# The effects of the COVID-19 pandemic on real convergence of the European Monetary Union

Tudor-Mugurel AURSULESEI*

**Abstract**

*The COVID-19 pandemic has placed the European Monetary Union (EMU) in front of a new economic reality. All the health restrictions enforced at the EU level had repercussions on the real convergence of the Eurozone. In the present article, we aimed to observe how real convergence in the Euro area was affected by the analysis of the main economic indicators extracted from the scientific literature. Furthermore, we created an aggregate index of real convergence to determine how it was affected during the pandemic period. We put all this analysis in the context of the effects arising as a result of the pandemic and the various measures implemented at the union level for economic recovery. In the proposed article, we conclude that following the pandemic period, EMU member states abandoned the real convergence criterion. The main policy recommendation emerges from this conclusion: the need for coordination at the EMU level regarding all economic and financial policies adopted.*

*Keywords*: pandemic crisis, economic crisis, real convergence, euro zone

## Introduction

One of the biggest and most complicated contemporary events, which had a significant impact on the world, was the COVID-19 pandemic. What we call today the global pandemic COVID-19 is the result of the global spread of the SARS-CoV-2 virus and the end of 2019, the beginning of 2020. One of the main areas where the pandemic made its presence feel was the economy. Our analysis focuses on the European Monetary Union, which faced new economic challenges generated by the various social distancing or isolation measures adopted at the EMU level or individually by each of the 19 member states (Ahmad *et al*., 2019).

Through this study we aim to analyse the effects of the COVID-19 pandemic on the EMU. We explore the various fiscal and monetary policy measures adopted at the union level to mitigate the effects of the crisis as well as the impact on real convergence.

As the pandemic spread worldwide and an increasing number of restrictions began to appear in society, its effects began to become more pronounced (Goniewicz, 2020). Social distancing measures

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and the limitations of various economic activities have brought about effects, such as the interruption of supply chains or the closure of some economic sectors. The labour market was also affected, thus generating a new type of shock in the EMU. In response, governments and monetary authorities have taken swift and innovative measures to support the business environment, jobs and financial stability (Marti, 2021).

Although the consequences are complex and still unfolding, this scientific analysis aims to provide a deeper understanding of how the pandemic has shaped and continues to shape the Eurozone economy, thereby contributing to the foundation of more informed decision-making and more effective policies in the future.

The purpose of this scientific article is to analyse how real convergence in the European Monetary Union was influenced during the Covid-19 crisis. Furthermore, we aim to observe the effects of the crisis on the economy and the measures have been implemented to reduce the negative effects. As a novelty, the proposed study, in addition to the separate analysis of each indicator of real convergence and the effects produced on the economy, aims to create an aggregate index of real convergence and put it in the context of the pandemic crisis. To create the aggregate index of real convergence, we use data on the most important indicators of real convergence: GDP per capita, unemployment rate, trade openness and price index (Aursulesei, 2023).

## 1. Real convergence - literature review

This section aims to clarify the meaning of real economic convergence. Real convergence implies a reduction in structural disparities that can influence competitiveness and competition in respective economies. These criteria complement the provisions of the Maastricht Treaty, which stipulate nominal convergence criteria. Although it is not a mandatory requirement for joining the euro zone, it is desired that they are met, because they reflect the real situation of national economies. The purpose of real convergence is to promote economic development so that the states wishing to join the union reach the economic level of member states. In addition, after joining the European Monetary Union, the aim is to synchronize the economic cycles of the member states because significant differences in growth can lead to major imbalances within the union.

The theory of optimal monetary areas suggests that, as long as the economic cycles of the member countries do not synchronize with those of their partners, the abandonment of autonomous monetary policy may have negative economic effects (Bojești eanu and Manu, 2011, p. 31). Thus, a crucial condition for joining a monetary union is that business cycles are aligned between member countries (Mongelli, 2002, pp. 31-33). If there is no synchronization of economic cycles within the

monetary union, common monetary policy may affect member states differently, increasing the risk of misunderstandings between states when making monetary policy. Each state will want to promote its own economic agenda, which may not coincide with the vision of other states on the subject (Artis, 2003, pp. 10-12).

However, the scientific literature in the field of the theory of optimal monetary areas offers solutions for protecting national economies in the event of the occurrence of asymmetric shocks as a result of the abandonment of autonomous monetary policy. These protection criteria, the criteria of real convergence, include aspects such as the mobility of production factors (Mundell, 1961, p. 660), international economic openness (McKinnon, 1963, p. 723), diversification of national production (Kenen, 1969, p. 57), financial integration (Ingram, 1973, pp. 6-8), inflation similar to that of other member states (Fleming, 1971, p. 480), wage flexibility and political commitment (Dyson, 2000, pp. 203-209).

The scientific literature emphasizes that the countries that adapt best to abandoning their own monetary policy in favour of the common one are those whose incomes and prices are closely correlated with the other states in the union (Alesina, *et al*., 2002, p. 9). However, it has been observed that the Euro area is not characterized by similar developments in the economic cycles of member states (Acedo Montoya and De Haan, 2009, p. 2012). If we follow the evolution of the EMU from its establishment to the present, we can see that there are gaps between states in terms of the onset of economic or financial crises, as well as the time of recovery from the crises. We can mention here the different crises that different member states went through, such as: Greece, Ireland, Portugal or Italy; crises that were less felt by other members (Aursulesei, 2021).

The recent crises experienced in the euro area, whether they were of a financial nature or specific to the area itself, have shown that the member states of the monetary union have not registered a real sustainable convergence, because the politician at the national level will always put his own interest first, leaving the "common good" of the union on the back burner. For political decision makers, it is more important to adopt measures that will please the national electorate, even if these decisions can affect the steps taken up to that point in the path of economic convergence (Dăianu, *et al*., 2017, p. 50).

The effects felt by the member states following various crises, as well as the lack of decision-making unity, can be observed by analysing real convergence. In order to deepen the problem of real convergence at the EMU level, we have identified in the specialized literature 4 indicators that are the most representative in the study of real convergence: trade openness (Mundell, 1961; McKinnon, 1963; Kindleberger, 1971); unemployment rate (Mundell, 1961; Davies, 2011; Sensier *et al*., 2016);

GDP per capita (Davies, 2011; Kaitila, 2013) and price index (Mundell, 1961; Fleming, 1971; Williamson, 1974).

## 2. Measures adopted at the level of the European Monetary Union in the context of the COVID-19 pandemic

During the COVID-19 pandemic, the member states of the European Monetary Union adopted a series of measures to be able to protect the national economy from the harmful effects of the crisis. There was no full synchronization of all the measures adopted. Some measures were taken at the European institution level, but many decisions were made at the national level. Thus, from the start, we cannot discuss a priority in terms of economic convergence as a result of the implementation of these measures. Following the analysis of the economic measures implemented at the European level during the COVID-19 crisis, we extracted a series of decisions that had a more significant influence on economies.

The first measure taken at the European Monetary Union level was the emergency procurement program in the context of the pandemic (PEPP) of the European Central Bank. In March 2020, the European Central Bank launched this program with the aim of maintaining market stability and keeping under control favourable financing conditions for both governments and the population. More specifically, bonds, both sovereign and corporate, were purchased through this program to reduce borrowing costs, while simultaneously encouraging lending (Grund, 2020).

States have also taken several fiscal measures at the national level. Thus, each state decided to adopt some fiscal incentive packages to stimulate the economy. The adopted packages had a diverse component, such as: measures to support companies affected by the various restrictions, compensation for employees affected by the sanitary measures adopted, or various other types of social aid to support the population affected by the various restrictions.

Another joint measure was the creation of the European Union Recovery and Resilience Fund. This financial package agreed in July 2020 had a value of 750 billion euros (Vanhercke, 2023). The purpose of the fund was to support reforms and investments in the European Union, especially in states affected by the pandemic. This package aims to strengthen resilience and accelerate economic recovery. These funds were accompanied in the euro area by loans granted through the European Stability Mechanism. Thus, the member states of the European Monetary Union were able to obtain emergency loans of up to 2% of GDP to finance various expenses associated with the COVID-19 crisis.

Moreover, to support member states, the European Commission and European Council applied temporary measures that allowed member states to exceed certain budget deficits and public debt

limits. Thus, derogation from the fiscal discipline of the union and the Stability and Growth Pact appeared (Corti, 2023). Countries that have been affected more by the pandemic have received increased aid from the European Commission. The main criteria in this discrimination were the vulnerability of the health system and degree of economic development.

These are only part of the measures adopted at the European level with the aim of reducing the negative effects of the COVID-19 pandemic on the economy. From the study of the measures adopted both at the level of the entire euro zone, but also at the individual level of each state, we expect to observe an influence on real convergence as well. For this reason, the main hypothesis from which we start in this article emerges: all the measures adopted at the Eurozone level as a result of the pandemic crisis have led to a decrease in the real convergence between the member states. In what follows, we propose to analyse the evolution of real convergence in the European Monetary Union during this pandemic crisis.

### 2.1. The economic effects of the COVID-19 pandemic

The Covid-19 pandemic has had a significant impact on the entire world map. This epidemic spread rapidly worldwide and had effects not only on the sanitary level, but also on the social or economic level. In the present research we have chosen to focus on the economic effects of the pandemic on the economy of the European Monetary Union. Looking back at all the measures implemented by the member states, but also by the institutions of the European Union, we can delineate several effects that were also felt in the economy (Aursulesei, 2023).

One such economic effect is the occurrence of an economic recession. The health crisis has created an unprecedented situation in recent history, namely the closure of key sectors of the economy. The most affected sectors were by far that of: tourism, hotels, restaurants or the organization of events. Considering that among the members of the European Monetary Union, we find that states have the tourism industry as their main activity sector, their receipts to the state budget have decreased significantly (Pavaluc *et al.*, 2020). Furthermore, the limitations imposed on businesses in affected areas have led to supply chain problems. The closure of factories has led to delays in the delivery and supply chains, thus affecting the production of goods and services. This pronounced decrease in the demand for tourism services and events during the pandemic was also reflected in the economic statistics of the union which triggered a period of economic recession (Ahmad *et al.*, 2019).

At the level of the European Union, there was also talk of an increase in unemployment as a

result of the decisions implemented during the pandemic. Because of the isolation measures and various restrictions imposed, people were laid off during this period. The most affected were temporary workers and those in closed sectors of the economy. Many states have resorted to the term technical unemployment, a form of unemployment that did not necessarily mean a different dismissal of employees, but rather a suspension of employment contracts during the period when the restrictions imposed by governments were in force (Akbulaev *et al*., 2020).

The social distancing measures imposed by governments have led to an increase in government spending (Tiliuță and Diaconu, 2020). States had to allocate significant amounts of money to support the health system, to grant various social aids to people affected by the government measures implemented, or to support companies affected by the situation in society. Support for companies came through the allocation of various grants and loans to overcome the crisis situation or through the implementation of various fiscal policies to stimulate business (Marti and Puertas, 2021). All of these budget allocations led to an increase in the budget deficit and public debt. The states had to turn to different lines of financing to be able to cover these unforeseen expenses.

It is true that among all these negative effects, we can also identify effects with a beneficial character to society. First, the most important benefit of this crisis period was the forced acceleration of digitization (Cone *et al*., 2022). Both the state and private companies had to accelerate efforts to implement new technologies in the economy, in order to be able to maintain that important social distance during such a pandemic (Pinzaru *et al*., 2020).

Another effect that we could pass to the category of positive effects, but equal to that of negative effects, is the change in consumer preferences. Starting from the emergence of new technologies in the economy, consumers have learned that there are new work opportunities, new methods of satisfying needs or new typologies of products and services (Goniewicz *et al*., 2020). All these changes are also reflected on different economic indicators.

Finally, we must emphasize that governmental measures, as well as the economic effects of the pandemic, were different from one state to another. Even if we are discussing a union in our case, the measures were not necessarily coordinated at the level of the entire community block. There are several common measures, but many of them have been taken individually at the state level (Casquilho-Martins *et al*., 2022). Starting from this non-unitary policy at the European level, it is opportune to analyse how the economic convergence of the EMU has been affected. Has it been brought to the front or has it been abandoned to meet the monetary needs of each member state?

## 3. Methodology

To design the methodology of this article, we selected a total of 19 member states of the European Monetary Union (we excluded Croatia, which only joined the euro zone on January 1, 2023). In the analysis of these states, we selected statistical data from the Eurostat database, for the period 2011-2022. The reason why we started our analysis from the year 2011 is not to interfere with the data due to the financial crisis of the year 2007. We consider that the year 2011 marks for most member states the end of the world financial crisis and the start of a period of economic growth. In the selection of the relevant indicators for our analysis, we selected from the scientific literature the 4 indicators most used in the study of real convergence. Thus, in our research, we used the following indicators: GDP per capita, unemployment rate, trade openness and price index.

**Table 1. Real convergence indicators**

| Indicator | Indicator's description | Indicator's relevance | References |
|---|---|---|---|
| GDP per capita | Current prices, euro per capita. Gross Domestic Product (GDP) per capita shows a country's GDP divided by its total population. | Real convergence aims at economic development, the states that want to join to reach the economic level of the Member States. The amplitude of Member States' business cycles is being monitored, as major differences in growth between them can lead to major discrepancies and the imbalance of the Union. Other indicators (excluding nominal convergence indicators) are targeted at real convergence, in particular macroeconomic indicators: price level, GDP per capita, unemployment level, level of imports and exports. | Davies (2011); Kaitila (2013). |
| Unemployment rate | Percentage of population in the labor force; aged 15 to 74 years (16 to 74 years in Estonia and Italy) unemployed during the reference week, had actively sought work during the past four weeks and were available to begin working immediately or within two weeks. | | Mundell (1961); Davies (2011); Sensier *et al.* (2016). |
| Price index | Index 2015=100<br>The Harmonized Index of Consumer Prices (HICP) gives comparable measures of inflation for the countries and country groups. It measures the change over time of the prices of consumer goods and services acquired by households. | | Mundell (1961); Fleming (1971); Williamson (1974). |
| Trade openness | Exports plus imports as percent of GDP | | Mundell (1961); McKinnon (1963); Kindleberger (1971). |

Source: Developed by authors based on the research in May 2023

We considered it appropriate in the analysis to also use an index of real convergence, starting from the 4 selected indicators. For each variable that is a component of the real convergence index, the yearly EU average is computed. For each country, the difference between the value of a variable and its EU average, for each year, was calculated. These differences were further considered when calculating the aggregated index of the real convergence. To create this index, we started with the methodology proposed by Nardo *et al*. (2008). The aggregate index of true convergence is a weighted average of the loading scores of the principal components extracted by applying Panel Principal Components analysis. In other words, we calculate the weights for each indicator using the squared loadings in the variance explained by each component.

$$I_i = \frac{1}{v}\sum_{j=1}^{v} x_{ij}\, w_j$$

$$w_j = \sum_{m=1}^{M}\left[\frac{Explained\ variance_m\left(loading_{j,m}\right)^2}{\sum_{l=1}^{M} Explained\ variance_l \sum_{n=1}^{v}\left(loading_{n,m}\right)^2}\right]$$

Where:

M - is the number of selected components and the load

j,m- is the loading score of variable j for component m and is zero when the variable does not contribute to the formation of the component. The criterion considered for selecting the number of components, M, is that its eigenvalues are greater than 1.

After calculating the weights, we obtained the following results, which we use in the calculation of the aggregate index of real convergence for each member state of the European Monetary Union.

**Table 2. Variables' weights for the real convergence index**

| Variable | Weights |
|---|---|
| GDP per capita | 0.4349 |
| Unemployment rate | 0.1170 |
| Price index | 0.0163 |
| Trade openness | 0.4316 |

Source: Developed by authors based on the research in May 2023

After the weights were calculated, the variables were normalized using the min-max method, as follows:

$$x_{norm_i} = \frac{x_i - x_{min}}{x_{max} - x_{min}}$$

for variables in which small values indicated low performance, and

$$x_{norm_i} = \frac{x_i - x_{max}}{x_{min} - x_{max}}$$

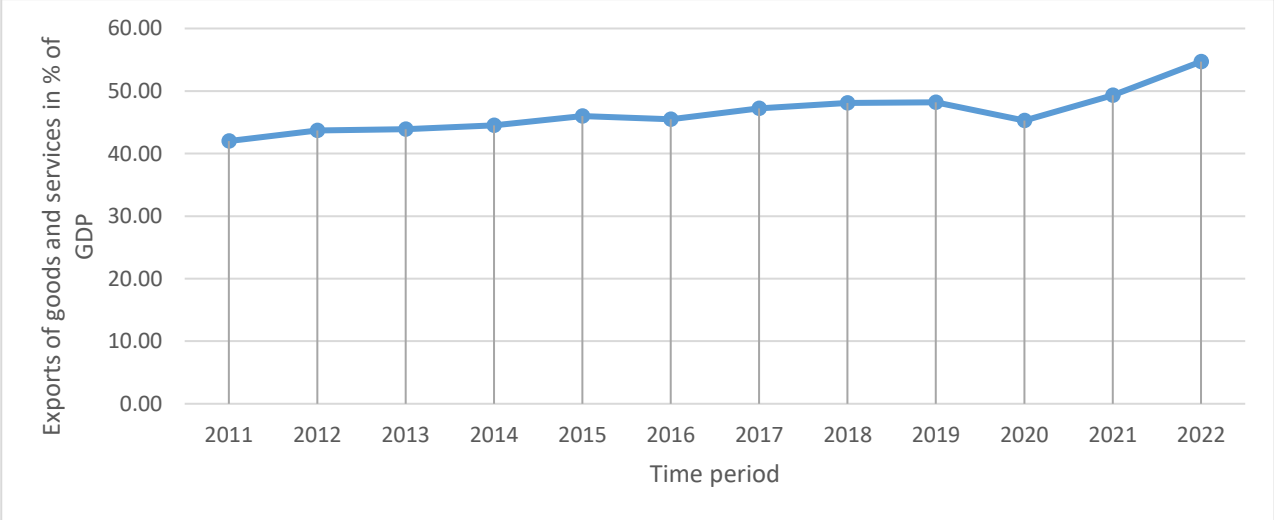
for the variables for which small values indicate high performance.

Using the normalized variables, the final indexes will take values in the [0, 1] interval. We can continue the analysis by normalizing the results obtained, in order to be able to group the member states of the euro zone into different clusters according to their resilience in the face of the pandemic crisis. However, this stage will be part of a future study. In this article, we summarize the calculation of an aggregate indicator of real convergence and its application to the average of the indicators of the euro area.

## 4. The evolution of real convergence indicators in the context of the COVID-19 pandemic

In what follows, we propose to observe how the main indicators of real convergence behave during a pandemic crisis. Our goal is to identify if during that period we observe a contraction of the economy and then to see if the analysed indicator returns to an upward trend.

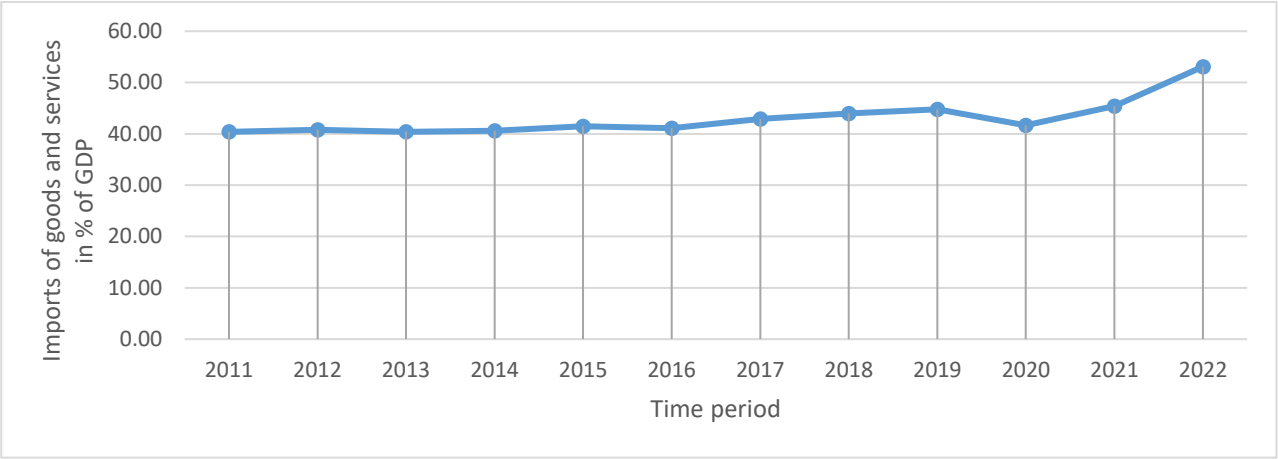
**Figure 1. Exports of goods and services in % of GDP - Euro area - 19 countries**




Source: Developed by authors based on the research in May 2023

The first indicator analysed is the export of goods and services as % of GDP. As we can see, the period 2011 – 2019 captures an upward trend of this indicator. Growth is suddenly interrupted in 2020, the year that coincides with the onset of the COVID-19 pandemic and the main restrictions adopted at the European level. Thus, the year 2020 records an export value of only 40.3% of GDP. We can see that later, in the years 2021 and 2022, exports return to an upward trend, one that is even more pronounced compared to the period before the crisis.

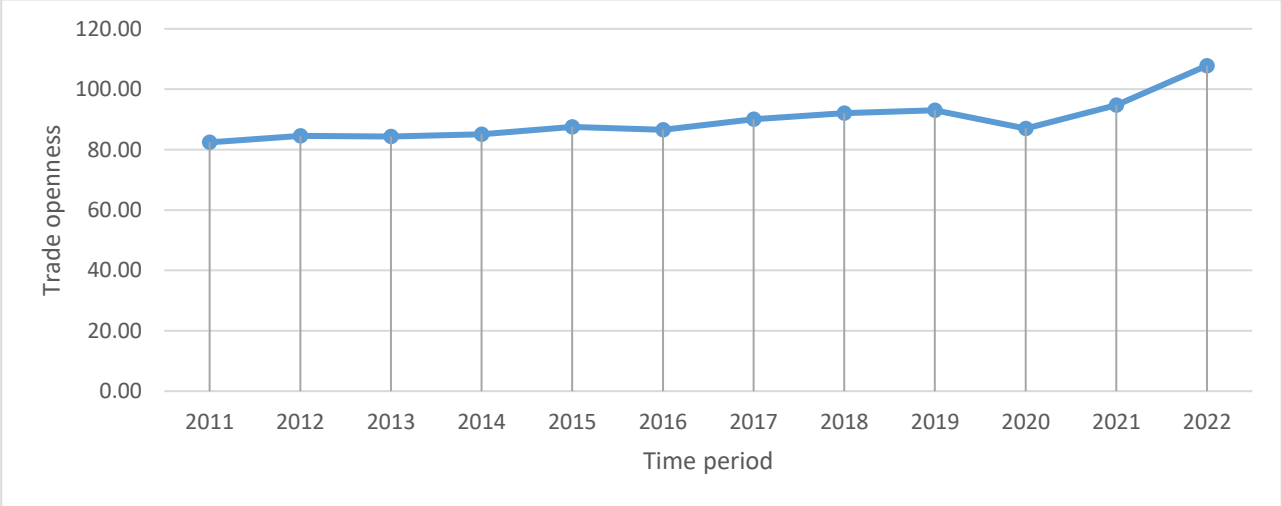
**Figure 2. Imports of goods and services in % of GDP - Euro area - 19 countries**




Source: Developed by authors based on the research in May 2023

Regarding imports, we can observe that in the period 2011-2016 the trend is relatively constant. From 2016 to 2019, the trend is upward, and the crisis period is marked by a decrease in imports to a value of 41.7% of GDP. After this period, the trend becomes upward again.

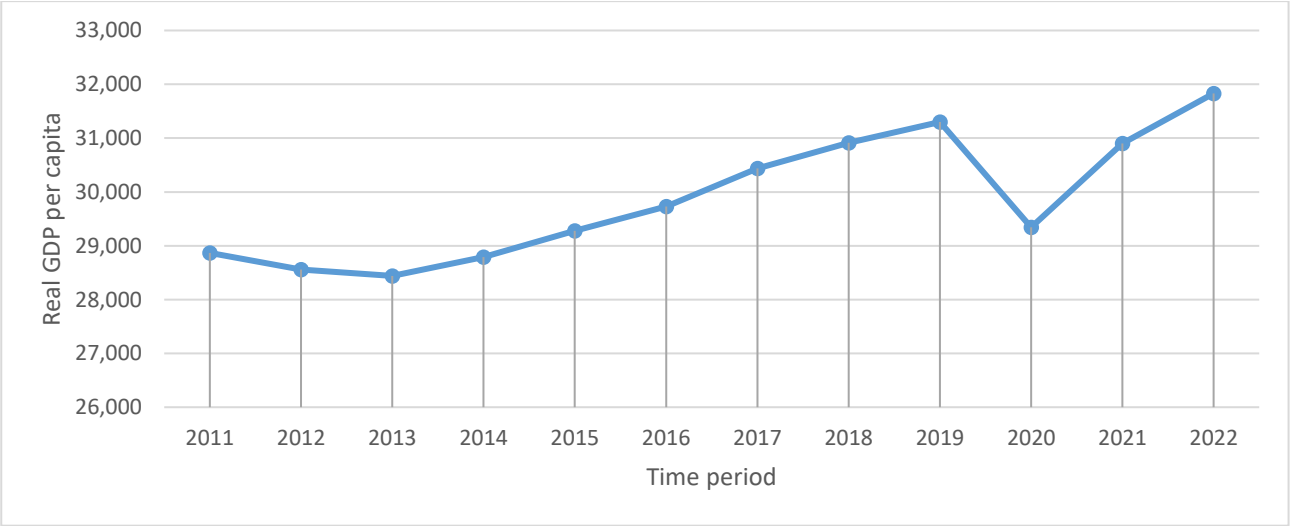
**Figure 3. Trade openness - Euro area - 19 countries**




Source: Developed by authors based on the research in May 2023

If we observed how imports and exports evolved at the level of the European Union, we considered it appropriate to observe the overall evolution of trade openness. Therefore, the period 2011 – 2019 is marked by an upward trend of this indicator. The year 2020 stands out due to the decrease in economic openness to a value of 87% of GDP. The period of negative effects of the pandemic crisis was quickly overcome, the 2021-2022 period brought this indicator back on an upward trend, a much more pronounced one.

**Figure 4. Real GDP per capita - Euro area - 19 countries**

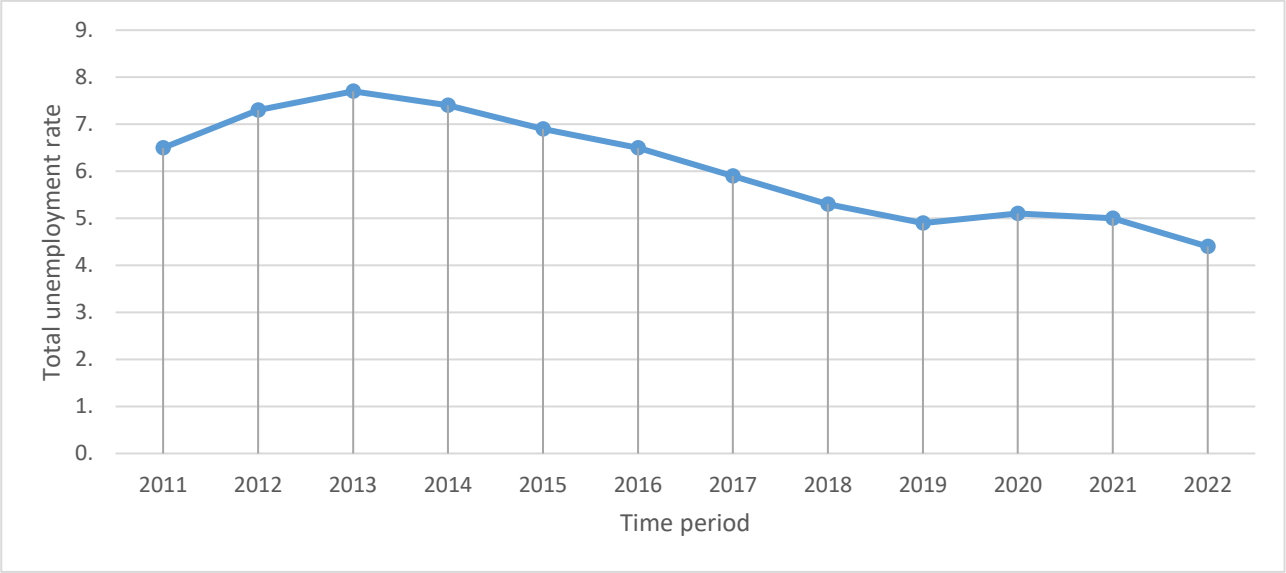



Source: Developed by authors based on the research in May 2023

The next indicator analysed is real GDP per capita. As we can see from figure no. 4, this indicator best presents the depth of the pandemic crisis in 2020. We can observe a decrease in the value of the indicator in the period 2011-2013, followed by a sustained increase until 2019, when the value of GDP per capita was 31,300 euros. The year 2020 brings a sudden drop in GDP per capita, up to a value of 29,340 euros. Again, we can see how from 2021, the value of the indicator re-enters an upward trend.

From figure number 5, we can see a somewhat surprising evolution of the unemployment rate at the level of the European Monetary Union. Starting from 2013, until 2019 the value of the unemployment rate is downward, reaching a value of 4.9%. As we anticipated, the year 2020 marks an increase in the unemployment rate, but not as much as expected. The increase was relatively small. This year, the unemployment rate reached a value of 5.1%. Again, after 2020, a return of the indicator to the normal trend can be observed.

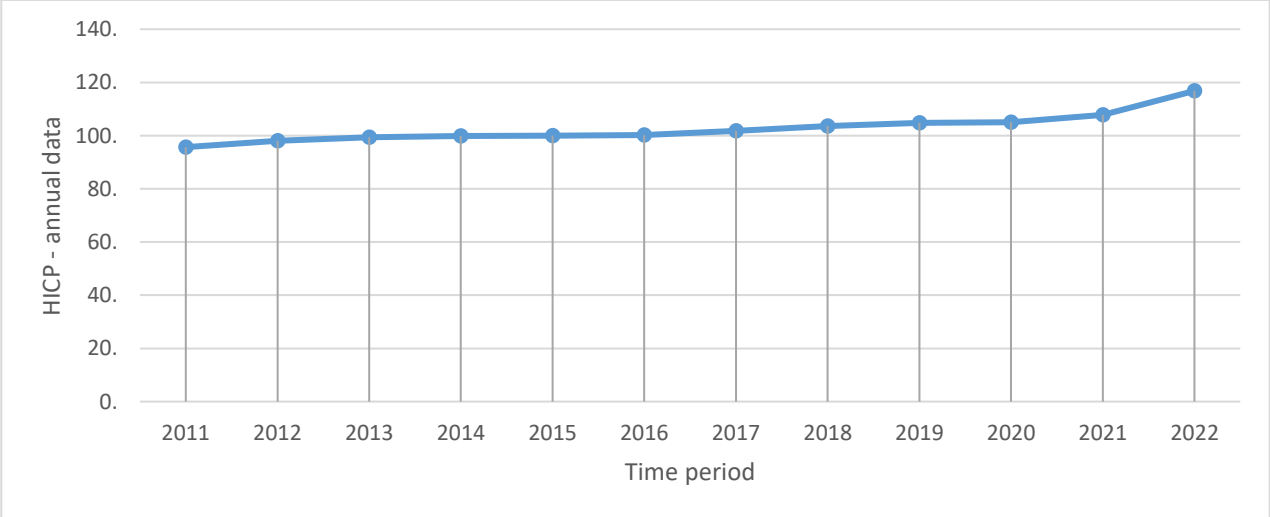
**Figure 5. Total unemployment rate - Euro area - 19 countries**




Source: Developed by authors based on the research in May 2023

It is surprising to note that the period of the pandemic brings an increase in the unemployment rate at the level of the European Monetary Union of only 0.2 percentage points. From this we can deduce that the peak period of the pandemic crisis was not accompanied by real unemployment. Even though many economic activities were suspended during that period, we did not face a mass layoff of employees, but rather a suspension of employment contracts, that technical unemployment. With the reopening of the economy and the relaxation of restrictions, much of the economic activities have been reopened and employees have resumed their activities.

**Figure 6. Harmonised index of consumer price (index: 2015 = 100) (HICP) - annual data - Euro area - 19 countries**




Source: Developed by authors based on the research in May 2023

The last indicator analysed is the price index. As we can see, throughout the analysed period the trend of this indicator was an upward one. The year 2020 brings only a very slight slowdown in growth.

Our research continues by calculating the value of the aggregate index of nominal convergence for the average of the European Monetary Union in the analysed period.

**Table 3. The average of the real convergence indicators in the Euro Area – 19 countries**

| Time | Trade openness | GDP per capita | Unemployment rate | Price index |
|---|---|---|---|---|
| **2011** | 82.4 | 28.870 | 6.5 | 95.67 |
| **2012** | 84.5 | 28.560 | 7.3 | 98.06 |
| **2013** | 84.3 | 28.440 | 7.7 | 99.38 |
| **2014** | 85.1 | 28.790 | 7.4 | 99.81 |
| **2015** | 87.5 | 29.280 | 6.9 | 100.00 |
| **2016** | 86.6 | 29.730 | 6.5 | 100.23 |
| **2017** | 90.1 | 30.440 | 5.9 | 101.78 |
| **2018** | 92.1 | 30.910 | 5.3 | 103.56 |
| **2019** | 93 | 31.300 | 4.9 | 104.80 |
| **2020** | 87 | 29.340 | 5.1 | 105.06 |
| **2021** | 94.7 | 30.900 | 5.0 | 107.78 |
| **2022** | 107.8 | 31.830 | 4.4 | 116.82 |

Source: Developed by authors based on the research in May 2023

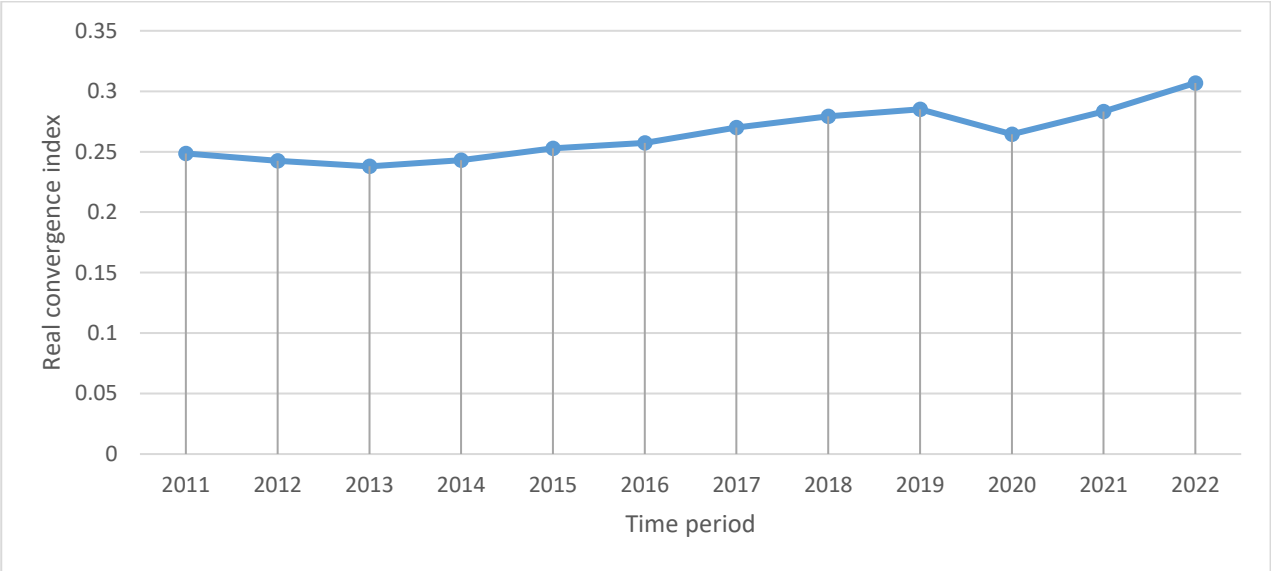
**Table 4. Aggregate index of real convergence and standard deviation for the Eurozone**

| TIME | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|---|
| **Real convergence index** | 0.248498 | 0.242408 | 0.237899 | 0.243098 | 0.2528 | 0.257214 |
| **Standard deviation** | 0.165131 | 0.168703 | 0.170078 | 0.171517 | 0.17773 | 0.17885 |
| **TIME** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** |
| **Real convergence index** | 0.269878 | 0.27914 | 0.285174 | 0.264525 | 0.283228 | 0.306864 |
| **Standard deviation** | 0.176898 | 0.17658 | 0.183172 | 0.1861 | 0.187763 | 0.184329 |

Source: Developed by authors based on the research in September 2023

In table 4 we calculated the aggregate index of real convergence for the average values in the euro area. Therefore, we applied the weight of the variables resulting from the formula proposed by Nardo *et al*. (2008) and present in the OECD guide for building composite indexes, on the average value of each indicator at the level of the entire EMU. This article only aims to analyse the evolution of this index in the context of the COVID-19 pandemic.

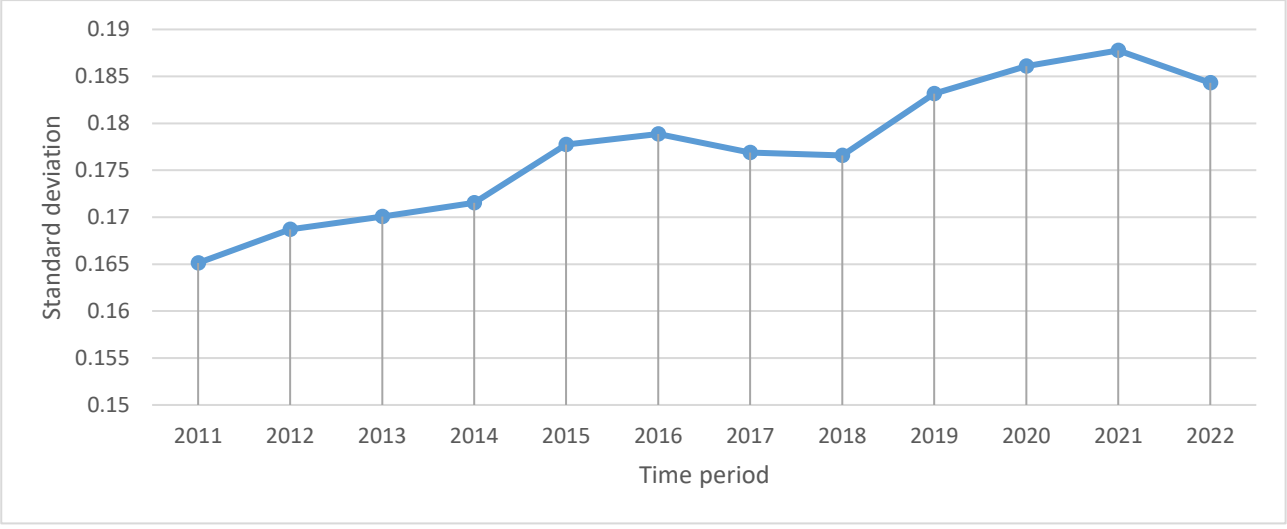
**Figure 7. Real convergence index - Euro area (19 members) average**




Source: Developed by authors based on the research in May 2023

Based on the values of the aggregate index of real convergence, from table no. 4, we built figure number 7 to be able to graphically visualize how this index evolved during the analysed period. The period 2011 – 2013 reveals a decrease in the value of the index at the level of the European Monetary Union, while the period 2013 – 2019 marks an increase in this index. As we anticipated, the year 2020 brings a decrease in the value of the aggregate real convergence index. Therefore, social distancing measures and various restrictions adopted at the level of the member states of the euro zone also affected the value of this index.

**Figure 8. Evolution of real convergence in Eurozone (standard deviation of real convergence index)**




Source: Developed by authors based on the research in September 2023

For better relevance regarding the evolution of real convergence at the level of the Eurozone, we calculated the standard deviation of the aggregate index of real convergence between states, for each year of the analysed period. The higher the value of the standard deviation, the greater the disparities between the states, so we are moving away from a convergence of the economies of the member states. As we can see from table number 4, the general trend at the level of the euro zone is rather an increase in the disparity between economies. Only the period 2016-2018 and the year 2022 bring an increase in real convergence at the level of the euro zone. We can see that the moment of the pandemic crisis is on a trend of increasing disparity, so the measures adopted by each individual member state have led to an increase in them. There has not been full coordination among members to limit the effects of the pandemic in a way that does not affect the real convergence of national economies.

**Conclusions**

Following the analysis undertaken, we reached a series of conclusions, which can create an overview of what the influence of the COVID-19 pandemic meant on the economy of the European Monetary Union. These conclusions can be the basis of future scientific research and at the same time can be a benchmark for political decision-makers both at the central European level and at the national level of the member states or in the process of accession.

First of all, we could observe that the COVID-19 pandemic had a multitude of effects on the economy at the level of the European Monetary Union. Starting from the closure of economic sectors to rethinking the way of doing business. The effects were felt by all member states of the euro area. It is true that some felt these effects more strongly, others that had an economy much more anchored in reality faced a smaller shock.

Following the analysis of the main representative indicators for real convergence, we could observe that trade openness (where we included both imports and exports as a percentage of GDP) and GDP per capita had the most drastic decreases during the peak period of the pandemic. The effects of the pandemic were also seen in the analysis of the unemployment rate. We could observe how in the year 2020, unemployment had an upward trend. However, we were faced with an interesting situation. The increase in the unemployment rate in 2020 was not of the caliber we expected. On the other hand, we could observe that the price index was not affected by the crisis, registering only a small decrease in the growth trend.

Following the creation of the aggregate index of real convergence, starting from the scientific

literature, we were able to draw several conclusions. First of all, GDP per capita and economic openness have the greatest weight in the composition of the index. Calculating the value of the index in the analysed period for the average of the European Monetary Union, we could see how there is a tendency towards a real convergence of the member states most of the time. However, in 2020, the value of the aggregate real convergence index registered a noticeable decrease. Regarding real convergence, we could observe that at the level of the euro zone, there is a trend of increasing disparity. Even during the pandemic crisis, the implemented measures failed to stop this trend, but rather accentuated it.

A final conclusion concerns the measures adopted both at the central level by the European Monetary Union and at the level of each member state. I could see that there was some unity in the implementation of the measures. The European Monetary Union and the European Union tried to create as many levers of support as possible for the European states. We can deduce that the measures helped to keep the unemployment rate under control, but also the short period (of only one year) of the decrease in the value of the real convergence indicators.

This scientific article provides new research opportunities for us. We propose to continue the study through an analysis of the economic effects of the COVID-19 crisis of each member state. Moreover, we want to see if we could group the member states into different clusters in terms of the intensity of the effects felt and at the same time if we can identify a series of adopted measures that had a greater influence in the economic recovery.

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