



Development Analysis of the Construction Sector at the European Level in the 2011-2020 Period

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ABSTRACT

The construction sector has strategic importance for macroeconomic development. It is one of the main areas generating jobs and stimulates economic activity through its relations with other sectors of activity, it is responsible for the development of infrastructure, and constructions made for residential, commercial, or industrial purposes, but it is also a great consumer of resources and energy and waste generator. This paper analyses the evolution of the main macroeconomic indicators of the construction sector in the European Union between 2011 and 2020. The conclusion is that, by 2020, the construction sector, described by several indicators, was increasing, especially in the developed countries of the European Union. The year 2020, however, caused decreases in these indicators due to the crisis generated by the Covid virus. In the last part of the study, we conducted a comparative analysis of the values of some indicators in Romania with those at the European Union level. The result of the study is that the evolution of the sector in Romania did not follow the same path as the European one, and the fluctuations from one year to the other are quite visible in Romania, while the European path is quite constant, reflecting the stability generated by the countries with a strong economy within the European Union.

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1. Introduction

The construction sector is of strategic importance for Europe and its member countries and is a pillar of economic and social development. The development of this sector impacts significantly other sectors of the economy and has a beneficial role on the number of jobs.

Compared to the EU level, the construction sector accounts for almost 9% of European GDP and generates almost 18 million jobs (2018) (ECSO 2018, p6), mainly among small and medium-sized enterprises (up to 95%). The construction sector is a consumer of intermediate production (raw materials, chemicals, electrical and electronic equipment), but also of related services (Bărbuță-Mișu 2012, p32). Due to its importance, the construction sector has a considerable influence on the development of the economy.

The role of this strategically important sector is visible not only through residential, commercial, or industrial construction, but also through the development of infrastructure. This sector is also used to rebuild and rehabilitate existing buildings.

This branch of the national economy is facing a series of changes which will have an important effect on its development and which relate to the internationalization of the labour force, the globalization faced by European society as a whole, the aging of the population, the development of urban areas to the detriment of rural ones, increasing concern for pollution reduction (the construction sector being one of the largest waste-generating sectors) and technological innovations.

The specific challenges of this sector are multiple and complex. If we refer to the residential and commercial construction sector, the challenges relate to limiting the space available for new construction in urban agglomerations, to the technical requirements that new constructions must meet, and builders must adapt to these demands, by using new technologies, but also by adopting new regulations in the field (statista.com).

Urban areas are where most of the European population lives, where 60-80% of natural resources are consumed, where 50% of global waste and 75% of polluting emissions are produced. Circular economy has become a priority policy at European level as part of the European Green Deal, especially for resource-intensive sectors such as the construction sector (Bertozzi C, 2022, p1).

The Circular economy principles (Ellen MacArthur, 2022) concept is a main objective for the construction sector, based on:

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- reduce pollution and eliminate waste
- increase efficiency in use of raw materials
- environmental friendly.

Implementation of these principles to the construction sector envisages the adoption of rules on improving the resilience of buildings, their life span, the reduction of waste at each stage of the construction of a target, but also the efficient use of available resources (European Commission Report, 2021, p14).

Even if it generates 10% of European GDP, about 50% of fixed capital formation at European level, it generates the most jobs, around 20 million at union level, it is one of the largest consumers of energy, 40-45% of European consumption and another 5-10% are consumed in the production and transport of materials and products necessary for the construction of the objectives (FWC sector competitiveness studies, 2014).

Therefore, the future strategy of the construction sector shall take into account the social challenges and the climate in the European Union and globally. Considering these requirements, for the growth of the construction sector at the European level, the European Commission adopted in 2012 - **Construction 2020** - an action plan aimed at interconnecting the policies of the Member States of the Union leading to the achievement of the objectives: stimulating investment, qualifying the available workforce, increasing resource efficiency, strengthening the construction market, strengthening the European firm's global competitiveness (Objectives of the ECSO).

2. Presentation of the construction sector at the European level

The construction sector was one of the sectors of the economy strongly affected by the financial crisis, which had a strong negative impact and caused strong decreases in demand, especially in the residential sector. The main causes of the decrease in construction demand are the tightening of eligibility conditions in the granting of real estate loans.

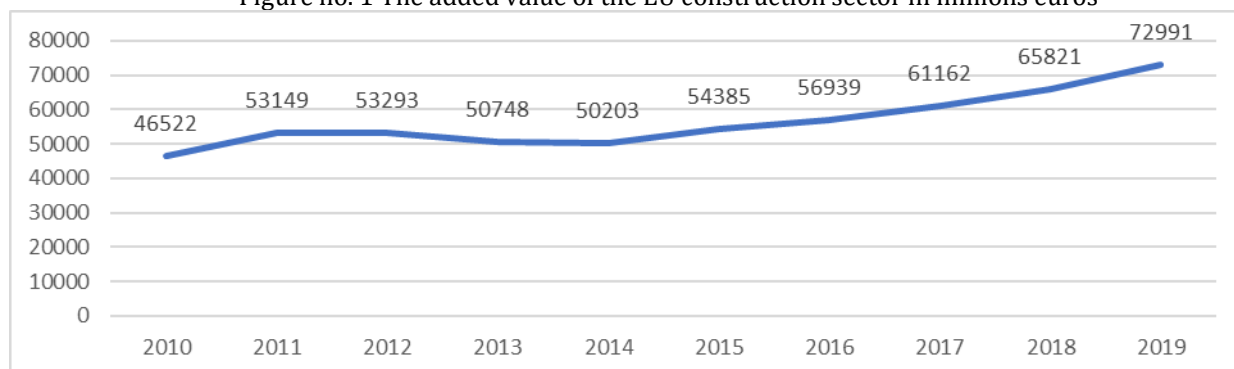
The crisis has led to a reduction in budget expenditure, which has had the direct effect of reducing investment in infrastructure. European countries have adopted several fiscal incentives to facilitate investment and consumption: Reducing VAT on new buildings, reducing the tax on buildings if they are renovated, lower interest rates on real estate loans.

2.1. The added value of the EU construction sector in millions of euros

The process flow in the construction sector includes a wide range of economic activities such as: raw material extraction, design construction, manufacturing and distribution of construction products, management, verification of construction works, maintenance, renovation and demolition, recycling of demolition waste.

As such, the construction sector plays an important role in achieving the European Union's goals for smart, sustainable, and inclusive growth. It has a direct impact on workers' safety and quality of life. Newly built buildings, infrastructure, and construction products have an important impact on the efficient use of energy resources, the fight against climate change, and the environment in general.

Figure no. 1 The added value of the EU construction sector in millions euros



Source: *Gross value added (GVA) in the EU environmental economy by NACE Rev. 2 activity available from <https://ec.europa.eu/eurostat/databrowser/view/ten00134/default/table?lang=en> accessed on February 20, 2022.*

Except for 2013 and 2014, where this indicator has decreased compared to previous years and from subsequent years, the added value of the construction sector indicates the development of this branch of activity (Figure no. 1). In 2019, the added value of the sector increased by 63,7% compared to 2010.

2.2. Indicators analysed at EU 28 Member State level

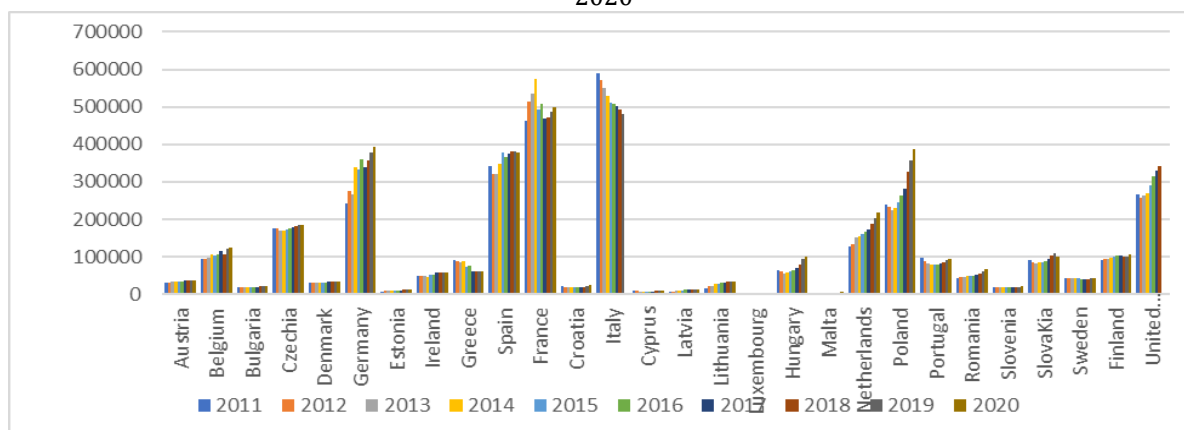
At European level, the construction sector has also registered increases in indicators in the last years of the analysed period, following the recovery of economic growth after the recoil in and after the crisis years.

The analysis below was carried out based on quantitative indicators: number of enterprises, employees, analysis of turnover, production value, added value of the sector, as well as gross margin of the construction sector. I have also studied the level of investments in this sector compared to the other sectors of the national economies of the EU Member states, as well as comparisons of the evolution of the construction sector between Romania and the EU.

2.2.1. The number of enterprises

The evolution of the number of enterprises is one of the key elements for this study. Europe's developed economies have kept their number of businesses in the analysed period at a steady pace, with fluctuations of around 10%. The year 2020 compared to 2019 was characterized by maintaining the constant number of economic agents in the construction field at European level (Figure no. 2).

Figure no. 2 The number of construction enterprises in the EU 28 in the period 2011-2020



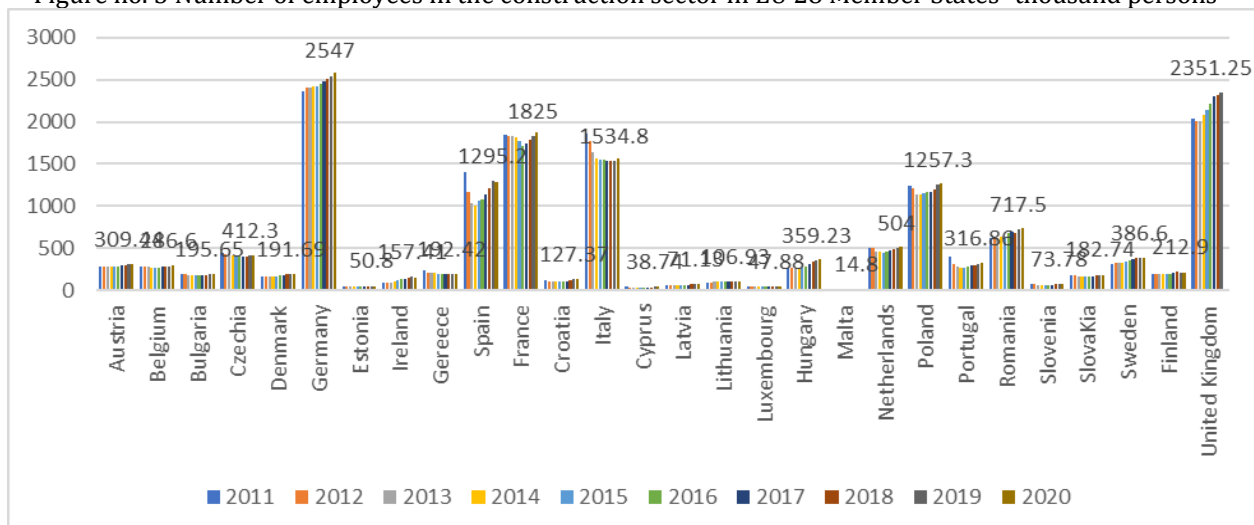
Source: Annual detailed enterprise statistics for construction (NACE Rev.2, F) (sbs_na_con_r2) available from https://ec.europa.eu/eurostat/databrowser/view/sbs_na_con_r2/default/table?lang=en, accessed on February 20, 2022

Greece recorded the largest decrease in the number of construction companies in 2020 compared to 2010 by 44%. In fact, Greece has not reached the number of enterprises since 2010, and this indicator is constantly decreasing in the analysed period. Lithuania recorded a doubling of the number of companies in 2020 compared to 2010 (increase of 93,8%), followed by Hungary (79,5% in 2020/2013) and Latvia with an increase of 75% in 2020/2010.

2.2.2. Number of employees in the construction sector in EU 28 Member States

This sector generates 18 million jobs in the European Union according to the 2018 ECSO report. An important factor in this study is the evolution of this indicator (Figure no.3).

Figure no. 3 Number of employees in the construction sector in EU 28 Member States- thousand persons



Source: Gross fixed capital formation by AN_F6 asset type available from https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_AN6_custom_2304645/default/table?lang=en, accessed on February 20, 2022. *For the UK, it is given data until 2019

The number of employees in 2020 is bigger than all others year for the analysed period, except 2010 and 2011. The biggest increased was in 2020 compared with 2012, in Ireland, with 64,79%.

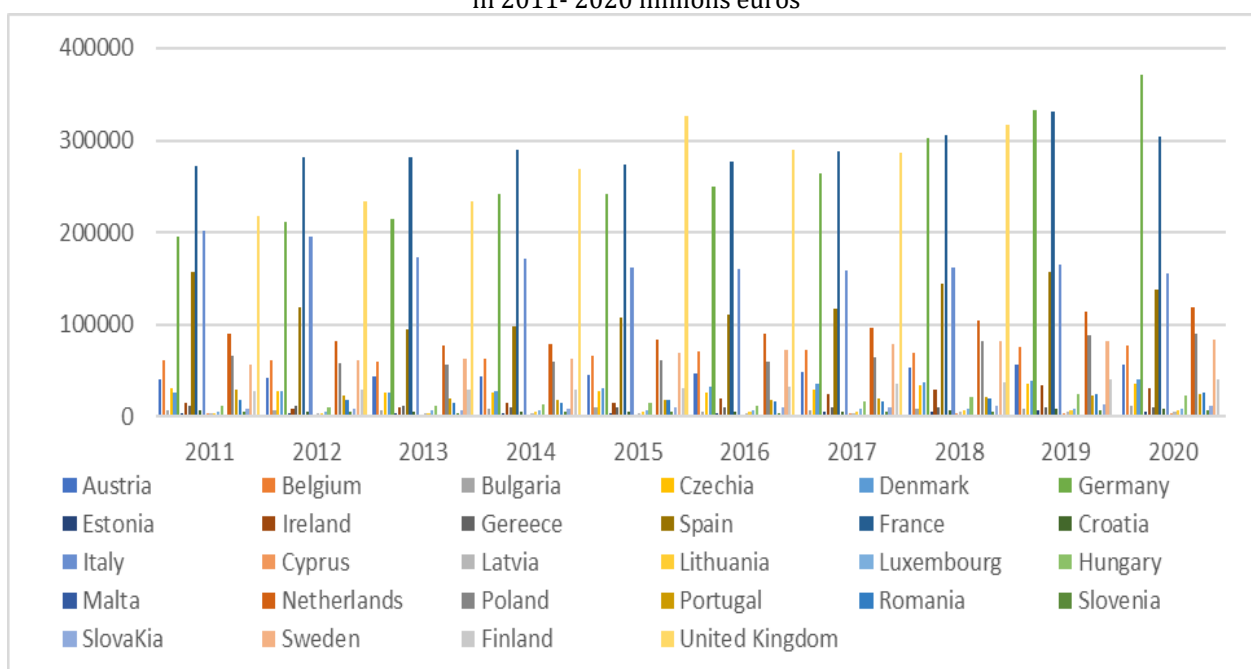
Hungary and Malta also recorded an increase in the number of employees in 2020 compared to 2010, 2011 and 2012 with values of 40% and 45% respectively.

The developed economies of Europe have seen increases in this indicator (Germany, Belgium, Austria, France, England) with values up to 10%. Portugal, Greece, and Italy recorded decreases in the number of employees in 2020 compared to 2010 and 2011. The 2020/2019 report generally showed that the same number of employees were maintained, with the largest decrease being 7% in Ireland. The fact that the first year of the pandemic did not affect the number of employees is also a result of the tax incentives imposed by Member States to support this sector of activity.

2.2.3. The evolution of the turnover of the construction sector in the EU 28 Member countries

Turnover represents the total revenues achieved by a company and is one of the most used financial indicators in the financial analysis.

Figure no. 4 The evolution of the turnover of the construction sector in the EU 28 Member countries in 2011- 2020 millions euros



Source: Annual detailed enterprise statistics for construction (NACE Rev.2, F) (sbs_na_con_r2) available from https://ec.europa.eu/eurostat/databrowser/view/sbs_na_con_r2/default/table?lang=en, accessed on February 20, 2022

Ireland is the European country that recorded the largest increase in turnover in 2020 compared to 2011 (3,5 times) and 2012 (3,1 times). Other emerging economies doubled their turnover in 2020 compared to some years in the analysed period: Bulgaria in 2016, Cyprus in 2014, Hungary in 2012 (Figure no. 4).

Greece is one of the countries in the European Union that recorded a decrease in turnover each year (between 20%), followed by Italy which had the same downward trend. Even if this countries recovered from the decrease of the indicator, they did not reach the level of the turnover in 2010.

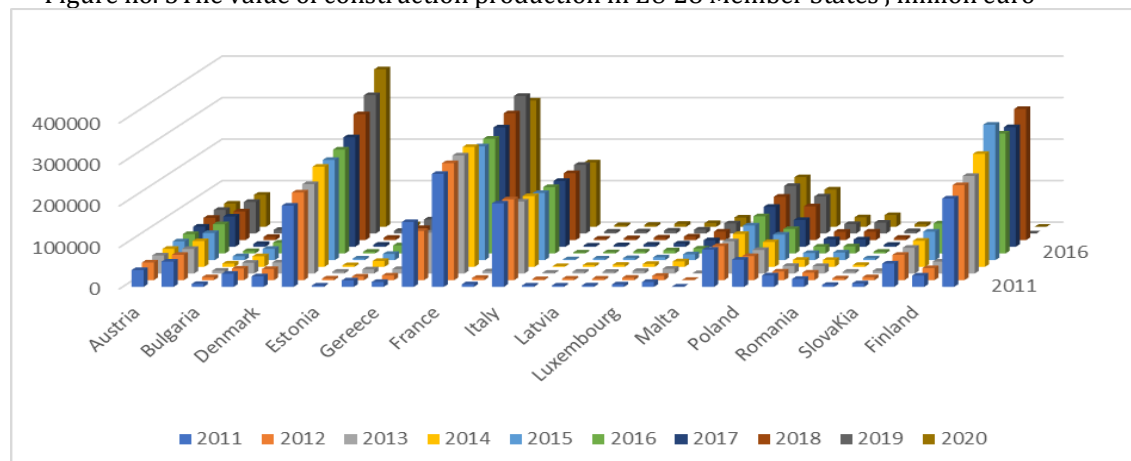
Developed economies had a steady evolution of the indicator, with increases between 10-20% in the analysed period. This growth is achieved gradually, from one year to the next, consistently, without spectacular fluctuations, which demonstrates the stability of this area of the economy in this category of Union States.

In 2020, compared to 2019, there were no major fluctuations of this indicator.

2.2.4. The value of construction production in EU 28 Member States

Production in the construction sector did not have spectacular developments in the analysed period, but the fact that European countries had a relatively constant evolution to this indicator demonstrates the economic stability in general and in this particular economic sector.

Figure no. 5 The value of construction production in EU 28 Member States , million euro



Source: Annual detailed enterprise statistics for construction (NACE Rev.2, F) (sbs_na_con_r2) available from https://ec.europa.eu/eurostat/databrowser/view/sbs_na_con_r2/default/table?lang=en, accessed on February 20, 2022

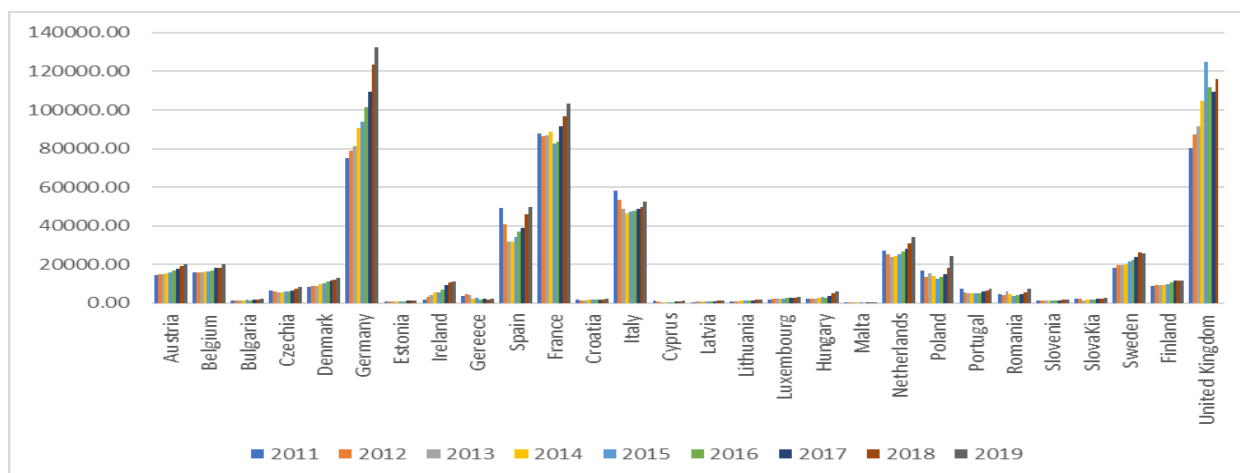
At this indicator Ireland recorded spectacular developments in 2020 (Figure no. 5). Compared to 2011 and 2012, the increase was 3,5 times and 3,1 times. Bulgaria doubled its production in 2020 compared to 2016. Italy and Greece recorded production declines in the 10 years analysed, reporting production in 2020 at each of the years of the interval. Italy recorded a higher decrease in 2020 compared to 2011, of 23%, after which the gap began to decrease, but did not reach the value since 2011. The same trend has been seen by Greece. Sweden and Finland had increases of 47% and 48% in 2020 compared to 2011, and Germany also doubled its production in 2020 compared to 2011, and in subsequent years it was 80% and by the middle of the range of 50%. It is interesting to note that, apart from the two mentioned countries, the other Community countries have registered increases in production in the construction sector. The exception to the rule is found in the report to 2019 where 15 States faced a decrease in production by up to 10%, and the other construction level was relatively the same in 2020 as in 2019.

2.2.5. Added value of the construction sector in EU 28 Member countries

Added value is the added wealth surplus by harnessing human potential and contributing to the realization of added value. The indicator reflects the economic and financial performance of the enterprise.

Ireland is following the upward trend of the other indicators in 2019 compared to 2011 and 2012, with an increase of 6-fold and 3,5-fold respectively. Greece also recorded decreases in value added in 2019 compared to the years of the analysed interval. However, compared to 2016 and 2018, the value of production registered a slight increase of 3% and 20%. Italy has evolved better at this index, with decreases only compared to 2011 and 2012, and thereafter increases were in the range of 7-13%.

Figure no. 6. Added value of the construction sector in EU 28 Member countries – millions euros



Source: Annual detailed enterprise statistics for construction (NACE Rev.2, F) (sbs_na_con_r2) available from https://ec.europa.eu/eurostat/databrowser/view/sbs_na_con_r2/default/table?lang=en, accessed on February 12, 2022
No data are available for 2020.

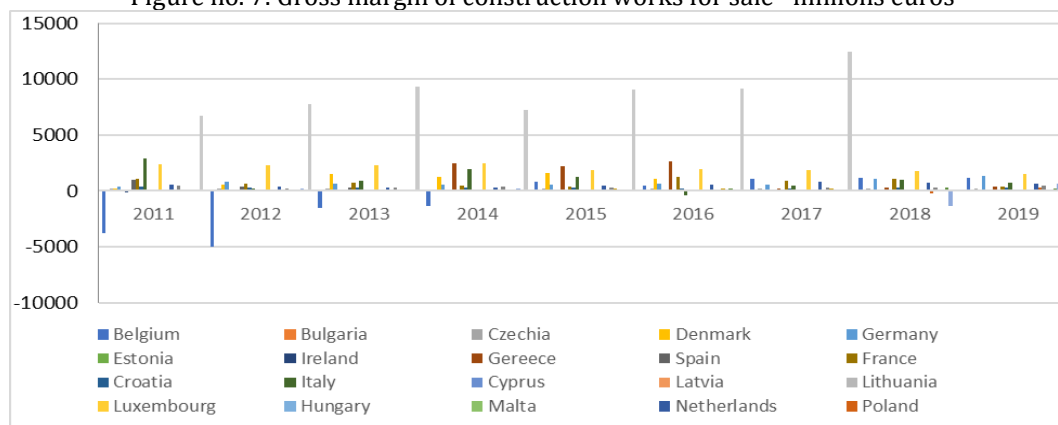
Hungary and Malta had increases between 20-30% in 2019 compared to the other years of the interval, Germany between 30-70%, along with the Czech Republic, Estonia, Poland. The other European

countries also saw increases of between 10% and 50% in the value added by the construction sector in total economic activity.

2.2.6 Gross margin of construction works intended for sale

Gross margin is actually the profit an entity obtains, the difference between the selling price (excluding VAT) and the cost of production. Gross margin is the difference between sales and cost of cost of prices sold (Brezeanu, 2008, vol1, p148).

Figure no. 7. Gross margin of construction works for sale– millions euros



Source: Annual detailed enterprise statistics for construction (NACE Rev.2, F) (sbs_na_con_r2) available from https://ec.europa.eu/eurostat/databrowser/view/sbs_na_con_r2/default/table?lang=en, accessed on March 12, 2022
Cyprus, Latvia, Hungary, Malta did not report data for the calculation of this indicator.

This indicator cannot establish a unitary trend. Austria has fallen 3,5 times and 4,4 times since 2019 2017 in 2018 and construction profit has fallen 16% since 2010 (Figure no. 7).

Belgium, on the other hand, started with negative margin values, with the lowest value in 2012 (-5029,7 million euro), reaching a value of 6 times higher from 2015, being the first year of the analysed period in which it recorded profit, its value increased by 50% by 2019.

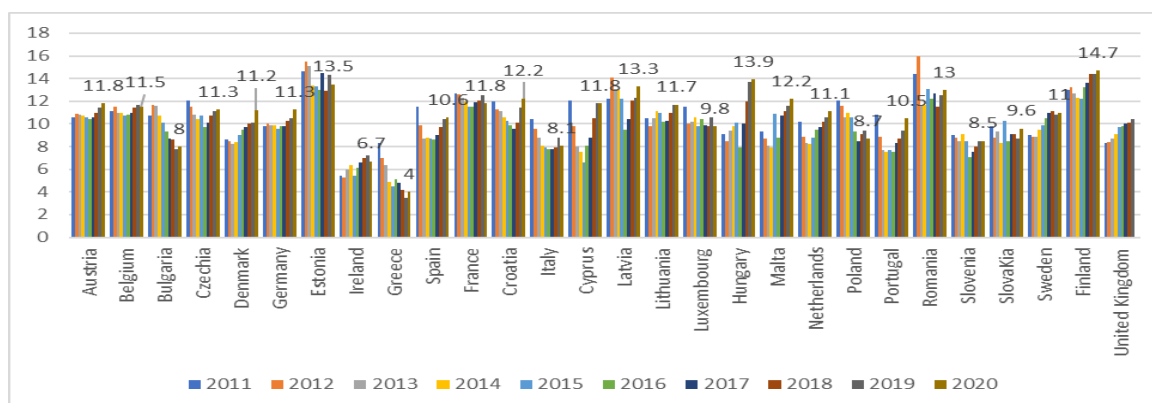
Denmark also saw a dramatic decrease in the margin, from EUR 217,6 million in 2011 to EUR 1,3 million in 2019 (167 fold decrease). Sweden had a strong decline in 2018, with a negative margin of -1367,5 million euro, starting from positive values in previous years. In 2019 it managed to restore and increase the margin value by 3 times compared to 2018.

Germany, France, Italy, the Netherlands had constant relative dynamics in the analysed period, with no major differences between the analysed years. Romania had a similar trend, registering increases from one to another until 2016, after which the gross margin was on a downward trend until 2019 included.

2.2.7. The share of construction sector investment in GDP for EU 28 Member States

Looking at the data in the chart below, it is worth noting that the recorded values are positive. The largest share of construction investments between EU countries was registered by Romania in 2012 and was 16%, followed by Estonia with 15,5% in the same year. Shares of 14% recorded Romania (2011), Estonia (2010) and Finland in the period (2018-2020), Latvia (2012).

Figure no. 8. Percentage of construction sector investment in GDP for EU Member States 28- % GDP



Source: Gross fixed capital formation by AN_F6 asset type available from https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_AN6_custom_2304645/default/table?lang=en, accessed on January 29, 2022

The lowest share of construction investment was recorded in Greece at 3,5% in 2019 (Figure no. 8). The maximum value of this indicator in Greece was 8% in 2011. Ireland ranks next with values ranging from 5,3% (2012) to 7,2% (2019). The largest increase in the share was in Cyprus at 22% in 2020 compared to 2015.

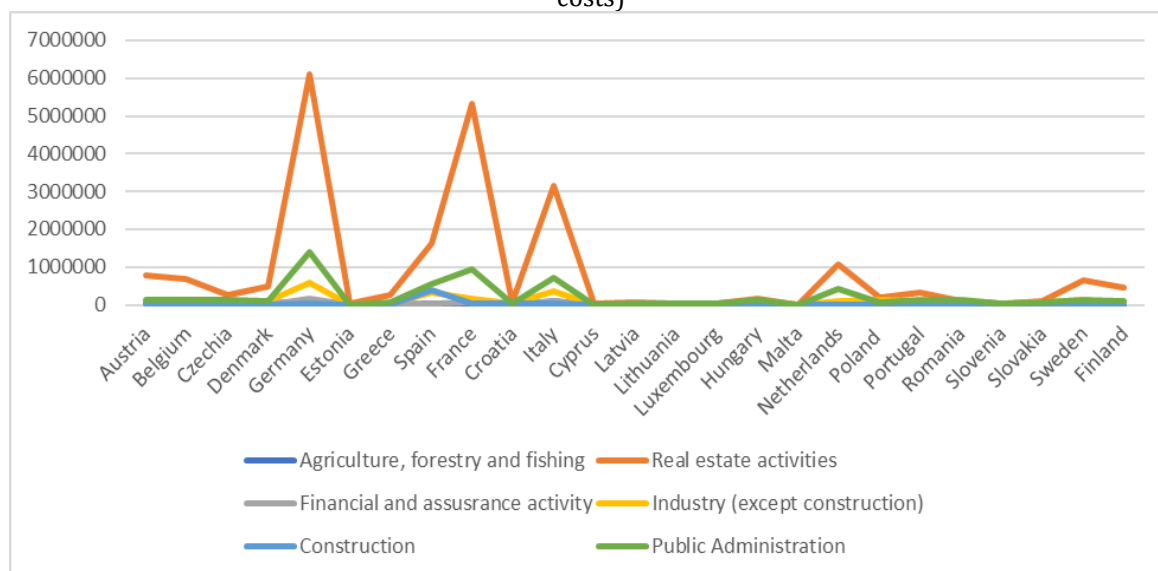
Germany, Great Britain, Sweden, with a developed economy and a strong macroeconomic context, so the evolution of this indicator was constant in the 10 analysed. Countries such as Spain, Portugal, Greece, hit hard by the financial crisis, have failed to reach the share of construction investments in the years before the crisis. Romania falls into the same category, failing to increase the share of investments in 2011 (13% in 2020 compared to 14,4% in 2011). The long recovery period after the crisis is also due to a weak fiscal policy and a lower degree of economic development.

But, no doubt, the trend of EU Member States is upward, with the share of investments increasing from one year to the other.

2.2.8 Investments in construction by industry

Investments in construction by industry are studied for the 2019. It is easy to see that the largest share of investment is in the real estate sector, followed by public investment and investment in the construction sector (Figure no. 9).

Figure no. 9. Cross-classification of fixed assets by industry and by asset millions euros (current replacement costs)



Source: Cross-classification of fixed assets by industry and by asset (stocks) available from https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_NFA_ST_custom_2308421/default/table?lang=en, accessed on February 10, 2022

For Bulgaria, Ireland and United Kingdom there are no data available

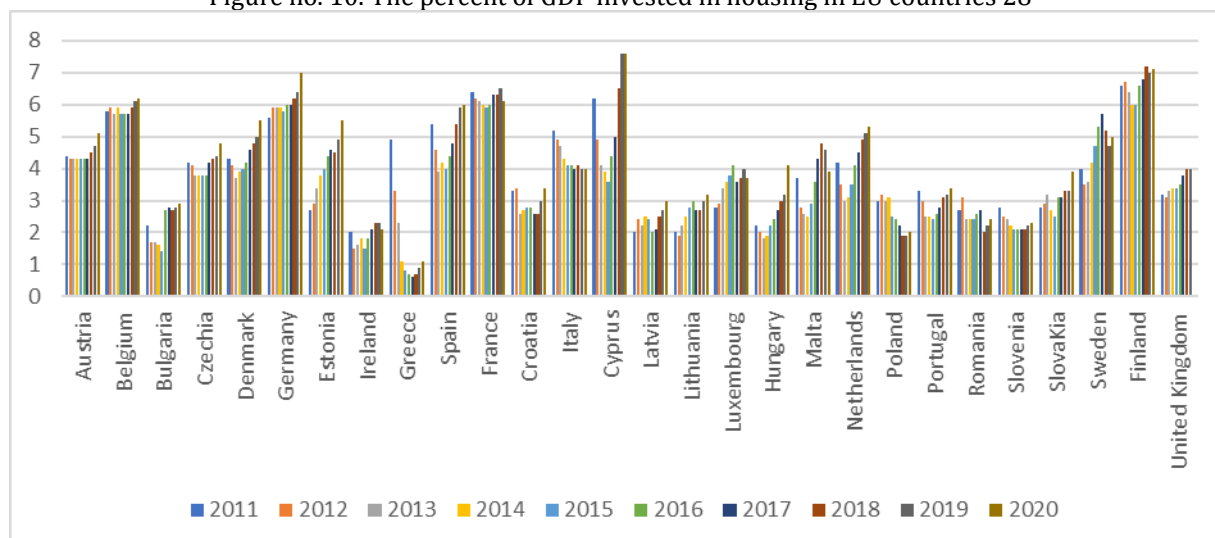
The highest level of investment is in Germany (6.111.293 millions euros), followed by France (5.332.378 millions euros) and Italy (3.148.571 millions euors). There is a growth in investment for the analysed period.

2.2.9. The percentage of GDP invested in housing in EU 28 countries

In 2011, France, Finland and Cyprus invested more than 6% of GDP in housing. In 2020, Cyprus and Finland continued to invest more than 7% of GDP in this area (and while Finland saw steady growth, Cyprus fell to 3;6% of GDP in 2015, after which it started to increase the invested percentage again). Germany has gradually increased its share of investment, from 5,3% of GDP in 2011 to 7% in 2020. The UK also experienced a slight increase of 1% in the 10 years analysed (Figure no. 10).

Greece has the lowest values and the biggest fall, down 88% in 2020 compared to 2010.

Figure no. 10. The percent of GDP invested in housing in EU countries 28



Source: Gross fixed capital formation by AN_F6 asset type available from https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_AN6_custom_2308252/default/table?lang=en accessed on February 10, 2022

The graph shows that countries in northern Europe have a higher share of housing investment, % of GDP, but also a constant evolution of this indicator. Combined with other indicators, countries with a stable and developed economy lead not only by the level of indicators, but also by the constant evolution and the low impact that the financial crisis has had on them.

3. Comparisons of the evolution of the construction sector between Romania and the EU

The development of the construction sector in Romania during the analysed period was slightly different from that at European level. The need for new construction, infrastructure, is much higher in Romania than at European level, and the effects of the financial crisis have had a bigger negative impact in the Romanian economy.

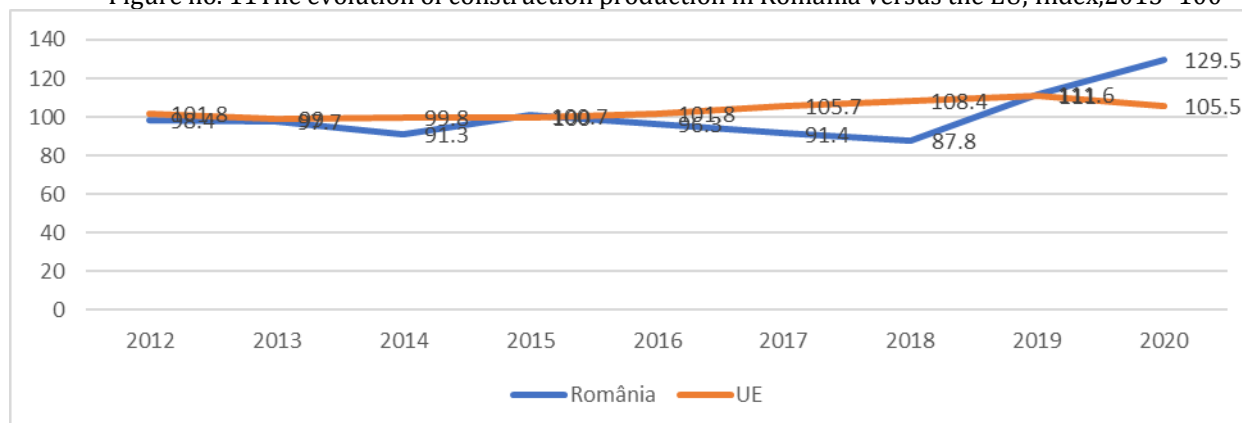
In the case of Romania, the trends are not constant, the developments are sinuous, which denotes the economic instability facing the Romanian economy.

At European level, the course is constant, there are no sudden decreases or increases in the indicators analysed, which reflects the stability caused by developed economies that have the ability to resist the influences due to different economic contexts.

3.1. The evolution of construction production in Romania versus the EU

In Romania, the index volume of production had about the same evolution in the period 2012-2018, fluctuations were not major, between 1% and 9%, but since 2018 the production started to increase by 22% in 2019 and by 16% in 2020 (compared to 2019).

Figure no. 11 The evolution of construction production in Romania versus the EU, Index, 2015=100



Source: Eurostat, Construction cost (or producer prices), new residential buildings - annual data, available from, https://ec.europa.eu/eurostat/databrowser/view/sts_copr_a/default/table?lang=en, accessed on February 11, 2022

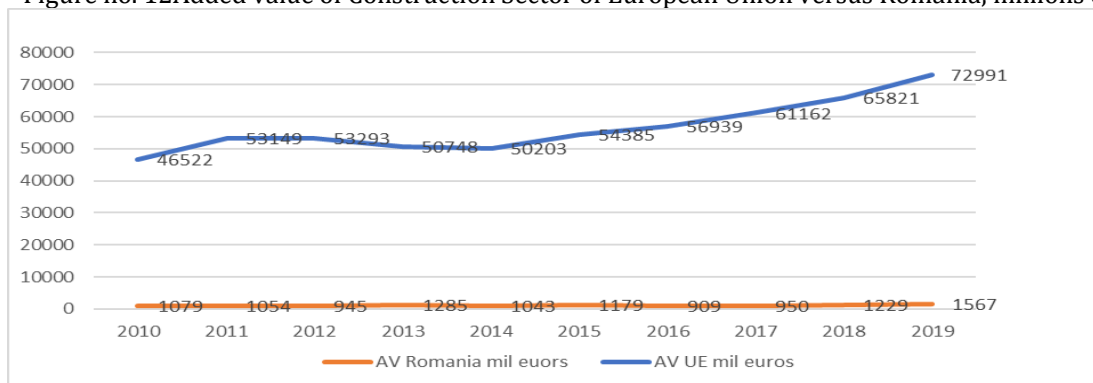
At European level, by 2016 the differences were almost insignificant from one another, with increases of around 2% from one to the other since 2016. However, 2020, the year of the pandemic, caused a

6,6% drop in production due to the closure of the construction sector in Western Europe due to the pandemic wave (Figure no. 11). However, this phenomenon was one of the factors that generated the positive evolution of the construction sector at that time. The prospects of the Romanian construction sector are favourable in the medium and long term, and the funds granted by the European Union for the development of infrastructure projects and for the acquisition or construction of houses will have a positive influence on the development of this sector (ECSO, Country Profile Romania, p3).

3.2. Added value of Construction Sector of European Union versus Romania

At European level, the value added by the construction sector has been constantly increasing, up to 56,89% over the 10 years analysed.

Figure no. 12 Added value of Construction Sector of European Union versus Romania, millions euro



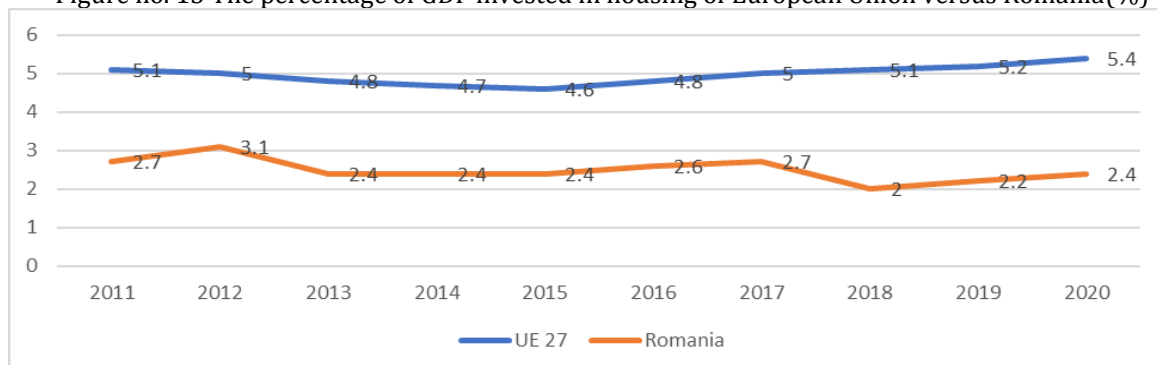
Source: Gross value added (GVA) in the EU environmental economy by NACE Rev. 2 activity available from <https://ec.europa.eu/eurostat/databrowser/view/ten00134/default/table?lang=en>, accessed on February 20, 2022, National Institute of Statistics Press Release 332/18.12.2020, Press Release 297/21.11.2019, Press Release 301/21.11.2018, Press Release 297/21.11.2017, Press Release 301/21.11.2016, Press Release 293/19.11.2015, Press Release 281/19.11.2014, Press Release 279/19.11.2013, Press Release 276/19.11.2012, Press Release 248/18.11.2011

In Romania, the added value of the construction sector had a sinuous evolution, marked by an increase of 25% in 2013 compared to 2010, then a decrease of 39,5% in 2016 compared to 2013, followed by a continuous growth of 81% until 2019, the lowest level reached in 2016. The increase of this indicator indicates that through the production process in the field of construction, the newly created value has also increased, being the result of the development of this sector of activity.

3.3. The percentage of GDP invested in housing of European Union versus Romania

If at European level, the share of GDP invested in housing is around 5%, in Romania the level of the investor was 2,4% in 4 years of the 10 years, the lowest value being recorded in 2018 of 2%, the highest figure was 3,1% in 2012 (Figure no. 13). The concentration of new housing takes place mainly in urban areas, especially in developed cities, with areas with low economic development and low population levels being disadvantaged.

Figure no. 13 The percentage of GDP invested in housing of European Union versus Romania(%)



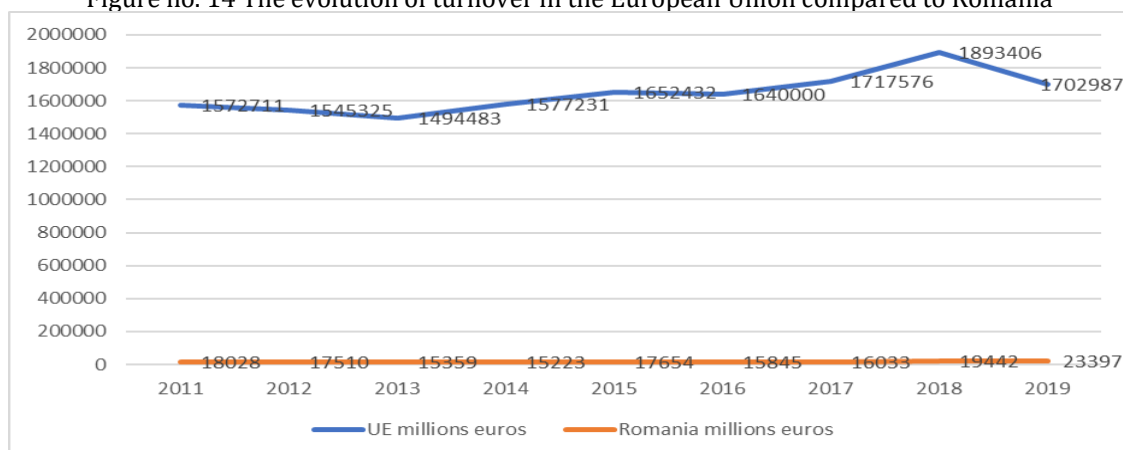
Source: Gross fixed capital formation by AN_F6 asset type available from https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_AN6_custom_2308252/default/table?lang=en, accessed on February 20, 2022

3.4. The evolution of turnover in the European Union compared to Romania

The fact that in 2019 the turnover is lower than in 2018 is due to the Brexit and not to the decrease of this indicator. In fact, if we look at the data available on Eurostat for the EU 27, 2019 saw a slight increase of 8%

compared to 2018 (Figure no. 14). At EU 28 level, in 2013 alone turnover was 5% lower than in 2011, but this decrease was recovered in 2014 and then the trend was increasing.

Figure no. 14 The evolution of turnover in the European Union compared to Romania



Source: Annual detailed enterprise statistics for construction (NACE Rev. 2, F) available from https://ec.europa.eu/eurostat/databrowser/view/sbs_na_con_r2/default/table?lang=en, accessed on February 22, 2022
National Institute of Statistics Press Release 303/23.11.2021, Press Release 332/18.12.2020, Press Release 297/21.11.2019, Press Release 301/21.11.2018, Press Release 297/21.11.2017, Press Release 301/21.11.2016, Press Release 293/19.11.2015, Press Release 281/19.11.2014, Press Release 279/19.11.2013, Press Release 276/19.11.2012

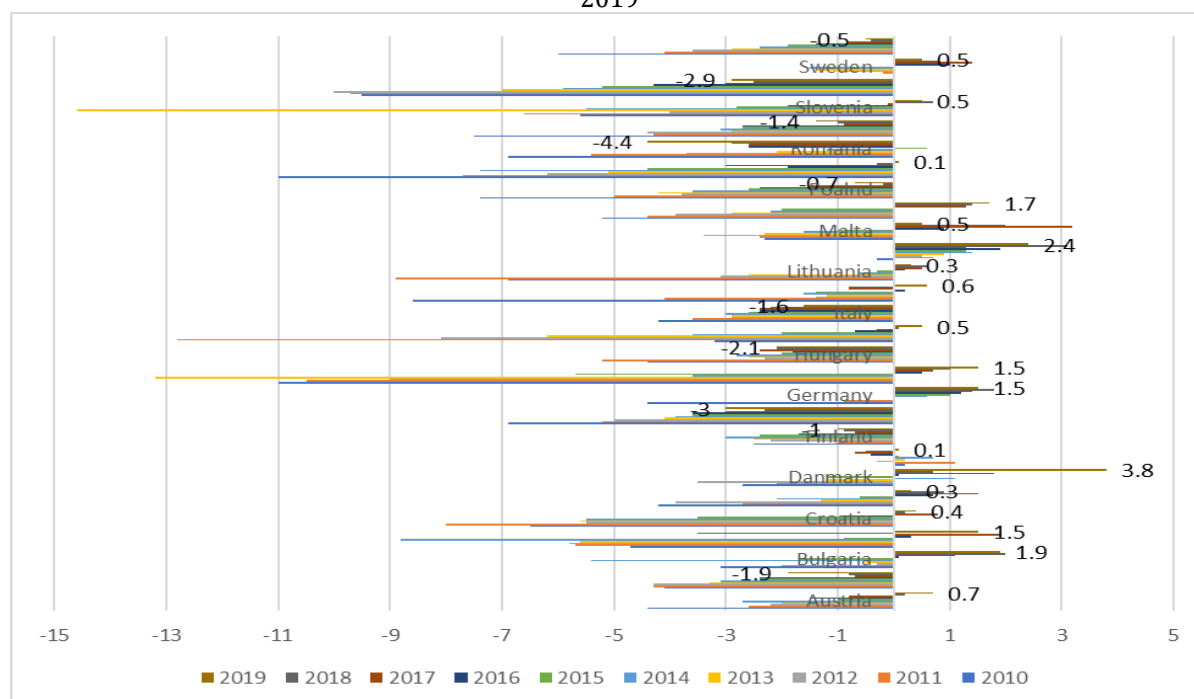
Romania, since 2016, has been on an upward trend. The biggest difference was recorded in 2015 when the turnover increased by 55% compared to 2014. It was only in 2018 that the level recorded in 2011 was exceeded by 16%. 2019 saw a 23% increase compared to 2018.

Overall, however, there is an increase in the analysed indicators, both in the European Union and in Romania.

3.5 The evolution of the budget deficit for the EU 28 countries in the period 2010-2019

The GDP growth for EU Member States, presented in Figure no 15, shows that all Union countries have recovered from the losses during the financial crisis and the post-crisis period, with only 10 countries having negative GDP values in 2019, which are lower than in 2010, the rest have higher budget revenues than spending.

Figure no. 15 The evolution of the budget deficit for the EU 28 countries in the period 2010-2019



Sources: Government deficit/surplus, debt and associated data available from https://ec.europa.eu/eurostat/databrowser/view/GOV_10DD_EDPT1_custom_603631/default/table?lang=en, accessed on February 23, 2022

4. Conclusions

Since 2017, from the analysis of financial indicators, the economic growth recorded in the economies, was also noted in the construction sector. The increased consumption, demand for housing and infrastructure determined economic growth in the years before 2020. The increase in the number of employees, the number of companies in the construction sector, the value of production, all these indicators reflect the development of the construction sector based on the increase in demand and the gradual relaxation of lending.

To stimulate demand and investment in this sector of the economy, States intervened through levers that aimed to stimulate construction: Reduction of unemployment, monetary policies to prevent the “warming” of the real estate market and the emergence of real estate bubbles, public investments in infrastructure, schools and hospitals, reduction of VAT for the purchase of new housing, tax cuts and taxes for companies and employees in the construction sector.

The development of this type of activity is carried out only in the context of overall economic growth of the national economies of the EU Member States, a permanent improvement in the well-being of the population and fiscal and monetary policies to support the achievement of these goals.

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