	11.53333333333330
2015-01-01	Q1	11.30000000000000

2015-04-01	Q2	11.06666666666670
2015-07-01	Q3	10.73333333333330
2015-10-01	Q4	10.60000000000000
2016-01-01	Q1	10.36666666666670
2016-04-01	Q2	10.20000000000000
2016-07-01	Q3	9.93333333333333
2016-10-01	Q4	9.80000000000000
2017-01-01	Q1	9.53333333333333
2017-04-01	Q2	9.20000000000000
2017-07-01	Q3	9.00000000000000
2017-10-01	Q4	8.73333333333333
2018-01-01	Q1	8.60000000000000
2018-04-01	Q2	8.30000000000000
2018-07-01	Q3	8.03333333333333
2018-10-01	Q4	7.96666666666667
2019-01-01	Q1	7.80000000000000
2019-04-01	Q2	7.66666666666667
2019-07-01	Q3	7.46666666666667
2019-10-01	Q4	7.50000000000000
2020-01-01	Q1	7.36666666666667
2020-04-01	Q2	7.70000000000000
2020-07-01	Q3	8.53333333333333
2020-10-01	Q4	8.26666666666667
2021-01-01	Q1	8.23333333333333
2021-04-01	Q2	8.06666666666667
2021-07-01	Q3	7.50000000000000
2021-10-01	Q4	7.13333333333333

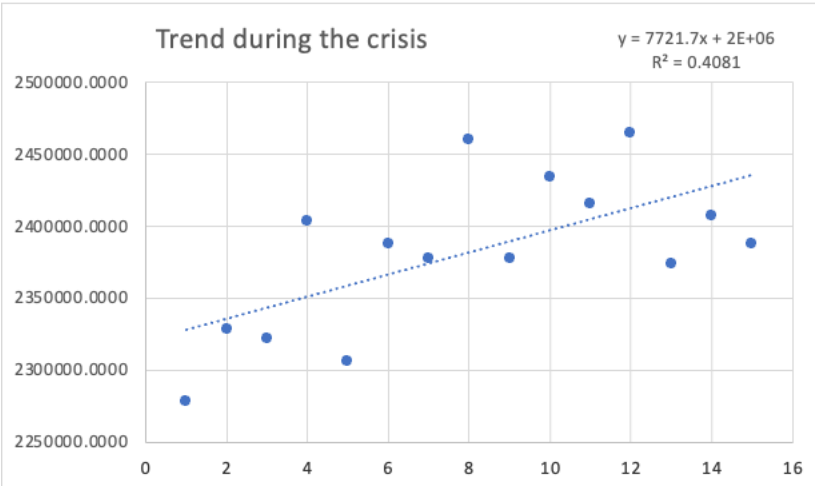
Source: FRED, 2022

Figure 24, GDP trend prior to the crisis



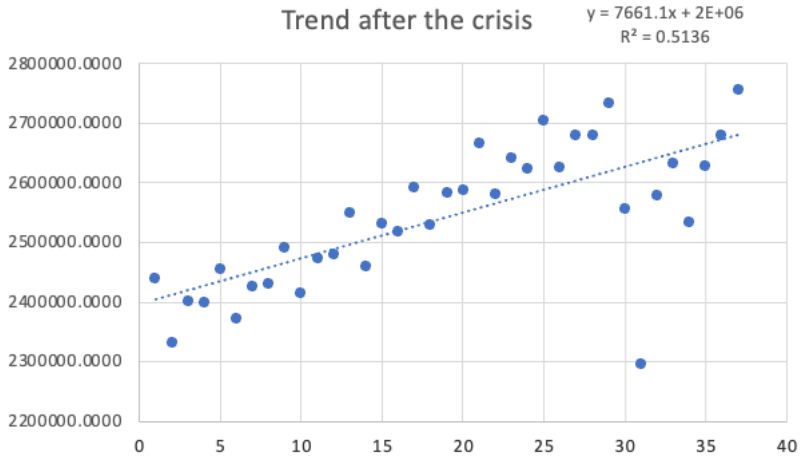
Source: own processing

Figure 25, GDP trend during the crisis



Source: own processing

Figure 26, GDP trend after the crisis



Source: own processing