



TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 25, 2021

**A new decade
for social changes**

www.techniumscience.com

ISSN 2668-7798



9 772668 779000

Issues concerning the dynamics of labor productivity at the level of the companies in Constanța County operating in the "Construction" sector before and after the COVID-19 pandemic

Mari-Isabella Stan

Ovidius University of Constanta, Faculty of Law and Administrative Sciences
stanisabella@yahoo.com

Abstract. The construction industry sector plays an important role in the national and local economy, and its activities are vital for achieving the objectives of economic and social development which lead to increasing the citizens' quality of life. In the construction sector, the COVID-19 crisis has led to a reduction in site productivity, which has led to an increase in compliance costs, delayed projects and increased the exposure of construction workers to risk and infection. Given that many companies have experienced substantial declines in turnover and high turnover uncertainty during this pandemic, a continuous analysis of the economic climate, respectively of the main indicators of the companies active on the market is a very important element in terms of outlining an overall view of the current situation, as well as the trends in the construction sector. This study provides an empirical analysis as to before and after the COVID-19 pandemic level of labor productivity of economic agents operating in the construction sector in Constanța County. Starting from assessments of the average turnover and the evolution of the workforce of the companies in the construction sector located on the territory of Constanța County, the objective of the research was the dynamical analysis of the level of labor productivity and the way it was influenced by the emergence of this unexpected event. The obtained results confirmed the research hypothesis, namely that the level of labor productivity is influenced by the level of investment and it registers a moderate increase, yet on a noticeable increasing trend, the probable reason being the construction projects for public investment carried out in the area.

Keywords. Labor productivity, construction sector, Constanta county, COVID-19.

1. Introduction

The construction sector is of paramount importance, having an important effect on the prosperity, health and quality of life for the citizens of a country (Alaloul et al., 2021); housing construction, rehabilitation, construction of production units, infrastructure and public works are important elements for the modernization and maintenance of the economy, promoting, on the one hand, the productive and industrial activity and, on the other hand, the well-being of the society (Zubizarreta et al., 2017).

The term "construction" is the name of a branch of the technique that deals with the design, execution, maintenance and exploitation of various structures or infrastructure works, a branch which represents an important economic activity. Thus, a study by Pheng and Hou (2019) shows that construction is an important economic activity that crosses all the three economic sectors: the primary sector, which involves the extraction of natural resources; the

secondary sector, which involves the manufacture of construction materials and components and the transformation of these materials into finished buildings; and the tertiary sector, which involves the provision of consulting services, such as project management, structural design and engineering.

The construction industry plays an important role in the economy, and the activities of this sector are vital for achieving the objectives of socio-economic development through the development of infrastructure, the construction of shelters and, of course, the employment process. On the other hand, national economic development depends on local economic development, namely on increasing the economic competitiveness of local areas in order to improve the living conditions of the communities.

The Strategy for the Sustainable Competitiveness of the Construction Sector and its Enterprises (COM/2012/0433 final) shows that the construction sector plays an important role in the European economy, being one of the main consumers of intermediate products, such as raw materials, chemical products, electrical and electronic equipment and related services.

In Romania, according to the *National Competitiveness Strategy 2015-2020* (Government Decision no. 775/2015), the construction sector has a great potential for growth, acting as a catalyst for economic development, and being considered one of the "10 sectors of the future".

However, the emergence of the Covid-19 pandemic in the year 2020 was an extraordinary shock, the European economy, and implicitly the one in Romania, being severely affected. The effects of the pandemic hit among many other economic sectors the field of investment strategies in construction (Kaklauskas et al., 2021). Thus, the coronavirus pandemic also affected the construction sector represented by builders, designers, manufacturers, and distributors of construction materials. According to the analysis carried out by Euler Hermes, "before the spread of Covid-19, the construction sector, although emerging from a cyclical peak, was still expanding, with the largest companies displaying a solid financial outlook. However, being a sector dependent on physical labor, the construction sector experienced a significant interruption due to the Covid-19 pandemic, despite being considered an essential activity in many countries".

Although the Covid-19 crisis significantly affected Romania's economy, according to the Eurostat Report on the situation in the European Union's construction sector, drawn up in April 2020, compared to the March 2020 situation, "Romania had the highest annual growth in the EU", which is why an analysis at the level of the companies operating in the "Construction" sector before and after COVID-19 is required.

2. Literature review

The construction sector is hundreds of years old in the world, years in which its activity has been significantly expanded, encompassing many sub-domains of activity. In the most common context, construction covers complete processes involved in the development of buildings, infrastructures, installations, both civil and industrial, as well as associated activities that make the existence of developed works possible. The construction industry also has the potential to generate economic activities in other sectors of the economy, such as production, transport, trade, and financial services, due to its interconnections with other sectors, thus playing an important role in the employment process (Opoku et al., 2021).

Although this is a technical type of work, the construction process begins with the planning, financing and design of the project, it continues with physical works, until the respective object is built and ready to be used. The construction also covers repair and maintenance activities, extension works, modernization, demolition, dismantling and

decommissioning; thus, construction, renovation and demolition are key sectors of the industry related to the built environment (Guerra et al., 2021).

Due to its economic importance, the performance of the construction sector can significantly influence the development of economy, as a whole (COM/2012/0433 final), with companies in the sector having some unique characteristics, and being defined as "project-based, service-enhanced forms of enterprises", their activities differing significantly from the activities in other sectors (Zubizarreta et al., 2017).

A very important economic indicator in establishing the efficiency of a field of activity is "productivity", which illustrates how efficiently the expenses are made in the whole production process. The level of labor productivity can be calculated as the ratio between "turnover" and "number of employees".

The researchers Fulford and Standing (2014) pointed out that the construction industry suffers from a low level of labor productivity and they argued that it lags behind other industries in terms of improving efficiency. Labor productivity is an important topic in the construction industry (Ghodrati, Yiu and Wilkinson, 2018), therefore, in order to predict the evolution of the economic dynamics of this sector of activity it is necessary to analyze the indicators "turnover" and "number of employees" for the economic agents in this business.

"Turnover" is one of the most used financial indicators and it represents the sum of the revenues of a company obtained by selling products or services which are provided in a certain period of time. Therefore, "turnover" is made up of the total income generated from carrying out commercial operations during the company's activity, excluding financial and exceptional income. However, "turnover" is related to the market.

The "number of employees" indicator includes persons employed with a fixed-term or an indefinite employment contract, whose contract was not suspended during the reference year. The construction industry is one of the most intense labor industries in the world, the construction workforce being considered a valuable asset for every construction company. (Ghodrati, Yiu and Wilkinson, 2018). A study conducted by Eriksson, Qin and Wang (2014) shows that the level of turnover can be the result of the human resources management practices chosen by the company, and can have a direct effect on the company's innovation activities.

Although the construction industry faces many challenges, including low productivity, lack of research and development, and poor advances in technology (Opoku et al., 2021), growth in the construction sector largely depends on the size of the business, the financial capacity of the strongest companies, which allows them to develop their ideal growth model (Zubizarreta et al., 2017).

The construction sector in the European Union is strategic for the economies of most countries in the world. Romania is one of the largest markets in the Central and Eastern European region, with a constantly developing construction sector, but which also faces sector-specific problems. For this reason, over the years various normative acts have been approved so that construction companies can benefit from certain advantages. Thus, on November 29, 2018, an Agreement was signed between the Government of Romania and the Employers' Federation of Building Companies on measures for a sustainable economic growth of Romania, based on investment for the next 10 years, declaring the construction sector a priority sector of national importance for the Romanian economy for the next 10 years, starting in January 1, 2019 (Government Emergency Ordinance/GEO no. 114/2018). The document stipulates the exemption from the payment of the employer's social contributions for the period January 1, 2019 - December 31, 2028, the reduction of the employees' social contributions by 3.75% and a minimum gross salary of 3,000 lei for the construction employees. After GEO no. 114/2018, with its subsequent amendments and completions, other normative acts and the Fiscal Code

introduced amendments which established the fiscal facilities related to the construction sector. Thus, in order to benefit from tax facilities, companies are required to achieve a turnover from construction activities of at least 80% of the total turnover. In the case of construction companies, turnover can be achieved on a contract or order basis, covering materials, labor costs/manpower, equipment used and transportation, as well as other ancillary costs necessary to carry out the activity.

An analysis published by the International Work Finder shows that "one of the biggest problems of the civil, industrial and agricultural construction market remains the acute shortage of skilled or unskilled labor, despite all the measures taken by governments that went as far as granting important tax exemptions in terms of the labor taxation in the sector".

Another major problem is the crisis caused by the coronavirus pandemic, which poses a threat to the economy and the standard of living of the citizens. In the construction sector, the COVID-19 crisis has led to a reduction in site productivity, which has led to an increase in compliance costs, delayed projects and increased the exposure of construction workers to risk and infections (Olanrewaju et al., 2021). Many companies have experienced substantial declines in turnover and a high turnover uncertainty during the COVID-19 pandemic (Groenewegen, Hardeman and Stam, 2021).

Therefore, a continuous analysis of the economic climate, respectively of the main indicators of the companies active on the market, represents a very important element in terms of outlining an overall view of the current situation, as well as the trends in the construction sector. The analysis was carried out according to the NACE classification, at the level of the activity sectors of the construction sector, by means of the "turnover" and "number of employees" indicators, thus being able to draw comparisons between them more easily.

3. Methodology and data

The purpose of this article is to analyze before and after the COVID-19 pandemic the degree of labor productivity at the level of economic agents from Constanța County which have as their main object of activity, according to the NACE classification, *Construction*.

Constanța County is located in the southeastern part of Romania between the Danube (to the West) and the Black Sea (to the East), in the historical province of Dobru(d)ja, to the North it borders Tulcea County, and to the South, Bulgaria; it has an area of 7,071 km², occupying 3% of the total area of the country, being the eighth largest among the counties of the country.

In Constanța County, the companies operating in the construction sector have an important role in the economic development of the area, the main cause being the increase in demand on the real estate market and the high volume of investment in the large infrastructure of the region.

For the analysis carried out we have used the data provided by the National Institute of Statistics of Romania (INSSE) and the Ministry of Public Finance (ANAF / National Agency for Fiscal Administration) for the 2018–2020 time frame, the year 2019 being considered a reference year for the emergence of the Covid-19 pandemic. The centralization and systematization of data, such as obtaining the indicators used in the statistical description was carried out with the help of the program *Statistical Package for the Social Sciences* (SPSS). The empirical study has used all the companies from Constanța County whose main object of activity is Construction.

A first objective of the analysis has been to obtain assessments regarding the average turnover and the evolution of the labor force of the economic agents operating in the construction sector in Constanța County, for the 2018-2020 time frame. The second objective

has been to analyze how labor productivity in the construction sector in Constanța County has been affected during this pandemic, in order to obtain a comparative image in dynamics using the years 2018-2020, the years before and after COVID. The analysis has confirmed the research hypothesis, namely that the level of labor productivity is influenced by the level of investment and it registers moderate increases in the construction sector also as a result of the COVID-19 pandemic.

The option of analyzing the average values used in this study has led to conclusions on the general conduct of the activities pertaining to the chosen NACE code.

The analyzed database that includes all the companies on the territory of Constanța County whose main object of activity is the construction sector was created by applying several filters: the NACE code (companies with codes between 41.00 and 44.00 were selected) and companies with a turnover greater than zero.

This group of activities includes the following sub-activities: 41.10 Development (promotion) of building projects, 41.20 Construction of residential and non-residential buildings, 42.11 Construction of roads and motorways, 42.12 Construction of railways and underground railways, 42.13 Construction of bridges and tunnels, 42.21 Construction of utility projects for fluids, 42.22 Construction of utility projects for electricity and telecommunications, 42.91 Construction of water projects, 42.99 Construction of other engineering projects n.e.c. (not elsewhere classified), 43.11 Demolition, 43.12 Site preparation, 43.13 Test drilling and boring, 43.21 Electrical installation, 43.22 Plumbing, heat and air conditioning installation, 43.29 Other construction installation, 43.31 Plastering, 43.32 Joinery installation, 43.33 Floor and wall covering, 43.34 Painting and glazing, 43.39 Other building completion and finishing, 43.91 Roofing activities, 43.99 Other specialized construction activities n.e.c.

4. Results and discussion

The analysis of business development in emerging economies has long been in the theorists' focus of attention. The predilection for asset management or workforce efficiency may show a diminishing progression in the neighboring regions and even within the subgroups of the same field of activity. An interesting study, conducted by Aivaz (2020), highlighted the predilection of the companies for managing their assets in correlation with the evolution of the workforce and the analysis of turnover in the Dobrudja region, with a correlational perspective of the two indicators. The results of another study conducted by Aivaz (2021a) indicated that the management of fixed assets contributed to the achievement of operational turnover, which may be a possible explanation for the difference in economic development between areas or sub-activities. Although companies have a similar demographic and economic potential, they show very different business indicators.

Starting from these considerations, in order to obtain some assessments regarding the average turnover and the evolution of the workforce in the sector, an analysis of the economic agents operating in the construction sector in Constanța County will be carried out, for the 2018-2020 time frame.

Table 1 presents the average level of turnover and the average number of employees for the year 2018, for each NACE subgroup and the number of companies within each subgroup.

Table 1. Report on the average turnover and the average number of employees for the year 2018

NACE name		Turnover	No employees
41.10 Development (promotion) of building projects	Mean	847,067.49	4,35
	N	203	120

41.20 Construction of residential and non-residential buildings	Mean	564,900.96	7,49
	N	1,278	776
42.11 Construction of roads and motorways	Mean	6,495,739.35	35,21
	N	40	33
42.12 Construction of railways and underground railways	Mean	4,829,121.20	74,60
	N	5	5
42.13 Construction of bridges and tunnels	Mean	318,445.00	3,00
	N	1	1
42.21 Construction of utility projects for fluids	Mean	1,467,618.20	11,47
	N	25	17
42.22 Construction of utility projects for electricity and telecommunications	Mean	4,589,890.18	18,00
	N	11	8
42.91 Construction of water projects	Mean	4,362,960.18	26,45
	N	17	11
42.99 Construction of other engineering projects n.e.c.	Mean	2,764,990.52	24,95
	N	31	21
43.11 Demolition	Mean	165,778.25	2,20
	N	8	5
43.12 Site preparation	Mean	271,911.95	2,17
	N	19	12
43.13 Test drilling and boring	Mean	430,955.87	3,75
	N	16	12
43.21 Electrical installation	Mean	755,958.77	8,62
	N	211	140
43.22 Plumbing, heat and air conditioning installation	Mean	479,621.88	6,16
	N	325	203
43.29 Other construction installation	Mean	1,892,162.31	21,60
	N	26	20
43.31 Plastering	Mean	134,803.08	2,14
	N	12	7
43.32 Joinery installation	Mean	358,085.96	4,56
	N	81	55
43.33 Floor and wall covering	Mean	568,629.28	17,11
	N	43	18
43.34 Painting and glazing	Mean	139,078.68	4,86
	N	34	14
43.39 Other building completion and finishing	Mean	101,196.42	3,60
	N	24	15
43.91 Roofing activities	Mean	580,704.92	6,71
	N	24	17
43.99 Other specialized construction activities n.e.c.	Mean	987,821.48	9,17
	N	120	77
Total	Mean	781,969.10	8,51
	N	2,555	1,587

Source: Processed by the author using the SPSS program

Regarding the economic agents operating in the construction sector in Constanța County, for the year 2018, from Table 1 one can notice that the average turnover of 781,969.10 lei is achieved by 2,555 companies, while 1,587 have an average number of employees of 8,51.

Table 1 highlights the average level of turnover and the average number of employees for the year 2018, by subgroups of activities according to the NACE code for companies in the construction sector in Constanța County. Thus, one can notice that the subgroup *Construction of roads and motorways* (42.11) recorded by far the highest average value of turnover of 6,495,739.35 lei for a number of 40 companies, whereas the average number of employees is 35,21 for a number of 33 companies; the subgroup *Construction of railways and underground railways* (42.12) recorded an average turnover of 4,829,121.20 lei and an average number of employees of 74,60 for a number of 5 companies; the subgroup *Construction of utility projects for electricity and telecommunications* (42.22) recorded an average turnover of 4,589,890.18 lei for a number of 11 companies, whereas the average number of employees is 18,00 for a number of 8 companies; the subgroup *Construction of water projects* (42.91) registered an average turnover of 4,362,960.18 lei for a number of 17 companies, whereas the average number of employees is 26,45 for a number of 11 companies; the subgroup *Construction of other engineering projects n.e.c.* (42.99) recorded an average turnover of 2,764,990.52 lei for a number of 31 companies, whereas the average number of employees is 24,95 for a number of 21 companies. These figures reveal the interest in the development of investment in large infrastructure through investment financed from European funds and government programs carried out by the local authorities. Infrastructure development ensures a sustainable economic development through investment, acting as a driving force for the development of other sectors of the economy, as well.

The economic entities in the subgroups of activities carrying out finishing works for the construction of residential and non-residential buildings: *Plastering* (43.31), *Painting and glazing* (43.34), *Joinery installation* (43.32), *Plumbing, heat and air conditioning installation* (43.22), *Floor and wall covering* (43.33), *Roofing activities* (43.91) and *Other building completion and finishing* (43.39), while being more numerous, they have low average values of turnover and an average number of employees, which could be explained by the low value of works contracts compared to those in the large infrastructure investment.

As can be seen in Table 1, the main groups of activities in terms of the number of active companies are: *Development (promotion) of building projects* (41.10) which recorded an average turnover of 847,067.49 lei for a number of 203 companies and an average number of employees of 4,35 for a number of 11 companies and *Construction of residential and non-residential buildings* (41.20), which recorded an average turnover of 564,900.96 lei for a number of 1,278 companies, whereas the average number of employees is 7,49 for a number of 776 companies, a fact which indicates that the activities carried out by these subgroups are not always carried out on a contract basis, the workforce is paid with low salaries and Romanian workers go abroad. In this regard, at the end of the year 2018 the *Agreement between the Government of Romania and The Employers' Federation of Building Companies* was signed by which the construction sector was declared a priority sector of national importance for the Romanian economy for the next 10 years, starting from January 1, 2019.

Table 2 shows the average level of turnover and the average number of employees for the year 2019, for each NACE subgroup and the number of companies within each subgroup.

Tabel 2. Report on the average turnover and the average number of employees for the year 2019

NACE_name		Turnover	No_employees
41.10 Development (promotion) of building projects	Mean	1,409,436.01	4,19
	N	216	145
41.20 Construction of residential and non-residential buildings	Mean	755,122.18	8,42
	N	1,358	854
42.11 Construction of roads and motorways	Mean	10,077,598.65	32,82
	N	46	34
42.12 Construction of railways and underground railways	Mean	6,155,084.83	75,17
	N	6	6
42.13 Construction of bridges and tunnels	Mean	380,100.00	3,00
	N	1	1
42.21 Construction of utility projects for fluids	Mean	3,942,294.13	14,04
	N	30	26
42.22 Construction of utility projects for electricity and telecommunications	Mean	3,914,754.80	21,00
	N	15	8
42.91 Construction of water projects	Mean	4,782,423.56	28,10
	N	16	10
42.99 Construction of other engineering projects n.e.c.	Mean	5,490,132.67	33,95
	N	30	22
43.11 Demolition	Mean	272,785.63	2,25
	N	8	4
43.12 Site preparation	Mean	249,724.58	2,67
	N	26	15
43.13 Test drilling and boring	Mean	546,895.94	4,25
	N	17	12
43.21 Electrical installation	Mean	819,356.33	7,47
	N	227	159
43.22 Plumbing, heat and air conditioning installation	Mean	547,504.29	6,74
	N	347	220
43.29 Other construction installation	Mean	1,509,550.33	18,45
	N	30	22
43.31 Plastering	Mean	264,165.33	7,56
	N	12	9
43.32 Joinery installation	Mean	405,062.08	4,60
	N	87	57
43.33 Floor and wall covering	Mean	690,625.78	13,21
	N	45	29
43.34 Painting and glazing	Mean	140,495.86	3,11
	N	29	19
43.39 Other building completion and finishing	Mean	121,412.74	3,00
	N	23	12
43.91 Roofing activities	Mean	558,028.39	7,00
	N	18	14
43.99 Other specialized construction activities n.e.c.	Mean	1,642,696.40	13,62
	N	125	76

Total	Mean	1,098,805.63	9,15
	N	2,712	1,754

Source: Processed by the author using the SPSS program

A Eurostat report regarding the situation in the construction sector in the European Union in the year 2019 showed that "Romania registered an increase of 23.3% in the construction sector, in June 2019 compared to the same period of the year 2018".

Regarding the economic agents operating in the construction sector in Constanța County, for the year 2019, from Table 2 one can notice that the average turnover of 1,098,805.63 lei is achieved by a number of 2,712 companies, whereas 1,754 have an average number of employees of 9,15.

Therefore, the national growth trend in the sector is maintained at the level of Constanța County. The numerical growth of construction companies was an important support for the overall growth of the sector, reflected in the increase in the average turnover by 40% and the increase in the average number of employees by 7% in 2019 compared to the year 2018.

From Table 2 compared to Table 1 one can notice that the subgroups of activities specific to engineering constructions (which include all the other constructions that do not fall into the category of buildings, namely: communication routes, works of art, hydrotechnical constructions, chimneys, television towers, water, gas, sewer pipes, power lines, etc.) increased in the year 2019 compared to 2018. Thus, the sub-activities *Construction of roads and motorways* (42.11), *Construction of railways and underground railways* (42.12), *Construction of utility projects for electricity and telecommunications* (42.22), *Construction of water projects* (42.91) and *Other specialized construction activities n.e.c.* (42.99) recorded higher average values of turnover and average number of employees than in the year 2018. The increase in the average values of these sub-activities specific to the sector are significant for the sustainable economic development of the county given that the territory of Constanța County includes a substantial part of the coastal area (Stan and Vintilă, 2021) and works were carried out for the protection and rehabilitation of the Romanian Black Sea coastal area affected by serious erosion problems, within the EU-funded project "Reducing coastal erosion, Phase II (2014-2020)" (Stan, Aivaz and Ionițiu, 2019).

The same increase is observed as regards the subgroups of activities *Development (promotion) of building projects* (41.10) and *Construction of residential and non-residential buildings* (41.20), as well as those carrying out finishing works for the construction of residential and non-residential buildings, which have recorded higher average values of turnover and average number of employees compared to the year 2018. This fact is explained by: the implementation of fiscal facilities for the construction sector which has led to a halt of the massive departures of construction employees across borders and the increasing demand on the real estate market. As an up-stream market, the real estate market can have significant effects on the residential construction sector (Ma et al., 2021).

Table 3 shows the average level of turnover and the average number of employees for the year 2020, for each NACE subgroup and the number of companies within each subgroup.

Table 3. Report on the average turnover and the average number of employees for the year 2020

NACE_name		Turnover	No_employees
41.10 Development (promotion) of building projects	Mean	2,727,638.64	4,52
	N	239	153
	Mean	856,761.68	9,14

41.20 Construction of residential and non-residential buildings	N	1,449	920
42.11 Construction of roads and motorways	Mean	10,967,152.22	44,24
	N	46	33
42.12 Construction of railways and underground railways	Mean	6,280,283.50	85,40
	N	6	5
42.13 Construction of bridges and tunnels	Mean	369,060.00	3,00
	N	1	1
42.21 Construction of utility projects for fluids	Mean	3,863,775.82	14,68
	N	34	25
42.22 Construction of utility projects for electricity and telecommunications	Mean	3,139,893.16	16,40
	N	19	10
42.91 Construction of water projects	Mean	5,350,324.33	26,00
	N	15	10
42.99 Construction of other engineering projects n.e.c.	Mean	4,200,551.22	32,46
	N	36	28
43.11 Demolition	Mean	57,750.56	1,50
	N	9	4
43.12 Site preparation	Mean	644,952.90	5,71
	N	29	17
43.13 Test drilling and boring	Mean	638,542.11	5,00
	N	19	12
43.21 Electrical installation	Mean	735,400.72	7,74
	N	249	168
43.22 Plumbing, heat and air conditioning installation	Mean	498,981.98	5,95
	N	357	240
43.29 Other construction installation	Mean	1,880,555.21	19,40
	N	29	20
43.31 Plastering	Mean	538,828.45	5,56
	N	11	9
43.32 Joinery installation	Mean	740,536.05	5,98
	N	84	54
43.33 Floor and wall covering	Mean	833,266.81	13,00
	N	47	33
43.34 Painting and glazing	Mean	158,527.87	6,11
	N	38	18
43.39 Other building completion and finishing	Mean	129,852.45	2,75
	N	22	12
43.91 Roofing activities	Mean	635,966.90	7,50
	N	21	16
43.99 Other specialized construction activities n.e.c.	Mean	1,301,683.89	12,19
	N	130	86
Total	Mean	1,247,158.47	9,65
	N	2,890	1,874

Source: Processed by the author using the SPSS program

At national level, the construction sector is one of the few sectors which recorded increases during the year 2020. According to the National Institute of Statistics' data, in the year 2020, the total volume of construction works increased by 16% compared to 2019, in a context in which, at European level, the results indicate a decline in activity in the year the COVID-19 pandemic began, both cumulatively and in most Member States.

The ascending trend is also maintained in Constanța County in the year 2020; as can be seen from Table 3 all sub-activities in the construction sector registered significant increases, with an average turnover of 1,247,158.47 lei achieved by a number of 2,890 companies, whereas 1,874 companies have an average number of employees of 9,65. Also in the year 2020 the numerical growth of construction companies was an important support for the growth of the sector, reflected in the increase in average turnover by 13.5% and the increase in the average number of employees by 5.4% in the year 2020 compared to 2019. Although the average values are on an upward trend, there is still a tendency to slow down growth in the year 2019 compared to 2018 due to the impact of the pandemic on economic activity, in general.

In the year 2020, the "star" of the sub-activities in the construction sector was *Development (promotion) of building projects* (41.10) which registered the highest increase in the average turnover. Thus, turnover increased in the year 2020 by 93.5% compared to 2019, and there was an increase in the average number of employees by 7.8% in 2020 compared to 2019, probably due to the increase in demand and implicitly in the prices on the real estate market.

Recent studies (Petrișor, Sirodov and Ianoș, 2020; Petrișor et al., 2021) have shown that the rapid pace of urbanization, intensified by economic activities, has led to changes in land cover and use; however, in Constanța County, the urbanization of the Romanian coast seems to have stopped (Petrișor and Petrișor, 2021), which has led to a moderate increase in investment in cities and resorts, amid accentuated discrepancies between the urban and rural areas.

The year 2020 was also marked by the increase in prices for construction materials doubled by a workforce crisis, which led to an increased price of residential and non-residential buildings, and implicitly to higher costs on the real estate market. Thus, the price of residential construction is an essential indicator in order to optimize the decision-making process of market stakeholders for property development (Ma et al., 2021).

In the year 2020, the Covid-19 crisis spread rapidly throughout the planet, and the governments of the affected countries quickly adopted measures to fight the phenomenon (Rus, Sandu and Tasește, 2020). The Romanian Government also adopted a series of normative acts regarding the establishment of emergency measures to limit and prevent the spread of COVID-19.

The coronavirus crisis poses a threat to the economy and the standard of living of its citizens. In this context, the rapid evolution of the COVID-19 pandemic has also led to challenges in the Romanian construction sector. Although during the pandemic work continued to be done on the building sites "there were important municipalities which decided to close the building sites in March, but they were reopened in April. There were also building sites which were closed due to the decision of the beneficiaries to postpone or suspend the development of the investment", according to Laurențiu Plosceanu, ARACO president, in an interview given in June 2020 in Construction Magazine.

The paralysis of the economic activity, starting in March 2020, has had negative effects on the labor market. The reduction of activity, and implicitly of the workforce demand, caused by the COVID-19 pandemic had negative effects of medium intensity in the construction sector (Vasile, 2020). Thus, at national level, the crisis led to the suspension of employment contracts

in the construction sector, the number constantly increasing in the analyzed period (30.03.2020–12.05.2020) to 11.6% compared to the number of employees (Chivu and Georgescu, 2020).

In order to establish the relationship between efforts and effects, between investment capacity and business performance, it is necessary to discuss certain concepts involving these two main elements, including asset management itself, asset value, MA maturity, asset performance indicators, business performance and business performance indicators (Aivaz, 2018a; Aivaz, 2018b).

Thus, in order to observe the evolution of the companies in the construction sector in Constanța County, it is necessary to analyze the way in which labor productivity in the sector was affected before and after the Covid-19 pandemic, given that productivity, as a primary form of economic efficiency, reflects the utility of an activity, in the sense of achieving a certain goal, in a given time interval (Mirea and Aivaz, 2016). Labor productivity is calculated as the ratio between turnover and number of employees and is considered the most relevant indicator used in economic analysis.

Figure 1 highlights the dynamics of labor productivity at the level of companies in Constanța County operating in the "Construction" sector for the 2018-2020 time frame.

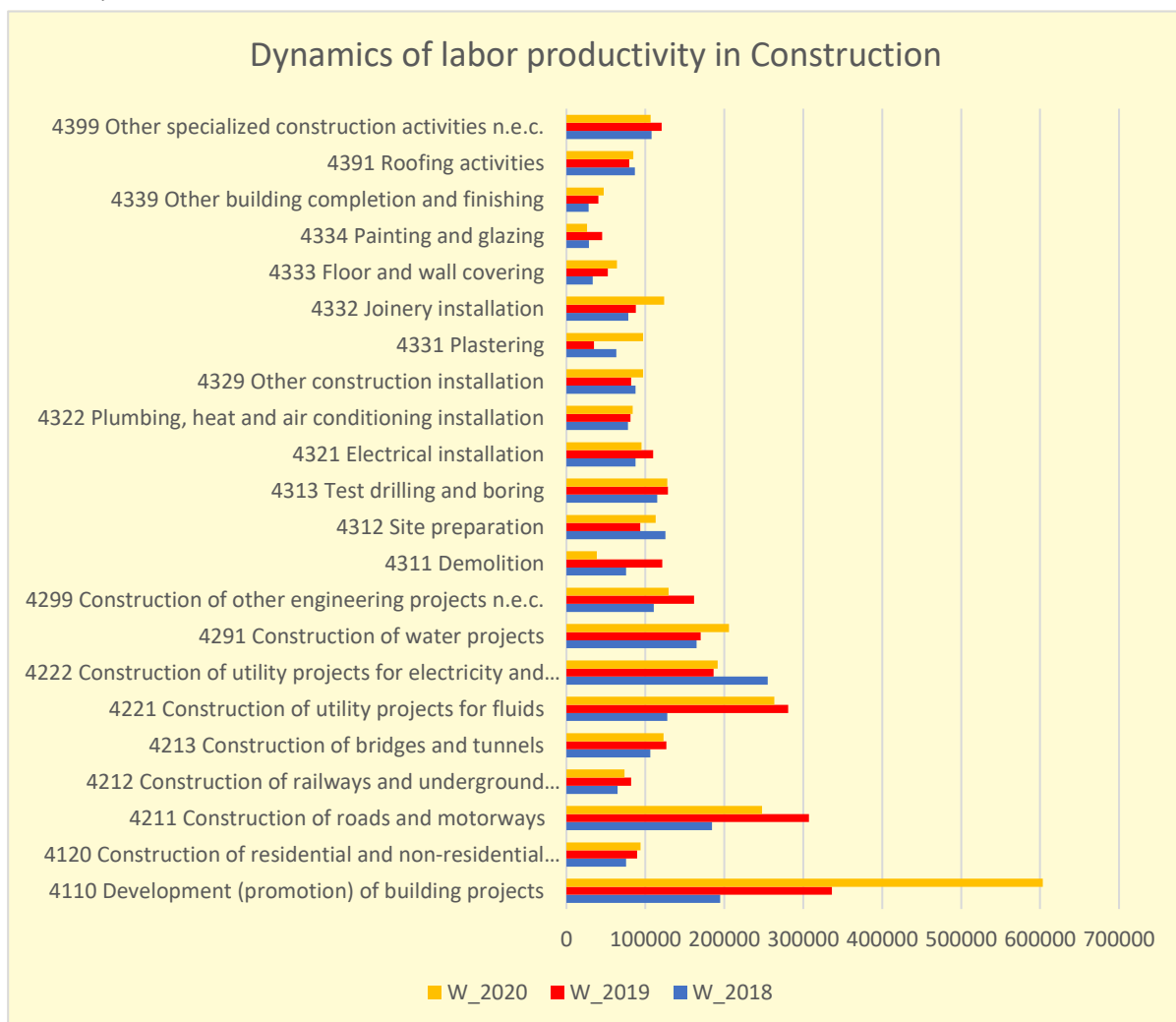


Figure 1. Labor productivity at the level of companies from Constanța County operating in the "Construction" sector

From the graph presented in Figure 1, it can be seen that in the year 2018 the highest level of productivity belongs to the group NACE 42.22 - *Construction of utility projects for electricity and telecommunications* (254993.8989 lei / employee), and the lowest to the NACE 43.39 group - *Other building completion and finishing* (28110.11667 lei / employee).

In the year 2019, the sub-activity *Development (promotion) of building projects* (41.10) has the highest productivity degree, with a value of 336380.9093 lei / employee, and the *Plastering* sub-activity (43.31) has the lowest productivity degree, of 34942.50397 lei / employee.

In the year 2020 it can be seen that the highest degree of productivity also belongs to the NACE 41.10 group - *Development (promotion) of building projects*, with a value of labor productivity of 603459.8761 lei / employee, an increase by 79% compared to the previous year. It can thus be deduced that the production factors are used efficiently in this sector of activity, compared to the NACE class 43.34 - *Painting and glazing*, which has the lowest degree of productivity, of 25945.64157 lei / employee.

There is a direct link between the construction sector and the economic development of the countries, hence the conclusion that construction productivity has a significant impact on the economy (Dixit et al., 2019). On the other hand, it is well known that the sustainable economic development of the construction sector is closely linked to the measures taken to intensively support public investment at central or local level. Sustainable development has become an increasingly frequent topic lately, thus the prerogatives of performance and operational continuity require attention within the study for a better future (Aivaz, 2021). In this context, the effort of economic agents must be directed towards identifying innovative solutions to support the prospects of increasing their performance, to professionalize the workforce existing on the market (Aivaz, 2016), to streamline outsourced logistics services or to provide various services related to the personnel. In a generic sense, the predilection for creating a sustainable material base seems to confirm the prospects of continuity and profitability in the case of companies that provide support services to other entities (Micu et al., 2016), such as the construction sector.

It should be emphasized that, although the construction sector is well developed in Constanța County and has registered significant increases, the analysis undertaken reveals that for some subgroups of activities labor productivity in the year 2020 was on a downward trend compared to the year 2019 and even 2018. The sub-activity with the best prospects is *Development (promotion) of building projects* (41.10), mainly due to the general trend of the increase in prices of housing and other real estate assets, a structural change in the residential investment market being evident. At the same time, remote work (i.e., working from home) triggered a higher demand for larger apartments / houses, which would better adapt to blending the professional life and personal life into a single unit (Kaklauskas et al. , 2021) as an effect of the COVID-19 pandemic.

Following the undertaken analysis, it can be seen that the productivity of companies in Constanța County operating in the construction sector has maintained an increasing trend before and after the Covid-19 pandemic, the likely reason being the construction projects for public investment carried out in the area.

5. Conclusions

The COVID-19 pandemic has had a serious impact on the global economy, with many countries taking emergency measures to mitigate the impact of the pandemic on commercial activities (Masayuki, 2021). Therefore, all necessary measures had to be taken to maintain the economic infrastructure, to avoid job cuts and the closing down of operational enterprises.

COVID-19 is the most critical health and safety risk facing the global construction sector (Olanrewaju et al., 2021). As a result, companies in the construction sector are facing difficulties in managing the workforce and financing their business due to the health crisis. However, although companies continue to operate at almost normal capacity, their costs have increased, due to the increasing costs of purchasing materials, the investment in protective equipment and the implementation of various measures to prevent the infection of their employees.

One solution for streamlining the sector is COVID-19 support measures for enterprises which include grants, financial support for different segments of the business population, tax delays and the temporary elimination of bankruptcy regulations (Groenewegen, Hardeman and Stam, 2021). In Romania, too, the Government has promoted measures to support the companies and their employees, which also focused on the construction sector, seen as a priority sector, so that entrepreneurs could ensure the financial flows needed to pay for materials and equipment, employees, subcontractors.

The moderate growth of the construction sector in recent years is driven by the rising prices for construction materials, the workforce crisis and the lack of support measures to intensively sustain public investment. Another cause of the moderate growth of the construction sector, in general is the COVID-19 pandemic. Rapid changes in investor behavior occurred during the pandemic, becoming evident in the construction sector (Kaklauskas et al., 2021).

References

- [1] K.A. AIVAZ: Aspects Regarding the Profitability of Companies in the Towns of Constanta County, in 2016 and 2017. *Ovidius University Annals, Economic Sciences Series*, ISSN: 2393-3127, ISSN-L: 2393-3119, **XVIII**(2), 88-93 (2018a).
- [2] K.A. AIVAZ: Dynamics of the Profit Rate of Companies Grouped by Activity Fields in Constanta. *Ovidius University Annals, Economic Sciences Series*, ISSN: 2393-3127, ISSN-L: 2393-3119, **XVIII**(2), 82-87 (2018b).
- [3] K.A. AIVAZ: Considerations on Asset Management and Turnover Factorial Correlations: The Case of Dobrogea Region, Romania. *Ovidius University Annals, Economic Sciences Series*, ISSN: 2393-3127, ISSN-L: 2393-3119, **XX**(2), 68-74 (2020).
- [4] K.A. AIVAZ: Investigating the impact of subsidy revenues on turnover at the level of companies in agriculture, forestry and fishing in the coastal area of the Black Sea. *Annals of "Dunarea de Jos" University of Galati, Fascicle I. Economics and Applied Informatics*, Print ISSN: 1584-0409, Online ISSN: 2344-441X, **2**, 31-38 (2021a), <https://doi.org/10.35219/eai15840409189>.
- [5] K.A. AIVAZ: Financial Performance Trends and Corporate Responsibility Incentives in a Group of Support Services in Constanța County, Romania. *Annals of "Dunarea de Jos" University of Galati, Fascicle I. Economics and Applied Informatics*, Print ISSN: 1584-0409, Online ISSN: 2344-441X, **1**, 52-60 (2021b), <https://doi.org/10.35219/eai15840409167>.
- [6] W.S. ALALOUL, M.A. MUSARAT, M.B.A. RABBANI, Q. IQBAL, A. MAQSOOM, W. FAROOQ: Construction Sector Contribution to Economic Stability: Malaysian GDP Distribution. *Sustainability*, **13**(9), 5012 (2021), <https://doi.org/10.3390/su13095012>.
- [7] D. ANTONESCU: Sectorul Întreprinderilor Mici și Mijlocii în timpul crizei COVID-19. Cazul României [The Small and Medium Enterprise Sector during the COVID-19 Crisis. The case of Romania]. *Munich Personal RePEc Archive*, 2020, https://mpra.ub.uni-muenchen.de/100295/1/MPRA_paper_100293.pdf.

- [8] L. CHIVU, G. GEORGESCU: Vulnerabilități ale pieței muncii din România sub impactul COVID-19 [Vulnerabilities of the Romanian labor market under the impact of COVID-19]. *Munich Personal RePEc Archive*, 2020, https://mpra.ub.uni-muenchen.de/101676/1/MPRA_paper_101676.pdf.
- [9] S. DIXIT, S. N. MANDAL, J. V. THANIKAL, K. SAURABH: Evolution of studies in construction productivity: A systematic literature review (2006–2017). *Ain Shams Engineering Journal*, ISSN 2090-4479, **10**(3), 555-564 (2019), <https://doi.org/10.1016/j.asej.2018.10.010>.
- [10] T. ERIKSSON, Z. QIN, W. WANG: Firm-level innovation activity, employee turnover and HRM practices — Evidence from Chinese firms. *China Economic Review*, ISSN 1043-951X, **30**, 583-597 (2014), <https://doi.org/10.1016/j.chieco.2014.02.005>.
- [11] Euler Hermes România, Criza COVID-19 stârnește o criză de profitabilitate majoră pentru IMM-urile din construcții [COVID-19 crisis generates a major profitability crisis for SMEs in the construction sector], https://www.eulerhermes.com/ro_RO/stiri-si-analize/ultimele-stiri/criza-covid-19-starneste-o-criza-de-profitabilitate-majora-pentru-imm-urile-din-constructii.html, accessed on 13.10.2021.
- [12] R. FULFORD, C. STANDING: Construction industry productivity and the potential for collaborative practice. *International Journal of Project Management*, **32**(2), 315-326 (2014), <https://doi.org/10.1016/j.ijproman.2013.05.007>.
- [13] Government Emergency Ordinance No. 114 of December 28, 2018 on the establishment of measures in the field of public investment and of fiscal-budgetary measures, amending and supplementing certain normative acts and extending certain deadlines, published in Official Gazette No. 1116 of 29 December 2018.
- [14] N. GHODRATI, T.W. YIU, S. WILKINSON: Unintended consequences of management strategies for improving labor productivity in construction industry. *Journal of Safety Research*, ISSN 0022-4375, **67**, 107-116 (2018), <https://doi.org/10.1016/j.jsr.2018.09.001>.
- [15] J. GROENEWEGEN, S. HARDEMAN, E. STAM: Does COVID-19 state aid reach the right firms? COVID-19 state aid, turnover expectations, uncertainty and management practices. *Journal of Business Venturing Insights*, ISSN 2352-6734, **16**, e00262, 2021, <https://doi.org/10.1016/j.jbvi.2021.e00262>.
- [16] B.C. GUERRA, S. SHAHI, A. MOLLAEI, N. SKAF, O. WEBER, F. LEITE, C. HAAS: Circular economy applications in the construction industry: A global scan of trends and opportunities. *Journal of Cleaner Production*, ISSN 0959-6526, **324**, 129125 (2021), <https://doi.org/10.1016/j.jclepro.2021.129125>.
- [17] A. KAKLAUSKAS, E.K. ZAVADSKAS, N. LEPKOVA, S. RASLANAS, K. DAUKSYS, I. VETLOVIENE, I. UBARTE: Sustainable Construction Investment, Real Estate Development, and COVID-19: A Review of Literature in the Field. *Sustainability*, **13**(13), 7420 (2021), <https://doi.org/10.3390/su13137420>.
- [18] M. MASAYUKI: Productivity of firms using relief policies during the COVID-19 crisis. *Economics Letters*, Elsevier, **203**(C), 2021, <https://doi.org/10.1016/j.econlet.2021.109869>.
- [19] L. MA, H.J. LIU, D. EDWARDS, M. C.P. SING: Housing Price Dynamics on Residential Construction: A Case Study of the Australian Property Sector. *Structural Change and Economic Dynamics*, ISSN 0954-349X, 2021, <https://doi.org/10.1016/j.strueco.2021.10.001>.
- [20] A. MICU, A. E. MICU, K. AIVAZ, A. CAPATINA: The Genetic Approach of Marketing Research. *Economic Computation and Economic Cybernetics Studies and Research*,

ISSN: 0424-267X, eISSN: 1842-3264, **50**(3), 229-246 (2016).

- [21] M. MIREA, K.A. AIVAZ: Analyzing "the workforce cost" and "the net nominal earnings" in the main economic activities, by principal component analysis. In Pamfilie, R. et al. (Eds.), *BASIQ International Conference: New Trends in Sustainable Business and Consumption*, ISSN: 2457-483X, Bucharest, RO: ASE, 201-209 (2016).
- [22] D.-G. J. OPOKU, S. PERERA, R. OSEI-KYEI, M. RASHIDI: Digital twin application in the construction industry: A literature review. *Journal of Building Engineering*, ISSN 2352-7102, **40**, 102726 (2021), <https://doi.org/10.1016/j.jobe.2021.102726>.
- [23] A. OLANREWAJU, A. ABDULAZIZ, C.N. PREECE, K. SHOBOWALE: Evaluation of measures to prevent the spread of COVID-19 on the construction sites. *Cleaner Engineering and Technology*, ISSN 2666-7908, **5**, 100277 (2021), <https://doi.org/10.1016/j.clet.2021.100277>.
- [24] L.S. PHENG, L.S. HOU: The Economy and the Construction Industry. In: Construction Quality and the Economy. *Management in the Built Environment*. Springer, Singapore, 2019, https://doi.org/10.1007/978-981-13-5847-0_2.
- [25] A.-I. PETRIȘOR, L.-E. PETRIȘOR: Recent land cover and use in Romania: A conservation perspective. *Present Environment and Sustainable Development*, **15**(1), 81-92 (2021), DOI: <https://doi.org/10.15551/pesd2021151007>.
- [26] A.-I. PETRIȘOR, I. SIRODOEV, I. IANOȘ: Trends in the National and Regional Transitional Dynamics of Land Cover and Use Changes in Romania. *Remote Sensing*, **12**(2), 230 (2020), <https://doi.org/10.3390/rs12020230>.
- [27] A.-I. PETRIȘOR, L. MIERZEJEWSKA, A. MITREA, K. DRACHAL AV. TACHE: Dynamics of Open Green Areas in Polish and Romanian Cities during 2006–2018: Insights for Spatial Planners. *Remote Sensing*, **13**(20), 4041 (2021), <https://doi.org/10.3390/rs13204041>.
- [28] M. RUS, M.L. SANDU, T. TASENȚE: Covid-19 crisis in Romania - between perception and attitude. *Technium Social Sciences Journal*, **6**(1), 69–87 (2020), <https://doi.org/10.47577/tssj.v6i1.332>.
- [29] M.I. STAN, D.F. VINTILĂ: An Investigation of the Structure of Fixed Assets of Construction Companies in the Context of Coastal Area Development. *Ovidius University Annals, Economic Sciences Series*, ISSN: 2393-3127, ISSN-L: 2393-3119, **XXI**(1), 171-178 (2021).
- [30] M.I. STAN, K.A. AIVAZ, I. IONIȚIU: Projects to Reduce the Coastal Erosion of the Romanian Black Sea Area. *Ovidius University Annals of Constanta-Series Civil Engineering*, **21**(1), 109-114 (2019), DOI: <https://doi.org/10.2478/ouacsce-2019-0013>.
- [31] M. ZUBIZARRETA, J. CUADRADO, J. IRADI, H. GARCÍA, A. ORBE: Innovation evaluation model for macro-construction sector companies: A study in Spain. *Evaluation and Program Planning*, ISSN 0149-7189, **61**, 22-37 (2017), <https://doi.org/10.1016/j.evalprogplan.2016.10.014>.
- [32] *** ARACO: Sectorul construcțiilor din România față în față cu provocarea pandemiei COVID-19 [The construction sector in Romania faces the COVID-19 pandemic] in *Constructions Magazine* no. 170 from June 2020, <https://www.revistaconstrucțiilor.eu/index.php/2020/06/01/araco-sectorul-construcțiilor-din-romania-fata-in-fata-cu-provocarea-pandemiei-covid-19/>, accessed on 20.10.2021.
- [33] *** European Commission, *Eurostat*, <https://ec.europa.eu/eurostat/data/database>, accessed on 18.10.2021.

- [34] *** Federația Patronatelor Societăților din Construcții / Employers' Federation of Building Companies, Acord între Guvernul României și Federația Patronatelor Societăților din Construcții [Agreement between the Government of Romania and the Employers' Federation of Building Companies], <https://federatiaconstructorilor.ro/files/docs/AcordConstructiiFPSC-GuvernulRomaniei.pdf>, accessed on 16.10.2021.
- [35] *** International Work Finder, Construcțiile civile și industriale – domeniu afectat de criza forței de muncă și soluțiile care se aplică deja în compensare [Civil and industrial construction – an area affected by the workforce crisis and solutions already applied in compensation], <https://work-finder.eu/construcțiile-civile-afectate-de-penuria-de-angajati/>, accessed on 15.10.2021.
- [36] *** National Institute of Statistics, <https://insse.ro/cms/>, accessed on 20.10.2021.